Nicole Pfeffermann · Tim Minshall
Letizia Mortara *Editors*

Strategy and Communication for Innovation

Second Edition

Springer

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Foreword

The most effective way to cope with change is to help to create it.
I. W. Lynett

The ability to innovate—i.e. successfully introduce new products and services to the market—is a key success factor that underpins the profitability and competitive advantage of firms. Innovation management thus needs to be considered as a core organisational capability for all growth oriented firms. In recent years, due to pressure for higher rates of innovation and the widespread diffusion of new technologies, innovation management has gained increasing importance for all firms. However, whereas in the past innovation was mostly driven through internal Research & Development (R&D) activities, today's firms need to rely on more cross-functional innovation teams and on the engagement with various external stakeholders to achieve the required level of innovation performance. External engagement is needed not only to allow firms to fuel their new product and service development pipelines, but also to commercialize their internally developed innovations in new ways. The ability to manage these 'open innovation' processes has become a necessity for firms today. Consequently, interest in open approaches to innovation among managers and researchers has risen sharply over the past 10 years. One output of this increased interest has been the recognition of the importance of communication for success in open innovation. From a strategic management perspective, communication represents a critical skill needed to explore and create the diverse routes for the commercialization of ideas across functions, organizations and industries. Communication facilitates information exchange through various channels for building trust between stakeholders, leading to corporate reputation-building in the long-run. Via appropriate communication firms can build and re-configure resources and capabilities for innovation, such as innovation communities.

This book presents an update on the state-of-the art theoretical and practical understanding of this field, building upon the initial steps developed in the first edition. This new volume bridges the gap between innovation management and communication management to reveal multiple perspectives on strategic innovation.

This book, organized around eight central themes, is a resource for managers and researchers alike that provides new insights, perspectives, examples and interesting case studies on the role of communication in an open innovation world.

Business Model Innovation and Strategic Open Innovation

How can companies overcome business model innovation challenges and design open innovation initiatives to achieve business growth?

The opening paper by Eppler and Hoffmann identifies internal business model innovation challenges and highlights visual solutions to overcome obstacles of managing and communicating the multi-stage process of organizational transformation. This chapter provides a literature review and a new perspective on business model innovation to illustrate its challenges and the potential of using visual solutions to overcome them. Visualization helps companies to overcome critical obstacles to the renewal of their business model such as the constraints of the dominant logic and the problems of creating new knowledge. Visualization approaches such as *sketching* used in combination with tools such as *scenario planning* allows the comparison and contrasting of different future views facilitating the analysis of the 'big picture' and challenging the dominant logic.

The chapter by Vanhaverbeke and Roijakkers advocates for the integration of open innovation initiatives into strategy, beyond the activities of product development, and the need for an investigation into management processes for such a purpose. This broader perspective on open innovation has implications for both academic theory (where open innovation is typically linked with the new product development funnel) and for open innovation management practice within a broad spectrum of firms, including those who do not carry out new product development themselves.

The chapter by Moeslein presents strategic options for open innovation and discusses core tensions in managing strategic open innovation initiatives. Three types of innovators in open innovations exist: core inside innovators, peripheral inside innovators, and outside innovators. These types can be integrated in open innovation through the use of five innovation tools for successfully designing open innovation initiatives. The tools allow for large numbers of innovators to contribute, to empower these innovators to collaborate in widely distributed settings, to foster high-speed interaction, and to provide a global memory for innovators to build on.

Breakthrough Innovation

How can companies deal with breakthrough innovation?

Breakthrough innovation can lead to corporate growth and new business opportunities. The chapter by Ford, Ferriani and Probert identifies two basic conditions for companies to engage in breakthrough innovation: (1) The creation of an environment conducive to idea generation and (2) the capability to accept risk. In this chapter, the mechanisms through which established firms can harness these fundamental enablers are explored, providing an overview of the main factors that

cause established firms to oppose breakthrough innovation projects and conceptualizing the generation of breakthrough innovation as a two-stage search-selection process. Focusing on the selection phase, this chapter proposes three types of regime that established firms can adopt to overcome innovation barriers: (1) individual driven (2) lead user driven and (3) application domain driven. Examples from BAE Systems, Rolls-Royce and ARM are used to illustrate the effectiveness of these selection regimes.

Capabilities and Resources for Innovation

How can companies systemically create knowledge through co-creation, build strategic innovation networks, and drive organizational flexibility for innovation?

Open innovation does not only focus on product innovation; it also involves other activities such as service innovation and co-development on strategic corporate level with external parties. The chapter by Koch, Rapp and Kröger investigates how web-based co-creation platform design helps to develop a new political strategy by systematically attracting the knowledge of experts and individual members of the public. A new insight from this chapter is that open strategy should result in communication-oriented change projects rather than just software-focused web-based platform projects.

The chapter by Crispeels, Huculeci, Willems and Scheerlinck states that knowledge is a critical resource underpinning successful innovation acquired through inter-organizational networks. Empirical research in the Flanders' biotechnology industry provides new results and perspectives on how actors in industries interact in different networks, such as innovation networks and strategic networks. By using social network analysis methods, the researchers show that collaboration between two organizations on one network level might lead to various forms of interlocking of the organizations at other network levels.

The last chapter of this section by Hülsmann, Tilebein, Cordes and Stolarski provides a perspective on innovation capability from a strategic management perspective. The capability to imagine alternative strategic logics and management processes is a basic condition for organizational flexibility. The main conclusion of this chapter is that strategic management should be aware of cognitive diversity to unlock the full potential of organizations. The authors recommend applying an agent-based system to investigate conditions under which cognitive diversity contributes to innovation capability.

Multiple Perspectives on Communicating Innovation

How can companies communicate in innovation clusters? How can managers communicate innovation to address stakeholder's desires, interests, and emotional needs?

The chapter by Blasini, Dang, Minshall and Mortara focuses on the role of communicators in innovation clusters. This chapter reveals that an understanding of the role of key communicators in innovation clusters is essential in order to understand the dynamics of communication interrelations and the links to cluster development. One insight is that communicating inside and outside a cluster demands the creation of a common language for successful information exchange relating to complex innovations with a broader audience.

As the open innovation process becomes accessible to consumers and other external parties, new challenges in innovation communication emerge. The chapter by Bruhn and Ahlers describes an approach for integrated innovation communication that aims to ensure the systematic coordination of complex tasks and the interfaces used to communicate in an open innovation process. Based on an integrated marketing communication approach, this chapter covers a multi-level process of integrated innovation communication that spans from idea generation to stagnation, and highlights the communication elements that help ensure the integration of several components throughout an open innovation process.

What determines the success of innovation? Customer focus represents the key success factor for companies, and professional innovation marketing therefore results in the so-called competitive innovation advantage (CIA). This chapter by Steinhoff and Trommsdorff describes basics of innovation marketing as a field in marketing science to answer the question from a market-related perspective.

A critical success factor in the commercialization of an innovation is people and their word-of-mouth (WOM) communication. WOM communication can foster information transmission of new products and services throughout the market. The chapter by Mazzarol presents new perspectives on the nature of social capital, strategic networking (the *commercialization net*) and WOM communication in the commercialization of innovation. It shows that firms need to possess strong networks at the production, resource, and social layers in order to support the adoption of an innovation.

In the last chapter of this section, Mast presents an internal perspective on how communication strategy can be created for communicating innovations. Based on the results from a study conducted in Germany, Mast concludes that innovation communication programs can be planned, but there remains a lack of knowledge regarding stakeholder's desires, interests, and emotional needs.

Managing Communication for Innovation

How can companies efficiently manage internal and external communication activities for innovation?

The chapter by Pfeffermann provides a new perspective on visual and scent-based communication for innovation in the digital information age. Although the sense of smell is the oldest human sense, only in recent years scholars have studied scent and its psychological effects to tap into someone's emotional responses and memory. This chapter presents a theoretical approach of integrating innovation communication with concepts from psychology research, introducing a new management approach of innovation communication. The three-step model proposed encompasses re-/designing, implementing, and measuring innovation communication and points out specific analytical and visual-creative tools that could support planning innovation communication. The chapter suggests integrating scent-based communication in innovation management to emotionally reach to stakeholders and engage them in open innovation by addressing their desires and needs.

Innovation Communication and Collaborative Innovation

How can companies coordinate (open) communication activities for innovation and strengthen collaborative innovation?

The chapter by Belasen and Rufer identifies characteristics of adaptive culture and innovation communication that contribute to effective interfunctional collaboration. Based on the Competing Values Framework for Corporate Communication, roles, relationships, and communication patterns become apparent for successful commercialization of technology through open innovation. The new insight from this chapter is that lateral communication in organizations and an adaptive culture represent the most effective mechanisms to facilitate interfunctional coordination.

The chapter by Pfeffermann describes the cross-functional innovation communication capability. This capability is defined as the transmission of information between an organization and its stakeholders to increase corporate value. Three functions are needed for innovation communication: (1) *building* and *modifying function* (knowledge creation), (2) *improving function* (management of strategic assets) and (3) *intensifying function* (corporate innovation reputation). The chapter presents eight dimensions of the innovation communication capability and illustrates the direct and indirect effects of innovation communication on corporate value.

Features of a relational communication strategy for effective collaborative innovation include high communication quality, bi-directionality, and open communication climate. The chapter by O'Toole and Holden identifies nine features

and four key mechanisms to increase communication in collaborative innovation. Illustrative examples are provided to support propositions about the features and mechanisms of a communication process in successful collaborative innovation.

Collaborative innovation also implies to focus on collaborative communication. This issue is discussed in the chapter by Viardot, which points to the emergence of a new category of manager (*network orchestrator*) who is capable of interacting and communicating clearly, simply, effectively and consistently with all innovation partners. This chapter presents results on how technology-driven companies have to redefine information flows and engage the whole company into collaborative innovation rather than only innovation teams.

Social Capital and the Social Enterprise

How can companies move from a 'learning' to a 'sharing' paradigm?

The chapter by Ferguson addresses the question 'What are the strategic considerations in using social media platforms and open source practices such as crowdsourcing as tools in innovating organizations?' Ferguson discusses this question from several perspectives, and explores seven characteristics of audiences that should be taken into account in planning for innovation and suggests theories that support a user orientation. The key words for success in the new digital world are identified as *trust*, *respect*, *transparency*, *openness*, *sharing*, *recognition*, and *timeliness*. This chapter emphasizes that strategic planning for communication of innovation demands building on the existing knowledge of audiences, social media, crowdsourcing, communication, and innovation theories.

The chapter by Rodríguez-Montemayor provides a literature review from a multi-disciplinary perspective that explores the impact of social media on the innovation process. Organizations are *networks of conversations* and innovation activities are taking place via a sense-making process across teams and business networks. Social media can support making sense of knowledge in the context of the firm's overall strategy; i.e. social media supports innovation narratives resulting in the unlocking of the full potential of novel ideas through a common and clear innovation strategy.

Innovation and Communication Strategy in Practice

How can companies design integrative innovation and communication strategy?

The chapter by Andersen presents the case of Danske Bank, one of the Nordic region's leading banks, using the structure provided by the *Innovation Radar Framework*. It provides an in-depth analysis of the reasons why a communication

strategy should be an integral part of a company's overall corporate innovation strategy.

The final six chapters present specific case examples, illustrating different aspects of innovation communication in practice. Eberl describes how communicating for innovation has been managed by Siemens on a holistic basis, with particular focus on the firm's environmental technologies.

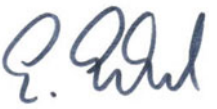
Steinhoff and Breuer describe the approach taken by Telekom Innovation Laboratories to develop a user-centered innovation approach to identify and specify options for radical innovation. The case study focuses on the initiation phase of the approach, with emphasis on the use of *Futures Workshops*.

The operation of SAP's Global Co-Innovation Lab Network is discussed by Patsch and Zerfass. This chapter uses a social structural perspective on innovation and communication to describe how structures are created to enable co-innovation actions in organizational practice.

Kröper, Bilgram, and Wehlig describe how Vorwerk Thermomix Research Community uses online research communities to gain consumer insights and create new products. They describe how a strongly committed group of people helps to establish in-depth dialog in which people not only perform a particular task assigned to them, but also exchange, share and develop ideas.

Kastelle and Ohr present the two contrasting cases of Lorna Jane and TravelOrg to discuss how social media can influence all phases of an innovation process, and the links between use of social media and innovation capability.

The final chapter focuses on innovating and communicating in networks through orchestration. Cartwright and Smith illustrate how this is exemplified by emerging artists who independently promote and sell their music.



Ellen Enkel

Acknowledgments

The collection of works, published in this edition, aims to make a valuable contribution to the area of strategic innovation management and communication, covering recent and future developments in open innovation, innovation communication and management practice on managing and communicating innovation online and offline in the innovation economy.

A number of people have contributed to making the second edition of this book possible. First of all, we would like to thank Prof. Dr. Hülsmann, Jacobs University Bremen, and Thomas Lehnert, Senior Editor Engineering at Springer-Verlag, who saw the potential of this project and gave their early commitment to the concept of this book as well as the support that brought the book's first edition to fruition. Special thanks also go to Jan-Philip Schmidt, current Editor, Physical Sciences and Engineering, and his Book Coordination Manager Ms. Heather King, for their support and advice in preparing the book manuscript and market launch.

Writing book chapters is especially challenging when submission deadlines compete directly with other academic, professional, and social tasks. We would like to express our strong gratitude to all authors for taking the time to contribute a chapter.

Finally, our thanks go to the readers and reviewers of the first edition, who have supported us preparing this second volume. Last but not least, we sincerely hope that researchers, students, colleagues, business managers, and innovators/visionaries will enjoy reading this book and be inspired by multiple perspectives and theoretical and managerial implications provided by the thoughtful book chapters.

Bremen, April 9, 2013

Nicole Pfeffermann
Tim Minshall
Letizia Mortara

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Part I
Strategic Perspectives on Innovation

Chapter 1
Strategies for Business Model Innovation: Challenges and Visual Solutions for Strategic Business Model Innovation

Martin J. Eppler and Friederike Hoffmann

Abstract Business model innovation is a key task of an organization's senior management team. Little is known, however, about business model innovation challenges that need to be addressed and how managers can structure the task of developing novel and commercially viable business models. This chapter analyzes the challenges an organization faces when changing the current business model and proposes visual solutions to overcome these challenges and develop new business models in existing firms. The argument supporting this proposition is developed in three stages: First, based on the existing management literature on business models, this chapter derives a set of challenges for business model innovation. Second, leveraging current visualization research, the chapter discusses several visual solutions to these specific challenges. Finally, we discuss how the characteristics of visual tools can practically support senior management teams in meeting the challenges of business model innovation.

1.1 Introduction

The innovation of business models is one of today's most challenging tasks for managers (Chesbrough 2006; Christensen and Raynor 2000) as both rapid technological and environmental changes proceed (Johnson et al. 2008). Nevertheless, anecdotal evidence suggests that business model innovation is not yet treated systematically, but often happens by chance or not at all. While innovation is on the strategic agenda of most firms today, which have extended their resources and strategic efforts to foster innovation by exploring new technologies and business services or processes (Dougherty 1992), many organizations have shown limited abilities to innovate their business models (Chesbrough 2010).

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The risks and costs associated with changing the current business model places the task for innovation at top-management and strategic units (Peterovic et al. 2001). Aiming at changes to the core of a company's value proposition, business model innovation affects and concerns various, if not all stakeholders inside as well as outside the firm. Among the challenges to be met by the development team are the needs to collect, process and distribute information, structure an inclusive and creative process to develop a new business model, while being under both time and economic pressure.

Furthermore, relatively little is known about how new business models are developed. The few existing studies on business model innovation were conducted ex post, as for example the study of Hilti's business model innovation (Johnson et al. 2008; Meehan and Baschera 2002). Considering the high risk that business model innovation poses to the survival of a firm, other researchers have suggested to develop scenarios in order to explore the feasibility of new business model options (Jonda 2007; Pateli and Giaglis 2005).

So far, no sufficient method for business model innovation has been developed. Nevertheless, first approaches are proposed. Chesbrough (2010) suggests that experimentation in existing firms with new business models is the key to gain sufficient data to decide upon the most successful option for a functional new business model, while Voelpel et al. (2005) see the need for "sensing" customer needs and business model requirements. Thus, a business model innovation development procedure needs to offer means to change the current business model, while at the same time minimize the risks of failure through testing new business model prototypes.

We believe that two issues are key for business model innovation as a management and communication process: first, the challenges a firm faces need to be identified and second should be targeted with visual solutions in order to develop new business model ideas. This chapter identifies in a first step challenges for business model innovation and, second, visual solutions from the existing literature, therewith combining two literature streams towards a systematic process of business model innovation. We suggest visual solutions, as visualization facilitates knowledge creation and transfer, structures knowledge and team processes and thus can facilitate innovation.

In contrast to our approach in this chapter, extant research only focuses on establishing a common business model definition, evaluating business model components and identifying business model types and typologies. Disagreement exists among scholars on whether business models are to be understood mainly as method, process or strategy (Lambert 2006; Osterwalder and Pigneur 2002; Pateli and Giaglis 2004). We follow Magretta (2002), who argues that business models describe how the pieces of a business fit together by telling a story that explains how an enterprise works, and should not be confused with the above stated terms (Magretta 2002). A business model does not fix the strategy for achieving the business goals, nor does it explicitly provide how the model may be implemented. As a working definition, we follow the comprehensive definition provided by Osterwalder et al. (2005):

> A Business Model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. In a description of the value a company offers […] to customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate […] revenue streams.

As business model innovation has not been defined in the literature, we refer to it based on our business model definition and in analogy to the highly recognized innovation definition by Baregheh et al. (2009) "Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace" (Baregheh et al. 2009).

Hence, *business model innovation is a multi-stage process whereby organizations transform new ideas into improved business models in order to advance, compete and differentiate themselves successfully in their marketplace.*

In Sect. 1.2 we outline is the difficulties firms encounter when aiming to change their business model.

1.2 Business Model Innovation Challenges

Every firm faces well-analyzed external environmental challenges relevant to its business model, as illustrated in Porter's Five Forces framework (Porter 1985). While these challenges often initially induce the need to innovate the current business model of a firm, there are many important *internal* challenges to innovation that need to be considered as well. In the following, we develop an inventory of *internal* challenges firms face when attempting to find new business models.

Chesbrough (2010) focuses on two main challenges to business model innovation, which we continue to use for our analysis: confusion of what the right business model may be, which he refers to as *cognitive challenges*, and obstruction by the firms internal structures and processes, which we refer to as *organizational challenges*. These two main challenges to business model innovation may also be described as barriers to innovation, which are "conflicts with existing assets and business models, as well as cognition in understanding these barriers" (Chesbrough 2010).

For an initial list of business model challenges, we have analyzed the literature on business model innovation, on innovation processes in firms, as well as on knowledge creation and problem solving in groups. We have then matched the challenges with potential visual solutions, which we have identified in previous research as being essential to facilitate innovation in organizations. We continue by introducing three cognitive and three organizational challenges.

1.2.1 Cognitive Challenges

The cognitive challenges we have identified are based on the *individual level* and fall into three main themes: challenges based on the *complexity* of the task, the existing *dominant logic*, and the *knowledge* required.

The first challenge for business model innovation we address is its *complexity* (Damanpour 1996; Lundberg and Richards 1972). The complexity of the task of mastering business model innovation is expressed by the uncertainty of the innovation process itself (Doganova and Eyquem-Renault 2009; Garud and Karnoe 2003), and especially overwhelming when carefully assessing and understanding the firms current business model (Erikkson and Penker 2000; Malhotra 2000; Osterwalder and Pigneur 2002; Pateli and Giaglis 2005), which is one of the prerequisites of business model innovation. Complexity usually arises when many elements, which are interrelated in an intransparent manner, need to be considered. This is given for business model innovation, as market forces and internal developments are not always inter-related in an easily discernable fashion.

For some researchers the major obstacle to business model innovation is the *dominant logic of a firm* (Chesbrough and Rosenbloom 2002), which is "the way in which managers [in a firm] conceptualize the business and make critical resource allocations decisions" (Prahalad and Bettis 1986). The logic is stored via shared schemas, cognitive maps, mind sets as well as belief structures, and frames of reference; and is determined by the managers' previous experiences. Managers appear to focus on data relevant for the dominant logic; however, if the task is to change the dominant logic of doing business by developing a new business model, the dominant logic may pose a serious obstacle to innovation. The dominant logic filters out ideas that are not conform to the dominant logic. Chesbrough (2006) refers to the dominant logic earlier in his work as "bias of the current business model". The dominant logic is also described as path-dependency (Coombs and Hull 1998) or the need to change a company's mindset (Wall et al. 2007). Furthermore, the dominant logic is understood as circular logic, as the logic influences actions, and the result of the actions shapes the dominant logic through feedback (von Krogh et al. 2000). Hence, the current business model can be understood as the dominant logic of the firm, which is questioned if substantial problems or a substantial crisis of the current dominant logic arise (von Krogh et al. 2000).

Research on the dominant logic is highly advanced, with already certain strategies suggested to overcome the dominant logic of the firm. Christensen (1997), Christensen and Raynor (2003), as well as Amit and Zott (2001) see the major requirement for business model innovation in a new way of strategic thinking towards a more integrative, dynamic, adaptive, and entrepreneurial strategies in order to overcome the firm's internal resistance, or *dominant logic*, in developing and adopting a new business model. As Chesbrough (2010) notes, those conflicts arise from the underlying configuration of assets that support the prevailing business model. Doz and Kosonen (2010) argue, that both *distancing* and *abstracting* are required for the generation of new perspectives and

alternatives, by considering the possibility of applying different business models to the same business (Doz and Kosonen 2010). Also, *cognitive diversity* among executives is necessary to allow for the generation of genuinely different and independent alternatives (Peterovic et al. 2001). Furthermore, cognitive biases, as for example the role and interrelationship between search processes that are forward-looking, are based on the actors' cognitive map of action-outcome linkages, while those that are backward-looking, or experience-based (Gavetti and Levinthal 2000), relate to the dominant logic of the firm.

Thus, while first potential solutions to handle the challenge posed by the dominant logic of the firm exist, the challenges is far from being met and remains among the major obstacles to business model innovation.

The third cognitive challenge is concerned with *knowledge* sharing and creation across epistemic boundaries (Carlile 2002, 2004; Dougherty 1992; Peterovic et al. 2001), essential to any kind of innovation and necessary if the new business model is elaborated in team work. The creation of knowledge occurs through the insights resulting from the information pooling process (Harris and Woolley 2009) and from interacting with other sources of knowledge outside the team, which may be internal or external to the company (Nonaka 1999). The management of group processes (in-group bias) and the group knowledge work in teams pose another related challenge to successful business model innovation. Groups often encounter challenges beyond their prior knowledge and experiences, and then having to learn how to materialize innovative ideas under pressure in a dynamic environment (Chao-Tung and Yi-Wen 2007). This type of knowledge integration is hence a fragile process that requires systematic and continuous support with corresponding tools. In the following section we will show that visual methods can be fruitfully used to meet this challenge.

1.2.2 Organizational Challenges

The organizational challenges we have found are threefold as well: challenges based on the *resources*, *values* and the *team* (Christensen and Raynor 2000; Leonard-Barton 1992).

Resource fluidity is emphasized as core challenge for business model innovation by most scholars (Christensen and Raynor 2000; Doz and Kosonen 2010; Leonard-Barton 1992; Zott and Amit 2010). The resources available for business model innovation build the foundation for the whole idea generation and later implementation. Without sufficient resource allocation and support, business model innovation is doomed from the start. Hence, Doz and Kosonen (2010) argue, that resource handling is among the core capabilities for innovation, as they understand resources as "the internal capability to reconfigure capabilities and redeploy resources rapidly" (Doz and Kosonen 2010). Furthermore, the resources necessary in order to change a firms current business model need to be carefully

assessed in order to identify core resources, which may continue to offer an competitive advantage based on their position in the new business model.

A firm's *values* are important for business model innovation as they are expressed by the firm's culture, working methods, and habits; all of which are in movement when a new business model is developed. Changing working methods, habits, and culture require involving employees and their creativity in the innovation process, thus, an overall change in a firm's culture may become necessary (Bettis and Prahalad 1995; Christensen and Raynor 2000; Doz and Kosonen 2010). The most important issue concerning values is that they are for most part not stated explicitly. Thus, it becomes a challenge to identify the values which may foster change and those which are preventing change.

Choosing the right *team* for business model innovation is another challenge, as multiple stakeholders are involved in business model innovation, which leads to conflicts between departments, such as operations, engineering, marketing, sales and finance (Bettis and Prahalad 1995; Chesbrough 2010). Once the team is established, it has to be enabled to work properly, which requires to identify values, motivations, expectations and hidden agendas. Furthermore, coordination challenges to organize team work may hinder the business model innovation process substantially (Bartel and Garud 2009; Doganova and Eyquem-Renault 2009).

To summarize this section, we have depicted the challenges and their relations in Fig. 1.1. We found that one major challenge effects all other challenges, namely the *dominant logic*, while all of the challenges influence and add to one challenge, namely *complexity*.

The challenge of the *dominant logic* affects all challenges that we have identified by setting the mindset, previous *knowledge*, *team* compositions and determines the firms' *values*. As Chesbrough and Rosenbloom (2002) argue, the dominant logic filters out ideas and behaviors that do not comport with the current dominant logic of the firm, thus doing anything in a new way becomes inherently difficult. The dominant logic also influences patterns of *resource allocation* through its impact on executive's decision making criteria in the resource allocation process. Changes in resource allocation that are necessitated by a new business model thus have to overcome strong organizational inertia. Last, the dominant logic adds to the *complexity* of the task.

Furthermore, the team challenges are influenced by and influence knowledge and value challenges. The *team* challenge impact on both the *values*, as corporate values and individual values influence any team process and especially the unity among the team members (Chesbrough 2010), as well as on *knowledge* creation and sharing, while the *resources* and their flexible allocation build the foundation of business model innovation (Chesbrough 2010; Doz and Kosonen 2010; Zott and Amit 2010).

Finally, the challenge which is the result of the previously mentioned challenges is *complexity*. The complexity as a challenge itself is thus further enhanced by the specified interaction of business model innovation challenges.

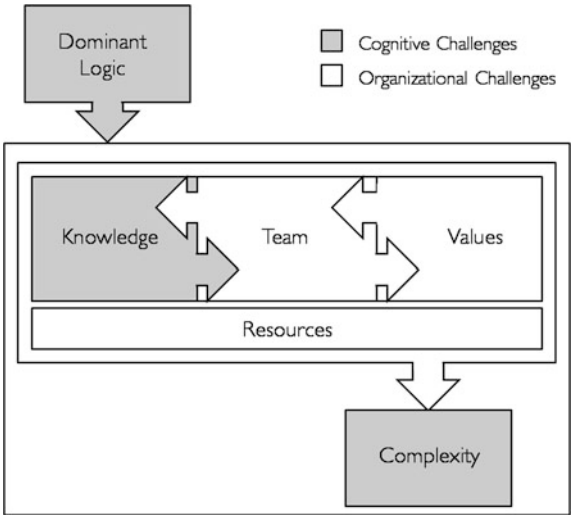

Fig. 1.1 Business model innovation challenges

1.3 Visual Solutions for Business Model Innovation Challenges

The challenges business model innovation poses to any organization are not only multiple, but are interlinked, as argued and visualized in the section above. In our research on visualization tools and techniques in management, we found that visualization offers multiple opportunities to tackle the identified challenges, as it enables cooperation, clarifies complex issues and fosters creativity.

The opportunities offered by visual tools are emphasized by boundary object theory, with boundary objects being agents that socially organize distributed cognition. Furthermore, boundary objects allow members of different groups to read different meanings particular to their needs from the same material, while cognition is distributed by forms of nonverbal knowledge, for example through interactions with sketches and drawings (Henderson 1991; Star and Griesemer 1989). Recent findings on boundary objects theory suggest that boundary objects are involved in innovation activities. Examples in the literature are sketches and drawings (Carlile 2002; Henderson 1991; Doganova 2009).

Business model innovation requires the innovation team to consider and understand various and potentially conflicting positions of the stakeholder and units affected, complexity needs to be structured and mastered, which is considerably facilitated through the created artifacts. In addition, positions of stakeholders can be visualized and taken into consideration from the very beginning through visualizing brainstorming, position taking and rapid prototyping. Sketches, for example, can serve as boundary objects and assist communication to refine ideas further; serving to assist shared cognition and capture pertinent and implicit knowledge from different sources (Carlile 2002; Henderson 1991).

In a first step, we will match the identified challenges with visual solutions we have identified and experimented with.

Visualization helps to overcome the *dominant logic* of the firm by challenging self-imposed constraints (Mintzberg and Van der Heyden 1999; Platts and Kim Hua 2004), focusing attention (Fiol and Huff 1992; Platts and Kim Hua 2004) and enabling playful exploration of other mindsets (Mintzberg et al. 2007). For business model innovation sessions, we suggest to use scenario diagrams, which enable different views on the future (Huff 1992); and sketching, which fosters big picture thinking and abstracting (Mayer 2008).

The dominant logic influences the challenges posed by knowledge, the team and corporate along with the individual team members values, as well as resource allocation. These add to the overall complexity of the issue. In order to ease the challenges posed for the *team*, research has shown that visualization generally fosters mutual learning in teams (Bresciani and Eppler 2009) and offers coordination benefits (Eppler and Platts 2009). We suggest to use strategy roadmaps, in order to create involvement and foster creativity in innovation teams (Blackwell et al. 2008), as well as using sketches and prototypes to help integrating different viewpoints (Schön 1984). Following Schön (1984), visualization further elicits implicit values and triggers value-related dialogues, which facilitates to handle team members values just as dominant corporate values.

Knowledge creation and sharing is facilitated by visualization, as visualization generally stimulates thinking (Tufte 1990), fosters shared thinking (Fiol and Huff 1992), triggers memory (Craig 2000) and provides inspiration to innovation processes (Ewenstein and Whyte 2007). We suggest using collaborative visualization software to foster knowledge sharing in teams (Bresciani and Eppler 2009).

Without the necessary *resources*, business model innovation is seriously limited. Hence, we suggest mapping resources using for example core competence metaphors (Klein et al. 1998), which help to see their allocation potential and scope.

Finally, the *complexity* of the task may appear overwhelming at first. Here, visualization can help to map and clarify organizational complexity. We propose to use organigraphs (Mintzberg and Van der Heyden 1999) and graphic aggregation, such as portfolio diagrams to absorb complexity (Eppler and Platts 2009), and in a next step, to use the strategy canvas and profile charts to identify options (Kim and Mauborgne 2005). Especially interesting is the business model canvas elaborated by Osterwalder and Pigneur (2009), who offer a powerful visual tool which visualizes the most important parts of a business model while at the same time, reducing the overall complexity.

Table 1.1 provides a preliminary overview on the state of the art of challenges identified in the literature, matched with potential visual solutions and brief explanations of what those tools offer in particular. Furthermore, Table 1.1 illustrates various forms of visualization that provide a wide variety of mostly cognitive and communicative benefits to business model innovation. Most of these benefits arise due to the *flexible and provisional, and yet accessible and persistent quality of visualizations.* Visual *tools*, however, need to be embedded in an organizational structure which supports business model innovation.

Table 1.1 Business model innovation challenges and visual solutions

	Challenges	Visual solutions
Cognitive	Complexity	• Absorb complexity (Eppler and Platts 2009) • Organigraphs map and clarify organizational complexity (Mintzberg and Van der Heyden 1999) • Strategy canvas and profile charts (Kim and Mauborgne 2005) • Business model canvas (Osterwalder and Pigneur 2009)
	Dominant Logic	• Scenario diagrams enable different views on the future (Huff 1992) • Challenge self-imposed constraint (Mintzberg and Van der Heyden 1999; Platts and Kim Hua 2004) • Enable the playful exploration of mindsets (Mintzberg et al. 2007) • Sketching fosters big picture thinking and abstracting (Mayer 2008)
	Knowledge	• Foster shared thinking (Fiol and Huff 1992) • Stimulate thinking (Tufte 1990) • Trigger memory (Craig 2000) • Inspire (Ewenstein and Whyte 2007) • Sketches and prototypes integrate view points (Schön 1984) • Collaborative visualization software fosters knowledge sharing (Bresciani and Eppler 2009)
Organizational	Resources	• Resource maps visualize allocation potential and scope (Klein et al. 1998)
	Values	• Elicit implicit values and trigger value-related dialogues (Schön 1984)
	Team	• Foster mutual learning in teams (Bresciani and Eppler 2009) • Offers coordination (Eppler and Platts 2009) • Strategy roadmaps create involvement and foster creativity (Blackwell et al. 2008)

The visual tools and opportunities identified are often commonly known in many organizations, yet we found that they have not been *strategically* applied and used in order to foster business model innovation dialogues.[1]

In this chapter, we have provided pointers to a wide range of existing visualization methods and their specific benefits for business model innovation. Visual tools are likely to help in overcoming the many (especially cognitive)-based challenges firms face when innovating their current business model. Visual tools foster strategic change by clarifying, organizing and uncovering relationships among business model elements and by pointing towards unexplored opportunities.

[1] For readers interested in exploring the strategic use of visualization tools, we provide an interactive overview at: http://www.visual-literacy.org/periodic_table/periodic_table.html. We have also made available an interactive toolkit of interactive visual methods for business model innovation at lets-focus.com for downloading.

1.4 Conclusion

When business model innovation is the goal of top management teams, a variety of challenges are faced. In a first step, we have organized the challenges and grouped them into individual, cognitive challenges and collective, organizational challenges. For each category, we have identified three main challenges that are likely to occur in the course of business model innovation and thus need to be addressed. In a final step, we have shown how these challenges are interlinked, therewith offering opportunities to address the challenges together.

We suggest approaching the challenges using visualizations, such as interactive graphic methods, which have proven to successfully address many of these issues. However, those have not been used systematically in order to arrive at a new business model idea yet, with the only exception being Osterwalder and Pigneur's canvas (Osterwalder and Pigneur 2009). Their business model canvas has not been systematically evaluated, which will eventually allow for a better assessment of its advantages. In this chapter, we have provided pointers to a wide range of existing visualization methods and their specific benefits for business model innovation, based on our research. Visual tools help to overcome the challenges firms face when innovating their current business model by fostering strategic change through clarifying, organizing and uncovering relationships, dependencies and pointing towards blue ocean strategies.

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Chapter 2
Enriching Open Innovation Theory and Practice by Strengthening the Relationship with Strategic Thinking

Wim Vanhaverbeke and Nadine Roijakkers

Abstract In this chapter, we first argue that open innovation can be applied to situations where companies do not themselves develop new products or services. As a consequence, open innovation becomes relevant for a much larger group of organisations than hitherto. Second, we argue that open innovation scholars have failed to sufficiently differentiate open innovation initiatives in terms of their impact on companies' growth: Some open innovation initiatives lead to incremental innovations in existing businesses while others are used to establish completely new businesses. Both arguments illustrate the need to integrate open innovation initiatives into the strategy of the firm.

2.1 Introduction

We believe there is a pressing need to rethink open innovation. The development of open innovation has been tightly linked to the concept of the (open) innovation funnel. In this chapter, we argue that open innovation should be sundered from the 'innovation funnel' concept for it to perform even greater service in the future.

We make two arguments why the connection to the 'innovation funnel' should be loosened to enable new research paths to be found in the open innovation field. First, we argue that organisations in different kinds of industries can benefit from open innovation even when they do not develop new products or services themselves. This change in perspective makes open innovation relevant to a much broader range of organisations than before. Second, open innovation, with its main focus on the innovation funnel, has implicitly concentrated on R&D projects that, if successful, would boost growth in existing businesses. To date, innovation

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scholars have made few attempts to make comparisons between open innovation initiatives as: (1) ways to speed the growth of existing businesses; (2) ways to set up new businesses. Both arguments illustrate the need to integrate open innovation initiatives into the strategy of the firm. Scholars need to: (1) analyse how managers follow a stepwise process for linking firms' strategy with open innovation practices; (2) take the integration of open innovation into strategy seriously.

We explore these two themes in more detail in the following two sections. In the conclusions, we focus on the consequences of this attempt to broaden the scope of open innovation for both practitioners and scholars.

2.2 Open Innovation beyond New Product Development

Open innovation scholars have always (implicitly) focused on open innovation practices in the context of new product development. This is illustrated by the central place occupied by the open innovation funnel in Chesbrough's seminal book (2003). Open innovation has been defined in terms of inside-out or outside-in innovation. These two terms implicitly refer to the open innovation funnel where external knowledge is acquired to strengthen internal competencies and to speed up the innovation process within the company, and in which unused, internal knowledge is monetised through external paths to market. External knowledge is in-sourced to develop new products or businesses, or internal knowledge is sold to other firms, which deploy it for their own new product development.

However, Vanhaverbeke and Chesbrough (2013) show that open innovation can be applied to many more situations than just new product development. They claim that new product development is only one of many business activities where open innovation is applicable and valuable. New product development is not an option in many industries such as services where firms typically focus on creating solutions for customers rather than producing and selling products based on new technologies. Moreover, in many manufacturing industries, companies produce and sell commodities. In such cases, new product development is simply not an option. Vanhaverbeke and Chesbrough (2013) argue that in such industries, a company (the focal firm) should first determine which strategic drivers should be leveraged to gain competitive advantage. Next, technological innovations in other companies may be useful for leveraging the strategic drivers identified. Therefore, the focal firm has to set up a network (or an innovation ecosystem) including these companies: Technological innovations in the latter will lead to a competitive advantage for the former. In short, we should not automatically link open innovation to new product development but rather look for specific strategic drivers in certain situations.

A good example can be found in the crude oil business within a large oil company. The product sold by the business unit is clearly a commodity and hence new product development is automatically excluded (at least at the business-unit level). However, as in any business, competitive advantage in the crude oil

industry is determined by a number of strategic drivers. Two of these are: (1) early detection of large oil wells; (2) effective drilling of these wells. Competitiveness in the crude oil business depends on various technologies that boost the productivity of exploration and extraction. Oil companies have to find the richest oil wells before their competitors do and drill them more effectively through new technologies that allow them to extract oil more productively at greater depths. Although the oil industry is dominated by large companies with strong R&D capabilities, they rely mainly on specialised oil services companies such as Schlumberger and others to develop new technologies for oil exploration and extraction: The oil services sector is a beacon of innovation within the energy industry. Oil service firms typically receive more patents each year than most of the large integrated oil companies. The oil company gains a competitive advantage if it partners with Schlumberger (usually in combination with other specialised services companies), which has leading-edge exploration and drilling technology. An oil company can set up a research programme with these partners and (co-) finance the R&D of new exploration and drilling technology. They become strategic partners in advancing this technology. The oil company will typically require exclusive use of the technology for several years before Schlumberger can sell the technology to other oil firms.

The example of the crude oil business within oil companies is just one example of how companies that were not typically considered as open innovators can still drive competitive dynamics through innovation ecosystems and open innovation. In this setting, it is essential that the partnering companies have networked and mutually-independent business models. In the case of the iPhone: Apple creates value by setting up a platform for apps and the number of apps determines an iPhone's value for the customer. Obviously, app makers are dependent on the platform to create value for customers. Networked or linked business models are a recent development that has received attention from Osterwalder and Pigneur, authors of the best-selling book Business Model Generation (2009). Vanhaverbeke and Chesbrough (2013) provide other examples, such as SkyNRG (http://www.skynrg.com) and Curana (www.curana.be). Quilts of Denmark (www.qod.dk) represents another example where the technological efforts of external partners are used to leverage a strategic driver of QoD, which translates the technology into a profitable value proposition for its customers (Vanhaverbeke 2011). Curana and QoD are SMEs: They benefit through their open innovation network from the technological advances of their technology partners, which require scientific and technological knowledge that is hard to develop internally and involves large up-front investments that lie far beyond an SME's scarce resources.

To sum up, open innovation—once sundered from the open innovation funnel and new product development—offers business opportunities for a broad range of companies that were not previously considered as beneficiaries of open innovation strategies. Within this extended open innovation framework, new product development should be considered as a strategic driver that applies to some situations but not to others. To extend the applicability of open innovation, we always have to start from the strategy of a firm, identify the key strategic drivers for creating

value/enhancing the firm's competitive position, spot and select potential innovation partners, and set up a joint project to develop technologies or strengthen the firm's strategic drivers. Thus, even in the absence of any internal new product or service development, companies can still nurture their network of innovation and value-chain partners to boost their competitiveness. In the next section we will look in more detail at the key role played by strategy in the theory and practice of open innovation.

2.3 Open Innovation and the Need for a more Explicit Role of Strategy

Open Strategic concepts implicitly took a central place in seminal open innovation publications (Chesbrough 2003, 2006). The business model, for instance, is a central part of the open innovation funnel because it determines what external knowledge a firm needs to source from external partners and what internal knowledge can be licensed out or sold to other companies. As such, strategy has always been core to open innovation. However, very few publications have tried to get to grips with the complex relationship between open innovation and strategy. To our knowledge, apart from some practice-oriented publications (which implicitly integrate strategy into management decision making on open innovation) (Slowinski and Sahal 2010; Chesbrough and Appleyard 2007) is the only publication that analyses the relationship between open innovation and strategy in depth. Yet, they focus only on open invention and open co-ordination in which ecosystem partners play a role. Although quite interesting, in our view this approach limits the role of strategy in open innovation. In our opinion, open innovation projects should be differentiated according to their impact on the company's current or future growth. Depending on their impact, projects play distinctive roles in a firm's strategy. The strategic value of different open innovation approaches can only be assessed if open innovation is first integrated into firms' corporate and business strategies. Several practice-oriented authors have detailed how managers can follow a stepwise process to successfully link firms' strategy to open innovation practices (Slowinsky and Sahal 2010; Kirschbaum 2005). Yet, the link between open innovation on the one hand and strategy on the other hand has received scant attention in the academic literature. In contrast with the rapid growth of the open innovation literature, few articles have focused on open innovation and strategy (Chesbrough and Appleyard 2007; Dittrich and Duysters 2007).

In what follows, we show how the linkage between open innovation and strategy is crucial for big firms applying open innovation to new product/business development. We illustrate our argument by examining three well-known cases: Procter & Gamble's (P&G) Printed Pringles, the Swiffer Duster of the same company (Chesbrough 2003, 2006), and DSM's Emerging Business Areas (EBAs)

(Kirschbaum 2005). These examples of open innovation are considered successes by both professional journals and the academic literature. However, these three examples each have a different impact on the growth of the companies involved: The Printed Pringles and the Swiffer Duster examples represent cases where the company is strengthening its existing businesses while the EBAs at DSM portray the firm's bold bet on creating completely new divisions that should become operational within 3 to 10 years.

P&G's Printed Pringles. P&G wrote a public brief describing the technical problem of how to print edible dye images on their potato crisps and sent it out worldwide for potential solutions. A university professor in Bologna, running a bakery that was also producing baking equipment, rose to the challenge. He had already created an edible food dye that could be printed on cakes and biscuits. P&G licensed the IP from him and launched Printed Pringles within 8 months. Within one year, the new product boosted P&G's revenues by 14 %. Huston and Sakkab (2006) reported on how P&G was able to lower product development costs and time-to-market for the new product variant through the sourcing of external technology. The Italian bakery technology could not have been discovered by P&G if it had not developed a global network of potential sources of ideas and know-how that it set up as part of its open innovation programme. Printed Pringles was a commercial success and is a shining example of how a company can make use of existing external technologies for short-term improvements or for differentiating existing products.

P&G's Swiffer Duster. The Swiffer Duster is a second example of open innovation success in P&G. It illustrates how open innovation can be instrumental for the development of a new product category. P&G wanted to produce a duster as a follow-up to its successful Swiffer mop, but its internally developed prototype was unappealing. The Japanese company UniCharm had developed an attractive duster but the company did not have the manufacturing, distribution or marketing strength to introduce the innovative product in other markets beyond Japan. P&G's research team recognised the superiority of UniCharm's duster and saw an opportunity to work together. P&G signed a licensing deal with UniCharm to distribute the duster under the P&G name everywhere in the world except Japan. The Duster hit the market in 2003 and has made millions for both P&G and its Japanese partner. The resulting partnership enabled P&G to launch the Japanese innovation in the US in just 18 month under P&G's established Swiffer brand. Swiffer is now a market leader and is sold in 15 global markets. This case illustrates how large companies can insource external knowledge and innovative products to drive sales growth. It leads to a win–win situation for both partners because of their complementary positions. UniCharm had the right innovation but not the strength to market it globally. P&G is a global operator but lacked a product with UniCharm's merits and appeal. The licensing deal extending the sales of the new Swiffer outside Japan profits both companies and their consumers. Obviously, the Swiffer duster is a bolder strategic move than the Printed Pringles case but it is still a fairly simple case when it comes to the managerial challenges required to source the technology and successfully launch the product.

One way to broaden the focus of the open innovation literature is to link it explicitly to corporate strategy. Popular open innovation cases (such as the P&G examples) illustrate how a firm can benefit by using external knowledge sources to develop new products in existing businesses. This emphasis on the use of open innovation in existing businesses eclipses other potential strategic uses of open innovation. More specifically, firms also engage in open innovation to develop completely new businesses. Several companies have taken steps in this direction. IBM's Emerging Business Opportunities (EBOs) for example have received a lot of attention in the literature. IBM established its EBO programme in 2000 to identify and nurture new lines of business. An EBO focuses on 'white space' opportunities that promise to become profitable, 'billion-dollar' businesses within 5 to 7 years. EBOs are typically assigned an experienced IBM executive champion to manage the venture during its start-up phase. Pilot projects, almost always involving clients, validate and refine initial ideas for the EBO's products or services. Once an EBO has grown to sufficient size, it usually becomes part of an existing IBM business unit. Several EBOs achieved over $ 1,000 million in revenue and most ventures are in various stages of maturation and growth (IBM 2008). EBOs have been analysed in terms of organisational inertia and ambidexterity (O'Reilly et al. 1996). However, they also require a different approach to external partners and, consequently, open innovation has to be implemented in a way that differs from ventures in existing businesses. We describe DSM's EBAs—another example with similarities (but also differences) with IBMs EBOs—to examine how open innovation is fundamental in emerging businesses and how it takes a different form from that found when it supports existing businesses.

DSM's EBAs. DSM is a Dutch globally operating, science-based company active in health, nutrition, and materials. Innovation permeates DSM and its existing businesses, which are clustered into Nutrition, Pharma, Performance Materials, and Polymer Intermediates. The corporate Innovation Centre is responsible for developing future growth opportunities through Emerging Business Areas—EBAs involve exploration of new fields requiring combinations of the company's existing technical strengths in performance materials and life sciences with the purpose of creating future business opportunities (Vanhaverbeke and Peters 2005; Wijen et al. 2011). There are currently three EBAs: Bio-Based Products and Services, Biomedical Materials, and Advanced Surfaces. The EBAs are expected to generate € 1,000 million in revenue by 2020.

Developing new businesses (such as in the case of IBM or DSM' EBAs) sets different requirements for implementing open innovation than strengthening existing businesses (P&G examples). First, the new ventures have to be strictly aligned with corporate strategy: Some ideas may be very promising but if they do not tie in with the company's strategic direction then they are candidates for out-licensing or spin-offs. The alignment with corporate strategy is virtually absent in ventures that are created within existing businesses, as most of them are extensions of existing offerings. In this case, strategy is well known and the ventures are automatically conceived within the existing strategic context. Second, since these are completely new businesses, DSM has to broaden its skills or even develop new

ones. These ventures stretch the technological competences of the company almost by definition. DSM has to reach out to technology partners to access, assimilate, and integrate these skills. New skills are not necessarily technology-related: In order to have a viable business model for the EBA ventures, DSM sometimes has to create new routes to market. This can lead to acquisitions of firms with access to (potential) customers. Similarly, for realising the benefits of its technologies, DSM requires access to other parts of the value chain, which leads to partnerships with firms owning key complementary assets: The joint venture between the US-based POET and DSM in the second generation bio fuel refineries using bio-based feedstock is a good example. The production of cellulose-based ethanol requires close co-operation between feedstock producers, enzyme companies, fermentation companies, ethanol producers, and oil majors (distribution to pump stations). DSM is delivering the enzyme and fermentation technology. POET is a bio-refinery that has access to the feedstock and has the right outlets for selling the bio fuel to oil majors. The two partners will start the first bio-refinery in 2014 in Iowa and will license out the technology to other bio refineries in the US. The need to develop new skills and routes to market is usually absent in ventures cultivated by existing businesses. Third, the EBAs are developed in collaboration with a broad range of external (technology) partners. This kind of collaboration is quite different from that with partners creating new products within existing businesses. The vast majority of partners within the EBAs are science-based ones. This is because most of these ventures are several years ahead of market applications and face great technological challenges using new and unproven technology. Moreover, partners within the EBAs are often new contacts, unlike partners in existing business ventures that are mostly part of existing networks. Fourth, EBAs typically make use of different governance modes to source external technology than ventures to spur existing businesses given that most technology for the EBAs is still at an early development stage. There will be more contract research and long-term development agreements with universities and research labs. Corporate venturing also plays a crucial role in EBAs. By contrast, value chain partners take a back seat until the technology and the business model have been tested.

The technological developments required to launch ventures in the three EBAs are explorative in nature and very expensive. DSM is too small a company to independently finance the research required for the development and commercialisation of the technologies in the EBAs. Therefore, the company has been setting up several public–private partnerships in the South-East of the Netherlands. The BioMedical Materials Programme, for example, is a partnership of the Dutch government, academia, and industry, focusing on research and development in the field of biomedical materials. Since 2007, this programme has become a world leader in the field of biomedical materials and their use and applications in a clinical environment. Besides DSM and the University of Maastricht, leading players in the consortium include Philips Research, Organon, Medtronic, FUJIFILM Life Science, Pharming, TNO (Dutch Organisation for Applied Scientific Research), and most of the leading universities and university medical centres in The Netherlands. DSM took the initiative in setting up this programme to support

its ambitions to become a leading player in the biomedical market. The programme is fully in line with DSM's focus on developing the medical innovations of the future. The co-operation is a way of joining forces, speeding up development and attaining results that would be much harder for partners to achieve on their own. It also allows DSM to be a technology leader at only a fraction of the costs.

A similar initiative is the Dutch Polymer Institute. This Institute is a public–private partnership performing pre-competitive research into polymers and their applications. It links the main polymer producing and processing companies with top Dutch polymer research institutes. Founded in 1997, at the initiative of DSM and others, the institute is currently a European centre of excellence in the polymer science and engineering field. This spawns more scientific publications for the universities and intellectual property for the companies. The Institute fosters awareness of new technology and helps competing companies to work together to trigger innovation. It also makes university know-how available to companies, creating conditions that facilitate breakthrough inventions and trigger industrial innovation. Some 200 researchers are currently involved in the Institute's projects at knowledge institutions around the world. DSM is one of the major industrial companies involved in collaboration with the Dutch Polymer Institute: It allows the company to create opportunities based on early stage technologies that are at the core of the EBAs. At the same time it enables DSM to access state-of-the-art research at a relatively low price.

All in all, open innovation projects with an impact on either existing businesses or with implications for a company's growth potential in new areas play distinctive roles in firms' strategies. We therefore need to gain a better understanding of how different forms of organisation and management help companies team up with different kinds of external partners to either stimulate existing businesses or to create completely new growth areas. Different strategic growth targets (short-term in the business versus long term in the EBAs) lead to different ways of organising open innovation. Open innovation projects targeted at creating new growth areas should bring together all parts of the firm to ensure that relevant knowledge is centralized in one place. In ventures for creating opportunities within existing businesses only the focal business unit or a small group of business units are involved. In a similar manner, open innovation projects aiming to set up new businesses should involve a different set of partners than projects stimulating existing businesses. Notwithstanding the strong academic focus on open innovation projects for the purpose of creating growth opportunities within existing businesses, it should be noted that developing new products is just one possible key aim of open innovation projects. The development and incubation of early-stage ventures in business areas targeted as growth areas (beyond the existing divisions in the company) is another important option. Revealing the link between open innovation and the strategic drivers and purposes of companies opens up important new areas for future open innovation research.

2.4 Conclusions

When open innovation was launched by Chesbrough as a new concept in 2003, it was tightly linked to other concepts such as new product development, the innovation funnel, and business-model change in large companies. Gradually the scope of open innovation has been broadened, introducing new concepts such as open business models and open services innovation (Chesbrough 2006, 2011). In our view, it is time to explicitly incorporate open innovation into firms' strategy. This has been a major gap in the open innovation literature over the last 10 years and has hampered its adoption as a mainstream concept.

We focused on two topics in this chapter. First, open innovation can be useful for companies that are not involved in new product development. We gave examples of such firms, showing how they can become more competitive by accessing the open innovation activities of other companies. Second, the full potential of open innovation cannot be realised unless it is explicitly linked to corporate strategy. Some companies use open innovation in very different ways from those found in standard case studies. These firms tightly link open innovation to corporate growth targets. This leads to new open innovation applications (for instance when collaboration with partners focuses on building new internal (technological) competences).

Both topics show how important it is to embed open innovation initiatives in the firm's strategy. Several practice-oriented authors have described how managers follow a stepwise process to link firms' strategy to open innovation practices. It is time the academic literature took the integration of open innovation into strategy seriously. We discern the following potential implications of this broader concept of open innovation for research and practice:

- *Strategy as a starting point:* Introducing open innovation is pointless unless it is part and parcel of a firms' strategy. There is an urgent need to integrate open innovation into strategy and differentiate open innovation projects according to their strategic role. A shift away from new product development shows that a firm's competitiveness may rely on a broad set of strategic drivers. Examples include process innovation, boosting productivity, raising product quality and usability, cutting throughput time, reducing operational complexity and costs, and process integration. The business context will determine which aspects to focus on but in any case the focal firm can set up a joint research venture and encourage (technology) partners to speed up innovation in a given field. Therefore, managers should begin by identifying the key strategic drivers that can be leveraged by new (technological) developments with partners rather than start out with the need to open up during a new product development process.
- *The need to change the theoretical open innovation framework:* The extension of the open innovation framework also implies that the open innovation funnel is no longer the central analytical framework. It should be replaced by a new framework that incorporates items that are central in the innovation ecosystem literature (Adner 2012).

- *Understanding the diversity of open innovation projects:* Integrating open innovation activities into corporate strategy helps explain the large differences among firms when it comes to successfully implementing open innovation. Careful analysis of the role of open innovation in firms' strategies sheds light on the host of organisational and managerial practices that are now labelled as 'open innovation'. This diversity of open innovation activities mostly stems from firms' different strategic objectives.
- *Linking open innovation to the corporate growth and renewal literature:* In the literature, the scope of open innovation activities is usually determined by the business model of mainstream businesses in a company. The potential benefits of open innovation from a corporate growth and renewal angle are hardly broached in the literature: Several companies (such as IBM and DSM) have successfully used open innovation to build completely new businesses based on a fundamentally different approach.
- *Exploration/exploitation:* Once open innovation is tightly linked to corporate (growth) strategy, scholars can draw on a broad stream of literature on exploration/exploitation (March 1991) and the need to have an 'ambidextrous' company (Tushman and O'Reilly 1996; Janssen et al. 2012). "An ambidextrous organisation is one that is capable of simultaneously exploiting existing competencies (e.g., satisfying existing customers) and exploring new opportunities (e.g., developing new products)".
- *Capability building and dynamic capabilities:* When open innovation is part and parcel of corporate growth strategy, we might expect new competence-building to become a central topic. In this case, open innovation is not only instrumental for developing a product from research through to market launch. New competences also have to be built for corporate quests for new technologies and business areas. This is a chance to put the role of open innovation in developing new competencies and dynamic capabilities in the limelight (Teece et al. 1997: Teece 2007; Helfat et al. 2007).
- *Wider applicability of open innovation:* Extending open innovation in this way makes it more relevant to firms that are technology/innovation recipients (such as service industries, low-tech manufacturing industries, and governments). Recipients can begin and orchestrate collaboration while technology providers deal with implementation. This means open innovation can also help in fields such as: Creating and improving services; processes; technologies; management practices; ideas/concepts; strategies; and business models; competence building, regardless of the industry.
- *Managing innovation ecosystems as the new imperative:* Nambisan and Sawhney (2010) have shown how innovation ecosystems have to be managed. However, they limit their attention to firms that are technological innovators and require an ecosystem to get the technology developed and adopted. Our approach is different, leading to a different type of ecosystem and different guidelines for appropriate management of the ecosystem.

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Chapter 3
Open Innovation: Strategic Options, Actors, Tools and Tensions

Kathrin Moeslein

Abstract Open innovation describes innovation processes that span across the boundaries of organizations or research and development (R&D) departments. It integrates different types of innovators regardless of their institutional affiliations to generate creative ideas, innovation concepts and novel solutions. The purpose of this chapter is to describe underlying mechanisms and strategic options for realizing open innovation. It presents three types of innovators and their functions in innovation endeavors and introduces five tools that facilitate open innovation. Finally, challenges and core tensions are discussed as a basis for the successful management of strategic open innovation initiatives.

3.1 Towards Open Innovation

Open innovation approaches have different starting points, follow different paradigms, use different toolsets and thus are quite distinct. Two fundamentally different perspectives can be distinguished (Huff et al. 2013). First, inspired by the open source world of software development, open innovation is seen as an emerging phenomenon of largely self-organized and self-motivated, internet-based, dispersed but collaborative actors. Research and practice focus on independent participants and emphasize their open interactive collaboration.

This chapter is based on Moeslein and Bansemir (2011), Moeslein et al. (2012) and Moeslein (2013).

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The broadcasting of problems and potential solutions to potentially unknown participants is a defining element of open innovation from this perspective (Lakhani et al. 2007). Some even ignore or reject the role of organizations to coordinate joint activities. Eric von Hippel (MIT in Cambridge) postulates in his visionary deliberations that organizations as institutions and the importance of management for implementation of innovations could become obsolete (von Hippel 2005). This vision of dissolving organizations is inspiring and breaks with established thinking. Put into perspective, the concept of "democratizing innovation" outlines one possible extreme: the perspective of *"emergent open innovation"*.

An alternative view, described by Henry Chesbrough, sees open innovation as an antithesis of often hermetically separated R&D departments, so called "closed innovation". Traditionally, organizations bundle innovation activities in separate units, employ highly educated experts, entrust them with sophisticated innovation tasks, protect their intellectual property and rarely look outside for other solutions (Chesbrough 2003). Going in hand with the professionalization of functional organizational departments in the last decades, innovation from this perspective reflects a general preference for internal expertise and solutions, and a distinctive "not-invented-here" mentality towards external stimuli. Too often these characteristics become amplified into a "vicious circle". Open innovation then becomes a way of challenging the status quo to search for, find, develop and exchange ideas, concepts and innovations in all areas of concern. The possibilities for corporate innovation are enhanced by Web 2.0 and social software that facilitate collectively evaluating and selecting, and even implementing and merchandizing new goods and services around the world.

Both perspectives have become a reality in global innovation activities: *emergent open innovation* as a largely self-organized and self-motivated, internet-based, dispersed and collaborative innovation effort as well as *corporate open innovation* as a strategic process of opening up firm-sponsored innovation activities across organizational boundaries (Moeslein et al. 2012).

> Reichwald and Piller combine both perspectives and define open innovation as „[…] a multi-level and open search and solve process, which spans across organizational boundaries to include multiple innovators." (Reichwald and Piller 2006; translation by the author).

Following this paradigm, organizations tend to integrate external experts, purposefully allow internal innovators to participate in external innovation activities, communicate internal innovation projects at early stage, or try to initiate common innovation projects with customers, suppliers, or even competitors. This is not only true for product, process or organizational innovations, but to a similar extent for innovations in services, systems and even strategies.

On the one hand, Apple employed Tony Fadell as project manager and thus bought in his expertise, on the other hand, Apple relied on components largely developed by external innovation partners to launch the iPod. As the development of Apples iPod illustrates, there is already a tendency in industry to open up innovation processes towards services, systems and even strategies (Table 3.1).

Table 3.1 The Apple iPod story: system innovation by integration of outside and core inside innovators

"(…) The iPod originated around a business idea dreamed up by Tony Fadell, an independent contractor and hardware expert who helped to develop handheld devices at General Magic and Philips. "Tony's idea was to take an MP3 player, build a Napster music sale service to complement it, and build a company around it" Knauss [Editor's note: Knauss has been a close companion to Fadell] said (…) "Fadell left Philips and set himself up as an independent contractor to shop the idea around."
Apple hired Fadell in early 2001 and assigned him a team of about 30 people. (…) Fadell said, "This is the project that's going to remold Apple and 10 years from now, it's going to be a music business, not a computer business." Tony had an idea for a business process and Apple is transforming itself on his whim and an idea he had a few years ago.
Fadell was familiar with PortalPlayer's [Editor's note: At the time PortalPlayer was a cooperation partner of Apple] reference designs for a couple of MP3 players, including one about the size of a cigarette packet. And though the design was unfinished, several prototypes had been built. "It was fairly ugly," he said. "It looked like an FM radio with a bunch of buttons." The interface, Knauss said, "was typical of an interface done by hardware guys."
"(PortalPlayer) was attractive to Apple because we had an operating system," said Knauss. "That was a real selling point for Apple. We had the software and the hardware already done, and Apple was on a tight schedule."
Knauss said the reference design was about 80 percent complete when Apple came calling. For example, the prototype would not support playlists longer than 10 songs. "Most of the time building the iPod was spent finishing our product" Knauss said. At the time, PortalPlayer had 12 customers designing MP3 players based on the company's reference design. Most were Asian hardware manufacturers, Knauss said, but also included Teac and IBM.
Big Blue planned a small, black MP3 player, based on the company's own mini hard drives, which featured a unique circular screen and wireless Bluetooth headphones. "The design for IBM was a lot sexier," Knauss said" (Kahney 2004).

3.2 Actors in Open Innovation

Organizations that open up their innovation processes beyond organizational R&D departments build on the involvement of three types of innovators (Neyer et al. 2009): those members of an organization who have "innovation", "research" or "development" as an official task in their job description (*"core inside innovators"*), those external actors who get involved in the innovation processes of an organization often via open innovation platforms, while not being part of the organization itself (*"outside innovators"*) and last, but not least those employees across all functions, levels, and units of an organization who innovate without being "official innovators" by job description (*"peripheral inside innovators"*). These are employees within the organization who are not directly involved in the innovation process of their organizations by formal role, but nevertheless have enough information about needs and solutions to act as innovators. They engage in innovation mainly due to curiosity, proactivity and interest in the well-being of the organization (Table 3.2).

The story of the bubblegum in 1928 shows that peripheral inside innovators ever since participated in innovation activities. Walter Diemer did not actually

Table 3.2 The bubblegum story: innovation by inclusion of peripheral inside innovators

"In 1928, bubblegum was invented by a man named Walter E. Diemer. Here's what Walter Diemer, the inventor himself, said about it just a year or two before he died: "It was an accident." "I was doing something else," Mr. Diemer explained, "and ended up with something with bubbles." And history took one giant pop forward. What Mr. Diemer was supposed to be doing, back in 1928, was working as an accountant for the Fleer Chewing Gum Company in Philadelphia; what he wound up doing in his spare time was playing around with new gum recipes. But this latest brew of Walter Diemer's was unexpectedly, crucially different. It was less sticky than regular chewing gum. It also stretched more easily. Walter Diemer, 23 years old, saw the bubbles. He saw the possibilities. One day he carried a five-pound glop of the stuff to a grocery store; it sold out in a single afternoon.

Before long, the folks at Fleer were marketing Diemer's creation and Diemer himself was teaching cheeky salesmen to blow bubbles, to demonstrate exactly what made this gum different from all other gums. The only food coloring in the factory was pink. Walter used it. That is why most bubblegum today is pink.

Gilbert Mustin, President of Fleer named the gum Dubble Bubble and it controlled the bubblegum market unchallenged for years, at least until Bazooka came along to share the wealth. Walter Diemer stayed with Fleer for decades, eventually becoming a senior vice president.

He never received royalties for his invention, his wife told the newspapers, but he did not seem to mind; knowing what he had created was reward enough. Sometimes he would invite a bunch of kids to the house and tell them the story of his wonderful, accidental invention. Then he would hold bubble-blowing contests for them" (http://www.ideafinder.com).

work as an innovator, but as ordinary accountant. In his spare time he experimented with new chewing gum recipes. In 1928, bubblegum was launched and grew to global success. The bubblegum story shows that not only externals provide valuable input as innovators because of their enhanced knowledge in regard to needs and user information. In addition peripheral inside innovators show extraordinary engagement and motivation for innovating. To conclude, integrating this type of innovators seems especially fruitful, as they know the organization's products, processes, services and strategies, feel obliged to the company and have an undisguised perspective.

In open innovation initiatives, these employees can take a key role in bridging between the inside and the outside of the organization, in balancing between different interests of openness and closedness, and in making outside-in, inside-out and coupled innovation processes work seamlessly for improving innovation performance. The following table summarizes the three essential types of innovators in open innovation (Table 3.3).

All three types of innovators play a crucial role in innovation processes: *Core inside innovators* are by definition entrusted with developing new products, processes, services and strategies. We find that the vast majority of business offerings stem from inventing, discovering and developing capacity of this type of innovators. Designers, researchers, developers and innovators of the marketing, business operations or corporate strategy department usually belong to this group. Whilst organizational R&D departments, widely organized as closed departments used to be the "holy heart" of organizations, they open up ever more. *Outside*

Table 3.3 Three types of innovators in open innovation

Type of innovator	And where to find them
Core inside innovators	Employees of e.g. the R&D department or the strategic innovation unit for whom "innovation" is part of the job description
Peripheral inside innovators	Employees across all functions, levels and units of an organization for whom "innovation" is NOT part of the job description
Outside innovators	Customers, suppliers, value creation partners, universities, institutional research departments who reside outside the boundaries of the organization

innovators largely comprise customers, suppliers and value creation partners, as well as university members, researchers from research institutes, or even competitors. Within the strategy of open innovation, organizations implement manifold methods and tools to integrate outside innovators. E.g. innovation toolkits, innovation contests or open innovation communities are frequently used. Often, the greater public is inspired, motivated or even explicitly invited to participate. *Peripheral inside innovators* innovated ever since based on self-motivation, engagement and confidence, but are often not or only scarcely supported by tools. Idea management systems still prevail in companies as a main mechanism to integrate peripheral inside innovators. Although modern updates that include elements of social software and web 2.0 are available, they are usually not yet well integrated in organizational innovation strategies (Berger et al. 2005).

The fact that even today all three types of innovators have usually not yet been incorporated into an integrated innovation strategy and are not supported by integrated tools and platforms poses essential constraints for the innovation capacity of organizations. As early as in 1984, Robert Rosenfeld, founder of the office of innovation at Kodak, is cited with the following words: "The failure of large organizations in America to innovate is primarily the result of a communication gap, not a decline in ingenuity" (Rosenfeld and Servo 1984). Despite a dramatically grown variety of communication technologies (mainly enabled by web 2.0 and social software) and innovation tools, this problem rather intensifies than declines because of increasing specialization. In the following, we introduce a set of five classes of tools to strategically implement open innovation.

3.3 Tools for Open Innovation

Historically, the creation of innovations across the boundaries of organizations has always been possible. Before the rise of corporate R&D departments this co-creation of innovations in networks of innovative craftsmen, inventors, entrepreneurs, hobbyists or discoverers has long been the dominant pattern of innovation. Still, we today observe a fundamental change: with the rise of the interactive web, now virtually everyone has the chance to get involved in highly

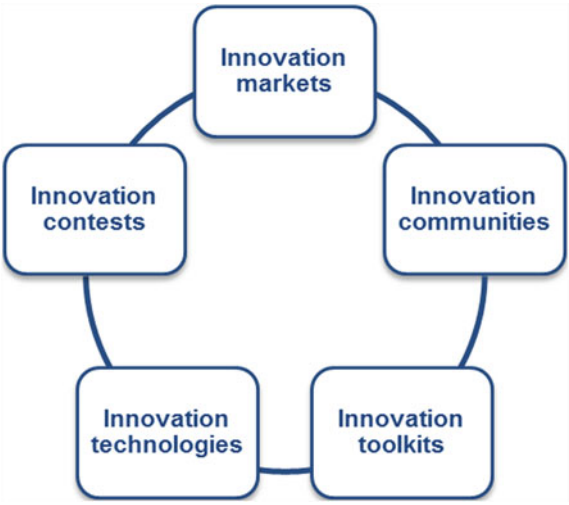

Fig. 3.1 Five classes of tools for open innovation

specialized innovation activities with large numbers of collaborators on a global scale. These innovation activities are stimulated and supported by a range of open innovation tools. In the following we will look at five classes of tools that primarily support and promote open innovation. These are:

(1) innovation contests,
(2) innovation markets,
(3) innovation communities,
(4) innovation toolkits and
(5) innovation technologies.

The development, diffusion and implementation of these kinds of innovation tools are mainly driven by the attractiveness, usability and inclusiveness of web 2.0 and social software features. This is evident, when looking at each of the tools, as well as their features and functions in open innovation processes as illustrated by short examples in the following. Well established, "traditional" innovation tools which specifically refer to innovation activities *within* corporate R&D functions (e.g. computer aided design (CAD) used by engineers etc.) are not in the focus of this chapter (Fig. 3.1).

3.3.1 Innovation Contests

Innovation contests in their basic structure have a long-standing tradition and have influenced industries or even societies for a long time. For example, in 1869, Emperor Louis Napoleon III of France offered a prize to anyone who could make a

"satisfactory substitute for butter, suitable for use by the armed forces and the lower classes." Still, neither Michel-Eugene Chevreul nor Hippolyte Mege-Mouris (historians are uneven about the inventor) were paid when they came up with margarine, since Napoleon died before. In the nineteenth century, innovation contests leave the realm of political organizers as they are increasingly adopted by industrialists as a powerful means of problem solving. Famous examples of this period include the "Rainhill trials" (1829) which were used by the directors of the Liverpool and Manchester Railway Company to decide whether hauling trains should be powered by stationary engines or locomotives. During the next century, realization of innovation contests slowly entered average business: An early example can be identified in 1997, when the "Fredkin Prize for Computer Chess" granted USD 100,000 for building the first computer to beat world chess champion Garry Kasparov (Haller et al. 2011).

So, what is actually new and what makes innovation contests an important tool for open innovation? Social software features and web 2.0 enable a multitude of actors to announce contests for exciting innovation challenges, with global reach at minimal costs. We define an innovation contest as a web-based competition of innovators who use their skills, experiences and creativity to provide a solution for a particular contest challenge defined by an organizer (Bullinger and Moeslein 2010).

Innovation contests are implemented in great variety. The continuum of different contests starts with simple idea and design contests, but also includes challenges that target radical innovations or marketable solutions. Many contests go far beyond targeting product or process innovations, but address innovative services, solutions or whole business model innovations. Formulating the innovation challenge for the contest is crucial. The way a challenge is framed and phrased finally decides about the range of innovators attracted, their expertise and motivation. At the same time, the framing and phrasing does not reveal competence deficits or strategic knowledge elements of the organizer. One main question that arises is, how does an organization formulate its innovation problem in such a way that the description motivates competent innovators to participate, does not reveal own competence deficits or strategic information, but still is concrete enough to deliver a relevant contribution for own innovation activities? To answer this question, experience is the best guide.

3.3.2 Innovation Markets

Innovation markets are virtual places, where innovation supply and demand meet. In general, they are realized as web 2.0 supported online platforms, on which innovation seekers (typically organizations) announce innovation challenges and innovation providers (typically individual innovators or teams of innovators) propose concrete solutions or concepts. Innovation markets act as intermediaries, connecting innovation seekers and innovation providers (often called "solvers").

A growing number of innovation markets are available online for "seekers" to announce innovation challenges and for "solvers" to contribute.

One renowned and well established innovation market is Innocentive. It was founded in 2001 by Eli Lilly and declares itself as "the world's first open innovation marketplace" (www.innocentive.com). It originally focused on innovations in the chemical industry. As of today, Innocentive reports approximately 250,000 registered "solvers" from nearly 200 countries, a total of more than 1,300 challenges posted with an average success rate of 50 %, more than 339,000 project rooms opened for collaborative innovation, more than 24,000 solutions submitted, 866 awards with a range of awards from about 5,000 to $1 million based on the complexity of the problem and a total of more than 28 Mio USD award money posted.

Other examples of innovation markets are NineSigma (www.ninesigma.com), Innovation Exchange (www.innovationexchange.com) or Battle of Concepts (www.battleofconcepts.nl). Whilst these markets focus on organizations publishing innovation problems, e.g. Planet Eureka (www.planeteureka.com) establishes a provider-driven innovation market. Solution providers get the possibility to look for both a suitable problem and a possible purchaser for their innovative solution. Organizations directly search for promising innovative concepts; an approach especially attracting small and medium-sized organizations.

3.3.3 Innovation Communities

Innovation communities enable innovators to collectively share and develop ideas, discuss concepts and promote innovations. Web 2.0 and social software based innovation communities normally bundle interested and specialized innovators for particular issues and thus support collective development and enhancement of innovation concepts. They originate from grouping together voluntarily and independently to create innovative solutions in a joint effort, embracing a family-like spirit. Open source communities are typical examples. Great success of these communities led to a growing number of issue-related communities in various industry sectors.

One interesting example of an innovative, self-organized and internet-based innovation community can be seen in the project *OScar* (www.theoscarproject.org): „The idea behind the OScar project is simple: A community of people virtually plans and develops a new car. The idea is about the goal to develop a simple and innovative car, but also about the way how this goal is achieved. We would like to convey the idea of open source to 'hardware' and we want *OScar* to be the precursor for many different projects in this field." The project was launched in 1999 on the basis of a published manifesto: "To built a car […] without any factory, any CEO, any funds, any boundaries, […] but instead with the support of lots of creative people in the web […] with a global spirit of optimism, […] representing absolute empowerment. Altogether, this meant to face huge challenges and to use 'the tool' internet in its

essential sense." Today, community-based car development is implemented in a highly successful way by Jay Rogers and his team at LocalMotors. And this is how LocalMotors describes itself as a key player in the world of vehicle innovation: "Local Motors leads next-generation, crowd-powered automotive design, manufacturing and technology to enable the creation of game-changing vehicles. Through open-source principles, Local Motors helps solve local problems, locally; makes transportation more sustainable, globally; and delivers, through distributed manufacturing, innovative co-created vehicles and components with its virtual community of more than 30,000 designers, fabricators, engineers and enthusiasts from around the world" (www.localmotors.com).

UnserAller, a facebook-based online innovation community founded in 2010, on the other hand, aims for simpler products, e.g. mustard, salad dressing, snacks, shower gel, and the like, and does it with impressive success. After just one year more than 10,000 members have joined this community as innovation developers at the unserAller community, run by the Munich based start-up "innosabi". Today, companies widely discover innovation communities as a tool for strategically creating innovations. While in the early days emergent and self-organized innovation communities were the typical pattern for innovation communities, we see today a growing trend in strategic, firm-sponsored innovation communities.

3.3.4 Innovations Toolkits

Innovation toolkits provide an environment in which users develop solutions step-by-step. Through the application of online toolkits for the design of individualized T-shirts (e.g. www.spreadshirt.com) or the customization of your new car or its equipment (e.g. www.mini.com) basic knowledge about this open innovation tool is already available in literally every household. Still, while the application of toolkits is quite widespread for the configuration of predefined solutions, the mass-customization of predesigned products or services or the selection of variants from a broad range of offerings, the application of toolkits for more innovative solutions is still in its infancy.

In order to implement toolkits for open innovation on the seeker's as well as on the solver's side efficiently, toolkits have to fulfill five basic requirements (see Reichwald and Piller 2006):

Full line of trail and error: Toolkit users tend to be more satisfied with their developed solution, when they can go through the entire cycle of problem solving. This requires that users receive simulated feedback on each step of the development process. Simulations enable users to evaluate the current solution, to improve on it in an iterative process. In this way, cognitive and affective learning processes are activated (learning by doing), which improve the quality of the solution.

Defined solution space: A toolkit's solution space defines all variations and combinations of feasible solutions. Basically, the solution space only permits innovation solutions, which take specific technical restrictions into account and are

"feasible" from a technical point of view. Depending upon the type of toolkit, these constraints are more or less strict (as we will discuss below).

User friendliness: User friendliness describes how users perceive the quality of interaction with the toolkit. The challenge is to find the right degree of complexity (between over-complexity and over-simplicity), openness and interactivity as to perfectly stimulate the innovators creativity and motivation. If expectations or capabilities are heterogeneously distributed among the potential innovators, the seeker may want to make different types of toolkits available to the potential target groups of innovators.

Modules and components: Modules and components are the basic building blocks of a toolkit, (f.i., programming languages, visualization, help menus, drawing software, text boxes, libraries), which make up its operational functions and are made available to potential innovators for supporting innovation activities. Modules and components make up the toolkit's solution space and determine its user friendliness.

Solution transfer: After innovators have developed a toolkit-based innovation, their concept or solution is transferred to a seeker or manufacturer. This toolkit based transfer has to allow for a perfect translation of the solver's or user's solution in the "language" of the seeker or manufacturer.

Toolkits currently available in the market can be broadly classified in the three categories which differ in their strategic goals, design principles and users to be targeted. *Toolkits for user innovation* support the generation of innovation ideas based on a 'chemistry kit'-like interface to enable complete trail-and-error cycles, featuring a broad solution space with high costs of usage. *Toolkits for idea transfer* foster application of existing ideas in a new context based on a 'black boards'-like interface with unlimited solution space and low costs of usage. *Toolkits for user co-design*, by contrast, facilitate product configurations based on a 'Lego kit'-like interface, using a restricted solution space and standardized modules and are mostly used as a sales tool.

Regardless of specific configurations, toolkit-based innovation essentially needs feedback (either by the system or by users), simulates possible solutions (regarding design, performance and costs) and fosters the quest for solutions. The core challenge in configuring innovation toolkits is to define the degrees of freedom.

3.3.5 Innovation Technologies

Innovation technologies enable to progress from concept level of a (product) innovation to prototyping or even production. Innovation technologies comprise all kinds of additive manufacturing technologies (e.g. 3D-printers), but also 3D-scanners or laser cutters. All these technologies are associated with the prospect of an ongoing democratization of innovation activities and with the often proclaimed trend towards 'personal fabrication'.

Whilst in programming of open source software programmers globally cooperate on their software code, innovation technologies enable us to collectively and globally develop intangible specifications for real products, services, and solutions. Two-dimensional software controlled cutting with CNC-cutters allows creating fascinating designs for furniture, fitments and accessories (e.g. www.ronen-kadushin.com or www.movisi.com). 3D-printers (i.e. printers that create three-dimensional objects out of plastic powder under CNC-control) allow a fast and immediate "printing" of prototypes during development processes and thus enable the so-called 'rapid prototyping'. They also enable individuals or organizations to design and produce customized products instantly. Innovators envision first to design and specify three-dimensional models of innovations and second to order these directly from their household computers. Prospective visionaries like Neil Gershenfeld, Director of the MIT's Center for Bits and Atoms, anticipated this trend of a future of 'personal manufacturing' or 'personal fabrication' quite a while ago. His book "FAB: The Coming Revolution on Your Desktop From Personal Computers to Personal Fabrication" vividly describes a future where anyone of us could become a producer or manufacturer, even at home (Gershenfeld 2005). While many did not believe in the proclaimed revolution of 'personal computing' at a time when computers were mainframes and only available for companies or governments, today we still struggle to imagine a future of 'personal manufacturing' or 'personal fabrication' where every household can become a production unit in a future world of value creation.

From a technical perspective this future is less hard to imagine: additive manufacturing (as opposed to our traditional subtractive manufacturing) is mainly digital manufacturing as 3D-computer models are translated in 3D-printouts. 3D-printers are already available more and more widely, prices are falling and application areas growing. It is obvious, that CAD software or 3D-scanners in combination with laser cutters or 3D-printing open up new possibilities of potential personal production. The analogy between personal computing and personal fabrication, in this context, is a helpful one to understand the anticipated future developments. Similar to our current printing with simple printers at home, or better ones in offices or copy shops, we can expect cheap and easy-to-use 3D-printing (and other manufacturing) facilities if not at home then at least in fabbing shops around the corner. Fab labs are already created world-wide. And while they might mainly target a young generation of hobbyists, so-called 'service bureaus' as production-oriented 'copy shops of the future' are targeting a more professional audience. In addition, all kinds of internet companies start to offer manufacturing services for the products and innovations created by simply anyone.

3.4 Tension of Open Innovation

All presented tools for open innovation include four common and novel effects. They allow (1) for large numbers of innovators to contribute, (2) empower these innovators to collaborate in widely distributed settings, (3) foster high-speed

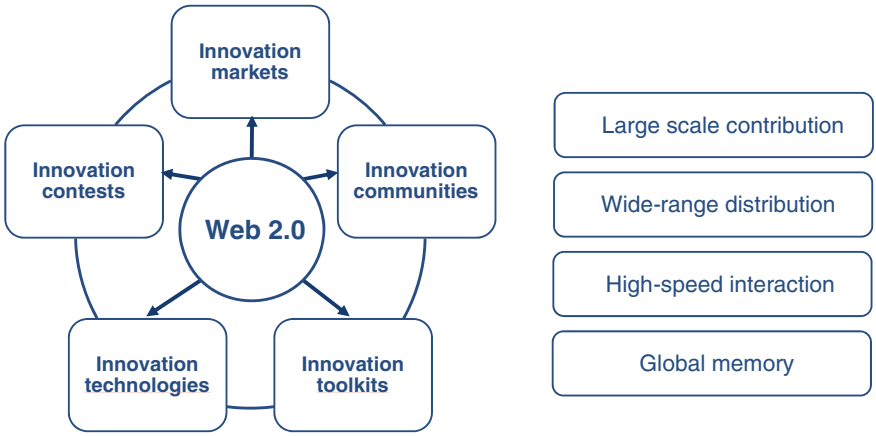

Fig. 3.2 Tools for open innovation and their effects

interaction that radically accelerates innovation processes and (4) provide a global memory for innovators to build on. These four effects clearly facilitate collaboration across organizational boundaries and symbolize new opportunities to create innovations. Additionally, the five innovation tools open up spaces for novel strategies, which allow integrating all three types of innovators described earlier (Fig. 3.2).

Today we see these tools mainly used separately and often only targeted to one specific innovators group. For the future, however, we should look at these tools as basic building blocks of possible open innovation platforms. To combine these building blocks wisely requires a better understanding of their modi operandi, but also of the tensions that open innovation creates in all kinds of value creation settings. These tensions are manifold and of utmost importance for leading innovation. Only a few can be sketched in the following.

Single versus team innovators: The existing conflict between individual and team innovation is intensified in open innovation. Additional and globally dispersed innovators (individuals as well as teams) are integrated in organizational innovation activities. Furthermore, the community of innovators, as an increasingly internet-based innovative community, reaches a more and more dominant status in open innovation. However, a loose interconnection of individuals and groups of individuals established to be common in innovation activities across boundaries of organizational units and organizations as a whole.

Local versus global range: The question between local pooling vs. global dispersion of innovation activities was long regarded as an 'either-or' question. Several successful cases clearly proof that prerequisites are given to bundle and complementarily combine global creativity and innovation potential of many dispersed participants with local strengths. This step is enabled by the presented tools. However, handling these tools successfully and to gain competitive advantage remains as a core challenge for strategy and management.

Evolution versus revolution: Whilst the opinion prevailed for a long time that outside innovators could only contribute to continuous (evolutionary) innovations, many examples show that they support both continuous and discontinuous (revolutionary) innovations. Organizations have to deal with the predominant challenge of how to design, implement and strategically incorporate open innovation.

Closed versus open: Besides opportunities to reshape innovation activities, organizations have to face challenges to strategically handle arising conflicts between closed and open innovation. One main challenge lies in the decision, whether to open innovation activities partially or totally, replacing closed innovation with open innovation. Balanced strategies are needed that combine the advantages of opening innovation activities with the strengths of cohesive R&D departments. This decision has to be integrated with the organization's strategy.

The development story of Apple's iPod in combination with iTunes is an impressive example of discontinuous innovation that influences individual as well as affects existing boundaries of business sectors or even changes economic rules of whole industries. It is also a perfect example of successfully and strategically combining open and closed innovation in an overall corporate innovation strategy.

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Chapter 4
Overcoming the Innovation Barrier: A Search-Selection Model of Breakthrough Innovation in Large Firms

Simon J. Ford, Simone Ferriani and David R. Probert

Abstract Breakthrough innovations are important to the firm. They enable firms to challenge the existing technological order and shape new paths, allowing them to engage in corporate reinvention, growth and new business development. They represent rare, valuable and inimitable sources of competitive advantage for firms. Yet most established firms have too many obligations and too much to lose to justify the obvious risks of chasing radical possibilities. There are a number of causes for this risk averseness: under-investment in radical innovation, falling into competency traps, being constrained by core rigidities, and remaining overly committed to their main customers. Drawing on previous research in the field, we suggest that two fundamental enabling conditions can be identified for an established firm wishing to engage in breakthrough innovation. First, it must create an environment conducive to idea generation. Second, it must have the fortitude and risk tolerance to persevere and allow the most promising ideas to have a fair chance to succeed. Focusing on the latter topic, three types of organizational selection regimes are highlighted that have proven particularly effective to this purpose. These regimes are characterized as (1) individual driven, (2) lead user driven, and (3) application domain driven, with illustrative case examples provided from BAE Systems, Rolls-Royce and ARM respectively. While there is no single best way through which breakthrough innovation can be successfully pursued, given the multifaceted nature of the environment we suggest that the domain driven approach is the one that is most likely to be conducive to successful breakthrough innovations. High technology domains are subject to incredible uncertainty and offer some of the richest opportunities for experience based learning. In such settings the use of variegated feedback from multiple facets of the application environment may serve as superior selection mechanisms to the judgment of corporate headquarters.

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4.1 Introduction

The ability to create new and valuable breakthroughs offers firms an unambiguous competitive advantage. However because breakthrough innovations represent a major departure from established ways of capturing value in a given market, attempts at such innovations frequently fail. Numerous studies have highlighted how dominant practices and routines supporting success in one market and/or technological domain may represent significant barriers to developing breakthrough innovations (e.g. Henderson and Clark 1990; Leonard-Barton 1992; Chandy and Tellis 2000). Taken in combination, these studies paint a bleak picture for established firms attempting to generate breakthrough innovations.

Yet despite the myriad examples of incumbent firm failures and entrant firm successes, there is a growing set of counterexamples that highlight cases of successful breakthroughs among incumbents (Cattani 2006; Fleming 2001; Macher et al. 2004; Methe et al. 1997; Stefik and Stefik 2004; Yamanouchi 1989). For example, in tracing the origins of a broad range of breakthrough innovations in office products and consumer durables across 150 years, Chandy and Tellis (2000) found that after World War II incumbents actually introduced the majority (75 %) of these products. Similarly, Klepper and Simons (2000) found that nearly all dominant U.S. manufacturers of televisions previously were dominant producers of radios and that they took the lead in television product and process innovations, while Methe el al. (1997) saw how industry incumbents and diversifying entrants can be credited with a number of major innovations in the telecommunications and medical device industries.

A better understanding of the drivers of breakthrough innovations has great strategic importance because superior performance often depends on being consistently innovative (Nelson 1991). Furthermore, understanding how incumbents nurture and sustain their innovative pre-eminence in an industry is a crucial step in explaining durable sources of superior performance and reducing competitive threats. While some scholars have started to address this issue (Ahuja and Lampert 2001; Fleming 2001), the majority of research interested in the relationship between incumbency and innovative capability is typically concerned with cases where established firms react to technological innovations brought about by other firms, rather than with incumbents' proactive search for technological breakthroughs. Examples of this approach include studies on the capabilities of the established firm to adapt to the new technology and redirect its innovative efforts accordingly (Tripsas 1997; Rosenbloom 2000); and, more generally, on the impact of such inventions rather than their creation (Achilladelis et al. 1990). As a result, little is known about the incumbents' internal organizational practices and processes that are conducive to the innovation, along with what organizational conditions are required to sustain the genesis of breakthrough innovations.

Although accounts of breakthrough innovation are rife with elements of serendipity and unpredictability, they also suggest the presence of organizational elements that incumbent firms may act upon in order to sustain their innovative

performance. Two fundamental enabling conditions are apparent for an established firm wishing to engage in breakthrough innovation. The firm must create environments (1) conducive to idea generation, and (2) in which risk and uncertainty is tolerated so that some of these ideas can be developed and brought to market.

The first is the upstream creative challenge of developing the ability to 'see differently'. Since radical concepts often spring from the imagination of individuals or teams, the challenge is to create an organizational context where creativity may flourish. The second is the downstream implementation challenge of successfully applying and marketing the unique concept, which requires the ability to implement the concept by matching it to the actual needs of the market. Without the ability to see differently, the firm is unable to change the rules of the game and without the ability to implement it, the firm will join the ranks of companies that failed to capitalize on their pioneering inventions such as Xerox with personal computers (Chesbrough and Rosenbloom 2002) and EMI with the CAT scanner (Teece 1986).

In this chapter we explore mechanisms through which established firms can harness these fundamental enablers through adopting selection regimes that counteract the tendency to stifle or eliminate radical novelty. We begin by providing an overview of the main factors that cause established firms to oppose breakthrough innovation projects. We then conceptualize the generation of breakthrough innovation as a two stage search-selection process. The first stage, search, is aimed at increasing the likelihood of coming across new opportunities by prompting experimentation. The second stage, selection, is aimed at sifting out and supporting the implementation of the most valuable opportunities. Focusing on the selection phase, we propose three types of regime that established firms can adopt to overcome innovation barriers: (1) individual driven, (2) lead user driven and (3) application domain driven. Examples from BAE Systems, Rolls-Royce and ARM are used to illustrate the effectiveness of these organizational selection mechanisms.

4.2 Factors Inhibiting Breakthrough Innovation in Established Firms

Innovation is the generation and commercialization of ideas, processes, products, or services that the relevant adopting unit perceives as new. It can be new to either the firm or the firm's customers. Depending on their 'newness', innovations can be incremental (continuous) or breakthrough (discontinuous). Incremental innovations are critical to sustaining and enhancing shares in mainstream markets (Baden-Fuller and Pitt 1996) and focus on improving existing products and services to satisfy ever-changing customer demands (Bessant 2003). Incremental innovations usually emphasize cost or feature improvements on existing products or services. In contrast, breakthrough innovation concerns the development of new businesses or product lines based on new ideas or technologies or substantial cost reductions

that may significantly alter the consumption patterns of a market (Yamanouchi 1989; Garcia and Calantone 2002).

Over the years researchers have put forward a variety of terminologies to address this distinction and characterize innovations that represent a major departure from existing practices in products or processes development. So, for instance, innovations have been described as being revolutionary, radical, disruptive, or discontinuous. While it is beyond the scope of this essay to go through a taxonomical analysis we are well aware that there are some important conceptual differences underlying the semantics.

As Table 4.1 illustrates, the conceptual emphasis in the literature that has first introduced these nomenclature changes depending on such aspects as the cost/performance improvements, the relationship with the existing capabilities, and the receptiveness of the market. These terms overlap to a considerable extent since they all share at least two important characteristics. First they all embody a fundamental distinction between predictable and original innovations. Second, they are all premised on the general assumption that innovations that are unique, original, and unexpected are far more valuable from a competitive standpoint than innovations that are predictable, incremental, or mundane. Hence, in the rest of the chapter, we will use the term 'breakthrough innovation' as an overarching notion to represent any creative and original action by individuals or project teams that enables firms to capture at least temporary monopoly profits or that results in a significant increase in market share.

Established firms face the problem that they have too many obligations to risk chasing the potential of breakthrough technologies which may or may not be successful in the market. Yet despite these risks, the danger of being leapfrogged and deposed by upstart market newcomers means that established firms must pursue radical technologies as part of their innovation portfolio. Given this imperative, why do established firms generate breakthrough innovations so infrequently? A variety of arguments have been put forth by researchers in innovation management to explain this tendency. Established firms are described as under-investing in radical innovation (Henderson, 1993), falling into competency traps (Levitt and March 1988), being hampered by their core rigidities (Leonard-Barton 1992), and remaining committed only to their main customers (Christensen 1997). As a consequence, established firms may not survive future cycles of creative destruction (Schumpeter 1934). We expand upon these issues in the sections that follow.

4.2.1 Organizational Inertia

Organizational theorists have emphasized the roles that organizational inertia (Hannan and Freeman 1984) and structured routines (Nelson and Winter 1982) play in constraining the actions and limiting the success of incumbent firms. Organizational inertia limits the abilities of incumbent firms because the structures

Table 4.1 Types of technological innovation (adapted from Maine and Garnsey (2006))

Innovation type	Emphasis
Radical innovation	Depth of impact on industries Substantial cost/performance improvements
Revolutionary innovation or competence-altering innovation	Requires change in firm capabilities
Discontinuous innovation	Break with preceding technologies
Disruptive innovation	New technological attributes and new competencies enable new entrants to take market share from incumbent firms

and systems that facilitate survival in stable and predictable environments become liabilities in environments undergoing rapid change (Hannan and Freeman 1984).

A similar and related literature argues that organizations develop highly structured routines in order to reduce the costs associated with information acquisition and coordination (Nelson and Winter 1982). Establishing efficient routines is crucial for organizational learning and performance (Nelson and Winter 1982) yet an increasing reliance on efficient routines may prevent firms from sensing valuable opportunities that would drag them beyond those practices. Indeed, organizational evolution and learning literatures suggest that as organizational routines become entrenched, organizations tend to exploit existing knowledge and capabilities, possibly crowding out more exploratory activities (e.g. March 1991).

Furthermore, an inability to "*recognize the value of new information, assimilate it, and apply it to commercial ends*" (Cohen and Levinthal 1990, p. 128) also has been argued as a reason why incumbent firms have difficulties reacting to discontinuous innovations. This arises from limitations in the "absorptive capacity" of firms. Such capacity is built incrementally upon prior and related knowledge but radical innovations generally require knowledge that exists outside of the firm and incumbent firms are unable to recognize and fully embrace new technological paradigms.

4.2.2 Cultural Resistance

As successful organizations become larger and older they tend to develop shared expectations about how things are to be done, leading to forms of cultural resistance to change (Dougherty 1992). As has been noted by Tushman and O'Reilly (1996): "*Cultural inertia, because it is so ephemeral and difficult to attack directly, is a key reason managers often fail to successfully introduce revolutionary change even when they know that it is needed* ". This problem is exacerbated by the tendency of organizational departments to develop rather impermeable cognitive orientations and 'thought worlds' (Dougherty 1992) that partition information and insights, thereby inhibiting the kind of collective action

that is necessary for innovation. Very often such orientations reflect the identity of the departments as organization members create their identities on the basis of what they know how to do well (Orr 1990). Furthermore, deviating from existing knowledge domains also poses threats to the identity of the organization (Cook and Yanow 1993).

4.2.3 Lack of Incentives and Aversion to Risk

While there are clear benefits to proactive change, only a small minority of far-sighted firms initiate discontinuous change before a performance decline. Part of this stems from the risks of proactive change. Large corporations are comfortable developing sustaining technologies which build on their existing strengths because radical new technologies may destabilize established companies' core competencies (Tushman and Anderson 1986). They excel at knowing their market and having mechanisms in place to develop existing technology. Yet such an innovation trajectory reduces technical variation and stunts a firm's learning potential. As has been noted, "*in some circumstances extensive experience with a technology may be a substantial disadvantage*" (Henderson 1993, p. 251).

Radical technologies often look financially unattractive or excessively risky to incumbents. Many of these higher risk initiatives can only be developed over a considerable period of time, sometimes as long as 20 years in some industries. The time-horizon to build up knowledge about the potential markets and the further development of the technologies involved is much longer than in the case of incremental innovations. Furthermore, the potential market may appear small and its cost structure too high to serve the radical technology, while at the same time the market may be so new as to make it difficult to determine who the most likely customers are and what they actually need. As a result, it is not uncommon that hundreds of new ideas get killed before any one innovation hits successfully the market (Freeman and Soete 1997). In addition, there is the need for more 'patient money' to be invested. However, it is very likely that in the corporate world where shareholders pay attention to quarterly reports, the need for quick results will get in the way of the patience required for breakthroughs (Rice et al. 1998). As a result of these factors, there are very limited incentives to investing in breakthrough innovations and it is unusual for major companies to re-invent themselves to develop entirely new business models.

4.2.4 Overcommitment to Current Customers

Market orientation endorses the classic marketing principle that urges firms to stay close to their customers and put their customers at the top of the organizational chart. Yet in recent years doubts have been raised regarding the unquestioning

focus that firms may place on their markets (Daneels 2004). There is the possibility that an overemphasis on customers could lead to trivial innovations and myopic research and development (R&D), which might lower the firm's innovative competence (Daneels 2002).

Major innovations introduce a very different package of attributes from those that mainstream customers historically value. It is very difficult for companies to predict with any accuracy the attributes of a radical technology that will in future be valued by the consumer (Christensen and Bower 1996). Accordingly, a customer-oriented firm may risk itself in the 'tyranny of the served market'. The firm pursues innovations that directly address existing customers' unsatisfied needs and that promise the best returns. As a consequence, it is unlikely to make substantial investments in market based innovations that have an unknown future, stifling the generation of radical innovations (Daneels 2004). Listening closely to the current wants of their existing customer base can therefore lead companies to fail to spot the true future market potential for breakthrough technologies and miss emerging technological opportunities (Christensen 1997).

4.3 Search-Selection Processes

The studies reviewed in the previous section present compelling explanations for the failure of established firms to develop breakthrough innovations. Yet despite the myriad examples of incumbent firm failures and entrant firm successes, there is a growing set of counterexamples that have been illustrated in the literature (Cattani 2006; Fleming 2001; Macher et al. 2004; Methe et al. 1997; Stefik and Stefik 2004; Yamanouchi 1989). From these accounts we have identified two fundamental enabling conditions for established firms wishing to engage in breakthrough innovation. The firm must create environments (1) conducive to idea generation, and (2) in which risk and uncertainty is tolerated so that some of these ideas can be further developed and brought to market.

Within these accounts, however, limited attention has been placed on the critical transition point when the emerging innovation realizes commercial importance (Adner and Levinthal 2002). Many examples exist of major innovations that prove unviable in the market place. Witness the many variants of pen-based computing and personal digit assistants (PDAs) that have been commercial failures (McGahan et al. 1997). The subsequent challenge (even before any commercialization strategy is decided) is then to identify market domains that are more likely to accept the new technology.

Seeking to integrate the enabling conditions with the identification of market domains conducive to radical novelty leads us to conceptualize the generation of breakthrough innovations as a two stage search-selection process. Search is aimed at increasing the likelihood of coming across new opportunities by prompting experimentation, while selection aims to eliminate the weakest ideas and technologies, supporting the implementation of the most valuable.

In the sections that follow, we describe these phases in greater detail. We focus on the selection phase as it here that market domains conducive to radical novelty can be analysed. Within this phase we propose three types of regime that established firms can adopt to overcome innovation barriers: (1) individual driven, (2) lead user driven and (3) application domain driven. We use examples from BAE Systems, Rolls-Royce and ARM to illustrate the effectiveness of these selection regimes.

4.3.1 Search Phase

The problem of innovativeness is often defined as a problem of lack of combinatorial variety. The solutions to this problem are then mechanisms to enhance the level of experimentation or 'slack search' (Cyert and March 1963) on the part of the organization. More precisely, because inventions are either novel combinations of physical components or rearrangements of previously tried combinations (Henderson and Clark 1990), an organization wishing to enhance its innovativeness should encourage experimentation with a wide variety of components. This well established 'recombinant view' of the creative process (Simonton 1999), suggests that the first step to innovation is to bring together components (competencies, technologies, schemas, etc.) that were previously separated. So, for instance, we know from Fleming's research (2001) that inventors from firms that encompass experimentation with greater technological diversity are more likely to put together a previously untried combination because they are allowed a greater combinatorial space. We also know that experimentation with diverse components stimulates critical processes in breakthrough generation such as analogies, divergent thinking and technological brokering (Hargadon 2003).

Utterback's (1994) argument that breakthroughs come from recombination of well-understood technologies supports this strategy. Similarly, Ahuja and Lampert's (2001) findings indicate that experimentation with unfamiliar technologies, emerging technologies and pioneering technologies enhance the chance on the creation of technological breakthroughs. This form of experimentation can be facilitated in a diversity of ways. Fleming (2001), for instance, in his in-depth analysis of the organizational sources of HP's thermal inkjet discovery describes how HP actively supported juxtaposition and turbulence by recycling engineers across disciplines, encouraging social networking and favouring physical proximity of scientists, to promote idea circulation and interaction (planned and unplanned). In order to encourage experimentation, Nissan Design International deliberately promotes 'creative abrasion' by hiring people in contrasting pairs (e.g. balancing nerds with hippies). At Philips Research, researchers were encouraged to spend some of their time, about half a day a week, on topics not immediately related to their day-to-day work. This officially legitimized bootlegging work, labelled 'Friday-afternoon experiments', created a fertile ground for some major technological opportunities at Philips (Vanhaverbeke et al. 2003). In a similar way, to allow for experimentation and serendipity, at 3 M researchers are encouraged to

spend up to 15 % of their time on a research project of their choice. This ensures that problem driven research does not preclude curiosity driven search.

The vision of technological foresight would be wonderful to have, but such insight is likely to be rare and certainly unpredictable ex-ante. Lacking such vision, organizations must exploit their current wisdom about the world and engage in ongoing search as to future possibilities. To the extent that an incumbent can continuously experiment and recombine disparate knowledge components, its ability to invent breakthrough may not decrease over time. Experimentation can counter learning traps and blinders by providing experience in novel areas. Thus, rather than worrying about externally caused technological obsolescence, firms might stay inventive by focusing on increasing the recombinant mixing and turbulence amongst their current set of inventors and technologies. On the other hand, however, experimentation commonly leads to highly ambiguous results which, for the reasons already illustrated, tend to be judged by old or inadequate innovation routines. As noted by Sharma (1999) "*the overwhelming volume of new ideas and the need to invest to carefully evaluate any one of them in itself restrains innovative activity in large firms*". This brings us to the critical issue of adopting appropriate selection criteria for sifting out promising opportunities from the larger pool of emerging possibilities. We discuss this aspect in the next section.

4.3.2 Selection Phase

Search is just a first step towards change. It provides the raw material for a selection process. The real challenge is to allow this diversity at a sub-system level to provide the basis for a 'cascade' of actions influencing resources allocation and strategy that have the potential to prompt step changes at the organizational level. What makes this phase extremely challenging is that organizations tend to have a singular set of selection criteria since initiatives are typically evaluated as to whether they fit an organization's existing strategic context. This limited granularity of the selection criteria reinforces the general tendency of large organizations to persist in a given trajectory. How can organizations counteract this propensity and induce variegated feedback mechanisms that may enable promising experiments to emerge?

Three types of organizational selection regimes can be distilled from the literature that seem to have proved particularly effective to this purpose. We characterize these selection regimes as follow: individual driven, lead user driven and application domain driven. We discuss each of them separately.

4.3.2.1 Selection Driven by Individuals

Individual driven selection processes are characteristics of large firms which aim at simulating the entrepreneurial conditions usually associated with new entrants

(Baden-Fuller 1995; Stopford and Baden-Fuller 1994). The selection process is led by enterprising employees or champions who emerge in an organization and make a decisive contribution to an innovation by actively and enthusiastically promoting its progress through critical stages, particularly those early on in the process (Humble and Jones 1989; O'Connor and Rice 2000). Such process can take several forms: internal ventures, spin-offs or skunk works. Internal venture and spin-offs usually result from deliberate efforts on the part of the incumbent to take advantage of new promising opportunities that require protection from the counterproductive forces within the mainstream. Skunk works projects arise more informally when product champions encounter organizational forces unsympathetic to their ideas. In this setting projects are managed outside of the organizational context and may not even be exposed to a selection process.

The internal venture may or may not constitute a separate division or separate project that is organizationally or geographically separate from the rest of the firm, but it is unique in that it has objectives that are largely independent from, and in some senses counter to, the rest of the firm. For large corporations, stimulating an enterprising unit internally is an especially valuable option when the new opportunity has a lower profit margin than the mainstream business and should serve the unique needs of a new set of customers. The logic is to keep units small and autonomous so that employees feel a sense of ownership and are responsible for their own results. This encourages a culture of autonomy and risk taking that could not exist in a large, centralized organization. For instance, Tushman and O'Reilly (1996) suggest that at HP the $7 billion printer business emerged not because of strategic foresight and planning at HP's headquarters, but rather due to the entrepreneurial flair of a small group of employees who had the freedom to pursue what was believed to be a small market.

As an alternative, large firms may opt to spin-out the division or venture to allow for greater autonomy and strategic latitude. According to Christensen and Bower (1996), only three incumbents in the entire history of the hard-disk-drive industry achieved commercial success with a radical technology. They attributed the success of two of these incumbents to the spin-out of an independent venture to pursue the new technology.

A spin-out might be appropriate when there is low strategic fit between the new technology and the parent company's existing lines of business or business model. Such has been the case with a number of ventures originating from the Philips Technology Incubator in Eindhoven. For entry into the incubator, venture teams must satisfy the incubator board that the development of the technology is aligned with the strategic aims of the firm. However, during the period of incubation, divergence between this strategic aim and the application of the technology often occurs, leading to the venture's spin-off as the most appropriate outcome of the process (Ford et al. 2010).

Whether it is based on internal development or spin-out, the entrepreneurial pursuit of a new opportunity by large firms is often led by corporate venturing entities (Birkinshaw 1997; Rice et al. 2000). These are typically specialized entities established by large firms with the purpose of identifying and nurturing

new business opportunities for the corporation, either by incubating internal business ideas (as in the case of the Philips Technology Incubator previously mentioned), or spinning out businesses. A well known example of this approach is Xerox Technology Ventures (XTV), the venture fund established by Xerox to commercialize internal technologies that might otherwise have languished. The XTV concept is to create an entrepreneurial vehicle, funded by the parent company, which mimics the traditional venture capital model. The new product venture can have the best of both worlds by exploiting new technologies without giving up access to all corporate resources. The parent company benefits by not having to manage areas outside of its core business (Chesbrough 2002).

Unlike formal internal ventures and spinoffs, skunk works projects are not subject to an explicit selection process. Instead they typically rely on the drive and commitment of their supporters in defying the skeptical scrutiny of the organization. Skunk works typically originate from informal bootlegging initiatives. An individual (or group of individuals) low in the corporate hierarchy identifies a problem and a route to a solution, and decide to go ahead with it without the knowledge or permission of people higher in the organization. At IBM for instance, small skunk works have a full year of low-overhead operation without any question asked before managers decide whether or not to move their projects into the company's mainstream. Likewise, Du Pont's pioneering success in developing and commercializing Lycra Spandex to replace rubber in the leg bands of baby diapers stemmed from the activity of a sequestered team of six people which operated for a few years unencumbered from the normal bureaucratic haggling that comes with typical corporate resistance (Gwynne 1997).

While skunk works may prove highly effective in fostering breakthroughs, they are not without problems. Project evaluation is typically haphazard, occurring at a variety of time points, and the allocation of resources ranges from subversive hoarding to scrounging. In addition, the insulation of these groups from the corporate environment can reduce access to key resource such as technological or market know-how, distribution channels and key individual knowledge sets.

4.3.2.2 Case Example: BAE Systems Autonomous Systems Facility

BAE Systems has sought to reduce bureaucratic overheads and work at a quicker pace at its Autonomous Systems Facility (ASF) in Warton, Lancashire. A skunk works operation in the vein of the Boeing Phantom Works, it originated from the entrepreneurial activities of a small group of modeling enthusiasts in the late 1990s who were interested in the potential of unmanned air vehicles (UAVs). Operating in their own time, these engineers began to experiment with some of the technologies that had already been developed by BAE Systems in autonomous control systems, developing a prototype based on an off-the-shelf airframe. Demonstrating this prototype convinced their management that this was an area in which BAE Systems could make technological advances.

In an industry where full-scale aeroplanes cost in the hundreds of millions of pounds, decisions have traditionally been made at the board level as a top-down process. During the period 2000–2002, there was much deliberation about whether to proceed with the development of UAVs but eventually it was determined that the potential military and civil markets were worth pursuing and the ASF was created in 2002. At its inception the facility had 10 employees but has since grown to 50. This group is comprised of full time facility workers along with a variable number of specialists seconded from other areas of BAE Systems. These secondments help bring in necessary technical knowledge such as optics and sensor management, neural networks, intelligence technology and novel flying shapes.

The ASF purposefully exists as a countercultural entity with the aim of making breakthroughs through rapid incremental learning and development. In addition to fostering this mentality, the ASF doesn't set normal day to day objectives, instead seeking to stretch its engineers through applying greater time pressures and more demanding targets. The team is continually issued challenges by its leaders; for example, the possibility that the British customer might buy an American product motivates the engineers to rise to the challenge.

Despite these time pressures, engineers at the facility are not constrained in how they approach problems and there is a significant level of personal ownership in particular projects. Another aspect of the facility's culture is that the attitude that innovation emerges from adversity and that a limitation in the availability of resources forces engineers to explore alternative solutions to problems. Finally, and perhaps most importantly, there is acceptance that success is not guaranteed and that some project failures are an inevitable.

4.3.2.3 Lead User Driven Selection

Users driven selection processes have gained popularity thanks to the seminal studies of von Hippel and colleagues (von Hippel 1988, 2005; von Hippel et al. 1999). Lead users are those progressive users that have a high motivation to obtain a solution to their so far unmet needs (von Hippel 1988). They are well ahead of market trends and have needs that go far beyond those of the average user.

The lead user approach is designed to collect information about both needs and solutions from the leading edges of the target market and from markets that face similar problems in a more extreme form. As such it may be an effective way to probe and validate breakthrough innovations. For example, an automobile manufacturer who wants to improve its braking system can look at auto racing teams. Furthermore, this company can look at users out of the target market that face similar problems. Braking for example plays an important role in aerospace, and it is in this sector where innovations such as anti-lock braking systems (ABS) were first developed. The firm's effort is therefore directed towards finding prototype product and service ideas that have already been generated and selected by lead users than it is on selecting in-house generated ideas (von Hippel et al. 1999).

In essence, the lead user approach moves the focus of the selection process from the firm to its external environment. This approach can provide useful insights especially for companies that operate at the front end of their target market, because they depend on ideas from related fields to further improve their products. This is consistent with the study of Chandy and Tellis (1998), which found that companies focusing on future customers, rather than on current customers, have a greater degree of radical product innovation. An advantage of the lead users approach, in particular, is that lead users have a thorough understanding of the problem to be solved and are usually open minded to combine knowledge from different fields. Therefore they can help to identify key fields that are in certain aspects ahead of them and from which they expect useful insights for the products they use. A fundamental challenge, however, is to identify a lead user to follow and to extract the relevant information from. This can be difficult and time consuming as there are often many more innovating users thinking about a problem than there are manufacturer-based developers, and these users are thinking about and testing a wide range of ideas.

4.3.2.4 Case Example: Rolls-Royce Linear Friction Welded Blisks

In 1985, The Welding Institute (TWI) approached Rolls-Royce with basic concepts for an innovative processing technique for the manufacture of bladed disks ('blisks'). Existing approaches to constructing blisks required skilled machinists to attach the blades to a central hub using mechanical fastenings. TWI had identified an alternative approach for connecting these types of components through a technique called linear friction welding (LFW) and had begun to develop prototypes. While this process had previously been patented in 1969, it had not been further developed.

Rolls-Royce management recognized that this technique could bring about significant improvements in aerodynamic performance and reduction in cost. Rolls-Royce and TWI developed a pilot programme, also bringing in German aeronautical firm MTU. Two demonstration linear friction welding machines, termed 'oscillators', were developed as a result of this project, with TWI and Rolls-Royce each retaining an oscillator. However, with the future direction of the research uncertain, Rolls-Royce sold their oscillator to MTU in 1992. This uncertainty arose because Rolls-Royce didn't have an application for the new process. In contrast, MTU had gained a place as engine supplier on the Eurofighter program and had determined to further develop the LFW process independently.

In 1997 an opportunity appeared: the Eurofighter workshare agreement had been renegotiated by the member states and this led to Rolls-Royce gaining a contract as blisk supplier along with MTU for the Eurofighter EJ200 engine. It was recognized that the blisk order for the Eurofighter was small but that it provided Rolls-Royce with an opportunity to develop a manufacturing capability in LFW-blisks in readiness for the upcoming Joint Strike Fighter (JSF) program. However, by this time Rolls-Royce was almost 5 years behind MTU in developing this

manufacturing capability, while in the US, General Electric and Pratt and Whitney had also developed some LFW-blisk capability. As a consequence the project team evaluated their position and decided that process changes were required.

These changes included the creation of a larger, cross-disciplinary development team, along with a strategic division of labour. This division brought about the separation of development activities between that of the process and the machine tooling for the smaller blisks that were intended for military applications ($\sim$0.5 m diameter) and those larger blisks that would be used for civilian applications ($\sim$1.5 m diameter). In addition, the team realized that it was necessary to look outside the firm for sources of missing specialist expertise. This brought the team into contact with MTS Systems, a small Californian-based firm that was able to provide turnkey solutions for the oscillator and its tooling.

These approaches led to the development of a manufacturing capability for the smaller diameter blisks in 2001, delivering two Eurofighter Typhoon engines per week when operating at full capacity. Involvement in the Eurofighter program provided Rolls Royce with the ability to demonstrate performance improvements and cost reductions in time to join the JSF program in 2003. Involvement in this program led to a significant increase in production, with Rolls-Royce increasing its manufacturing capacity to five engines per week at full volume.

As a result of this R&D initiative, Rolls-Royce maintained its position at the leading edge of turbine engine technology. With the military its lead user of advanced blisk technology, it has since taken this technology and further developed it for larger blisks in the civilian aerospace market. A number of complementary process innovations have also emerged during the course of the process development (e.g. a patented gas shielding process for cleaner welding), along with a number of further research avenues in the manufacture of blisks from composite materials.

4.3.2.5 Application Domain Driven Selection

Pursuing new avenues for innovation requires a complex coupling between technical development and a technology's market application. Because of the belief that technological revolutions usually occur in the lab, managers sometimes undervalue the importance of applications. Yet the selection forces that operate at the level of the niche domain of application may prove highly consequential in triggering radical step-changes in a firm's route to innovation. Compared to the low dimensionality of the basis by which initiatives are internally evaluated, the market environment is composed of numerous niches each with its own requirement and selection criteria. This requisite variety may induce critical shifts in the functionality by which a technology is evaluated and unleash resources for supporting its development and commercialization. As noted by Adner and Levinthal (2002): "*beneath the revolutionary emergence of new technologies is often a process of shifting application domains and rapid subsequent growth in the new domain*" (*p. 63*).

The term 'technological speciation' denotes an innovation that shares a prior lineage with another technology but has radical new features that result from its exposure to new selection forces in the market with a different niche structure of the resource space (Levinthal 1998; Adner and Levinthal 2002). Even where the advance of science and technology is steady and incremental, when a new domain of application is opened up for such knowledge (or for a combination of known technologies) a major discontinuity may ensue. For example, video recording involved a combination of known image storing and signal processing technologies applied to the consumer video market. EMI's medical scanning instrumentation was a combination of known X-ray technology and information processing technologies, combined in a new application for the medical market.

The implication of these observations is that there are probably many technological developments that could take off, in the appropriate application domain (Adner and Levinthal 2002). Thus, the speciation approach shifts attention from the selection of the proper technology to the selection of the appropriate domain of application and thereby to its matching with the technology. This approach points to the importance of 'probing' (Lynn et al. 1996) multiple domains of application and learning from gradual feedbacks that accumulate as the existing technology is adapted to the selected niche. The challenge is then for managers to anticipate the structure of the possible selection environments in which they can develop a given technological initiative and actively look for ways to move the speciation process forward. By expanding a firm's search space, and fostering engagement in new markets, firms learn about consumer preferences and requirements (Adner and Levinthal 2002). As a result of this feedback-driven interaction with the environment, new technologies may develop and eventually come to commercial fruition. In a recent study by Cattani (2006), for instance, it is shown how Corning developed fiber optics by leveraging its long-standing expertise in specialty glass into the telecommunication industry. The breakthrough was a result of the adaptation of this existing know-how to the performance demands of the new domain.

This approach is not without limitations though. Multiple domains may generate noisy rejection signals. For instance an innovation rejected in one niche may find acceptance in another or at a later stage of development. As noted by Adner and Levinthal (2002): "*The open ended nature of this feedback can make abandoning projects quite difficult*". Firms need to be able to probe opportunity paths in a timely and efficient manner so adopting efficient resource allocation processes is a critical component to implementing this approach.

4.3.2.6 Case Example: ARM[1]

ARM Holdings is a world leader in the design of microprocessors for mobile electronics. Its origins can be traced to Acorn Computers, one of the early

[1] A more detailed account of this case can be found in Ferriani et al. (2012).

microcomputer developers based in Cambridge, UK. Building on its initial success with its BBC Micro computer, in 1983 Acorn Computers determined to develop its own microprocessor for its next generation Archimedes computer. This was no small undertaking: microprocessor development can take significant resources, such as the estimated 200 man years required for National Semiconductor to develop the 16,032 microprocessor. Looking to develop a microprocessor on much more limited resources, Acorn identified reduced instruction set computing (RISC) as a means to achieving this. The project was a success, with the design of the Advanced RISC Machine (ARM) completed in 1985, and VLSI responsible for its manufacture.

While technically proficient, issues with sales and distribution limited Acorn's ability to capitalize on the ARM microprocessor, and in the late 1980s it became apparent that for the potential of the ARM microprocessor to be fully realized then it needed to be done outside the confines of Acorn. At that time, Apple was designing a personal digital assistant (PDA), the Newton. The ARM microprocessor was identified as having the necessary functionality for this portable device and in November 1990 the decision was made to spin-out the 12-man ARM processor team as a joint venture between Acorn, Apple and VLSI.

The new venture, ARM, took the strategic decision to be a "chipless, chip company", adopting an IP licensing business model in which developing relational capabilities was of great importance. While the Apple Newton was not a commercial success, its development led to the launch of the ARM6 family of microprocessors in November 1991. A license for these microprocessors was acquired by GEC Plessey Semiconductors in January 1992 for use in microcontrollers. A former Design Manager at Plessey remembers ARM's approach as: "*We've got this core. It must be useful to people for something. We don't really know how you might want to use it but we're prepared to work with you to understand it*". Along with working with its licensees to understand the application of the technology, ARM also worked with these partners to learn more about their manufacturing needs. As ARM CEO Robin Saxby commented, ARM needed "*to have an intimate understanding of the manufacturing process and work with our partners in areas like test, de-bug, yield and performance enhancement*".

As the number of ARM's partnerships increased, the company also gained further valuable learning and experience from the further client services offered, including consultancy, feasibility studies, training and prototype supply. The commercial breakthrough for ARM came when Texas Instruments licensed ARM's chips, together providing Nokia with a microprocessor for its emerging mobile phone business. The success of this application market attracted increasing numbers of licensees so that by the end of 2001, ARM had 65 partners across the world. By this point ARM microprocessors had become the de factor standard with an estimated 77 % share of the global embedded RISC microprocessor market. Building on this breakthrough, ARM was well-positioned as the mobile phone market transitioned to smart phones and tablet computing.

The ARM example shows the potential power of the application domain driven selection. The ARM microprocessor was trialed in a series of application domains;

for the first seven years in microcomputers, then subsequently in PDAs and microcontrollers before its breakthrough growth in mobile phone handsets and later in mobile computing. Each application provided an opportunity for feedback and learning about the technology, the market and customer needs.

4.4 Conclusions

Breakthrough innovations are important to the firm. They enable firms to challenge the existing technological order and shape new paths and allow them to engage in corporate reinvention, growth, and new business development (Burgelman 1983). They represent rare, valuable, and inimitable sources of competitive advantage for firms (Barney 1991). Ever since Schumpeter associated the advent of revolutionary technologies with *"waves of creative destruction"*, there has been debate about the relative role of incumbent large firms and new entrants in sparking these waves of change. Over the past 20 years, most of the analytical writing has been against incumbents, based on the general observation that new firms are less likely to be affected by the kind of change preventing forces typically associated with large companies' entrenched wisdom. Entrants have less to lose, and for them a breakthrough innovation may be the only chance to gain a foothold. Meanwhile, numerous 'antibodies' are present in large organizations that systematically detect and hamper the progression of fundamentally different ideas that may threaten the company's status quo (Garnsey and Wright 1990).

As we have illustrated in the first part of the chapter, some of these barriers are a result of firms' path dependence and their consequent resistance to modify competencies or organizational practices that have proved successful in the past, while others stem from their aversion to the inevitable risks and uncertainties that characterize radically new technologies. These barriers are pervasive in large organizations and represent a powerful impediment to breakthrough innovations. Despite these barriers, some large firms are able to systematically reinvent themselves and contribute major innovations (Ahuja and Lampert 2001; Fleming 2001). Accordingly, in the second part of the chapter we have sought to illustrate the key mechanisms and practices that underpin such deviations from the mean. To this end, we have conceptualized the generation of breakthrough innovation as a two step search-selection process. In the search phase firms need to wider their solution space by encouraging experimentation and stimulating recombination of previously separated components (knowledge sets, technologies and schemas). These combinatorial thought trials (Simonton 1999) afford greater creative opportunities and more possibilities of creating innovations.

The generation of variety, however, is obviously not sufficient. We surmise that the lack of variety is not even the key constraining factor in bounding the incumbent's innovative potential. Indeed, variety very often results as a natural by-product of large firms' ongoing operations. As illustrated by Garud and Nayyar (1994), most established firms have vast storehouses of knowledge that is poorly

exploited. The real challenge is then how an organization can select effectively among the variety available. Experiments and search, in other words, must be integrated by sufficient variety in the feedback mechanisms which guide the internal selection process within an organization.

We have characterized three types of selection regimes that summarize the canonical forms of such processes: individual driven, user driven, and application domain driven. Each of these approaches can prove viable in choosing among promising alternatives and thereby supporting radical innovations in large companies. Yet, we also emphasize a salient difference in the degree of granularity that is embodied by these selection processes. Individual and user driven approaches both rely on single sources of feedback, be it an individual intuition (champion driven) or a user need or perception (user driven). The application domain approach, instead, relies on a broader set of niches each with its own requirements and selection criteria. Because the first two approaches allow for a higher degree of focus, they are probably better suited to enhance and capitalize on existing competences. Focus however, is likely to cause lower sensitivity to the broader range of opportunities available in the environment, which might prevent the organization from adequately assessing the signals that come from the market. These arguments suggest that the narrower the dimensionality of the selection approach, the more conservative the choice of projects is likely to be, and the less the potential of the approach to fostering radical change.

Given the multifaceted nature of the environment, we suggest that the domain driven approach is the one that allows for higher dimensionality in the selection criteria and for that reason the one that is more likely to be conducive to successful breakthroughs innovations. By experimenting with diverse domains and thus relying on variegated feedbacks to drive initiatives firms may engender radical changes even in the face of modest initial impetus (Adner and Levinthal 2002). High technology domains, in particular, are often subject to incredible uncertainty. As a result, they offer some of the richest opportunities for experience based learning. In such settings the use of variegated feedback from multiple facets of the application environment may serve as superior selection mechanisms to the judgment of corporate headquarters.

A breakthrough is something novel, something unheard of, which rises above the culture and the environment from which it emerges. Given the many intangible elements that affect a breakthrough it would be foolish to extrapolate a flawless success formula. Nonetheless large firms exist that do display a consistent and systematic ability in spurring breakthroughs and coping with change. Not only should this observation serve as a testament to the viability of managing for breakthroughs but it should also encourage further empirical efforts in this direction. Breakthrough innovations are rapidly in the spotlight ex-post, and companies are then praised or criticized for their decisions to pursue or overlook them. Rarely do firms have the foresight to anticipate tomorrow's waves of creative destruction. Yet, this is the challenge faced by managers. We hope our work will provide fruitful guidelines to address this challenge and allow for a more systematic understanding of the organizational and strategic processes that may

help overcoming corporate resistance and support breakthrough innovations in large established firms.

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Chapter 5
Harnessing the Innovation Potential of Citizens: How Open Innovation Can be Used to Co-develop Political Strategies

Giordano Koch, Maximilian Rapp and Niclas Kröger

Abstract Information and communication technologies provide firms with new opportunities to co-create innovations with their customers. The resulting trend towards "open innovation" has revitalized firm's interest in systematically tapping into external innovation sources. Whereas the first open innovation cases typically dealt with product innovation, latest developments show that also intangible service innovation or corporate strategies can be co-developed with users, customers, or employees. As internet technologies are also increasingly pervasive in the public sector, virtual citizen co-creation systems also constitute an important but unexplored research area within the public administration research. This is especially relevant since real case examples in the public sector underline the need for more openness in governmental decision making. To tackle the research question, how an online co-creating approach may be designed to develop a political strategy together with experts and citizens, we conducted a 22-month research project together with the state chancellery of North Rheine Westphalia. A virtual co-creation system to rework an existing political strategy together with experts and citizens was created, implemented and evaluated. During the 3 month live-phase the platform attracted more than 60,000 visitors and about 270 active and registered members. Furthermore, 250 contributions, uploads of 236 additional documents and studies, about 500 evaluations, and over 1,050 written messages were counted. Our results show how intangible public innovations, which are tied to social welfare, public ethics, and legitimization, can be systematically co-created. These insights add relevant theoretical contributions to the research fields of service innovation, open innovation, and most importantly to the research community of public administration. From a practical and managerial point of view, our insights are of practical relevance for system designers and managers within public administration, politicians, and consulting agencies which intend to virtually integrate citizens, experts as well as politicians into co-creation processes.

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5.1 Introduction

Times have changed since new products were successfully developed by selected experts inside the closed research and development departments of companies (Chesbrough 2006). Traditional innovation and product development cycles are struggling to keep up and are thus often considered as slower, limited in their flexibility and less innovative (Füller et al. 2011). Firms are increasingly confronted with the necessity to open up their internal boundaries to the outside in order to profit from creativity, use experience and knowledge of their customers (Chiaroni et al. 2008; Gassmann et al. 2010). Only this way the extremely dynamic, heterogenic and individualized demands of the modern customer requests can be met adequately (Sawhney and Prandelli 2000). The Internet and social networks offer the possibility to identify and analyze the widespread user experience/knowledge and make use of it (Füller et al. 2009). Today's customers connect with like-minded people, articulate their needs and discuss as well as evaluate products (Füller et al. 2004). Customers even further develop products and services, they modify them to better fit to their needs and this way generate a wide range of knowledge about the product that, in many cases, even has the potential to exceed the product development output traditionally developed by firm-related engineers (Füller and Matzler 2007). Consequently, many products and inventions, like for example the mountain bike, the surfboard or diapers were not conceived in a lab or R&D department, but rather invented and developed by active consumers, who demanded for something different and innovative.

While open innovation research indicates that "unknown outsiders" can constitute an important source of innovation and value-creation (Nambisan and Sawhney 2007), there is hardly any research discussing open innovation in public sector or public organizations dealing with production, delivery and allocation of goods with and for citizens. However, recent case examples on problem solving activities in the public sector undermine the need for more openness in governmental processes (Rowe and Frewer 2004). Although public organizations may not produce tangible products, the concept of open innovation has also been proven in the context of political innovation (Lee et al. 2011). Similar to the branch of open service innovation, political open innovation includes the collaborative development of policies, strategies, law or simply political positions, which do not necessarily need to be developed and discused by internal experts (Lee et al. 2011; Nelson and Sampat 2001; Nijssen et al. 2006).

These arguments show that the public sector is also feeling the pressure to implement a more direct communication system as well as to increase the collaboration orientated formats between politicians, entrepreneurs, citizens and other groups of interest (Lee et al. 2011). The relevance of this topic is supported by the fact that the number of people voting is decreasing significantly each election; the same is true for memberships in political parties and the overall disenchantment with politics (Filzmaier 2007). However, reasoning that citizens are less interested in political topics may not be the adequate conclusion (Koch et al. 2012). The fact

that participation in direct democratic formats is rapidly increasing in Germany since 1995 is certainly contrary to this assumption. Also protest movements including the personal engagement of the individuals involved, seem to enjoy increasing popularity. Therefore it has to be assumed that citizens do not generally turn their backs on political topics but rather avoid the traditional scenes of political action. Instead they are looking for more dynamic platforms for discussion in times of the Internet, social media and web 2.0 (Kaplan and Haenlein 2009). Political blogs and forums, online groups of politically interested people as well as online platforms, focusing on interaction and discussion, are offering a variety of possibilities to fulfill their needs. The current President of the United States, Barack Obama, showed that modern channels of online participation may be used by the administration to meet citizens needs more adequately (Obama 2009). During his first election campaign and his first presidential term he initiated a whole list of different Open Government projects, aimed at more transparent, participative, collaborative and thus, more modern ways of integrating citizens into the formerly closed processes of policy development.

Within the research community of open and user innovation, first essays about democratizing strategy dialogs are drawing attention (Stieger et al. 2012). They typically refer to the formerly mentioned potential of innovating even intangible products. However, this research stream also applies open innovation mechanisms to intangible services, organizational processes, change projects, and also strategy development within organizations. First use cases in a corporate context show that open strategy processes not only provide more valuable results at the beginning, where typically only selected survey interviews should pretend an integrating and bottom up approach (Whittington et al. 2011). Open strategy may also provide significant value to the actual strategy development process, where employees are invited to equally contribute with their operative experience as well as knowledge and especially to the subsequent implementation of the developed strategy (Matzler et al. 2012). Since the development of political programs should per definition be developed by an elected citizen for citizens, the introduced approach of open strategy seems to have the potential to unfold much potential within the public sector. Consequently, this research effort aims at exploring how open innovation may be used to co-develop political strategies in a public sector.

To tackle the research question, we conducted a 22-month research project together with the state chancellery of North Rhine Westphalia. A virtual co-creation system to rework an existing political strategy together with experts and citizens was created, implemented and evaluated. Our results show how an open innovations approach may be used to co-develop a political strategy together with citizens. These insights add relevant theoretical contributions to the research fields of service innovation, open innovation, and most importantly to the research community of public administration. From a practical and managerial point of view, our insights are of practical relevance for managers within public administration, politicians, and consulting agencies, which intend to virtually integrate citizens, experts as well as politicians into co-creation processes.

5.2 Theoretical Background

5.2.1 Open Innovation in the Private Sector

New information and communication technologies, such as social media, offer quick access to a large crowd of creative minds at low cost, and this at least potentially on a global level (Piller and Walcher 2006). Hence, open innovation as well as crowdsourcing approaches have become popular strategies in the private sector to 1) systematically implement distributed and participatory problem solving and 2) value creation activities (Chesbrough 2006). The basic idea of open and user innovation is that a single organization cannot innovate in isolation, or at least gets better results when innovating in collaborative structures. At least in the private sector open innovation has been widely examined in the last decade (Dahlander and Gann 2010). Open innovation researchers state that institutions have to collaborate with different types of partners to acquire ideas and resources from external sources in order to stay competitive (Füller et al. 2004). Relying on this stream of literature we will now shift our attention to potentials of service innovation and open strategy in the public sector.

5.2.2 Open Service Innovation in the Public Sector

New Firms typically classify innovation as either a new process, including a new production or organizational process (Tether and Tajar 2008), or a new product or a new service offered by a firm to their customers. In other words, while one side focuses on how the firm creates value through innovation, the other side explains what changes are realized by the firm in terms of producing new products. Extensive research has been conducted to examine the influence of co-creation on innovation products in companies, but the importance of innovating services has not yet been discovered in detail, even though an increasing number of scholars try to focus on this topic (Nijssen et al. 2006). One reason for that might be the existing opinion about the distinctive nature of services (e.g. intangibility, heterogeneity) which needs to be considered when services should be innovated. However, both approaches have in common that firms are able to "tap into collectives on a greater scale than ever before" (Stieger et al. 2012, p. 46).

When taking a closer look at open innovation in the public sector, it becomes obvious that it is quite specific in nature. Public entities majorly relate in policies and public services as well as in the possible changes of the organizational processes and structures. Hence, public organizations need the help of citizens in order to improve their services or co-develop intangible programs, strategies or policies. This new development in the public sector is a key factor for satisfying the needs of citizens, as they are demanding a way to interact with politicians mainly through new communication channels (Koch and Rapp 2012). Even though

internal organizational changes in public administration can be seen as an important source of innovation, the continuous engagement of citizens, party members or experts are an important input in order to innovate public administration and their services as well as to adapt "political products" like party programs or strategies (Koch et al. 2012).

Nevertheless, the value of a new policy or a public service is not exchanged as it is for physical products. Indeed, the future value of a new policy relates not to its individualism and does not depend on the specific context of each individual customer like in the corporate service context, but relates much more to the welfare and justice in a collective community. So, public innovations are not just intangible but they regularly relate to a collective interest of a citizen community (Bach and Della Rocca 2000). This again makes an integrative approach even more attractive, since potential contributors should have natural interest in participating.

5.2.3 Introducing Open Strategy

Typically strategy processes are executed by a strict top down approach. Although strategies are normally not a product of a single board member, an individual strategist or even a (consulting) strategy team and often founded by market research data, trend analysis, and selected interviews, the actual strategy development and execution must be considered as not explicitly integrative (Chesbrough and Appleyard 2007). Not surprisingly, many strategies do not fail due to their actual quality but due to the fact that the implementers and at the end "normal" employees do not perceive themselves as strategy owners (Giles 1991). Consequently, scholars started to analyze and discuss approaches, which are capable of systematically involving all relevant stakeholders to ensure a shared understanding, a stronger and more lasting commitment, and respectively a more efficient and effective implementation phase (Sterling 2003).

Recent publications on open strategy rely on open innovation mechanisms as their theoretical and process orientated foundation. The approach of open innovation has been introduced to the strategic management research community, mainly by Chesbrough and Appleyard. As the bottom line, virtual open innovation platforms and related offline approaches are used in strategy dialogues to tap into the knowledge and experience of a larger group of employees and thereby create a better identification, engagement, and understanding of the strategy process (Chesbrough and Appleyard 2007). The underlying logic refers to the fact that crowds may gather more data and support the management in a more accurate understanding of problems. However, in line with researchers, which criticize that open strategy should not lead to a totally democratic approach, where all stakeholders have the same rights we explicitly emphasize the importance of experts, selected consultants, and board members during an open strategy process.

In this way, we understand open strategy as a combined offline/online approach which links top down and bottom up processes. Virtual collaboration tools serve as temporary and content-related networks across hierarchies and functions while fostering transparent participation and collaboration. Separated from time and location employees are theoretically able to contribute to the strategy development process; those remote as well as asynchronic working modes allow an efficient and effective mass orientated strategy process. The network-based platform structure enables the documentation of individual contributions (ideas, concepts, suggestions, solutions, etc.) and feedback orientated discussion and evaluation, as well as the systematic combination (inspiration) and the improvement of exciting content. Simultaneously, "traditional" strategy development formats may accompany the described process. Market research studies, trend analysis, but also closed collaboration formats (e.g. workshops) with consultants and executives will add value to the open strategy process. However, those experts must shift their attention towards the virtual strategy collaboration process to manage and steer the community action on the platform. This includes the tasks to activate a preferably diverse crowd, to prepare a well framed task description including additional materials (input), and finally motivate an independent network structure, where customers', or citizens' opinions should not be determined by other platform participants (e.g. by hierarchical structures).

5.2.4 Public Sector Open Strategy Objectives

Typically In the following we introduce a five objective framework, which was originally developed by Li and Bernoff to analyze the outcome of crowdsourcing projects (Li and Bernoff 2011; Bernoff and Li 2008). Recently, Stieger et al. (2012) adopted this framework to the context of open strategy. We will now use this framework to better understand and analyze an open strategy project in the public sector. Due to the fact that many strategies are struggling in the implementation phases, we will introduce a sixth dimension labeled "living", which will focus on the actual implementation and realization success of an openly developed public sector strategy (Table 5.1).

- *Energizing:* The first dimension focuses on the activation and motivation of relevant open strategy platform participants. In an open innovation setting, employees should have the voice and the chances to participate actively, spread the word, and invite likeminded employees. This dimension is especially important in the context of conducting public sector strategy project, since the targeted participants are typically not easy to reach employees within an organization, but rather a diverse and locally disperse crowd of citizens, experts, civil servants, or politicians. An activation and motivation strategy will help to identify the most relevant target groups, which will be more engaged due to their knowledge and experience, but also their topic or task related responsibility.

Table 5.1 Objectives for open strategy formats in a public sector setting

Dimension	Open strategy objectives within a public sector context
Energizing	Energizing aims to actively embrace citizens and experts to engage in the given setup and to motivate sustainably in order to share their experience and knowledge
Listening	Listening can be described as a key dimension as aims to opening up the internal administrative barriers to sustainably integrate the voices of citizens
Talking	Talking can be described as an external communication channel, which aims to promote the public initiative in order to generate more awareness for the respective project
Supporting	Supporting seems to be the hard ground work of open public collaboration initiatives as its objective is to actively give feedback to shared ideas and to motivate the citizens throughout the live phase
Embracing	Through the dimension of embracing you try to guarantee that an open public initiative is backed up by the majority of stakeholders and responsible persons within the institution
Living	Living can be described as a term that stands for the strong will to implement open strategy approaches, which were discussed and evaluated together with the citizens

Hence, "energizing" in this context aims to actively embrace citizens and experts to engage in the given setup and to sustainably motivate them to share their experiences and knowledge.

- *Listening:* As the second dimension for open innovation projects, Li and Bernoff introduced "listening" (Li and Bernoff 2011). Generally, the idea is to use an open innovation platform to involve the outside of a firm and thereby listen to a large peer group of users/customers (external perspective) or employees (internal perspective). Since political programs or strategies should by nature be developed for citizens, this dimension seems to be even more important in a public sector setting. From a citizens' perspective, participating in a strategic citizen dialog, documents or even spreading their opinions and arguments so that they cannot be ignored or "simply explained away as it moves up the hierarchy" (Stieger et al. 2012, p. 50). Therefore, "listening" can be described as a key dimension as it aims to open up the internal administrative barriers to sustainably integrate the voices of citizens.
- *Talking:* The third objective of an open innovation project can be defined as "talking". Although the main objective should focus on the generation of qualitative output, the communication and marketing dimension of such a platform should not be underestimated. This dimension can be subdivided in communication efforts aiming on community growth, on output development, or on more general, not directly related communication efforts. So, "talking" might in other words be described as an external communication channel, which aims to promote the public initiative in order to generate more awareness and traffic on the platform.
- *Supporting:* Open strategy is based on the idea of peer-to-peer feedback. This implicates the participative and collaborative aspect since platform participants

may support each other (Gebauer et al. 2012). Within the public sector setting such an open strategy approach can be a viable means to get in touch with other likeminded citizens, connect with experts or politicians and get feedback from them (Koch et al. 2013). Especially during the planning, implementation, and realization phases of a political strategy relevant peer-to-peer feedback is considered very helpful (Füller 2010). Moreover, a continuous community and platform management helps to motivate citizens and give them positive feedback to their invested time and engagement. Therefore, "supporting" seems to be the hard ground work as its objective is to actively give feedback to shared ideas and to motivate citizens throughout the live phase.

- *Embracing:* The final dimension introduced by Li and Bernoff focuses on embracing relevant stakeholders. We know that the successful implementation of strategies often fail due to the lack of motivated and engaged people within the organization (Chesbrough and Appleyard 2007). However, this implicates that the systematic integration of relevant experts and especially multipliers may be a success factor of strategy implementation. By using a more open strategy process these people can be identified, invited, motivated, and specially treated (embraced) to profit from their central and influencing role within the respective network. Again, this is especially important in a political context where politicians have to engage a number of relevant stakeholders (experts, non-profit organization, non-governmental organization etc.) when planning, developing, and implementing a new strategy. Consequently, through the dimension of "embracing" the project owner tries to guarantee that an open public initiative is backed up by the majority of stakeholders and responsible persons within the institution.
- *Living:* Since political strategies are typically ongoing the aspect of a sustainable implementation is of utmost importance. Spending a lot of time helping institutions in the scope of open government initiatives, raises the expectations of citizens enormously. If nothing happens with ideas and concepts or if there is no certain feedback to the engagement of citizens, negative rebound effects can arise. So, open strategy approaches may also serve as a valuable mechanism to report, discuss and evaluate the consequences of the actual strategy back to citizens.

Based on the foundation laid by literature on open innovation, crowdsourcing and co-creation and especially on the introduced framework of open strategy objectives, we developed a platform based open strategy project for the State Government of North Rhine Westphalia in Germany. The initiative was going to be conducted in the field of the 'One World Policy' strategy, which identifies the political activities of North Rhine Westphalia regarding economic, political, social as well as cultural guidelines for developing and emerging countries in the third world.

5.3 Methodology

Since we were not able to draw on already existing research from other open strategy projects within the public sector, we applied a rather explanatory and thus qualitative research approach focusing on a single case. To get a better understanding of the effects felt when open participatory approaches are incorporated into functions of governmental organizations, we chose a methodology that combines participatory and qualitative research. "Participatory Action Research Approach" (PAR) refers to a research process that makes scientists become active participants and participants become scientists in the project that needs to be analyzed (Checkland and Holwell 2007; Baskerville and Wood-Harper 1996). By creating a clear structure for planning, implementation, execution as well as systematic learning loops, it can be ensured that a new phenomenon in all its complexity is analyzed in a concrete use case (Butler et al. 2000). Therefore PAR is an approach primarily used for research questions that have only been analyzed very little, where scientists actually have to actively immerse themselves in the project. Furthermore, particularly complex effects are expected to be shown which can't theoretically be understood in advance (Wadsworth 1998; Kindon et al. 2007). Consequently, the participatory project was conducted in close arrangement with the leaders of the State Government of North Rhine Westphalia, the implementing agency and the research team. The research team was part of the entire project, as an observing and actively supporting entity.

5.4 The Empirical Study—The Online Consultation "One World Strategy"

5.4.1 Planning and Conception Phase

In 2011, the State Government of North Rhine Westphalia in Germany and the research team came up with the decision of conducting an action research initiative regarding a crowd sourced strategy process with citizens. The initiative was to be conducted in the field of the 'One World Policy' strategy, which defines the political activities of North Rhine Westphalia regarding economic, political, social as well as cultural guidelines for developing and emerging countries in the third world. Before the technical conversion was executed, several expert workshops took place, where members of NGOs and other influential organizations in the field of "one world politics" were invited. To design and implement this online co-creation project, the researchers closely cooperated with the project leaders. Therefore, the project setting enabled the research team to include the experts as co-researchers and to conduct the action research practically. Albeit the project's practical manner put some limitations towards the planning and implementation of the action cycles, it allowed the researchers to directly review and perform changes

regarding the design of virtual open strategy platform. During the project, a steady interaction took place between a wide range of stakeholders like the Ministry's experts, nonprofit organizations, as well as local foundations who provided additional know-how and the research team.

5.4.2 Realization Phase

Based on detailed concept and developed milestones, the online consultation was finally designed, programmed and eventually tested. The platform was launched on June 20, 2011 and open for visitors to register and discuss ten chosen topics (Fig. 5.1).

On the home page of the platform the Minister for Domestic Affairs, Europe and Media in North Rhine Westphalia, welcomed all visitors textually and pointed out the potential of the participation platform. Above this video a login/registration box was placed through which registered users were able to sign in and new users could access the registration page, where they could register by providing a user name and e-mail address. This method is particularly necessary, because it guarantees the authenticity of the user. After the registration process, the new user had to activate his account through the verification of the e-mail address by clicking a link sent to the address. Through this security mechanism only users that actually provided their own e-mail address were able to join the community. Furthermore, the page displayed the ten different areas of activity, to which the participants could submit entries: energy, environment, fair trade, education, universities and science, media, culture, health as well as economy, peace, migration, and cooperation. By color-coding a distinct reduction in complexity could be achieved. To improve interactive discussions from the beginning, social media was used in order to create further attention.

By clicking the main menu tab "join the discussion" participants were directed to the summary page of the various fields. In addition to a key visual of each topic, a brief summary of the topic and the key questions as well as additional PDF attachments containing detailed information, were given. Guiding the participant by providing key questions to focus their submissions prevented rambling discussions on issues that ultimately could not have been considered. Contributions to the subjects could then simply be uploaded through an idea submission form, which was displayed under the short description of the topic. Other users on the platform were able to evaluate the submitted concepts and ideas by simply "like" them through a "thumbs up-button" (Fig. 5.2).

In order to guide the citizens and experts on the platform, we provided them the following key questions which should be answered: (1) What are central topics and activities within this respective topic area? (2) Which are the best practices you know? (3) What kind of barriers should be considered? (4) Who are the central players within this political field? (5) What should a successful "one world strategy"

Fig. 5.1 Landing page

cover from your perspective? (6) Which goals and priorities do you see in this context? The topic field's related contributions could be read, evaluated as well as commented on by other community members. Furthermore, we allowed participants to write messages to other community profiles, which were also displayed in different activity streams (global, topic related, personal). Moreover, a static information page was given, where citizens were able to collect further information about the topic in general as well as the "rules" of the platform. The community, which consisted of the registered participants, was displayed on a special subpage, to open up the possibility of searching for other members, viewing their profiles, leaving messages on their pin walls and promoting social and interactive exchange.

5.4.3 Implementation Phase

Between June 20, 2011 and October 11, 2011 experts in the field of "one world policy" and other interested people were able to submit and discuss their ideas regarding the content and therefore the strategy of how North Rhine Westphalia should support third world countries. The official launch of the platform was accompanied by different marketing efforts, like word of mouth approaches and radio commercials. Additionally several print media covered the issue and thus served as an important communication tool. After the end of the submission and discussion phase the State Government of North-Rhine Westphalia systematically analyzed the submissions to incorporate the content into the One-World Strategy,

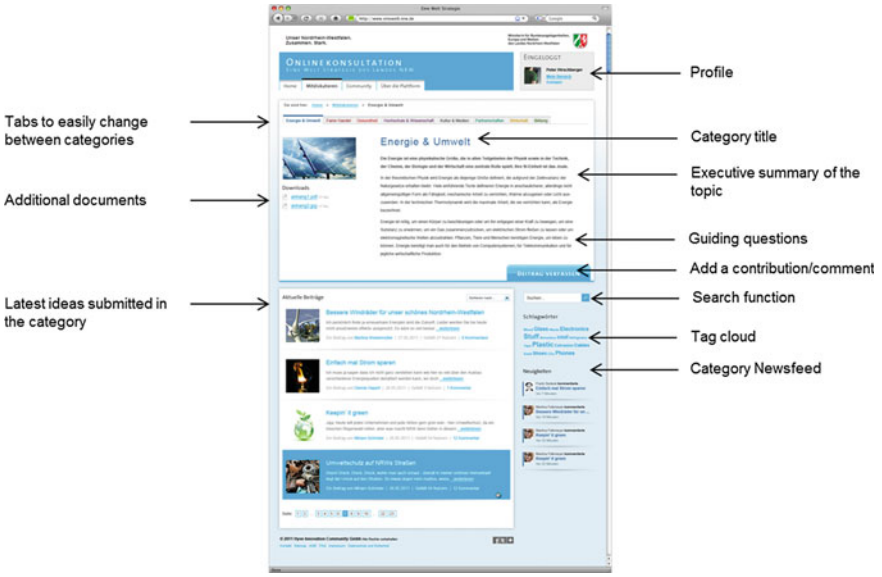

Fig. 5.2 Sub page of the open strategy project

which was finally enacted in December 2012. The final document has been printed and published in the name of the ministry and also uploaded to the platform.

5.4.4 Results and Evaluation

The research team took part in all relevant meetings, calls and workshops of the project team. Further, researchers were also active on the platform and directly interacted with users of the system. Thus, they could directly reflect on actions taken and were able to evaluate the design principles and their impact on user participation. Furthermore, the research team analyzed the qualitative content on the platform using the software ATLAS.TI. Within a sixteen-week period more than 60,000 visitors were recorded, of whom about 270 registered actively and submitted 250 ideas and contributions with an additional 326 PDF documents. Furthermore the community members left over 550 comments and evaluated the ideas more than 500 times, while also leaving about 270 personal messages on each other's pin walls. Thus, there was a high ratio of contributions and uploads of documents in relation to the total number of participants. This indicates a high participation interest.

In order to understand, whether the open strategy project reached its overall aim of generating new ideas, concepts, best practices, and thus innovating the existing one world strategy, we conducted a content analysis including all citizen generated

content from the platform. This content analysis of all contributions, including 251 postings and 537 comments, supported the general participation interest. Based on the different sub-categories and the guiding questions we developed 79 Codes, and assigned the postings and comments respectively, by using the qualitative content analysis software ATLAS.TI. Generally, all eleven sub-categories received a relatively equal number of postings and comments, which can be interpreted as an indicator for well performing user guidance on the platform. Considering the categorization provided during the upload process of postings the following three categories 'processes', 'actors', and 'goals' were clearly used the most, which again indicates an expertly focused community structure. To understand, whether the whole approach was accepted as a professional and serious participation tool, we analyzed the chosen communication modes of all uploaded contribution. The majority (58 %) were written in an objective and factual language, followed by 27 % of rather explaining and illustrating contributions. In contrast, only 11 % were considered as 'emotional' or even 'aggressive' (4 %). Considering project related postings, we found much affirmation. Some wrote that "they see great value in such a co-creation system, which will help the country to be politically better positioned in the future" (M.S.). Another participant comment on one of the community managers walls: "I hope that such initiatives are not only restricted to the state of NRW but will be best practices in Germany and Europe" (A.G.).

5.5 Insights

As described, the research team observed the co-creation process during the live-phases in order to understand how citizens, experts, and politicians might cope with the platform and afterwards, how the public administration would use the platform, the online as well as offline conversation to finalize the new "one world" strategy. In order to provide a structured project analysis we will us the initially introduced framework to present as well as reflect our insights.

Energizing

The facts reported above already indicate the results of the participation project and simultaneously provide some first hints regarding the success of "energizing" citizen and experts on the platform. In the following paragraphs, we will discuss our findings regarding the objective of energizing citizens by focusing on recruiting activities, community management, and activation strategies as well as the respective impact on the community and the content.

- *Recruiting activities:* In order to identify and activate relevant target groups, we learned that an online focused activation and recruiting strategy, accompanied by project related offline events, like workshops and conferences seems entirely sufficient. Due to budget restrictions, we did not use traditional media (print; tv;

radio) to advertise the open strategy project. Besides the very successful approach of identifying topic related bloggers, forums, and online journalists as virtual multipliers, we identified that offline events (e.g. workshop) can serve as a motivator for very engaged members as well as an important multiplier when talking about recruiting activities, because workshop members will tell others about their experiences afterwards and thereby recruit new members.

- *Community management:* In line with research on open innovation projects, we identified pro-active community management as a further crucial factor to really energize the growing community (Gebauer et al. n.d.). The research team participated as community managers on the platform performing the following tasks: monitoring (e.g. content screening & reporting), technical support, conflict management, activation (e.g. welcome messages, feedback, sharing and evaluating ideas) and triggering active participation. Thereby, we were immediately able to find solutions to task-related or technical problems and, even more important, establish a well guided and interrelated network structure. The latter addresses especially the fact that different community roles must be addressed and motivated differently to be "energized" (Koch et al. 2013).
- *Activation strategies:* Typically citizens and experts can be motivated intrinsically or extrinsically. However, we have learned that unlike company related open innovation platforms, public sector online participation approaches should mainly offer intrinsic motivation, because citizens want to influence politics sustainably. Non-cash prizes, like private sessions with politicians, may even serve as special forms of recognition. Furthermore, due to an active community management, we aimed at establishing a strong social grid between all community members, promoting feedback, additional materials, constructive comments, and evaluation. Technical functionalities like e-mail notifications, etc. supported re-activation of rather passive platform participants. Social networking functionalities, such as using personal profiles with a picture and message boards enriched communication between citizens.
- *Output evaluation:* To understand more about the process of energizing citizens, we divided the runtime duration of the platform into three phases and analyzed the community's activities. During the first month we had many recruiting activities; the respective output was rather average, counting 42 contributions, 92 evaluations and 78 comments (average length 428 characters). Since the recruiting activities typically need about 3–4 weeks to impact on the platform, the second phase was significantly more fruitful, ending up with 60 contributions, 95 evaluations and 147 comments (average length 680 characters). Interestingly, this phase was dominated by discussions, which almost doubled and also increased by 59 % regarding their average length. The third phase clearly profited from comprehensive recruiting activities during phases two and the typical project finish: we could report 151 contributions, 314 evaluations and 322 comments (average length 649 characters). That contributions and comments increased similarly and that the average length of the discussion at the end of the project was still constant refers to a very vivid and qualitatively elaborated community structure.

Listening

One of the strongest arguments for conducting public sector strategy development processes more openly aims to profit from citizens' knowledge, experiences, and their aggregated resources. Hence, finding the most appropriate ways of establishing an efficient and effective process of "listening" seems crucial. Generally, this dimension focuses on the abilities of the project initiator or the strategy owner to profit from external inputs. Traditionally, public administrations are used to consulting internal experts, when developing new political strategies. During this project we have learned that this dimension subsumes different potential starting points, which should be reflected in subsequent:

- *Capacity Building:* the ability to listen already starts during planning and conception of a public sector open strategy project. Civil servants, internal experts and politicians need to be integrated into the project as early as possible. To trigger capacity building process, we conducted lectures and workshops aimed at approach related (open innovation, open strategy, citizen participation) as well as project related (recruiting, tasks, roles, etc.) topics.
- *Engagement on the platform:* the second aspect focuses on the actual engagement on the open strategy platform. We observed that those experts from the public administration who participated actively on the platform, were more likely to positively participate und constructively use the platform output within the following strategy formulation phase.
- *Expert engagement:* the third aspect aims to systematically integrate experts (e.g. university professors, foundations, NGOs, etc.) on the platform. We have learned that experts may be a "translation function", and can serve as a credibility provider during and after the online phase.
- *Output formulation and implementation:* the final aspect emphasizes the importance of finding an appropriate mode of summarizing the content from the platform and analyzing as well as condensing the most important insights. One key take away from this study is to integrate the experts mentioned above as "consultants" in the post-platform realization and implementation phase.

Overall, we have learned that the dimension "listing" needs much attention and effort to ensure that the platform contributions find their way into the administrative processes and that the administration recognizes the potential of crowdsourcing for instance a strategy formulation.

Talking

The dimension of 'talking' in public sector participation projects isn't typically considered to be critical. However, we have recognized that the virtual setting causes some challenges regarding communication styles, sudden dynamics within the community as well as the different levels of expertise (heterogeneity) on the platform. By establishing a community management team, defining clear communication processes, and allowing a rather creative and spontaneous community spirit, the normal communication efforts were manageable in this project.

Besides the normal project communication we have learned that "talking" should be especially used by project owner. When aiming on the specifics of an open strategy approach, we see large potential in encouraging decisions makers (mangers, high level civil servants, politicians, etc.) to use such an open strategy platform to actively communicate their point of views. This will not only trigger feedback but also indirectly explain the position (e.g. boundary conditions) the management must cope with. The latter will especially support the implementation process, since all positions should be clearly defined.

Supporting

The dimension of "supporting" focusses less on a citizen/administration relationship, but rather on a horizontal interconnection of different platform participants. The open strategy process showed how relevant and important qualitative feedback is in order to improve concepts, rework ideas and connect input from different participants with each other. Focusing on the dimension "supporting" we found out that the welcoming and motivation of participants, by leaving messages on their personal pin-walls established a trustable and transparent setting, which leads to a constructive, creative, and feedback orientated community. Consequently, community members told us that without the permanent feedback of other platform participants and the support of the experts, many ideas would not have been in depth enough and not elaborated sufficiently to show exactly, where we should begin to further elaborate the existing strategy.

Moreover, it became clear that strongly discussed ideas had an impact on other ideas from the same topic, as users referred to already brought up issues and suggestions: In other words, the term "community" really had a proper meaning in this context as people discussed and suggested specific possibilities in order to help the idea generator improve his concepts. Questions affecting citizens' concerns were discussed by other participants. It was interesting to see that citizens were able to elaborate their point of views in such a virtual online dialogue and came up with strategic questions, which were then typically answered by very experienced citizens or experts. So, it was clear that feedback from the experts and moderators were just two out of three important feedback resources, as the interaction between the participants lead to broad discussions and new insights. Since we clearly communicated the available management resources, there were no complaints regarding a given amount of management support on the platform.

Generally, the "support" objective can be described as the core function of an open strategy platform, since it triggers the necessary community spirit.

Embracing

We understand the dimension "embracing" as the identification, activation, and sustainable motivation of engaged citizens, experts, and even politicians, that have the ability to understand the given problem statement and may further provide

respective ideas, solution, etc. to innovate the strategy. A quantitative analysis of the gathered content supports the thesis that the "one world strategy" open strategy platform was able to establish a very strong and active core community: About 73.6 % of the contributions were uploaded by 12.9 % of the registered members; 57 % of the written comments were uploaded by 11.6 % of the active platform members, and 45 % of the evaluations were carried out by 11.6 % of the community members.

Besides the core community, it was obvious that this new format attracts experts in the field of "one world policy". As the initial content for the platform was already created within different expert workshops, their continuous engagement was of major importance. On the other hand we have learned that the motivation and integration of externals experts, which were previously not known by the project owner and not part of the initial network, is another core benefit of an open strategy approach. As another important output, we were able to extend the given expert network and connect those with the "normal" citizens on the platform.

During the "post-platform-phases" we conducted a workshop and evening event with the most active and valuable participants and selected politicians. During the live discussion both the administration as well as citizens/experts recognized the value of this objective ("embracing"). Consequently, an open strategy project may serve as a nucleus, where initially a heterogeneous community gathers and where during the project progress various "special users" may be identified, activated and connected more closely to the project owner.

Living

The dimension "living" addresses the needs and potentials of an open strategy approach in respect of the sustainable development and implementation of a political strategy. In this context we would like to address three focal aspects: communication, capacity building, and offline/online interaction.

- *Transparent communication:* While many participation projects lack a sustainable implementation strategy and often lead to the opposite objective—to frustration of citizens, as their opinions were voiced but not heeded—the analyzed case in North Rhine-Westphalia can be seen as a good example of integrating the ideas of citizens and external experts into the political strategy. Right from the start the people in charge made it clear that valuable input matching their expectations and credo would be modularly integrated into the "one world strategy". Hence, no false hopes or expectations were generated and the citizens knew exactly what would happen to their ideas. As a consequence, no negative rebound effects have been measured or frustrated posts been found. Many approaches, suggestions and concepts were integrated into the "one world strategy", which was officially presented in spring-time 2013.

- *Systematic capacity building:* Another important aspect of "living" aims to have a responsible project owner throughout the participation process. This team needs to focus on pushing the underlying idea of an open strategy format, integrating topic related experts from other ministries or departments, and ensuring a sustainable project progress. We have gained the experience that this aim may only be met, if the project owners invest in the already introduced capacity building activities to prepare the administration and its employees.
- *Strategic offline/online interaction:* the third aspect of "living" aims to deliver a well-planned offline/online interaction. This implies that both diminsions are already considered in the planning phases. The same is true during the online discussion and afterwards, during the realization and implementation phase, which is rather offline dominated. Giving virtual feedback on progress, posting pictures of expert workshops or finally uploading the new strategy will integrate the crowd on the online platform and trigger trust, transparency as well as credibility.

5.6 Implications and Conclusion

The "one world" open strategy development process was a first and singular strategy development process in the public sector, which aimed to systematically integrate citizens and external experts. Consequently, the insights generated in this study are not generalizable. However, while linking our research to already existing open strategy research in corporate contexts, we conclude that in our specific context the open strategy approach was a powerful tool to co-develop an existing strategy. To summarize and reflect the main insights drawn from this study, the following paragraphs will discuss the results following three guiding questions:

- What the management of the public administration learned: concerning the conducted methodology, managers learned much about the importance of linking the virtual dialog platform with offline settings. Furthermore, the community management and recruiting/activation activities were also perceived as crucial success factors and supported the general insight that open strategy should not be categorized as a platform/software project, but rather as a communication orientated change project. Focusing on the level of activation, managers were rather surprised be the sheer amount of feedback and by its quality. However, they also recognized that using social software may lead to discussions which evolve in unpredictable ways. Interesting insights have been drawn from the realization and implementation phase. Since the administration is typically not used to coping with external input it was hard to really incorporate the platform insights redundant into the final strategy formulation. Here, we see much potential to optimize administration's processes in order to make

this rather in-transparent phase more understandable. Generally, mangers understood that open strategy does not initially reduce the required resources for a strategy development project. However, it was clearly understood that a more open approach leaves more room, or may even attract a more diverse portfolio of ideas, concepts, practices, and related citizen experiences, which would not have been possible within a traditional/closed approach.

- What citizens learned during the strategy process: from a citizen's perspective we have learned that such an approach is very attractive; this is also true for external experts. They profit from reading other contributions and discussing interactively with other participants on the platform. In general, they perceived such an integrative approach very positively, since it allows citizens to take an active role during the policy development process. However, we also received sceptical feedback, as some perceived the project as a marketing campaign. Neither were these participants sure, whether a platform contribution would really be integrated in the final formulation. Such concerns are typical for participation projects and should be carefully considered by the project provider, because a negative experience bears the risk of spreading virtually. The workshop events were considered very helpful.
- What we learned about the open strategy process: one of the main finding addresses expectation management during such an open strategy process. Hence, an early discussion of the approach with all relevant stakeholders is absolutely necessary. In this context we would like to emphasize again that an open strategy project should not be considered as a software project, but rather as a process and change topic. Furthermore, the recruiting, activation, and community management activations are of utmost importance, since they lay the foundation for a creative community and are consequently directly connected to the platform's output. The final learning addresses the implementation phases. Since politicians and public administrations are typically very good at developing citizen focused events, where positions are discussed etc. they automatically focus on the platform phases where they are able to communicate actively and underestimate the importance of the following realization and implementation phase. As formulated by some platform participants, citizens carefully follow the "post-platform-process" in order to finally read their contributions in the new strategy. If this process is not transparent anymore, the administration would compromise the whole participation process.

Summarizing the insights gained from open innovation literature, we were able to further elaborate and extend the five dimension framework, originally introduced by Li and Bernoff. Overall, the study was able to show that an open strategy approach is also applicable within a public sector setting. Hence, our discussions and insights contribute to open innovation and crowdsourcing literature (new fields of application for an already existing approach) and even more importantly introduce a new approach to the public administration research community.

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Chapter 6
Strategic and Innovation Networks in the Flanders Biotechnology Industry

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Abstract For organizations in high-technology industries, knowledge is a critical resource that can be accessed through inter-organizational networks. However, for industries characterized by a heterogeneous set of actors, little is known about how different networks within the industry interact. Therefore, our research question is: How similar are the strategic network and the innovation network in the biotechnology industry? To answer our research question, we study two networks of interest. First, the Board-of-Directors-network serves as a proxy for the strategic network that fosters knowledge transfer between organizations. Second, we analyze the innovation network by using the patent network that emerged from collaborative innovation activities. Subject of analysis is the Flanders biotechnology industry, which is characterized by strong performing research institutions, large firms and innovative SMEs. We use social network analysis methods to measure the similarity of both networks and to identify their key actors. We find that a connection between two organizations in the strategic network increases the probability of forming a new connection between the same organizations in the innovation network, or vice versa. This shows that collaborations between two organizations on one network level can lead to an interlocking of the organizations at other network levels. Our results also suggest that few companies establish and maintain a strong position in the biotechnology innovation network. This network is dominated by academic institutions, which are the key producers of scientific

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knowledge. Interestingly, the BoD-network has a more balanced composition and power structure and knowledge on strategic issues is transferred across a wide range of industrial actors. We also highlight the strong position of spin-off companies in the BoD-network and the absence of large firms in both networks. Our findings call for more research on the causal mechanisms of network formation and on the relationship between multiple networks within one industry.

6.1 Introduction

Innovation and organizational learning are critical in today's competitive global environment. Therefore, accessing and integrating external knowledge is crucial for an organization's success, especially in a knowledge-intensive industry such as the biotechnology industry (Cohen and Levinthal 1990; Grant 1996; Grant and Baden-Fuller 2004; De Clerq and Dimov 2008). Firms can access these external resources, such as knowledge, through inter-organizational networks (Gulati 1999). Networks are formed by the links between firms and other organizations and/or stakeholders. These links can, for example, emerge through a range of processes such as the formation of strategic alliances, the execution of collaborative research projects or through informal contacts. In general, a positive relation between the strength of a firm's network (position) and the firm's performance, also in terms of innovativeness, is witnessed (Baum et al. 2004; Zaheer et al. 2010). Network research is complementary to the theory on the resource-based view on the firm, which predominantly focuses on internal firm characteristics to explain firm performance (Wernerfelt 1984; Barney 1991; Newbert 2007). As a result, variances in organizational performance are best explained by a combination of both the organization's internal capabilities and its network characteristics (Zaheer and Bell 2005; Zaheer et al. 2010).

We investigate and compare both the strategic network and the innovation network of regional biotechnology organizations. For this purpose, we use two types of networks: the Board-of-Directors (BoD)- and the patent network. The BoD-network is the network that emerges when two or more organizations share at least one director (Dooley 1969). This strategic network plays a key role in transferring knowledge and fostering inter-organizational learning and innovation, especially on management practices and governance (Davis and Mizruchi 1999; Lyson and Raymer 2000; Kogut and Walker 2001; Davis et al. 2003). Patent networks, on the other hand, emerge when two or more organizations jointly apply for a patent. Patents are the result of an organization's innovative activities (Fabrizio 2009); so shared patents are the result of scientific or technological collaboration between the organizations involved. Hence, patent networks uncover the scientific and technological knowledge flows among organizations (Li et al. 2007).

We identify two research gaps with regard to inter-organizational networks and innovation. First, previous research mainly focused on a homogeneous group of

organizations such as financial institutions or Fortune 500 companies (e.g. Davis et al. 2003; Conyon and Muldoon 2008). However, when studying knowledge transfer in the biotechnology industry, we need to assume that knowledge is produced and shared by a heterogeneous set of organizations such as universities, academic spin-offs and industrial conglomerates (Swann and Prevezer 1996; Coenen et al. 2004). Second, even when a heterogeneous set of actors has been studied, analyses are mainly limited to one particular network (e.g. Balconi et al. 2004 study the Italian inventor network and distinguish between academic and non-academic inventors). Nevertheless, analyzing multiple networks for the same industry may help develop a more thorough insight in the network dynamics of knowledge transfer (Zaheer et al. 2010). In this chapter we investigate and compare the two networks of interest for a heterogeneous population in order to answer our research question: How similar are the strategic network and the innovation network in the biotechnology industry?

This chapter is built up as follows. First, we discuss the relevant literature and clarify our research objective before describing the data. Next, we discuss the methodology and results of our research. The final section reports on the main conclusions and limitations of the study.

6.2 Literature Review

Strong inter-organizational networks—sometimes referred to as 'small worlds'—lead to a higher level of firm innovativeness (Baum et al. 2004), regional success (Saxenian 1994) and effective knowledge transfer (Almeida and Kogut 1999; Singh 2005). Main reasons for this effect are that strong inter-organizational networks allow for (1) more effective knowledge transfer among the networked organizations; (2) the existence of knowledge spill-overs within the network; and (3) the sharing of resources (Ahuja 2000; Schilling and Phelps 2007). In the biotechnology industry in particular, the number of collaborative relationships a biotechnology firm is engaged in is found to have a positive influence on its innovative output (Shan et al. 1994). As a result, the locus of innovation is found within networks of learning, rather than within firms (Powell et al. 1996), which explains the increased interest in analysing the role of inter-organizational networks within industries as a vehicle for knowledge transfer and innovation (e.g. Coenen et al. 2004; Whittington et al. 2009).

With regard to strategic collaboration and knowledge transfer, the BoD-network is one of the main inter-organizational networks of interest. This network is formed by directors that are a member of two or more boards. Hence, the organizations are connected through one or more shared (or 'interlocked') directors. The BoD-network emerges because organizations often have to draw from a limited group of potential director candidates already known to the organization. By inviting

professional contacts from similar or known organizations, an interlinking of organizations is formed (Dooley 1969; Davis and Mizruchi 1999). This BoD-network is a formalized structure of strong ties that are based on intense and recurrent contacts (Davis et al. 2003; Robins and Alexander 2004), which are conditions for sustainable and specialized knowledge transfer (Giuliani and Bell 2005; Davis et al. 2003; Non and Franses 2007). The interlocking directors form the connections between boards, which is crucial for information exchange, diffusion of management and governance practices, and for the initiation and decision making on collaborative projects (Davis and Greve 1997; Davis et al. 2003; Cohen et al. 2008). BoD-networks are furthermore crucial for strategic knowledge transfer between organizations (Davis et al. 2003), while sharing a director among multiple organizations may result in inter-organizational alliances (Gulati and Westphal 1999). It is however argued that being highly embedded in this network may also have a negative impact on organizations. Interlocks may decrease firm performance due to capacity constraints of directors and the emergence of group thinking, which may lower the acceptance of novel ideas and hamper negative feedback loops (Boschma 2005). Furthermore, there is a constant risk of sharing sensitive information potentially nullifying a firm's competitive advantage. It is therefore key for an organization to balance the need for external knowledge against the aforementioned drawbacks of interlocked directors (Non and Franses 2007).

The patent network, as a second network type, is the inter-organizational network that emerges when organizations jointly apply for a patent, which is the result of joint scientific and technological efforts and investments (Balconi et al. 2004). Organizations applying for a joint patent have exchanged scientific and technological knowledge. As a result, these patent networks have been extensively analyzed at the level of individual inventor, inventor team or applicant organization. Inter-organizational patent networks are mainly analyzed in light of uncovering knowledge transfer dynamics (Chakrabarti et al. 1993; Singh 2005; Li et al. 2007). Importantly, Cassiman et al. (2010) find that firms with scientific collaborations perform better than organizations with no scientific linkages. Besides, patents from companies with strong links to the science community appear to have a larger impact than 'solo' patents (Cassiman et al. 2010). With regard to the heterogeneity characterizing high-technology industries, Balconi et al. (2004) find that academic inventors play a more central role in the patent network than their non-academic peers. This means that academic inventors act as important brokers of information and play an important role in bringing together research teams from different institutions or companies.

In sum, we use the BoD-network as a representation of the strategic network in the region's biotechnology industry while the patent network uncovers the innovation network. The following section introduces our empirical case and the methodology applied to answer our research question.

6.3 Data

The subject of analysis is the Flanders and Brussels biotechnology industry, the part of the Belgian biotechnology industry that is characterized by the presence of top research institutes, thriving start-ups and academic spin-offs in a large set of biotechnology application fields (Nauwelaers 2007). As Belgium is among the top countries in biotechnology innovation and industry performance (OECD 2006), this subject of analysis may therefore serve as a good practice example, allowing us to draw conclusions and formulate policy implications relevant for other regional biotechnology industries.

Our population consists of all biotechnology organizations involved in life sciences R&D and/or -production in Flanders and Brussels (as 1–100 % of their activities), using the OECD's list-based definition of the modern biotechnology (OECD 2005). The list was obtained from Flandersbio, the region's industry umbrella organization. Adding the region's academic hospitals has resulted in a research population of 148 organizations.[1]

The composition of the board of directors for all organizations was retrieved from their financial statements (2007). The 148 organizations count 1020 board positions (an average of 7.5 directors per organization), held by 915 persons. A vast majority (837) is director in one organization, while 78 directors are a member of at least two biotechnology organization boards.

In a next step, we selected all international patent applications between 2004 and 2011 in which at least one organization from our population was listed as an applicant. We found that 66 out of 148 organizations (44.6 %) patented their innovations during the selected time interval. On a total of 1,373 biotechnology patent applications, 249 (18.1 %) are shared between two or more organizations. In total, 22 organizations (14.9 % of population) are present in the patent network and thus share at least one patent with another organization from our population. We selected this time frame since the composition of the BoD-network is a unique emergent property of an industry, stable over time and resilient to major changes in policies, director turnover or industrial trends (Davis et al. 2003). Furthermore, BoD-positions in Belgian organizations are typically allocated for 5 or 6 years. Consequently, we can assume that the BoD-network was stable in the period 2004–2011, which allows us to gather enough data on joint patenting activities.

In Fig. 6.1, we give a visual representation of the BoD-network infrastructure of the studied biotechnology industry. This BoD-network infrastructure is a subset of the complete BoD-network as it only takes into account the interlocked directors and connected organizations, leaving aside unconnected organizations and directors with only one board position. We observe that the BoD-network of the Flanders and Brussels biotechnology industry consists of ten 'components', a term used to indicate the independent structures of interconnected organizations (numbered 1 through 10 in Fig. 6.1). Component 1 is clearly the 'largest connected

[1] Original dataset is available upon request.

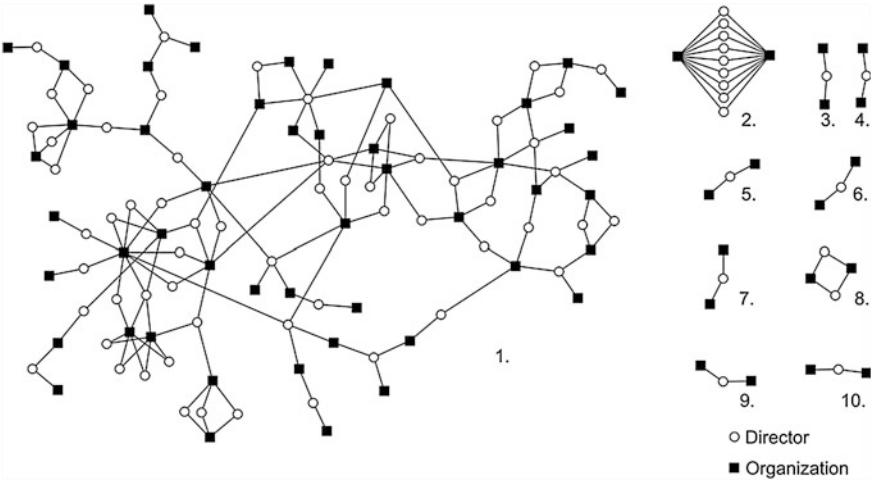

Fig. 6.1 The BoD-network infrastructure of the Flemish and Brussels Biotechnology Industry, own set-up

component' of the given industry as it contains most network actors of all components. The other components, numbered 2 through 10, consist of two organizations that are connected by at least one interlocked director.

Figure 6.2 shows the patent network infrastructure of the Flanders and Brussels biotechnology industry. Again, we only take into account the organizations that share a patent application and the shared patents to draw this network. Interestingly, this network infrastructure consists of only one component, showing no other independent structures of interconnected organizations. This indicates a strong inter-organizational collaboration on innovative projects in a specific segment of the industry, and a lot of isolated innovation activities in other segments of the industry.

6.4 Methodology

In this section, we describe the methodologies used to answer our research question: How similar are the strategic network and the innovation network in the biotechnology industry? We use a Jaccard-coefficient to measure how similar the portfolio of an organization's connections is in both networks. We complement this analysis by looking at the strength and by identifying the key players of the networks using measures for node centrality and power. We use UCINET Software, version 6.380 to perform the network analyses (Borgatti et al. 2002; Hanneman and Riddle 2005).

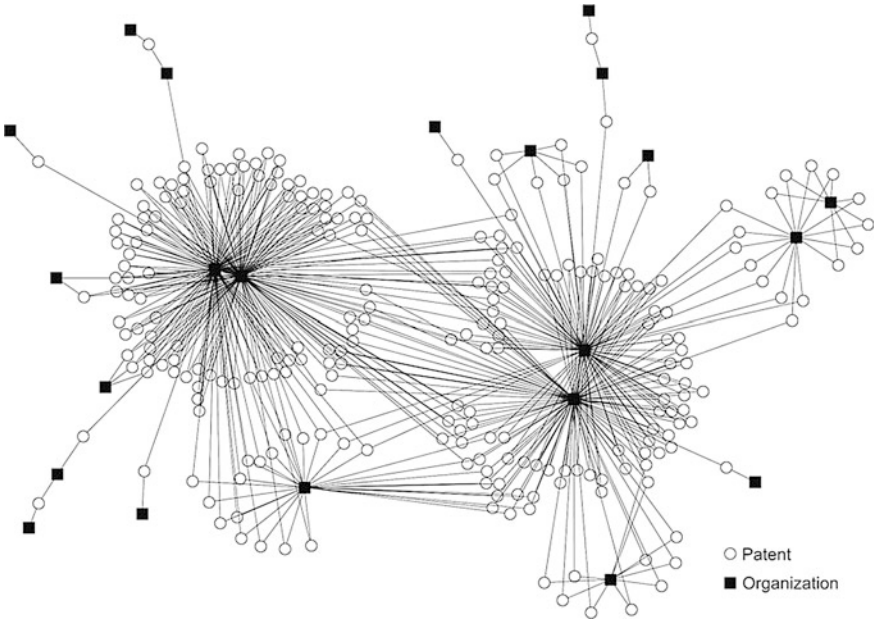

Fig. 6.2 The patent network infrastructure for the Flemish and Brussels Biotechnology Industry, own set-up

6.4.1 Similarities Measurements

This study entails two types of networks consisting of the same organizations. We investigate the similarity of these actors based on their ties to other organizations in the respective networks. To assess the similarity, we calculate the Jaccard-coefficient which calculates the number of times an actor possesses a tie to the same actor in both network infrastructures as a percentage of the total number of ties reported (Hanneman and Riddle 2005; Liben-Nowell and Kleinberg 2007). We calculate the Jaccard-coefficient as follows:

$$score(x, y) = \frac{\Gamma_{(x)} \cap \Gamma_{(y)}}{\Gamma_{(x)} \cup \Gamma_{(y)}}$$

with $\Gamma_{(x)}$ being the set of linked organizations in network X (BoD-network) and $\Gamma_{(y)}$ being the set of linked organizations in network Y (Patent network). This leaves us with an index that indicates the relative importance of shared relations in both networks with 0 indicating no shared relations, and 1 indicating that only shared relations exist. Standard errors to test measurement significance are based on a simulation based quadratic assignment procedure (Borgatti et al. 2002; Hanneman and Riddle 2005).

6.4.2 Node Centrality and Power

In order to investigate the strength of the network and to identify key players in both networks, we look at a number of network characteristics.[2] First, strong networks contain a large number of hubs. These hubs are actors in a network that are connected to many other actors and thus have a central role in the diffusion of information and knowledge (Giuliani and Bell 2005). Second, strong networks are characterized by a high degree of clustering (Watts and Strogatz 1998; Conyon and Muldoon 2006, 2008). Clustering is the extent to which actors in the network have a strongly overlapping circle of common connections. This means that clustering quantifies the different ways in which knowledge can flow from one node to another. Third, in strong networks the distance between nodes is short (Watts and Strogatz 1998; Conyon and Muldoon 2006, 2008). Distance is the number of steps it takes on average to get from one actor in the network to another. If the distance is short, a short chain of acquaintances links the network actors and knowledge can spread rapidly throughout the network (Davis and Greve 1997; Watts and Strogatz 1998; Davis et al. 2003; Baum et al. 2004; Conyon and Muldoon 2006, 2008).

To measure these concepts and to characterize networks, we use the three measures as introduced by Freeman (1979): 'degree centrality', 'closeness centrality' and 'betweenness centrality'. In this way, we can identify the critical nodes in the network, thus revealing the key players and powerful hubs in the strategic and innovation networks.

Degree centrality measures the number of ties that connect a node to other network actors. A high degree indicates the extent to which an organization can act as a hub in the network (Freeman 1979). The degree centrality however does not consider the global structure of the network, an element that is rather measured by closeness centrality.

Closeness centrality measures the distance, i.e. the number of edges separating a node from all other nodes of the network, for all nodes in the network. We calculate this measure using the reach-based centrality and closeness centrality for both networks (Borgatti et al. 2002; Hanneman and Riddle 2005). The more central a node based on this index, the shorter its relative distance to all other nodes.

Betweenness centrality quantifies to what extent a node is part of the geodesic paths (shortest paths) between other pairs of nodes from the same network. A high measure for a node, indicates that this actor possesses a high degree of control over the information flow in the network (Freeman 1979).

[2] Importantly, we narrow down our analysis towards these organizations present in the network infrastructure, thus omitting organizations that are not connected to the BoD- or patent network.

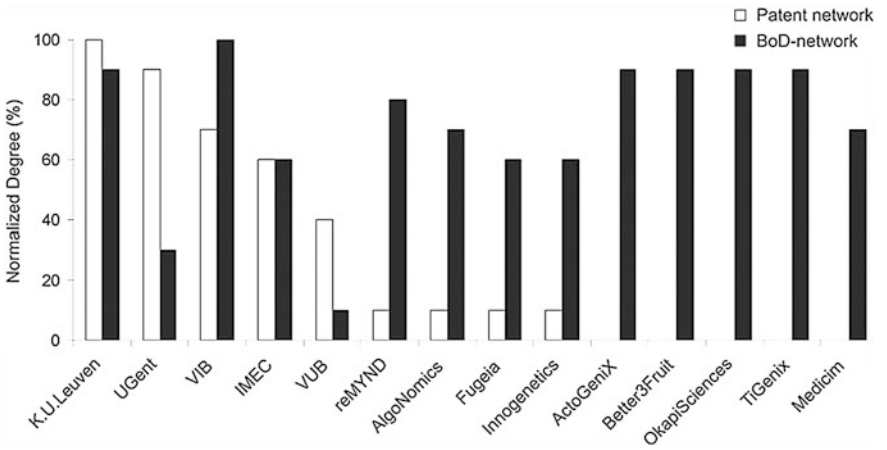

Fig. 6.3 Normalized degree centrality per organization, Top-5 organizations in the BoD-network (*black*) and the patent network (*white*)

6.5 Results

First, we assess the similarity between both the BoD-network and the patent network. Next, we compare the key actors in the networks, namely organizations with a high degree centrality or closeness centrality in the different networks.

Calculating the Jaccard-coefficient, we find a high and significant 4.5 % similarity between the BoD-network and the patent network of the Flanders and Brussels biotechnology industry. The average random similarity between the two networks, based on the simulation procedure, is 0.2 % (std. dev. of 0.4 %). As extreme low densities characterize the networks studied, expected co-occurrence of relationships in both networks is also very low (e.g. only 2 % of shared connections could be expected). As a result, a strong and significant probability is found (more than 6 standard deviations) that when a connection in the BoD-network exists, these interlocked organizations also share at least one patent. We are not able to draw conclusions with regards to the causal direction of this relation. However, this result suggests that when knowledge transfer happens through BoD- and/or shared patent networks, it is more likely that it happens simultaneously through both networks. In order to further explore and theorize this phenomenon, we compare in the remainder of this section those biotechnology organizations that possess a central position in both networks.

To compare the degree centrality of the organizations in both networks, we select the five organizations with the highest normalized degree centrality in both networks. The results are presented in Fig. 6.3. The white bars represent the organization's normalized degree centrality in the patent network and the black bars represent the normalized degree centrality in the BoD-network.

We observe that KU Leuven, VIB and IMEC are the only three organizations characterized by a high degree centrality in both networks. In both networks, these organizations hold advantageous positions and are in a position to influence knowledge flows in both networks. This also suggests that these organizations possess an efficient and effective information flow between the strategic and the operational levels. Given the literature on biotechnology innovation and the central role for academic centers of excellence in the industry, it comes as no surprise that these three central organizations are academic institutions. However, we notice that Ghent University and Vrije Universiteit Brussel are two major academic players in the patent network, while these organizations do not possess this position in the BoD-network. We furthermore observe that there are several companies with a high degree of centrality in the BoD-network, yet none are characterized by a similarly high degree of centrality in the patent network, which is clearly dominated by a number of research institutes from the region.

Figure 6.4 presents the organizations characterized by the highest normalized reach-based centrality in both networks (top five). The white bars indicate the organization's normalized degree of closeness (centrality) in the patent network, while the black bars to indicate the normalized degree of closeness in the BoD-network.

The results on closeness centrality confirm the results obtained from the degree centrality comparison. Academic research institutes in the network infrastructure play a central role in both networks. Some smaller firms possess a strong position in the BoD-network, without necessarily showing a strong position in the patent network.

In both the BoD- and the patent network, we observe large variations in the betweenness centrality measure. Moreover, in the patent network, structural constrains prevent us from calculating a useful and reliable betweenness centrality measure. Therefore, we exclude this measure from our analysis.

In sum, players with the highest centrality—VIB, K.U. Leuven, IMEC, and to a lesser extent Ghent University—are key players in both the strategic and the innovation network. These organizations have easier access to other organizations in the biotechnology industry and can influence the knowledge flowing through both of these networks.

6.6 Discussion and Conclusion

Balconi et al. (2004) already indicated the importance of academic inventor networks in science intensive industries. They suggested that these powerful inventors serve as 'inventor brokers', acting as connection between different research groups. We find support for this proposition at an organizational level, but also observe that a number of research institutes in the region are neither present nor powerful in the networks scrutinized. This may indicate that some research organizations have capabilities to combine a powerful position in the network that

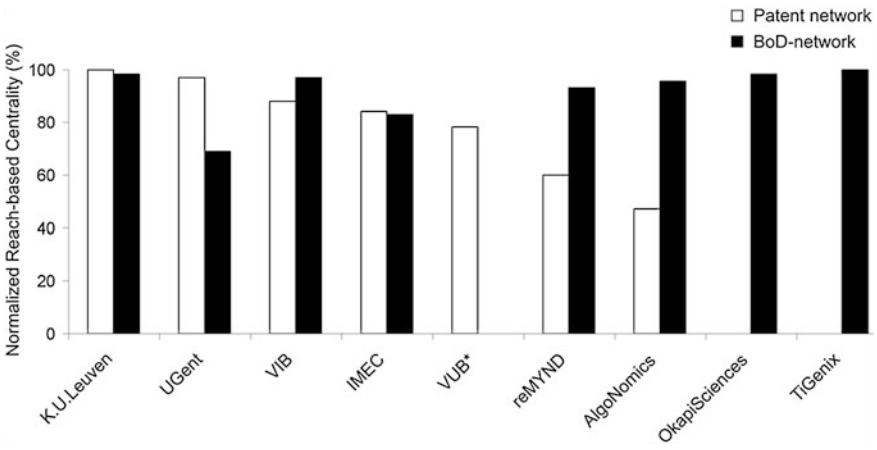

Fig. 6.4 Normalized reach-based centrality per organization, Top-5 organizations in the BoD-network (*black*) and the patent network (*white*). Reach-based centrality in the BoD-network was not calculated for VUB since this organization is not part of the main connected component, rendering the analysis of this measure useless

transfers science and technologies (patent network) as well as in the network that transfers knowledge on management and governance (BoD-network). In many ways, it is not surprising to find universities and biotechnology research institutes at the heart of the innovation network. But these institutes also access the BoD-network to use it as an essential platform and information-accessing tool with regard to knowledge on academic commercialization (Pusser et al. 2006). This indicates that institutes in a more favorable position in the innovation network will more easily access external knowledge and recognize opportunities. This access provides them with an increased stock of technologies that may be commercialized in a next stage. Furthermore, we notice that the smaller and more diversified institutions fall out of the networks, which may be due to a lack of critical mass or research scope. Future research should confirm these propositions (Fig. 6.4).

Interestingly, in the BoD-network, another type of key player emerges: the academic spin-offs. These new firms are built around intellectual property and technologies originating from the institution's laboratories (e.g. Tigenix, Fugeia, Actogenix). Close linkages with their parent institution characterize academic spin-offs. These linkages are often maintained as a means to access scarce resources. Hence, spin-offs' networking activities, not only with universities but also with customers and suppliers, are important for their future success (Péréz Péréz and Sanchez 2003; Lindelöf and Löfsten 2004). We observe that the linkages of spin-offs to the scientific community are more prominent in the strategic network than they are in the innovation network. While academic spin-offs are indeed well provided with knowledge on the insourced technology, they may need the access to the parent university's BoD-network so they can access knowledge on the commercialization of academic knowledge. Accessing inter-organizational

networks may, in addition, act as a signal of quality for new firms (Zaheer et al. 2010). This appears to be very important in the biotechnology industry, where technology companies tend to address independent directors, experienced CEOs and investors, to validate their technology and company.

Looking at the key players and composition of both networks, we observe an absence of large industrial conglomerates in both networks. Traditional R&D powerhouses such as pharmaceutical companies or chemical concerns are apparently less prone to access the regional strategic and innovation networks. It is likely that these firms access similar networks, but on an international level. This practice would however conflict with studies stressing the importance of physical proximity in innovative industries (Arundel and Geuna 2004; Boschma 2005).

A last remark concerns the structural characteristics of both network infrastructures. We observe that the networks are characterized by a prominent 'largest connected component', which groups the most important players in the regional biotechnology industry. In the BoD-network infrastructure, we observe a couple of other small components, while in the patent network we observe no other components than the main one. This means that at both levels, there exists a highly networked population of core players and a large group of unconnected organizations, which are excluded from the benefits and opportunities arising from participation in the studied networks.

In this study, we investigate to what extent the strategic network and the innovation network in the biotechnology industry are similar. We find that a connection between two organizations in the strategic network increases the probability of forming a new connection between the same organizations in the innovation network, or vice versa. This means that collaborations between two organizations on one network level can lead to an interlocking of the organizations at other network levels. Further research should clarify whether this dynamic stems from a need to minimize coordination costs or whether this is caused by effective knowledge flows between different levels within biotechnology organizations. In this case, organizations possessing superior internal communication capabilities align their partners at the different levels and achieve synergies between their strategic and innovative activities. Our results also suggest that very few companies establish and maintain a strong position in the biotechnology innovation network. This network is clearly dominated by academic institutions, which are the key producers of scientific knowledge. The BoD-network has a more balanced composition/power structure and knowledge on strategic issues is transferred across a wide range of industrial actors, including research institutes. This indicates that these institutes transfer technology in a unidirectional way (e.g. from university to spin-off), but at the same time need to access external strategic knowledge via other routes. Additionally, we observe that academic spin-offs are powerful players in the regional strategic network. Together with the observation that large pharmaceutical companies and smaller diversified universities are to a large extend absent in the networks, we propose that being part of these inter-

organizational networks is influenced by the organization's origin, scope and size. This calls for a more thorough investigation on what influences the composition of BoD-networks (see also Crispeels et al. in press) and patent networks.

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Chapter 7
Cognitive Diversity of Top Management Teams as a Competence-Based Driver of Innovation Capability

Michael Hülsmann, Meike Tilebein, Philip Cordes and Vera Stolarski

Abstract In order to gain and maintain innovation capability, organizations have to adapt their profiles and processes to perpetually changing environmental conditions. However, the resulting need for a high degree of flexibility, which includes avoiding an information undersupply by being stable but inflexible, entails the risk of an information overload. Therefore, a balance between an organization's flexibility and its stability is needed. Top Management Team (TMT) cognitive diversity seems to constitute a promising resource, which under certain circumstances can be turned into an organizational competence, allowing for a high but stable level of organizational flexibility. Employing insights from complexity theory and adopting agent-based simulation is suggested as a further research method in order to deduce underlying causal inter-relations.

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7.1 Introduction: Strategizing in a World of Variety and Change

Permanent changes in so-called "real-time-economies" have amplified the characteristics of markets as worlds of variety and change (Tapscott 1999; Siegele 2002). Beside others, this is due to fast and constitutional developments in information and communication technologies in the last ten up to 20 years, which contributed to a drastic shift from an industrial to an information age of the global society (Ottens 2003). Additionally, strategic management of organizations is more and more confronted with multiple, intertwined, sometimes contradictious, and mostly competing demands articulated by worldwide stakeholders and resource holders (Müller-Christ and Hülsmann 2003). In consequence, organizations like companies and their strategic management have to cope with an increasing complexity and dynamic in their relevant environments (Hülsmann and Berry 2004).

For that reason, the bases on which decisions in management are rendered are increasingly characterized by imperfect information (introduced into the management literature by Simon 1972). Organizations face the challenge that the amount of external information, emerging from their complex and dynamic environments, might exceed their information processing capacities (Hülsmann et al. 2008). These capacities however are necessary in order to develop ideas, concepts and practices that improve the respective company's product or service characteristics that are perceived as new and valuable by any stakeholder of the respective organization, in other words for the innovation capability (see e.g. Rogers 2003). Gaining and maintaining innovation capabilities requires the ability to adapt the company's profile and processes to the perpetually changing environmental conditions (e.g. shifting customer demands). A lack of this ability as an effect that emanates from a too low information processing capacity might lead to a so-called lock-in situation (Schreyögg et al. 2003). This includes a vital risk to the functionality and robustness of the locked organization (Hülsmann and Wycisk 2005b).

From a complexity-science based perspective organizations can be regarded as Complex Adaptive Systems (CAS). They consist of autonomous, heterogeneous, interactive and learning elements and co-evolve with their environments. Thereby, they exist in a so-called melting zone between the edge of chaos and the edge of order (Wycisk et al. 2008; based on Holland 2002; Kauffman 1993). According to Wycisk et al. (2008), international supply networks are one example for such a CAS, which leads to the term Complex Adaptive Logistics Systems (CALS). Hence, the management of such a CALS in particular, but as well as of systems (e.g. a network of companies) and single organizations (e.g. companies) in general, are claimed to deal with increasing complexity and dynamics and the endangerment of lock-in-situations.

The challenge lies in two opponent requirements: On the one hand organizations need as much as possible information to be processed in order to react

flexibly to changing environmental demands. On the other hand the information-inflow has to be on a manageable level (Hülsmann et al. 2008). In this means it is essential to understand how companies can adjust the level and quality of their capabilities and capacities with regards to the accessing, acquiring, and processing of knowledge and information to external requirements. Thus, a key factor for successful strategic management, aiming at the organization's long-term survivability by gaining and maintaining the innovation capability, even under complex and dynamic conditions, seems to be the organization's adaptivity, which is defined by Hülsmann (2008) as the ability to keep the balance between an organization's flexibility and its stability (Hülsmann et al. 2008).

This article addresses this challenge by focusing on an approach that aims at an increase of organizations' flexibility, without losing sight of the limitations of a flexibility spillover. According to Top Management Team (TMT) cognitive diversity research the heterogeneity of a team potentially contributes to organizational flexibility (Allen 2001; Akaishi and Arita 2002; Hülsmann et al. 2008; Stolarski and Tilebein 2009) by leading to an increased knowledge pool and inducing an extensive range of perspectives (Kauer et al. 2007; Pitcher and Smith 2001). The competence-based view, in which perspective flexibility can be seen as a competence itself, provides an adequate theoretical framework for an examination of cognitive flexibility as a source for flexibility as a competence on an organizational level (Sanchez 2004). However, former empirical diversity research does not deliver data of how and under which conditions cognitive diversity will reach its full potential as a driver for organizational flexibility. Additionally, it is not clarified yet from which degree on diversity endangers an organization's stability.

The overarching objective of this article is to analyze theoretically possible contributions of TMT cognitive diversity to organizational adaptivity and to point out approaches, elucidating the issue further. Therefore, several sub goals emerge: On a descriptive level, the need for organizational adaptivity and thus for a high but limited level of organizational flexibility will be specified. Furthermore, a description of flexibility as an organizational competence and TMT cognitive diversity as a possible approach to develop this competence shall be given. On an analytical level, the cause and effect chains between TMT cognitive diversity and the respective organizational flexibility and hence adaptivity shall be examined. Finally, implications for the management of organizations as well as for further research shall be deduced.

For that reason, the article proceeds as follows: In section two potential effects of organizational flexibility in relation to a company's information processing capability will be outlined, in order to show that a certain degree of flexibility is essential for an organization's innovation capability. Section three describes flexibility from a competence-based view, because TMTs are characterized by individual competencies that might lead in the following to organizational competences. Therefore, diversity management for TMTs will be emphasized as a special kind of the management of flexibility as an organizational competence. With recourse to these findings, section four introduces TMT diversity as a potential driver of organizational flexibility and proposes agent-based simulation

as an alternative research approach, in order to derive deeper insights regarding the specific interdependencies between diversity and the flexibility of organizations. Section five sums up the findings and illustrates the attended limitations of this research as well as further research requirements.

7.2 Locked Organizations: Limitations to Rationality-Based Decision-Making in Strategic Management

According to Dörner (2001) a complex system (e.g. an organization or an organization network) can be seen as "(…) the existence of many interdependent characteristics in a section of reality (…)". The more inter-relations among the elements within a system as well as between a system and its surrounding environment exist, the more information is potentially available (Dörner 2001; Malik 2000). Burmann (2002) gives the example of new global sales opportunities for companies, evolving from the vast amount of information on new products and technologies, which is offered via internet (Burmann 2002). The term "dynamics" describes the accelerated variation of the system status (e.g. the internet) over time (Coyle 1977; Probst and Gomez 1989). Applied to the mentioned example, dynamics could be understood as the permanently altering and available information on the internet. In this case, the elements (pieces of information) themselves change and thus the relations between them and other organizations and their elements alter as well.

Hence, in order to obtain the organization's abilities to react to timely demands, they have to deal with complex information that are perpetually changing. In other words, organizations have to be capable to adapt to changes in their relevant environments so as to ensure their survivability. A system's adaptivity, in turn, helps to keep the balance between a high level of flexibility and a system's stability (Hülsmann et al. 2008). Whereas the former can be achieved by processes of system opening (Hicks and Gullett 1975; Garavelli 2003), the latter can be achieved by processes of system closure (Luhmann 1973, 1994). Both processes are opposite action alternatives, from which an organization's management has to choose in individual situations. Thus, the management is confronted with perpetual decision-making situations regarding the system's endowment with information, which is necessary for the management to render their decisions rationally respectively nearly rationally (Hülsmann and Wycisk 2005b).

Processes of system openings are based on mutual inter-relations (Luhmann 1973), as they allow the system to communicate with the environment. Thereby it sustains the existential exchange process of resources (Staehle 1999; Böse and Schiepek 1989). While the system is in an open state, it is able to absorb some of the complexity within the environment and thereby the needed resources (Hicks and Gullett 1975). System openings are needed to gain an adequate amount of information for making preferably rational decisions. The higher the degree of

complexity in the environment, the higher is by trend the degree of necessary information to find a solution for a certain problem. By system openings the decision maker therefore allows for more complexity that has to be absorbed by the system (Hülsmann et al. 2008), while the ability of processing this amount of complexity remains on a constant level. At the same time, the management has to take into account the dynamics of information and the risk of an information overload caused by system openings (e.g. Hülsmann 2005; Gebert and Boerner 1995; Gharajedaghi 1982). Furthermore, because flexibility is enabled by a system's ability to open its borders for required resources (e.g. information) (Hicks and Gullett 1975; Garavelli 2003), the system structures can alter permanently in the course of aiming at maintaining the system's ability to meet the demands of its relevant environment. In order to avoid system boundaries which diffuse too much, the degree of flexibility has to be balanced by processes of stabilization.

Hence, processes of system closures are required as a compensating means (Luhmann 1973, 1994). Not every single piece of information adds to the decision-making process, wherefore the flow of information has to be cut at some point to enable a timely decision. Furthermore, no social system (e.g. organizations) is able to absorb the whole complexity of its environment. Hence, the problem of bounded rationality is immanent in every decision-making situation, which implies that managers are forced to base their decisions on incomplete information (Simon 1972). For this reason systems have to select the information they process, confining themselves to those parts which are still manageable by the system and necessary to solve specific problems (Luhmann 1994). In consequence, processes of system closure must be incorporated in a decision making process in order to select information in terms of quality and quantity with regard to its contribution to the company's innovation capability.

Therefore, in order to provide an organization respectively a system such as a CALS with a preferably high degree of adaptivity, its management has to find the optimum balance between system openings and system closures. In turn, this leads to perpetual decision-making situations. The management has to provide the system on the one hand with a preferably high degree of flexibility, but on the other hand it has to assure its stability. This can be seen as one of the major tasks and challenges in the management of such systems like organizations or organization networks.

If an organization does not succeed in balancing the underlying contradictory objectives, the management's ability to render decisions as rationally as possible might be restricted (Hülsmann and Berry 2004). The quantity and quality of information needed for a total rational choice in a complex and dynamic environment cannot be met by any system's capability to access, acquire or process information. Too much system opening, respectively flexibility, might therefore lead to an information overload. Too much system closure, respectively stability, might lead in contrast to an undersupply of information (Hülsmann et al. 2008). Both decrease the system's abilities in adapting to the changing and challenging demands of the environment and therewith to be innovative. If this is permanent

and not only a temporary incident the respective system or organization can become a so-called "locked organization" (Schreyögg et al. 2003). This phenomenon is based on path dependencies that develop in the course of repetitive actions of a system's single elements, fortified by feedback loops (David 1985). Actions that have been carried out in the past can therewith decrease the current range of possible action alternatives. Path dependency theory refers to this phenomenon as 'history matters' (Arthur 1989; David 1994). As a result, a dysfunctional and suboptimal situation with a limited choice of possible decisions might occur (Schreyögg et al. 2003). Processes of locking can therewith reduce an organization's capability to cope with the complexity of its environment by decreasing its ability to continue its exchange of vital resources with its environment. Neither can it identify all necessary resources (e.g. information about new products, new trends or innovations) from the offered mass in the environment nor evaluate or integrate them. As a consequence, the organization cannot respond to the demand of the environment (e.g. products of the company which potential buyers need) in time, quality, quantity, or place. This lack of flexibility could result in a disequilibrium which in turn could lead to negative environmental responses in terms of the required resources (e.g. through a lower volume of sales the company could loose its market shares). In the worst case, a lock-in situation may result in an organizational collapse (Hülsmann and Wycisk 2005b).

Therefore, the questions arise how to avoid a lock-in situation (ex-ante) and how to cope with an existing lock-in situation (ex-post). With recourse to the above stated dependencies between organizational flexibility and the risk of a lock-in situation, two challenges can be deduced: The increase of an organization's flexibility itself, as well as the increase of an organization's ability to cope with a high degree of flexibility. In other words, it is necessary to implement organizational flexibility on a level as high as possible, but low enough to ensure that the system's stability is not endangered, in order to gain and maintain the innovation capability.

7.3 Organizational Flexibility by Competence-Based Management

Subsequent to the above-mentioned need for organizational flexibility on a high but stable level, the question arises, how the organizational system's structure (e.g. of a company or of an organizational network of companies) can be created in order to allow a maximum level of flexibility without loosing the system's stability. One possible approach applying to the flexibilization of organizations is competence-management (Sanchez 2004). According to the competence-based view, flexibility can be seen as a competence itself (Sanchez 2004; Krüger and Homp 1997) and can be understood as a basic demand of the organization structure, allowing it to form and apply competences and to refine their

arrangement if necessary (Hülsmann et al. 2006). Important thereby is the differentiation between individual competencies and organizational competences (Müller-Martini 2008). In order to provide organizations with the required adaptiveness so as to secure a sustainable development and survival in dynamic, complex and highly competitive environments (Hülsmann and Wycisk 2005a), flexibility is not only necessary on the individual levels. Rather it has to be implemented as a competence on an organizational level, wherefore the competence-based perspective offers an appropriate theoretical framework (Sanchez 2004).

According to (Sanchez and Heene 1996, p. 8; Sanchez 2004, p. 521) competences can be described as "(…) the ability to sustain the coordinated deployment of assets in ways that help a firm achieve its goals." In the theory of the competence-based view a firm is seen as a learning organization that builds and deploys assets, capabilities and skills to achieve strategic goals (Hamel and Heene 1994).

Five different "modes" of competences have been defined by Sanchez (2004):

(1) cognitive flexibility to imagine alternative strategic logics;
(2) cognitive flexibility to imagine alternative management processes;
(3) coordination flexibility to identify, configure and deploy resources;
(4) resource flexibility to be used in alternative operations and
(5) operating flexibility in applying skills and capabilities to available resources.

Competence modes 3–5 are highly dependent on and limited by the competence modes 1 and 2. The cognitive flexibility, in turn, provides an appropriate connectivity to the approach of cognitive diversity. Therefore, this article focuses on the first two competence modes.

Competence mode 1 reflects an organization's ability to imagine different strategic ways of creating value in a certain market. Hence, it is highly dependent on the individual competencies of the organization's top managers to perceive the organization's relevant environment. Competence mode 2 reflects an organization's ability to imagine different processes in order to achieve the organization's strategic goals, which are, in turn, dependent on competence mode 1. In analogy to competence mode 1, this competence again highly depends on the individual competencies of an organization's top managers (Sanchez 2004). Although each meaning of the competence modes refers therewith to a different kind of flexibility, they all react towards a changing environment (e.g. changing markets or new technologies). Hence, they contribute, up to a certain point, to an organization's adaptivity. Therewith, the risk of a lock-in situation can be reduced. In consequence, the question arises, how organizations can achieve the competence "cognitive flexibility" regarding their strategic logics and their management processes. The latter are the pre-conditions for developing coordination, resource, and operating flexibility in order to enable organizations to avoid as well as to cope with lock-in situations as described above and hence, to gain and maintain innovation capability.

7.4 Design of Cognitive Diversity of TMT: A Key Issue of Strategic Organization?

According to the upper echelon perspective individual characteristics of TMT members like values, personalities, and experiences take influence on strategic choices and the overall performance of a firm (Hambrick 2007). TMTs constitute the aggregate informational entity, which is responsible for strategic decisions regarding the whole system's respectively organization's or company's future behavior and thus its development (Hambrick et al. 1996).

Speaking in terms of the competence-based view, TMT members' individual competencies might contribute to the TMT goals. In conjunction, individual competencies can constitute a resource, which composes an organizational competence under certain circumstances (Müller-Martini 2008). Focusing on TMT characteristics and composition (Hambrick et al. 1996), TMT diversity research contributes to the clarification of these circumstances.

TMT diversity is defined as the extent to which a top management team is heterogeneous with respect to its members' demographics or cognitions (Simons et al. 1999). As cognitive diversity, accounting for deep level differences like cognitions, beliefs, and attitudes, is much more potent in group interactions than surface-level demographic differences (Harrison et al. 1998) this article focuses on cognitive differences opposed to surface-level demographic differences, e.g. age or gender. Cognitive differences are defined as distinctions in individual information processing, which comprises the way a person perceives and uses information (Lord and Maher 1990). Similarly, team-level information processing describes the way a team perceives and uses information (Akgün et al. 2006; Hambrick 2007). From a competence-based perspective, the information processing capability of individuals as well as of teams can be regarded as a pre-condition to imagine alternative strategic logics and management processes. In other words it constitutes a pre-condition for the development of cognitive flexibility, which is, in turn, a pre-condition for the competence organizational flexibility (Sanchez 2004). In this context the questions arise, in what way cognitive TMT diversity contributes to the creation of such an organizational competence and how this competence again contributes to organizational adaptivity respectively how does it help to avoid or to cope with organizational lock-ins and to foster an organization's innovation capability.

In empirical diversity research it is often assumed that cognitive diversity potentially enhances a team's information processing capabilities e.g. in means of coding and sorting out information or considering alternative solutions to a problem (Akgün et al. 2006). This again provides several assets relevant to organizational flexibility, e.g. allowing for decision-making based on less imperfect information. The basic idea underlying this assumption is that diversity broadens a team's knowledge pool. The heterogeneity of team members with regard to e.g. knowledge, experience, and educational background enables them to produce a wide range of different ideas and to approach problems and tasks from

different perspectives, resulting in enhanced problem-solving quality, creativity, and innovation (e.g. Cox and Blake 1991; Thomas and Ely 1996). In addition to these effects, taking place inside the organization, diversity may lead to a better acquisition and assimilation of new external knowledge (Jansen et al. 2005) and thereby again can contribute to an organization's flexibility (Akaishi and Arita 2002; Allen 2001).

However, in analogy to the risk of an information overload and the resulting need for a balance between flexibility and stability, diversity does not proof beneficial by all means. A number of studies revealed risks related to high degrees of team diversity (e.g. Miller et al. 1998; Cronin and Weingart 2007). Accordingly, communication and cooperation barriers tend to arise in heterogeneous teams, hampering information processing. In this case diversity leads to rigidity, counteracting the potential benefits it may have otherwise and confronting an organization with further risks in addition to the difficulties in today's business environments.

Apparently, within the field of diversity research there is no consensus on diversity effects respectively, under which circumstances diversity emerges as a risk or a resource (see e.g. overviews in Kilduff et al. 2000; Van der Vegt and Bunderson 2005). Although there seems to be a high potential, there are no definite implications for how to manage a diverse team successfully respectively how to unlock organizations by diversity management.

However, numerous researchers agree that unmeasured moderator, mediator, intervening, independent, or dependent variables contribute most predominantly to the observed inconsistency of empirical studies (e.g. Carpenter 2002; Hambrick et al. 1996; Pitcher and Smith 2001). Further there is evidence that diversity is a multifaceted construct, whose facets interact with team processes in converse ways (Pelled et al. 1999). Aside from the complexity of the subject matter the underlying processes of information processing in diverse teams are highly dynamic and take influence on team performance in the course of time (Harrisson et al. 1998; Picher et al. 2001).

As Stolarski and Tilebein (2009) point out, classical empirical methods are not capable of comprising the complex and highly dynamic relationships, accompanying diversity effects. For example, numerous potentially relevant moderator and mediator variables, taking influence on the "cognitive diversity"—"team information processing" relationship must remain unconsidered (Stolarski and Tilebein 2009). Apparently, this calls for an alternative research approach and research method, which takes account of all relevant variables and of the dynamics evolving between the variables (Stolarski and Tilebein 2009). Thus, it will be possible to clarify TMT diversity effects and consequently to explore TMT diversity as a driver for organizational flexibility.

Complexity research provides illuminating insights regarding the relationship between diversity, information processing capability and adaptivity of systems. Thus a basic understanding of the complex and dynamic mechanisms, which underlie diversity effects, can be derived from complexity theory (Tilebein 2006a). Complexity theory, which has its roots in systems theory, evolutionary biology,

game theory, and information science, looks for common principles of complex adaptive systems (CAS). The dynamics of these systems can be either chaotic, locked in a stable state, or "on the edge of chaos" (Kauffman 1993).

Although chaotic systems are highly dynamic, they cannot respond to external impulses in a timely and adequate manner, comparable with organizations, being too flexible. Systems with a lack of flexibility on the other hand always reproduce their prior states wherefore they are not capable of adapting to changing conditions. Apparently, systems with too much flexibility and systems lacking flexibility are not able to cope in an adequate manner with the information provided by their environment, which, in turn, can lead to lock-in situations and hinder the organization to be innovative.

The edge of chaos is a balanced state where a system shows both stable and changing characteristics. In this state a system reaches a maximum in information processing capability, and it can display spontaneous order and absorb external disturbances (Langton 1992; Kauffman 1993; Wolfram 1994; Tilebein 2006b). This again reflects organizational adaptivity as described in Sect. 7.2.

The different types of dynamics in CAS are based on information processing procedures performed by the interrelated system elements, which are called agents, and on the information flows within the network of agents (Holland 1995). The more interaction partners each agent has, i.e. the higher the network density is the more information can be passed on through the network (Boisot and Child 1999). In order to be adaptive, CAS have to combine this information transfer capacity with adequate information storage capacities, which strongly relates to the idea of balancing system opening and system closure that was introduced in Sect. 7.2.

This analogy is acknowledged by results from agent-based simulation models, used in complexity theory (Law and Kelton 1991). For example, there is evidence from very simple agent-based models, Kauffman's Boolean Networks that an optimized fit between network density and diversity leads to adaptivity of the system. In contrast, networks with low diversity and low density might lead to locked systems, while highly dense networks between highly diverse agents might result in chaos. Lowering or rising diversity can optimize information processing capacity of those extreme systems and thus allow for adaptivity again (Kauffman 1993).

Agent-based simulation in general strives to model individual behavior and interactions of a system's micro-level entities, called agents (Klüver et al. 2003). Most important concerning the current issue agents possess schemes determining their individual goals and their actions, including their behavior towards and the information exchange with other agents (Dooley 2002, Klüver et al. 2003). This allows for simulating e.g. the emergence of cooperation in social groups, the communication of beliefs and aspirations, the negotiation with or without resorting to conflict, and the coordination of activities (Schieritz and Milling 2003; Wooldridge 2002). Additionally agents are able to interact not only among themselves, but also with their environment. In other words they absorb the information provided by their environment and adapt to them (Wooldridge 2002).

To sum up, in complexity research agent-based simulation is an established approach to examine diversity effects in regards to information processing capability and flexibility respectively stability of a system. Recently management science is beginning to realize and discuss on a broader basis the vast potential of simulation methods for experimental theory building (Davis et al. 2007; Hazy 2007).

7.5 Conclusions

In competitive environments of increasing variety and change strategic management has to face the risk of "locked organizations" (Schreyögg et al. 2003), which includes vital risks to the organization's operational reliability and robustness (Hülsmann and Wycisk 2005b) and to its innovation capability. Unlocking an organization from this risky state and reconstructing respectively maintaining its ability to cope with volatile and diverse environmental demands requires organizational adaptivity, which in turn requires a high, but stable level of organizational flexibility (Hülsmann et al. 2008). From a competence-based perspective the capability to imagine alternative strategic logics and management processes is an essential pre-condition for organizational flexibility respectively cognitive flexibility (Sanchez 2004).

The upper echelon view acknowledges a major role of management team characteristics in strategic decision-making and flexibility. Accordingly, one of the drivers of organizational flexibility seems to be TMT cognitive diversity. As shown many times in TMT diversity research, diversity leads to an increased knowledge pool, inducing an extensive range of perspectives (Kauer et al. 2007; Pitcher and Smith 2001). Thus diversity potentially enhances the flexibility of the organization, which might allow for adaptivity of the system (Allen 2001; Akaishi and Arita 2002).

To sum up, TMT diversity might constitute an organizational competence, which fosters the innovation capability. But the circumstances, which enable organizations to utilize this resource and develop an organizational competence, have not been identified by empirical research yet. While prior research has shown that top management team diversity affects strategic flexibility and performance, there is no consensus on the mechanisms underlying these effects.

Hence, strategic management should be aware of cognitive diversity as a potential driver of unlocking organizations. Adjusting the heterogeneity of a management team, e.g. via appointing new members to the team or by providing similar respectively dissimilar information to the team members, in order to allow for organizational adaptivity could be a first, practical approach. However, regarding the contradictory empirical results described above, caused by e.g. unmeasured moderator and mediator variables changing TMT diversity by way of trial in order to optimize organizational flexibility appears rather hazardously.

Accordingly, it is proposed to use agent-based models to clarify how and under which conditions diversity will reach its full potential as a driver for innovation capability. Referring to the shortcomings of empirical diversity research described above, agent-based simulation appears to be an appropriate approach to cope with the complexity and dynamic of intertwined variables, which contribute predominantly to the inconsistent results in empirical research.

Regarding the huge amount of TMT diversity studies, each focusing on different variables, which moderate the relationship between cognitive diversity and information processing (Stolarski and Tilebein 2009), it becomes clear that simulation models in management research will have to be more complex than those originally used in complexity theory, e.g. Boolean Networks. This renders more complex agent-based systems appropriate tools for modeling diversity and information processing in management teams as they are able to model aspects like, heterogeneity, autonomy, openness to the environment and communication (Bandte 2007).

Thus, it seems promising to develop and apply agent-based systems, which are capable of modeling decision processes in TMTs in order to ascertain the conditions under which TMT diversity contributes to the innovation capability of organizations.

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Part II
Communicative Perspectives on Innovation

Chapter 8
The Role of Communicators in Innovation Clusters

Bettina Blasini, Rani J. Dang, Tim Minshall and Letizia Mortara

Abstract Innovation clusters continue to be an important focus of economic development policies in many nations. Leading innovation clusters demonstrate that regional concentration strengthens the innovative capability and can lead to successful competitiveness on a global level, as demonstrated by regions such as Silicon Valley (US), Cambridge (UK) and Sophia Antipolis (France). However the successful creation of clusters still presents a challenge to policy makers as efforts to do so regularly fail. The development of innovation clusters has therefore received much academic and policy maker attention. While past research has examined a variety of factors as drivers for clustering effects, the role of communication within the cluster—and, specifically, the role of key individual communicators—in underpinning successful cluster development has received almost no academic attention. In this chapter, we will draw upon the relevant literature to develop a conceptual framework that will underpin research on this important topic by investigating the role of communicators in innovation clusters. Building on communication theories, the framework suggests that there are four influence-levels that shape and impact the role of communications in innovation clusters: the *Individual Level*, the *Organizational Level*, the *Cluster Level* and the *Context*. The interdisciplinary view on clustering effects contributes valuable

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insight to both communication studies and cluster theories. The framework developed within this chapter provides a structure to aid future research on the role of communicators within innovation clusters.

8.1 Introduction

Innovation clusters continue to be an important focus of economic development policies in many nations (Uyarra and Ramlogan 2012). Leading innovation clusters demonstrate that regional concentration strengthens the innovative capability and can lead to successful competitiveness on a global level, as demonstrated by regions such as Silicon Valley (US), Cambridge (UK) and Sophia Antipolis (France). However the successful creation of clusters still presents "[..] a unique challenge to policy makers" (Clark 2013, p. 6) as efforts to do so regularly fail. The development of innovation clusters has therefore received much academic (e.g. Porter 1998; Karlsson 2008) and policymaker (e.g. European Commission 2008; OECD 2012) attention. While past research has examined aspects such as specialized supply and demand, collaboration and competition, the infrastructure and mobility of goods as crucial drivers for clustering effects, the role of communication within the cluster in underpinning successful cluster development—and, specifically, the role of key individual communicators—has received almost no academic attention.

Perceptions gathered from interviews[1] in one of Europe's leading clusters indicates that this may be an important omission: "Public Communication is critical [..]. If it wasn't for the communication, the cluster wouldn't exist. It is very important that people within the cluster talk to each other and that the cluster communicates with the outside world" (PR consultant, Cambridge, UK). For complex clusters, which are characterized by diverse stakeholders, communication was seen by the same interviewee as the "segment that holds it all together". Gathering and sharing information, communicators build interrelations between the actors and create a communication network. "We joined up and connected the companies in the Cambridge area and we also connected those companies with trade collaborators in other parts of the world. We are the catalyst for growth," explained an editor in chief of a newspaper in Cambridge. Connecting and informing relevant stakeholders, communicators describe their work as, in the words of one interviewee, "breaking down boundaries. That's the core of communication".

Such statements point to an important yet under-researched issue, which merits attention in order to enrich our understanding of how innovation clusters develop. In this chapter, we will draw upon the relevant literature to develop a conceptual framework that will underpin research on this important topic. Building on

[1] Eight professional communicators working in the Cambridge (UK) cluster were interviewed as part of an on-going research project in April–May 2013.

communication theories, the framework suggests that there are four influence-levels that shape and impact the role of communications in innovation clusters: the *Individual Level*, the *Organizational Level*, the *Cluster Level* and the *Context*. The interdisciplinary view on clustering effects will contribute valuable insight to both communication studies and cluster theories. On a theoretical level this study provides a strong foundation for further research in the field of innovation communication and on a practical level it identifies aims and strategies of communicators in innovation clusters.

8.2 Economic and Sociological Cluster Theories

The geography of innovation shows a clustered economic landscape, characterized by a regional concentration of innovative capability. Established cluster theories discussed this phenomenon from different perspectives and identified factors, which support the local agglomeration. Marshall (1890, 1920) introduces the notion of external economies, an environment characterized by skilled labour, specialized goods, face-to-face contact and trust, which enables spill-overs and sparks innovative activity. Porter (1990, 1998, 2000) highlights the importance of external value and identifies supply and demand conditions, competition and collaboration and the context of the firm as most important for innovative capability. Krugman (1994, 1991) focuses on location and the dynamics of resource allocation across activities by identifying tangible and intangible goods that shape a complex economic environment. The research by Marshall, Porter and Krugman established a strong foundation to understand the dynamics of clustering-effects and influenced the academic perspective on how innovation takes places. While these papers have mostly been discussed in terms of their economic contribution, they also imply the importance of sociological aspects. Discussing externalities, Marshall, Porter and Krugman refer to information gathering, knowledge sharing and the resulting relations between the actors (as summarized in Table 8.1).

The sociological factors, as shown in Table 8.1, are kept implicit within the economic theories and are not explained in depth. This leads to a blurred understanding of sociological externalities based on interrelations, common knowledge and information spill-overs. Focusing on the characterization of interrelations within a network and the resulting information gathering and sharing processes, sociological theories complement the economic perspective on cluster dynamics. Network Theory, Knowledge-Based View and Gatekeeper Studies provide a valuable insight to the research field as shown in Table 8.2.

Both economic and sociological cluster theories highlight the importance of networking, knowledge gathering and information sharing. While economic theories imply such action as given processes, sociological theories acknowledge a deliberate and organized way of connecting and communicating. Gatekeeper studies point to the importance of specific actors managing information in order to

Table 8.1 The role of communication in economic cluster theories

Economic cluster theories	Role of communication
Marshall (1890, 1920)	Marshall introduces the idea of knowledge-spillover, which is based on the face-to-face contact of the people. According to Marshall, individuals move from firm to firm and exchange knowledge and ideas
Porter (1990, 1998, 2000)	In his diamond-model, Porter discusses knowledge about new innovations and early perceptions of new possibilities due to the close relationships between the actors
Krugman (1994, 1998)	Krugman's notion of centripetal forces can be understood as external economies, which are based on relationships and shared information

Table 8.2 The role of communication in sociological cluster theories

Sociological cluster theories	Author	Role of communication
Network theory	Granovetter (1973)	Close relationships that are characterized by strong ties are more likely to share knowledge than those who communicate infrequently or who are not emotionally attached. Weak ties, i.e. acquaintances, support the diffusion of knowledge, the creation of new opportunities and the emergence of new collaborations
	Burt (1992, 2001)	Structural holes define potential connections between units (e.g. people) that are not connected and lead to non-redundant information, as their sources are more additive than overlapping
Knowledge based view	Polanyi (1958)	Tacit knowledge can be understood as "not codified" knowledge. As it defies easy articulation or codification, it is difficult to exchange over long distances
	Asheim and Gertler (2006)	Tacit knowledge depends on shared conventions and norms that have been fostered by a common institutional environment and relies on a mutual language and communication codes. Thus it is transferred through face-to-face interactions between individuals
Gatekeeper studies	Dang et al. (2011)	To access tacit knowledge and context-laden information, "listening posts" are created in order to build channels inside and outside the cluster
	Lezaric et al. (2008)	Gatekeepers are characterized by three functions: • to search information from external sources • to transcode and translate the meaning of information • to transfer information and to disseminate accumulated and local knowledge

build relationships inside and outside the cluster. Communication studies have a long tradition in analysing actors who pursue these aims on a professional basis, but have never been applied to the study of clusters. This discipline opens new perspectives of analysing and understanding cluster processes. Thus the next section will introduce the different role of communicators as discussed in communication studies.

8.3 Communication Studies

Originally communication studies focused on journalism, which has been defined as public mass communication that targets a broad and heterogeneous audience in order to inform (Pürer 2003, p. 75). Over the last century, corporate communication, especially public relations, gained a lot of academic attention. Public relations can be also understood as public communication but in this case communication addresses defined stakeholders to pursue specific messages. In their interplay, journalism and public relations target a broad audience and thus shape and influence the public opinion. The following two sections introduce the actors in these professions.

8.3.1 Journalists

The understanding of the journalists' role has been changing over time in academic research. Based on the news-bias studies, early research regarded journalists as powerful "gatekeepers" who decide what is newsworthy according to their own principles. Further studies took social aspects into account: gatekeeping is part of a profession, influenced by social norms and values, political and social standards and criteria of production such as time pressure or constrained wordcount (Pürer 2003, p. 130). Research on news factors and news values strengthened the perspective that journalists are not isolated actors, but part of a social process that is influenced by journalism routines.

Targeting the public, journalism has always been attributed a strong impact on society and has been discussed in terms of its framing, priming and story-telling potential. Recent research assumes that mass media structure knowledge and opinions of the recipients and define what they perceive as important (Rössler 1997). Thus journalists do not influence what recipients think, but what they think about.

8.3.2 Public Relations Consultants

The area of public relations has become prominent in communication studies. Public relations is persuasive communication which follows a certain strategy to evoke publicity by both functioning as a source for journalism and targeting stakeholders directly. Public relations consultants have been understood as influential actors in the dynamics of public communication. Ever since Bearns (1985) stressed that public relations consultants determine journalism through timing and content, the relationship of influence has been a recurring theme in communication research. More recent studies show a rather balanced relation: the intereffication model by

Bentele et al. (1997) analysed the daily collaborations between public relations consultants and journalists and showed a bilateral give and take interrelation (Bentele et al. 1997). Based on these results, they created the model of intereffication. "Intereffication" stems from the Latin terms "inter" and "efficare" and means "to enable each other". While journalists needs the basic information of public relations, public relations benefit from the broad and heterogeneous audience of journalism and its significance. Therefore in analyzing public communicators both journalists and public relations consultants should be taken into account.

8.4 Innovation Communication

Understanding the traditional roles of communicators in communication studies offers valuable insight into the role of communicators in innovation clusters. Going back to Porter, clusters can be understood as "geographic concentrations of interconnected companies, specialized suppliers and service providers, firms in related industries and associated institutions (e.g. universities, standard agencies, and trade association) in particular fields, that compete but also cooperate" (Porter 2000, p. 253). Consisting of heterogeneous members, clusters are characterized by many communicators taking part in public communication, pursuing different aims and strategies. Hence, to understand the role of communicators in innovation clusters, the young and developing research field of innovation communication provides significant contribution.

Introducing the concept of "Innovation Journalism" in 2004, Nordfors sparked the academic debate about how communication might affect innovation innovations or innovation clusters (Nordfors 2004a, b, 2009; Nordfors and Ventresca 2006; Uskali and Nordfors 2007). His research highlights the importance of communication in two ways: Journalists start a public discussion and thereby create a public agenda. Furthermore journalists may explain complex innovations and create meanings.

Building on Nordfors' research, Zerfass (2005) introduced a broad view on communication, which includes not only journalism but also public relations and interpersonal communication as important to meet the challenges of innovation clusters. According to Zerfass the complexity of innovation clusters calls for manifold public and bilateral relations driven by communication. Innovation journalists as defined by Nordfors play an important role in facilitating information flow, which allows collaborations and the identification of entrepreneurial opportunities. Innovation public relations consultants aim to systematically plan, implement, and evaluate communication strategies in order to create an understanding of and trust in innovations. Finally innovation-related leadership communicators seek to influence attitudes towards innovations by mediating meaning in asymmetrical social relations (Zerfass 2005, p. 11).

Pfeffermann (2011) highlights the strategic perspective on communication by discussing innovation communication as a cross-functional dynamic capability of

an innovative company or cluster. As defined by Teece et al. (1997) dynamic capabilities are the firm's capacity to integrate, build and reconfigure internal and external resources and competences to address and shape rapidly changing business environments (Teece et al. 1997, p. 516). Pfeffermann shows that communicators can achieve this aim by introducing ideas and concepts, generating and highlighting context-issues, presenting the organization's innovative capability, building up new stakeholder schemata or modifying existing ones (Pfeffermann 2011, p. 263). Though Pfeffermann's research is only valid for public relations consultants—journalists aim for neutral information—it gives new and valuable insight to the research field of innovation communication.

Nordfors, Zerfass and Pfeffermann provide important contributions from different perspectives to the research field innovation communication. By highlighting the potential of communicators in innovation clusters their studies complement cluster theories on different levels.

In summary, according to Nordfors, Zerfass and Pfeffermann communicators may:

- Name and explain innovations (Nordfors 2004a)
- Create a public news agenda (Nordfors 2004b)
- Formulate a shared vision of the cluster (Zerfass 2005)
- Connect stakeholders inside and outside the cluster (Zerfass 2005)
- Create collaborations and entrepreneurial opportunities (Zerfass 2005)
- Introduce new ideas and concepts (Pfeffermann 2011)
- Build new knowledge schemata and or modifies existing ones (Pfeffermann 2011)
- Create and mantain a cluster's innovative capability (Pfeffermann 2011)

These highlighted issues point to the need for more research on the role of communicators in innovation clusters. The analysis of communicators requests an interdisciplinary approach to take both business and communication studies into account. In the next section the conceptual approach to analyse communicators will be introduced.

8.5 Conceptual Approach

Communication studies have a broad tradition in analysing communicators in various contexts. Its origins go back to sociological studies by Weber, Durkheim and Bourdieu who discussed action theory and identified the possibilities and limits of the individual's action. This can be seen as response to system theory, which dominated the field over a long period of time and drew attention away from the individual towards field structures. Based on the influential sociological studies, communication studies show different approaches to analyse the role of communicators by identifying the elements and composition of the "role". The interest of

communication studies can be explained by the potential influence of the communicator's role on the content of news. Thus some approaches focus on the media content, yet offer a valuable basis to understand and identify influencing factors on the communicator and of the communicator. Table 8.3 summarises the influential communicator studies by Shoemaker and Reese (1996), Weischenberg (1992), Esser (1998) and Preston (2009).

8.5.1 Theoretical Foundation

The Hierarchy of Influences approach by Shoemaker and Reese (1996), the Zwiebelmodell by Weischenberg (1992), the Integrative Multi-Level Model by Esser (1998) and the Clusters of Influences approach by Preston (2009) contribute valuable insight to the influences and the role of communicators. Though they follow different research interests, they show similar patterns and recurring sets of structures as summarized in Table 8.4:

As shown in Table 8.4, influence approaches usually draw on four or five influence levels to cover the complex power structure in the communication field. Whether four or five levels are identified, depends on the structuration of influence levels: While Shoemaker and Reese (1996) and Preston (2009) differentiate between economic and cultural background, Weischenberg (1992) combines these influences in a Media System level. Furthermore, the level Media Routines appears in most of the approaches as a level on its own, only Esser (1998) mentions routines in terms of patterns and structures in the context of the Organizational Level. Besides these minor distinctions, the approaches show a common structure:

1. Individual influences
2. Organizational influences
3. Communication system influences
4. Cultural, political, economical background influence.

The hierarchical order of the levels also shows the same composition: The individual level is in the centre of influence structure, embedded in the organizational influence level, covered by the system influences, surrounded by the macro influence level, such as cultural, political and economical conditions. While the early studies by Shoemaker and Reese (1996) and Weischenberg (1992) do not explicitly take interrelations between the levels into account, the more recent approaches by Esser (1998) and Preston (2009) highlight the reciprocal influences between the levels. According to Esser, the levels must be understood as "open" and not as "closed" systems (Esser 1998, p. 33).

To express in which context each of the levels works, graphic models provide important insight to the dynamic complexity of the communication field: By visualising, models simplify and structure the influences. Furthermore they create

Table 8.3 Conceptual approach on the role of communicators

Conceptual approach	Influence levels and categories
Shoemaker and Reese (1996)	Individual level: Personal aspects such as professional backgrounds and experiences, professional roles and ethics, personal attitudes, values and beliefs and the power within the organization
	Routines level: Routinized and repeated practises, which can be viewed as both enabling and constraining
	Organizational level: Organizational roles, organizational structure, organizational policies
	Extra-media level: Institutions in society, government, advertisers, public relations, influential news sources, interest groups, and other media organizations
	Ideological level: Social interest and the construction of meaning
Weischenberg (1992)	Media-actor: Demographic data, social and political opinions, perception of the role, image of recipient, professionalism and socialization
	Media-message: Origin of information, reference groups, patterns of presentation and news, construction of reality effects and retroactive effects
	Media-institution: Economical imperatives, political imperatives, organisational imperatives and technological imperatives
	Media-system: Societal conditions, historical and legal foundations, communication policy, professional and ethical standards
Esser (1998)	Individual level: Subjective values, political attitudes, work motivation, self-perception, professionalism and demographic data
	Organizational level: Job profiles and practices, organisational structure, distribution of competences, work processes, control and technology within the media organization
	Legal-normative and economic level: Economic conditions of the media market, press law, self-control in media, ethic foundation, trade unions and associations, education of journalists
	Historic-cultural level: Freedom of the press media history, perception of the press, journalistic tradition, understanding of objectivity, political culture and socio-political conditions
Preston (2009)	Individual level: Personal characteristics, background, values of the communicator, definitions and perception of their professional roles
	Media routines: Taken-for granted institutional practices and norms, that frame and shape how individuals work and function within complex settings
	Organizational influences: Organizational values, strategic goals, policies and power structures of the company
	Political-economic factors: Political and economic culture, distribution of power in society
	Cultural and ideological power: Norms, values and cultural background

a profound foundation for an empirical analysis as they define the relevant factors and point out interrelations. In the next section, a new model will be created in reference to the established models for the analysis of communicators in innovation clusters.

Table 8.4 Structure of influence levels

Levels of influence	Shoemaker and Reese	Weischenberg	Esser	Preston
Individual level	✔	✔	✔	✔
Media routines level	✔	✔		✔
Organizational level	✔	✔	✔	✔
Political and economic level	✔	✔	✔	✔
Culture and ideology level	✔		✔	✔

8.5.2 Creation of a Conceptual Framework

The research on communicators in innovation clusters requires a new and specific framework. Unlike the frameworks discussed earlier, which focus on journalism only, this research includes different kinds of communicators to meet the challenges of innovation clusters. This points to the need for an interdisciplinary understanding of influence levels and categories. The framework proposed in Fig. 5.3 classifies four influence levels:

1. Individual level
2. Organizational level
3. Cluster level
4. Context

The centre of the model shown in Fig. 5.3 positions the research interest of the study, the role of communicators in innovation clusters. This role is influenced by the levels around it: The individual influences, the organizational influences and the cluster influences. Graphically these influence levels are structured in a tetrahedron, which visualizes the reciprocal interaction between them. The openness of the levels is highlighted by the dotted lines that separate the levels. This visualization overcomes the problems of hierarchy as the influence levels are equally important and interact with one another. This interaction takes place within a societal background, which surrounds the influence-levels and the role of the communicator. It indicates that everything takes place in a certain context characterized by various factors, such as historical, cultural, political and economical conditions, which have to be taken into account. In the following section each level will be explained in detail (Fig. 8.1).

8.5.2.1 Individual Level

The individual level deals with the personal and unique attributes of the communicators. This level appeared in all models discussed earlier, as it covers important information about the personal position of the interviewees and thus builds the foundation for the understanding of their ideas. As this level implies various attributes, the model suggests three categories: disposition, socialization

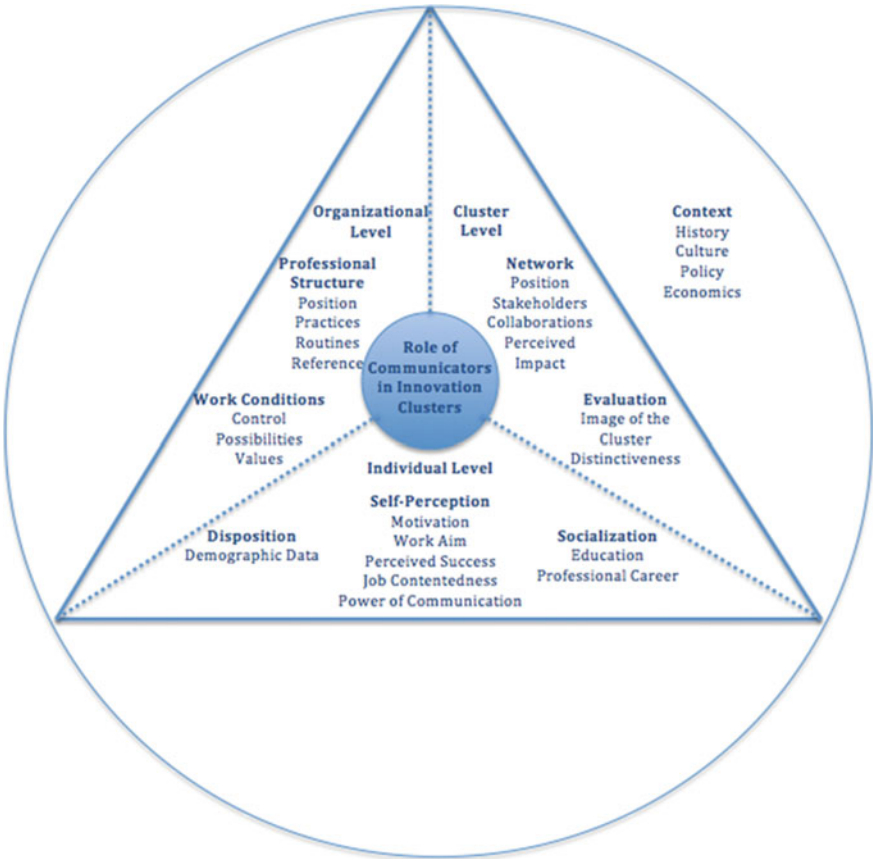

Fig. 8.1 The role of communicators in innovation clusters

and self-perception. Disposition covers the demographic data, such as gender and age. Socialization also refers to individual attributes, covering the communicator's education and professional career. This category provides information on the interviewee's background and thus creates a deeper understanding for the communicator's current position. Besides individual facts as dispositions and socialization, the individual level also covers the category self-perception. This category structures complex aspects of individual perceptions regarding the communicator's own role. Work motivation will provide valuable insight into the attitudes and expectations of the communicator. Closely linked is the definition of the work's aim, which identifies beliefs and ideas of the profession in general and the self-perception of whether the communicator feels s/he is successful in achieving these aims to check the broad aspirations with the reality. This leads to the next aspect, the job contentedness, which deals specifically with the satisfaction in the profession and links back to the realization of aims and motivations. Finally, the category self-perception points out to the importance of the perception of the power of communication. This aspect

completes the idea about communicators' profession, what they want to do, what they plan to do, if and how they achieve it and what greater power they feel they might hold. As discussed in the literature review, the individual communicator has been seen as very influential in terms of creating a news agenda. Though the attributes and attitudes of the communicator is crucial, research pointed to the importance of the organizational setting of the communicator. Thus the next influence level will refer to the organizational categories and influence factors in detail.

8.5.2.2 Organization Level

The organization level is also a strong component in the established models as it puts the individual in a context. The organization is the closest environment of communicators and frames their role strongly. Thus this level is distinguished into two categories, the professional structure and the work conditions. The professional structure first analyzes the position of the communicator within the organization. That implies the understanding of the hierarchy structures and power relations within their company. The description of the daily activities provides valuable insight into the work of communicators and how these might influence their role. The professional practices are closely linked to professional routines, which can be understood as both enabling and constraining. Analysing practices and routines, the reference groups of the communicators play a crucial role in different ways: As origins of information sources, as guidance in terms of professional capabilities but also as peer group pressure. Thus, reference groups have an impact on the role of communicators and should be analysed in the organizational context. The category work conditions investigates how the quality of the work is perceived by the communicators. This category implies an evaluation of the internal control, which could be developed trough hierarchal structures, peer pressure or organizational tendencies together with the possibilities and perceived freedom. The organizational atmosphere is much influenced by constraints and tolerance, and leads to the professional values that characterize a company. Values are a broad field and could be based on journalistic education, organizational codes or general ethic norms that influence the organizational context. In sum the organizational level acknowledges that the communicators work in an organizational context that shapes and conditions their professional role. The research interest demands to understand the role of communicators also in a broader context, which impacts both individuals and organizations: the cluster.

8.5.2.3 Cluster Level

The cluster level is highly specific to this research interest, as it has not been discussed in communication studies before. While the models summarized earlier in Sect. 5 focus on communication structures, such as media-institutions or the journalism field, our interest focuses on a very distinctive environment: innovation

clusters. This demands distinctive categories, which characterize—and thus analyze—the specifics of clusters. To identify relevant categories for the cluster level, the cluster theories provide valuable contributions. As discussed in the literature review, the benefit of clusters lies in the network structure, which makes information flow and knowledge spillovers possible. Thus the network is the first categories of the cluster level. This category refers to the interrelations and connections in terms of communication. First of all, the position in a network is influential for the role of communicators. Whether they are located centrally or rather distanced might impact the way they communicate. The position is connected with the important role of stakeholders: it is important to analyse who the stakeholders of the relevant communicators are and how they work with them together with the different communication strategies for each stakeholder. Bearing in mind the insights from the literature review, which identifies internal and external stakeholders of clusters, communicators can be seen as central actors who gather and spread knowledge. How the communicators perceive their communication strategies influence their stakeholders provides insight into their professional role and their work experience. This leads to the second category of the cluster level, the evaluation of the cluster. In this category, the perceived image of the clusters will be analysed. The image communicators have about a cluster will influence their behaviour, their opinions and hence their role. This second aspect only measures the individual opinion about the cluster. Analyzing the distinctiveness from the communicator's point of view completes the evaluation as this aspect summarizes the perceived most important characteristics about the cluster.

Defined as regional agglomeration, clusters are influenced by their specific environment. This environment must be understood as broad background which influences not only the cluster but also the organizations and actors of the cluster. Thus it is important to set the so far identified levels of influence in a certain context.

8.5.2.4 Context

The three influence levels individual level, organizational level and cluster level are embedded in a specific context. As explained earlier, the context impacts the influence-levels and the role of communicators in innovation clusters. The context is identified by history, culture, policy and economics. These conditions are highly specific to geographic areas and frame the cluster, organizations and actors. The history factor examines the historical evolution of the cluster and takes important milestones into account. History is closely linked to further factors, namely culture, policy and economics. While history focuses on the development of a cluster, the culture factor looks at the cultural environment of the cluster, for example the relation with universities and research institutions. The policy factor investigates how political decisions and support influence the cluster and shape its situation. Political initiatives might lead to financial support, which will be examined within the factor economics. This latter factor concentrates on the financial situation and

external support. The context is important for the cluster, the organization and the actors and conditions the role of communicators in innovation clusters.

Together, the individual level, the organizational level, the cluster level and the context create a valuable framework to analyse and understand the role of communicators in innovation clusters. Taking various levels and perspectives into account, the framework offers a strong foundation for further studies, which will be discussed in the following section.

8.6 Conclusions

The preceding sections brought together a diverse body of academic literature on cluster theories and communication studies in order to find interrelations between the two research fields. The classic economic cluster theories by Marshall (1890, 1920), Porter (1990, 1998, 2000) and Krugman (1994, 1991) indicate the importance of communication, which informs but also connects actors inside and outside the cluster. While economic cluster theories refer to communication as given spillovers, sociological cluster theories acknowledge communication as an organized, deliberate process and thus complement the economic theories. The insights of Network Theory (Granovetter 1973; Burt 1992), Knowledge-Based View (Polany 1958; Asheim and Gertler 2006) and Gatekeeper Studies (Lezaric et al. 2008) highlight the importance of communicators who build connections to gather and share information. While there is no research on communicators in innovation clusters, the young and developing research field of innovation communication discussed by Nordfors (2004a, b, 2009), Zerfass (2005) and Pfeffermann (2011) offers valuable insight and strengthens the demand for further research on the role of communicators in innovation clusters.

To achieve this aim, a conceptual framework has been created based on established conceptual approaches by Shoemaker and Reese (1996), Weischenberg (1992), Esser (1998) and Preston (2009). Though these studies focus on different research interests, they share a common quest into the interrelation between a communicator and the context that influences him/her in both constraining and enabling ways. As discussed in the literature review communicators are not isolated individuals but part of an organizational and social context. For the analysis of the role of communicators, the relevant variables are heterogeneous and complex. The discussed models identify different influence levels and allocate influence factors appropriate to the specific research question. Also this study's research interest requested a unique conceptual framework to take the specification of innovation clusters into account. The tetrahedron-shaped framework identifies four influence levels: the individual level, the organizational level, the cluster level and the context which cover influence factors that shape and condition the communicator. The framework offers a strong foundation to investigate the role of communicators in innovation clusters.

This study addresses an unexplored interdisciplinary research area at the interface of communication and business studies and thus makes a series of academic and practical contributions.

8.6.1 Innovation Communication

Innovation communication is a new research field, which developed over the last decade. So far, research concentrated on innovation communication in terms of either innovation journalism or innovation communication on a corporate level. This research focuses on communication at a cluster level and therefore views innovation communication from a complex perspective: a cluster's communication is published by many different actors in different positions, pursuing different aims with different strategies. While previous communicator studies focused on a specific profession in public communication, this study includes different professions, which overall create the public message of a cluster. This approach allows the comparison of different professional positions and will make patterns visible. The inclusion of heterogeneous professions also allows the analysis of interaction. As discussed in the literature review, the interrelations between journalists and public relations consultants are intense and influential. Including everybody who engages in public communication about the cluster provides a holistic and comprehensive perspective on innovation communication.

8.6.2 Cluster Theories

Addressing innovation communication at a cluster level, this research contributes also to cluster theories. While both economic and sociological cluster theories refer to communication, the role of communicators stays implicit. Though sociological theories highlight connections and the management of information, the range of actors involved remain unclear. Investigating the people who create and deliver messages about innovation in clusters sheds light on a research angle which has not been explored. The conceptual framework allows an understanding of the position of the communicators—who they are, what they do, what aim they pursue and which strategies they apply. This insight addresses the research gap between the assumed importance of communication in clusters and the missing data on it. The conceptual framework offers a valuable foundation for empiric research on the role of communicators in innovation clusters. The formulated categories, influence factors and their interrelation lead to a systematic structure for a qualitative interview guideline with relevant communicators. The results will establish how communicators connect in clusters, how they gather knowledge and share information and thereby create certain roles of communicators. Understanding the meaning of communicators will contribute valuable insight into

classic cluster theories in terms of clustering dynamics. In addition to established cluster factors such as specialized supply and demand, collaboration and competition and the infrastructure and mobility of goods, communicators and their information networks should also be seen as crucial drivers for a cluster's development. Based on this understanding, further future research will be able to focus on the impact of communicators on the cluster's success and investigate causal effects on a quantitative basis. It will be interesting to compare different clusters in different developmental stages and in different locations to make similarities and differences visible.

8.6.3 Practical Contributions

This understanding provides valuable practical implications. Innovation clusters are based on the premise of interrelations and common knowledge and demand the creation and maintaining of a network of information inside and to the outside of the cluster. This points to three major aims for communicators:

1. Create connections and dialogue with **internal stakeholders**
2. Create interrelations and communication with **external stakeholders** and the outside world
3. Create a **common language**

Internal communication is crucial to connect members within a cluster, to create a shared environment and a common vision. Only if members are connected and talk to each other will collaborations and entrepreneurial opportunities be possible. Knowledge spill-overs are rarely coincidence but based on a frequent dialogue between actors. As one journalist of one of the Cambridge High Tech Cluster explains "We actually joined up companies in the business community. We helped them collaborate with one another. Before you would have had companies operating in isolation. But you have got to have networks and connections. And we formed that role by publicizing companies and their role and what they were doing. We acted as catalyst for collaborations." It shows the important aim of communicators to connect and relate members of the cluster and thereby create a vibrant community. This practical insight refers back to cluster theories and provides valuable contribution to the studies of Marshall, Porter and Krugman who implied the importance of collaboration and shared knowledge by indicating the role of communication. Only if the cluster's members are aware of their environment, collaborations and entrepreneurial opportunities arise.

Furthermore **external communication** plays an important role as it connects the cluster to the outside world and allows collaborations with other clusters. External communication also has a representative role, aiming to attract potential members or financial supporters. A public relations consultant in Cambridge explained: "For Cambridge and the Cluster, to get this information out there is really key because you have people from around the world that are coming to

Cambridge to look at it, and some are coming here to invest, that's because they are hearing about it, they are hearing the positive news. This is one of the key places in the world. If we didn't communicate that would they think to come to Cambridge? It's really important to get that message across". The strategic communication to the outside attracts attention from all over the world and thus positions the clusters in a global competition. This result can be drawn back to theoretical position of gatekeeper studies as discussed by Dang et al. (2011) and Lezaric et al. (2008), who highlight the importance of creating channels not only inside but also outside the cluster. By representing the cluster to the outside world, communicators attract potential members and financial supporters.

To communicate successfully to the inside and the outside of the cluster, communicators have to create a **common language** by explaining complex innovations in order to make them accessible to a broader audience. A public relations consultant in the Cambridge cluster describes this process as "translation": "This is translation. The raw material compared to what is then written, you have to translate what can be something quite complex and put it into language. That is part of the communication, getting the language right that you are not dumbing down the technology or the invention but in that you are still caring up consistent messaging so that people will pick up and start to understand." Only by means of public communication, internal and external stakeholders will be able to comprehend unknown innovations. Communicators have to make sure that the message is consistent and understandable so that it reaches the recipients successfully. This has been discussed by Nordfors (2004a, b) in terms of journalism. Anecdotal evidence shows that also public relations consultants are aware of the importance of "translation" and pursue this aim and thus contributes to the research on innovation communication.

The identification of communicators' aims in innovation clusters makes the strengths and weaknesses of clusters visible and points to specific improvements in terms of internal and external communication and the creation of a common language. Understanding the role of communicators in innovation clusters provides first insights into the interrelations of communication and a cluster's development. This understanding allows future research on the dynamics of communication and creates a new perspective on the evolution of innovation clusters.

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Chapter 9
Integrated Communication in the Innovation Process: An Approach to Integrated Innovation Communication

Manfred Bruhn and Grit Mareike Ahlers

Abstract As innovation processes become accessible to consumers and other interested public parties in the sense of Open Innovation, Innovation Communication faces new challenges. The interface existing between internal and external commercial interests must be systematically coordinated in order to ensure that the development process is efficient and effective and that the developed innovation is successfully implemented on the market. Innovation communication plays a key role here in securing that the points liaising internal and external interests are integrated over the length of the innovation process. This is a complex task and involves coordinating communication objectives and publicity, integrating communication instruments and, not least of all, aligning the numerous target groups—from the research specialists in R&D to the Internet bloggers. The present chapter uses impulses stemming from integrated communication to develop a phase-oriented concept for integrated innovation communication that is capable of guaranteeing a systematic coordination of the interfaces involved and providing a central support in promoting a satisfactory outcome for the innovation process.

9.1 New Challenges for Communicating Innovations

9.1.1 From Closed Innovation to Open Innovation

Corporate innovation management has always faced multiple challenges. Progressive internationalization, shortened product lifecycles as well as a dramatic growth in information relating to products and services pose substantial risks for product development.

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The sobering failure rates for new products (up to 70 %) in the consumption goods markets clearly indicate that innovation processes, more often than not, fail to meet the needs of the target groups (N.U. 2006). In this context, the quest for strategies promising sustainability and promoting innovation has become critically important, especially with regard to the organization of the innovation's development proposal.

Up until a few years ago, the innovation process was primarily aimed at the company's internal processes, being organized as a so-called Closed Innovation. According to this concept, the company's own staff, in particular its researchers and developers, are seen as the central contributors to innovation. The ideas produced are handled confidentially and the new products are developed on the drawing board. Collaboration with clients and research institutes is not prohibited by the process, but usually only takes place at the beginning of the innovation process. The problem-solving phase, and thus the innovation process itself, is conducted extensively within the closed confines of the company (Chesbrough 2006; Trott 2011; Herzog 2011).

While a "closed" innovation policy can be seen as offering the advantages of minimal complexity and maximal controllability, the disadvantages and risks of such a strategy become more apparent in a global, dynamic competitive environment. On the one hand, internal innovation demands that a company invests heavily in accumulating internal know-how and establishing internal technical facilities. On the other hand, an absence of an adequate information transfer between product developers and product users presents the danger that innovations will not correspond to client needs and that development processes will be protracted (Lindman 2002; Ernst 2004; Reichwald and Piller 2009; Herzog 2011;).

The concept of Open Innovation was introduced in 2003, extending the discussion beyond the confines of Closed Innovation (Chesbrough 2006, 2012; Prahalad and Krishnan 2009). The fundamental idea here is to establish a corporate innovation policy that is collaborative in its outlook and that aims to integrate internal and external stakeholders within the innovation process, thereby closing gaps between technology and the market. Innovations, ready for market launch, are no longer developed solely within the confines of the corporation, but are the product of processes that dovetail internal and external processes. New external parties such as suppliers, competitors, end-clients and online communities (Ayuso et al. 2006; Mahr and Lievens 2012) are increasingly joining the ranks of the traditional innovation partners (research institutes, market research consultancies, etc.). In the United States, 30 % of a basketball community will be engaged in innovation activities, for example. Involvement in the innovation process is, in fact, the main stimulus driving the majority of members to join the club (Jawecki et al. 2009). In particular, the new use of consumer-based knowledge and creativity is the result of developments in the media environment, in the applications of social networking, and the 'you-too'-Internet, now such important aspects of daily experience. Modern forms of innovation research such as "crowdsourcing" (e.g., Howe 2008; Poetz and Schreier 2012), Consumer-Co-Creation (e.g., Payne et al. 2008; Filieri 2013) and Nethnography (e.g., Kozinets 2002; Kozinets 2012) are subsequent developments of this trend and an expression of a change in attitude to innovation policy.

9.1.2 Consequences for Innovation Communication

In addition to reflecting an open and modern innovation culture, open innovation policy is charged with the task of identifying all the relevant internal and external stakeholders and drawing them into the innovation process (Trott 2011). While within the closed innovation concept most interactions take place within the company, the open innovation process is characterized by numerous real and virtual interfaces liaising internal and external activities. This requires a process of control and alignment that spans the length of the innovation process in order to avoid friction losses that would jeopardize the opportunities that the open innovation policy has to offer (Reichwald and Piller 2009; Vesshoff and Freiling 2009). Effective and efficient communication management is therefore essential to the success of an open innovation policy.

From this perspective, innovation communication assumes a new importance in the context of the innovation process. Its function is no longer to simply communicate innovations to the external environment, but is now also responsible for aligning all internal and external interfaces throughout the innovation process. Academic and business communities are increasingly discussing the consequence that this has on the organization and management of innovation communication (see Mast and Zerfaß 2005; Zerfaß and Möslein 2009 as well as the study by Zerfaß and Ernst 2008). So far, no consistent approach has yet established itself definitively.

Many valuable impulses for innovation communication can be drawn from integrated communication. Integrated Communication Management is primarily aimed at aligning all internal and external communication instruments and messages—with the goal of conveying a consistent image of the communication's reference object (see in detail Bruhn 2009). The referenced object of the communication might be the company itself, a specific trade name, a product or, as in this case, an innovation. The alignment decisions for integrated communication are primarily based on conceptual criteria. Later, when it comes to the innovation's implementation phase, organizational and company-specific measures also have to be considered. The next section discusses the approaches for innovation communication derived from this in more detail.

9.2 The Concept of Integrated Communication as the Basis for Integrated Communication in the Innovation Process

9.2.1 Starting with Communication Deficiencies

With the advent of the twenty-first Century, integrated communication is no longer a novelty: It is a well recognized and long accepted necessity. As far back as the mid-1970s, the need to integrate communication instruments and measures has been

defined as the most important challenge facing companies. This imperative has not lost any of its force; instead, it has gained more and more momentum. Many developments have contributed to this: in particular, increasing competition in communications, the atomization of the media, the flood of information and stimuli inundating the consumer, as well as the dynamic increase in new channels of communication such as the social media. Developments such as these present new tasks and challenges for the integration of communication measures (Peltier et al. 2003).

A central task of integrated communication is to eradicate *communication deficiencies* in companies. Communication deficiencies occur where various implemented measures are not harmonized with regard to content, form or time. Certain communication interfaces present a basis for systematizing communication deficits: the relationship between locations where communication takes place (internal and external) and the relationships between levels where communication takes place (horizontal and vertical).

Classic deficiencies in company communications occur where there is a mismatch between *internal and external communications,* where a company's staff is not informed about proposed communication measures. *Internal communication deficiencies* may also occur, either horizontally in the alignment of inter- or intra-departmental communications or vertically in the hierarchical communication of messages between functions where the messages between staff and management do not share consistency in form or content. Communication deficiencies in *external communications* on a horizontal level will occur because a company employs different market-related tools for communication, which are non-aligned with regard to content, form or time. On the other hand, communication deficiencies may occur on multiple market levels because the marketing intermediaries that are engaged to provide services to supply end users have not had the required message content communicated to them (Johnson and Chang 2000; Sieg et al. 2010).

The deficiencies sketched here serve to highlight a corporation's need for integration and thus the necessity of instituting integrated communication. In view of the increasing importance of open innovation, the need for integration can be extended to the innovation process. The more acute communication deficiencies are between internal and external, and horizontal and vertical interfaces, the greater the danger is that important information will fail to be exchanged or will be late, that ideas will get lost, innovations will miss their targets, or costly time will be wasted (Sleeswijk et al. 2007; Vesshoff and Freiling 2009).

9.2.2 Conceptual, Organizational and Employment Approaches to Integrated Communication

The concept of integrated communication provides a framework for making conceptual, organizational and employment decisions to eradicate communication deficiencies and achieve the optimum level of effectiveness and efficiency in communications.

On a *conceptual level,* three types of *communication integration* take place: content, form and time integration. While the first type is principally concerned with guaranteeing consistency by using thematic associations, formal integration aims to strengthen recognition by employing uniform design principals. Time integration deals with aligning communications instruments during and between planning periods. In the framework of innovation communication, content and time integration are particularly important, where content integration presents the greatest challenges. Here, clearly defined guiding principles have to align communication goals, messages and measures across all points of contact between internal and external groups. This process employs a so-called *conceptual framework of integrated communication*: On the one hand this gives general rulings on the composition of communication content, and on the other hand, it provides explicit instructions on how the communication content should be implemented in daily work.

Beside the planning measures, the *organizational implementation* of integrated communication is extremely important. This entails setting up a management process that is capable of involving all the relevant departments and employees in the communication effort. This has implications for organizational implementation: It means that all overly rigid forms of structural organization have to be dropped and replaced by flexible methods of process organization, in particular process management and forms of team organization (Ahlers 2006).

Employment measures are closely associated with organizational structures and processes. These have to be specified within the context of the individual company, whereby integrated communication basically supports the case for institutionalizing the roles of a superordinate communications manager or team of specialists (Sonnenwald 1999; Johnson and Chang 2000).

This position functions as a kind of coordination office and is responsible for the supra-disciplinary planning, implementation and monitoring of communication (Sonnenwald 1999; Johnson and Chang 2000). Basic conceptual as well and organizational and employment information can be adopted from integrated communication for innovation communication. The integrated innovation communication process will illustrate this more clearly.

9.3 Development of a Process for Integrated Innovation Communication

Identifying the relevant integration needs is a precondition for planning and implementing innovation communication successfully. The innovation process maps the way for this and has to be specified more clearly for this purpose; it has to be structured within an innovation process for development and implementation (see Fig. 9.1).

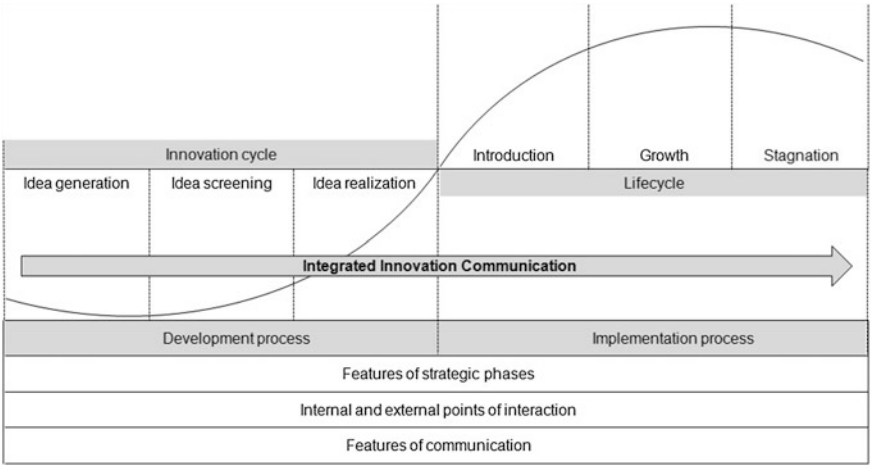

Fig. 9.1 Integrated innovation communication process

The *innovation development process*, in this context, refers to the cycle of innovation during which the integration requirements are considered for the generation of the ideas, for the selection of a specific idea, and for its realization. The innovation *implementation process* covers the product or service lifecycle and thus also the transfer of the innovation to the market. The requirements for integration are assessed along the course of the innovation's market life from market introduction, to market growth, and on to stagnation. In accordance with this systematization, the concept of integrated innovation communication (IIC) can be defined as follows:

> *Integrated innovation communication* is a process that aims to identify internal and external contact points in the development and implementation process of an innovation, as well as to develop and implement communicative measures that guarantee the alignment of these interaction points in order to achieve a maximum level of development efficiency and effectiveness internally as well as optimal market saturation externally.

Integrated innovation communication covers a multilevel process, the phases of which are marked by different characteristics and points of interaction. Consequently, communication plays a particular role in the individual phases, being defined by different goals and target groups as well as by specific communication instruments and contents. The interplay of these factors, again, has an influence on the alignment and integration needs between departments and employees as well as between internal and external stakeholders. Table 9.1 summarizes the features of innovation communication in the innovation development and implementation process. The following sections will discuss the individual phases more closely.

Table 9.1 Features of integrated innovation communication in the development and implementation process

Features	Idea generation	Idea screening	Idea realization	Introduction	Growth stagnation	
Points of interaction						
Internal points of interaction	Organisation of the innovation process, idea acquisition procedure	Appraisal and/or broad and narrow selection of the product ideas	Product test procedure	Product training	Interaction with product users	Interaction with product users
External points of interaction	Information about the innovation project, activation of the innovation community, acquisition of ideas	Broad and narrow selection of product ideas, feasibility studies	Testing procedure for products	Distribution of the new product on the market, communication and marketing mix	Sales process, communication and marketing mix, interaction with product users	Sales process, interaction with product users
Features of communication						
Internal communication target groups	R&D, market research, customer service, product marketing. etc.	Compare target groups for acquisition of ideas as well as production and finance areas	Person responsible for product testing	Product marketing product-PR, customer service, distribution, etc.	Product marketing, product-PR, customer service, distribution, etc.	R&D, market research, customer service, product marketing, etc.
External communication target groups	Research Institutes, consultants, lead-users, clients, opinion markers, online-community, etc.	Innovation community selected target groups for special test processes	"True" customers in e.g., laboratory and field experiments	Innovators, early adopters, first customers	First and subsequent buyers, broad mass, product users, online community	Latecomers, second-time purchasers, broad mass, product users, online-community

(continued)

Table 9.1 (continued)

Features	Idea generation	Idea screening	Idea realization	Introduction	Growth stagnation	
Communication objectives	Identification and motivation of the innovators, stimulating a fast rate of ideas, Steering the production of ideas	Steer and control idea testing, emotional bonding of innovation community, generating positive word-of-mouth	Acquiring suitable test individuals, information exchange between test procedures, and efficient feedback	Announcements, stimulating initial sales, activating networks, positive word-of-mouth, contagious effects	Emotionalization, raising stabilizing purchase frequency, observing user-buzz on the Internet	Cushioning emotionalization, identifying the reasons for the fall in Sales, and improvement opportunities
Internal communication instruments	Personal communication, internal blogs	Personal communication	Personal and written communication documentation	Training workshops, personal communication, intranet, internal blogs	Internal blogs	Personal communication
External communication instruments	Relevant homepages, blogs, communities, social networks, special online-platforms	Blogs, communities social networks, special online platforms, personal communication	Blogs, communities, social networks, special online-platforms, personal communication	Media advertising, sales promotions, direct marketing, online communication, social media, etc.	Supportive media advertising, sales promotions online monitoring, social media	Online-monitoring, social media, personal communication

(continued)

Table 9.1 (continued)

Features	Idea generation	Idea screening	Idea realization	Introduction	Growth stagnation	
Communication content	Innovation framework, stimuli	Realistic assessment of innovation idea, emotional bonding of the innovation community	Data and facts of the test results	Sales arguments, product merits, price advantages, product image	Consoildating sales arguments, reaction to user response	Reaction to user-responses
Integration requirements	In particular, alignment between internal and external acquisition of ideas	Coordination of internal and external appraisals of the idea	Information exchange between product development and product testing	Coordination or market communication, alignment of internal and external communication	Coordination of market communication, harmonization of user responses and internal communications	Harmonization of user responses and product improvements

9.3.1 Integrated Innovation Communication in the Development Process

Within the framework of innovation planning, multilevel planning processes are employed to provide a systematic base for decision making in product innovations. Classically, the process follows an established sequence of phases: searching for product ideas, gathering a broad selection of ideas, testing product concepts, making a narrow selection, and finally introducing the new product onto the market (e.g., Homburg 2012; Meffert et al. 2012). For simplicity, a three-stage innovation process can be introduced here, consisting of three phases: 'idea generation', 'idea screening and 'idea realization'.

The Idea Generation Phase

The phase of generating new product ideas marks the beginning of the development process. Product ideas are both systematically gathered and generated here.

The objective here is to accumulate as many ideas as possible to compensate for subsequent rejections.

The company can decide to generate its ideas for the product or service either internally or externally. The varying number of internal and external *interaction points* that have to be managed by communications depends of the degree of "openness" that the innovation process has. Information communicated here relates to initiating the innovation process, giving instructions on procedure, to actually recording product ideas.

The *communication target groups* are closely associated with the specified interaction points. The internal staff engaged here are primarily drawn from R&D, Market Research, Customer Service and Product Marketing.

Ideally, a cross-functional idea pool should be established, enabling a constant exchange of ideas and information. In this phase, companies typically access external providers such research institutes or market researchers and collaborate with information brokers or work together with lead-users (Lilien et al. 2002; Ernst et al. 2004; Lichtenthaler 2011). In line with the concept of open innovation, an ever-growing body of customers, opinion makers and interested parties are also involved in generating ideas. This open procedure offers the company substantial advantages; for example, an increased wealth of ideas, sharpened concentration on target groups and speed in producing ideas. On the one hand, the "right" external agents have to be drawn into the development process and, on the other hand, the "right" ideas have to be generated for these advantages to be exploited. In this phase, communication goals aim at identifying suitable external innovators as well as motivating them to participate in the innovation process. A major goal of communication is to elicit the best ideas in the shortest time. In addition to motivating the "innovation community", communications has a lead function in issuing timely and detailed information regarding the innovation's requirements

and objectives, be these "hard" factors such as technical framework conditions or "softer" factors such as "the cultural fit" of the product ideas (Ernst 2004).

At the onset of the innovation process, *communications instruments* are also employed to enlist the help of external parties in generating ideas, and in organizing and directing the process. To accomplish this, the development proposal has to be publicized to the relevant target groups through technology or design institutes and blogs or social networks such as Facebook and StudiVZ in order to mobilize "creative masses" by "crowdsourcing" (Füller and Mühlbacher 2004; Gardlo et al. 2012). OSRAM, for example, brought their development of a new 'emotional lighting' concept to the attention of more than 200 websites, communities and blogs and was able to attract 910 participants from nearly 100 countries in under 11 weeks to participate in the development of their product. While OSRAM brought its own online-platform to life, in the mean time numerous publically accessible "idea marketplaces" have sprung up (e.g., Innocentive, Fellowforce or Open innovators), where companies can call upon their target groups to submit ideas for product development. The possibilities offered by Web 2.0 extend even further by offering internal company support in the innovation process as well (McAfee 2006; Bertoni and Chirumalla 2011). In addition to the classic forms of personal communication, special blogs can also be set up within innovation teams for the purpose of exchanging and collecting product ideas. Whether one chooses to setup a blog for specialists or a blog inviting staff from other departments will depend on the degree of openness that innovation process offers.

With regard to communication contents, during the phase of idea generation, communication focuses on directing the quantity and quality of the product ideas. In addition to stimulating participation in the innovation process, information relating to the central framework conditions for the development process should be fed into the "fuzzy front end" of the innovation process as early as possible. This applies internally, but at the same time pays particular attention to the external "innovation community".

In connection with the communication deficiencies discussed earlier at the beginning of this chapter, the greatest *need for integration* arises in the idea generation phase in order to align internal and external communication. Here, especially, the product ideas that have been generated internally have to be aligned with those generated externally so that they can be jointly evaluated later on in the process, and, if necessary, developed further. If communication deficiencies arise at this stage, there is the danger that promising ideas (in particular, those acquired externally) may go unnoticed and 'founder'. Apart from aligning internal and external communication processes, the requirements for innovation can also be positioned internally: This may be done horizontally within the individual development teams, or vertically by aligning operational units with management. This insures that the innovation framework conditions are clearly communicated (Rothwell and Robertson 2002). Improvements to external communications should also be considered, where the use of different communication facilities cause deficiencies (e.g., idea generation via blogs, communities, etc.). The more

comprehensively that a company can satisfy its coordination needs in the idea generation phase, the better prepared it will be in the idea screening phase.

Idea Screening Phase

In the framework of the idea screening phase, the main task is to sort out less promising ideas effectively and efficiently, reducing the risk of failure so that available resources can be concentrated on the ideas that have the best chance of success (Trott 2011).

Points of interaction occur throughout the idea screening process from the broad and narrow selection of ideas through to the feasibility check. While the phases of the selection processes have both internal and external interaction points, the points of interaction in the feasibility analysis phase are mainly internal.

During the idea screening phase, the *principle communication target groups* consist of employees who have been commissioned with individual ideas. In addition to the R&D departments, these areas also have direct contact with customers and have first-hand experience of the product's use. At this stage, the production area and the finance area should also be viewed as communication target groups and thus guarantee the smooth running of the economic feasibility study. With regard to the external online community, communication at this stage concentrates on the active innovation community: Starbucks, for example, at www.mystarbucksidea.de asks its customers and readers not only to suggest product ideas, but also to discuss and appraise the ideas of other participants. Moreover, select customers may even be personally contacted and enlisted for special phases of the idea screening process, such as (Web-based) Conjoint analyses (Gustafsson et al. 2007).

The *communication goals* of this stage are concerned principally with directing and controlling monitoring activities. It is not only important for a company to gather information: The information has to subsequently be actively fed back into the innovation process so that a real exchange of ideas is guaranteed. This is important as it demonstrates the company's recognition of the innovation community's contribution and cements its commitment to the on-going innovation process. In this phase, generating positive word-of-mouth is an important communication goal. Members of the innovation community should be inspired to publicize the innovation process in their context and, in so doing, either bring more innovators on board or arouse curiosity in the new product (Horbel and Woratschek 2009).

Personal communication has an important role internally as one of the *communication instruments* in the monitoring phase. Communication can be conducted externally via online platforms. Where select external target groups are to be drawn more tightly into the process, a transition to more personal forms of communication is recommended.

The content of communication can be subdivided into rational and emotional messages during the idea screening phase. While, on a rational level, products are primarily appraised on a technical basis, companies will employ emotional communication to strengthen and extend the bonds they have with innovation

communities, not simply allowing the associations to fade out once the idea has been acquired (Kunz and Mangold 2004; Teichert et al. 2004). It is not unusual for communication managers to assume the role of moderator during this phase and to mediate between parties when critical idea appraisals take place.

The *requirements for integration* during the monitoring phase primarily concern coordinating the evaluation of the idea. A large number of employees and departments may be involved in the innovation process, which spans from product idea selection to the feasibility analysis, and only an on-going and comprehensive information policy can ensure that ideas are monitored and justified as being suitable and consistent. This is all the more important when external target groups are also drawn into the process. Basically, the requirements for integration are satisfied in this phase, once all the relevant ideas have been thoroughly checked, all the internal and external innovators have been informed about the monitoring process and the selected ideas have gained a high level of acceptance.

Idea Realization Phase

The idea realization phase focuses on building and testing prototypes as inexpensively and as quickly as possible, terminating the development process: The aim is to secure the product's market success with appropriate budgeting and to plan its market introduction.

Interaction points between internal and external target groups arise principally during the individual product tests of the idea's realization. A wide range of procedures is available here, from the concept test to mini test markets, each of these occasioning different interactions (Mahajan and Wind 1992).

When following a closed innovation approach, the innovation process is opened for the first time to technically unqualified people during the product tests. Acceptance tests are conducted to determine specific design features such as color matches and packaging sizes. The importance of external interaction points is well established with open innovation. In this phase, the communication target group is no longer the Internet innovation community, but is now made up of "real" customers who actually test the products in the field or in laboratory experiments.

During the idea realization phase, communication measures concentrate on promoting the efficiency of the realization process. *Communication goals* are particularly concerned with sustaining the exchange of information between staff involved in the realization process. Feedback from the test procedure has to be obtained, evaluated and fed back into product development process. With regard to external target groups, communication primarily focuses on securing suitable test individuals as well as informing the innovation community about main developments and sustaining their commitment.

Communication instruments that transmit information on the results of the relevant product tests are especially important during the realization phase. This may be communicated personally, and also impersonally in the form of protocols and experiment documentation. Established blogs and online forums can be used for external communications. For the recruitment of test subjects, individuals must

be contacted personally or at least in writing. The larger the company's data repository of customer contacts is, the smoother this process usually is.

The idea realization phase is all about exchanging information on the test results and forwarding suggestions for improvements. *Communication contents* consist of rational data and facts. In spite of the large number of external interfaces, the requirements for integration in the realization phase should, primarily, take place internally. Here, a continual exchange of information between the development team and the managers in charge of the test procedure must be guaranteed. The external requirement for integration consists in keeping the innovation community regularly informed about the realization process.

Once the test phase has been successfully completed, commercialization begins when the new product is introduced to the market. Innovation communication as part of the development process is followed by innovation communication as part of the implementation process.

9.3.2 Integrated Innovation Communication in the Implementation Process

The implementation process for innovation communication consists of the communication phases that involve internal and external target groups that are involved in scheduling the market development of a product or service. This process usually consists of the phases: introduction, growth, maturity, saturation and decline (i.e., Meffert et al. 2012, p. 849f.; Bruhn 2011, p. 63f.). To simplify this somewhat, a three-stage lifecycle is also introduced here, consisting of the phases: introduction, growth and stagnation (see, Table 9.1).

While innovation communication still focuses on a limited target group in the development phase—even if this is relatively broad where open innovation is concerned, in the implementation phase the communication process is open to as wide a public as possible in order to achieve the greatest possible market saturation.

Introduction Phase

The introduction phase is often the most important phase for a new product. Here one decides whether the original product ideas can be feasibly turned into a financially successful product. Often the introduction phase carries the greatest marketing and communication costs, which often means calculating with losses. It is all the more important, therefore, that communication measures are specified by precise directives and synergy effects are exploited.

Interaction points are established in the introduction phase through the sales and distribution of the new product on the market as well as through the launch of supportive, sales-promoting communication activities.

Often these measures are aimed at external *communication target groups* during the product's introduction. In particular, innovators and early adopters should be identified as potential customers and measures aimed at stimulating purchases should be used to provide them with information about the new product. In

addition to potential customers, media representatives and other opinion makers should be considered as an important target groups during the introduction phase. Ideally, these target groups will have already participated in the innovation process, producing synergy effects across the different phases. In addition to customers and opinion makers, internal target groups should be purposefully involved in innovation communication during product introduction. Where the communication of innovation is directed towards the outside arena, (product-) marketing and (product-) PR assume a central role. These departments can only fulfill this function however, if they have received adequate and timely information about the new product. The same applies to staff working in Sales and Distribution or in Customer Service or all staff in general who deal with customers and make use of the new product themselves or issue information on its use.

A central *communication goal* during the introduction phase is the goal of advertising the new product, its features and advantages in order to stimulate trial samples and first purchases. In addition to this, communication measures aim at activating opinion makers and generating positive word-of-mouth and contagion effects. Opinion makers are not necessarily or solely taken from the ranks of press representatives, but are to be found more and more in the Internet, and often have a substantial negative or positive influence on product appraisals (Helm et al. 2010). Only recently the biggest diaper innovation in 25 years by Procter and Gamble almost failed due to negative word-of-mouth on the internet claiming the new pampers would cause itchiness (N.U. 2010).

When selecting *communication instruments*, the company has more or less the whole spectrum of marketing communication at its disposal in the introduction phase. This spans from traditional media advertising, to direct marketing and sales promotion at the point of sale, and on to the interactive possibilities of online and social media communication. The possibilities offered by social media can also be employed for addressing internal target groups, promoting the new product through blogs, for example, and by simultaneously setting up a platform for exchanging experiences (McAfee 2006; Bertoni and Chirumalla 2011); however, workshops and user training courses are necessary for conveying more detailed product information relating to particularly demanding business areas.

Communication content in the introduction phase features both factual and emotional messages. While factual *communication content* deals primarily with sales arguments relating to product features, price advantages, and application possibilities, emotional communication content deals with building up a particular image of the new product.

The *requirements for integration* during the introduction phase correspond largely to the classic alignment requirements for integrated communication: The coordination of the content and scheduling of all the market communication measures is of particular importance in order to create a uniform and convincing market appearance. Here, it is equally necessary to integrate internal and external communication measures in order to guarantee that employees are informed about the product features that are advertized on the market and respond adequately to them.

Growth Phase

The use of marketing and communication measures usually increases awareness of the product, leading to above-average rates of growth.

The *points of interaction* in this phase correspond substantially to those in introduction phase, whereby, having gained initial experience in using the new product, the focus, here, is on the external interaction points.

Communication activities thus focus on external *target groups* in the growth phase. Here, early-adopters are no longer of prime interest, but rather first-buyers and recurrent purchasers who contribute to the increasing market saturation of the product. Media representatives usually become less important in this phase, while the (critical) online community is more important. In view of the fact that product descriptions gain a high level of credence in online-user forums and other communities, they can both positively and negatively impact the success of a product.

On the one hand, *Communication goals* in the growth phase are associated with increasing emotionalization, and an increase in purchasing frequency. On the other hand, the observation of Internet target groups once again becomes more important in this phase, for the purpose of identifying evidence of product faults and clues to product improvements.

Communication investments are generally recouped in the growth phase, whereby, depending on the level of communication pressure one wishes to apply, media advertising and sales promotion are still employed as *communication instruments.* A professional monitoring system should be set up for observing target groups in the Internet and be capable of not only analyzing product commentaries but also of entering into direct dialogues with the target groups (Berkman 2008).

In the growth phase, companies do not usually channel new *communication content* into the communication process. Here, it is more a matter of ensuring that the messages already communicated in the introduction phase are consistently repeated and reinforced. Beyond this, communication content consists of consumer comments, complaints about insufficient information ascribed directly or indirectly to the company, and how the company responds.

In the growth phase, *integration requirements* are concerned with aligning the different forms of market communication. At the same time, the need for alignment between external and internal communication increases as commentaries on products are picked up externally and have to be referred to internal desks.

Stagnation Phase

In the stagnation phase product turnover becomes regressive for the first time. Market potential has been exhausted and the market is saturated. Consequently, the intensity of communication activities also declines.

This does not mean, conversely, that the *interaction points* between internal and external target groups become less important: On the one hand, the sales process has to be precisely aimed at target groups just as before. On the other hand, it is now important to engage more intensively with product users in order to discover the reasons why sales have fallen as well as to identify new ways of improving or adapting the product.

External *target groups* therefore are of central importance during this phase. Current product users should be observed on online platforms and "listened to", to gain indications of the product's weak points (Berkman 2008). Beyond this, one can seek direct contact with select customer groups in order to collect concrete details for improving specific product features. At the same time, internal target groups can also be drawn into the communication process in order to pursue possible (further) product development from within the firm. Most often, the core team of developers is permanently occupied with product improvements; however, in the phase, they should be more involved in confronting requests for improvement from external sources.

Communication objectives are met by following two tracks in the stagnation phase. On the one hand, they aim to stabilize sales at the highest possible level by using emotionalization to limit the trend. On the other hand, the company must prepare a transition from the implementation phase to a fresh phase of development by identifying the reasons for the drop in sales and seizing strategies to renew stimulus. This does not necessarily mean that a renewed innovation process will develop out of the stagnation: It is more likely that products will simply be improved or new varieties of the product devised.

In the stagnation phase, costly *communication instruments* are usually dispensed with; however, it is all the more important in this phase, to exploit forms of "passive social media communication" by monitoring, and communicating with members via user-forums and blogs (Berkman 2008).

The communication content used in the stagnation phase corresponds to the content used in the growth phase. No new communication content is created; however, it is the way in which a company responds to its customers' enquiries—be these from the Internet, the company's Service Center or via sales field services—that is extremely important here. The more open and personal a company's approach to its customers is here, the more able it will be to win over customer support in a renewed process of innovation and improvement.

Where the *requirements for integration* had essentially concerned the alignment of external communications during the introduction and growth phases, in the stagnation phase the coordination between internal and external communications become much more important. This involves systematically gathering opinions expressed outside the company and presenting these to internal development teams. The achievement of this opens a path to recovery, from product stagnation to a new product idea.

9.3.3 Elements of Strategic Communication as Joining Brackets

The description of the individual phases of the innovation process highlights the complexity of the process, from idea generation through to market implementation. Coordination requirements arise in response to communication goals,

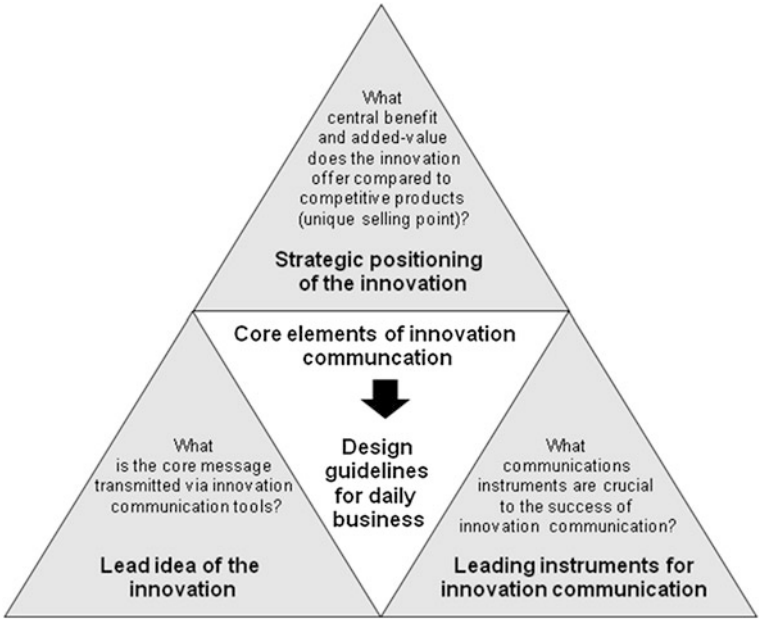

Fig. 9.2 Core components of an integrated innovation communication strategy

communication instruments and contents, and, not least, in response to the communication target groups.

In order to guarantee the integration of these components, a strategic concept is required that can stipulate and coordinate communication programs that are consistent over the long term, plausible and synergistically aligned. The development of a comprehensive *integrated communication strategy* is core to such a concept. This strategy must apply throughout, irrespective of the actual phase of innovation communication, in specifying the common framework for all communication measures. There are fundamentally three core components for guaranteeing integration in this context (Fig. 9.2):

1. *Strategic positioning of the innovation*: Strategic positioning is the desired image that a company aims to achieve for its innovation: what it wishes to communicate about its product. Here the company decides which of its new product's features should primarily be promoted, where the main customer benefit is, what advantages the innovation has over competitive products. Independent of how definitive and concrete the innovation's image is within the company and of how "open" the company's innovation process is, the innovation's strategic positioning can be decided early at the beginning of the development process or concretized during the idea generation phase. Strategic positioning provides a map for all of the communication measures and presents communications' overriding aim. To achieve this, it has to be formulated in

general terms on a composite level so that it is not compromised by the component interests of specific target groups. The relevant features of the innovation have to be reduced to a "common denominator".

2. *Lead idea of the innovation*: The strategic positioning of the innovation has to recur in all communication messages. A lead idea is developed for the innovation for this purpose; i.e., a fundamental statement containing the most predominant features of the innovation. This lead idea has to be considered for all phases of the innovation process and lays the guidelines governing communication with both internal and external groups. The characteristic "optimized user friendliness" thus provides the innovation community with bearings for its activities in the development process as well as a core message for advertising the innovation in the implementation process.
3. *Specifying the leading communication instruments for innovation*: The palette of communication measures available to innovation communication is almost limitless today. However, these communication measures, which are so essential to the success of an innovation and which provide the crash barriers for implementing other communication instruments, have to be defined. Here, it is recommended that a maximum of two leading instruments are employed for the development and the implementation phase together. During the development phase Internet forums and communities are suitable in the framework of open innovation processes, in addition to personal internal and external communications. Media advertising, as ever, holds a position of major importance in the implementation phase for many branches of industry, whereby forms of social-media communication are becoming ever-increasingly important, in particular for stimulating contagion effects.

The three core elements outlined above, the definition of strategic positioning for an innovation, the formulation of a lead idea and the specification of leading communication instruments, constitute the essential guidelines for establishing consistent innovation communication during the development and implementation phase of innovation. The formulation of these guidelines must necessarily remain relatively abstract at this level and need to be substantiated and elaborated explicitly for the purpose of practical application in communication and innovation activities. These three strategic elements have to be specifically defined for each of the individual phases so that they are provided with explicit procedural instructions. The strategic positioning of the innovation has to be explicitly laid out, stipulating which communication goals have to be realized in each of the individual phases so that the strategic positioning of the innovation is achieved on the market. In the development phase, these goals may relate to activating the "right" external innovators, for example, or in the implementation phase, to building up a sufficiently high level of brand awareness for the new product. The lead idea should be "broken down" until the central core statements addressing the internal and external target groups are documented for each phase of the innovation process. In the development phase, the core messages contain the requirements that are demanded of the innovation, while in the implementation phase, the formulation of the unique selling propositions (USP)

of the innovation focuses on real target groups. Ultimately, it is a matter of defining a kit of communication tools that will provide optimal support at each phase of the innovation process and facilitate the exploitation of synergy effects. This serves, particularly in the implementation phase of innovation communication, to substantially increase the effect of media advertising through the use of promotions and targeted PR-sales promotions.

The strategic components of innovation communication constitute the content of the mission statement for coordinating all communication activities within the framework of the innovation process. They establish the conceptual foundation for efficient and effective innovation communication and are of central importance to the innovation process. Apart from providing this conceptual basis, successful innovation communication also places demands on cultural, employment and organizational measures within the company. The major success factors arising from a company's culture of open innovation are its willingness to collaborate across departmental boundaries as well as its cooperation with external innovators and the establishment of cross-functional forms of collaboration.

Communication thus presents companies, researchers, developers and communication managers with numerous new challenges in the open innovation process. The opportunities and enormous innovation potential that are made available in this way can only boost impetus to embrace these challenges.

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Chapter 10
Innovation Marketing: An Introduction

Fee Steinhoff and Volker Trommsdorff

Abstract Innovation marketing has become a sector of marketing science in its own right. The reasons for the high acceptance of knowledge and methods of innovation marketing are twofold: enormous investments in new products and numerous failures. The crucial question is: what determines the success of an innovation? Why does one innovation succeed on the market, while others fail miserably? Success factors research, founded in the 1960s and expanded ever since, has unanimously identified the competitive innovation advantage—or CIA—as the most important factor for success (Trommsdorff and Steinhoff 2013). The CIA represents a competition-beating performance that delivers benefit to the customer, is perceived by the customer as such, that the competition cannot catch up to easily, and that can hardly be invalidated in its environment. Innovations with a CIA are more successful than imitations and marginal innovations, because they are comparatively beneficial and, in particular, address a basic conscious or subconscious need of the target customers. Moreover, major components of the CIA can be subsumed under the key word "customer focus". Although customer focus has become the dominant management credo in recent past, its implementation in the innovation process remains difficult. One reason for this is that traditional market research methods come up against their limits when it comes to innovations. Nonetheless, intelligent methods of innovation marketing are available to overcome this bottleneck factor. As such, the CIA really represents a meta-success factor; it is more the result of professional innovation marketing than its cause.

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10.1 Introduction

Companies currently face enormous pressure to innovate. In addition to repeatedly outlined arguments such as globalization, saturation trends in markets and increasing customer demands, another reason is rapid technical progress: a stream of new technologies, broader and deeper than ever before, awaits implementation in new product developments. Development departments in the textile industry, for example, are busy working on apparel of the future, high-tech fashion. Textiles are being equipped with additional features to make them "intelligent" companions in everyday life. A cell phone with Internet access has already been woven into a jacket–with sleeve keyboard, collar microphone and hood speakers. Researchers are also working on technologically enhanced textiles. Paraffin capsules integrated in the fabric will cool muscles: when the fabric heats up, the paraffin melts, absorbing the heat energy; when the fabric cools, the paraffin capsules solidify once again. Last but not least, substances with "on-board intelligence" are to deliver drugs such as aspirin directly to the skin, or bind odor molecules through cyclodextrins (Trommsdorff and Steinhoff 2013; FAZ 2002).

These and other new technologies harbor the potential for fundamental changes in the textile industry. In addition to covering present basic physiological and psychological needs (clothing to protect against inclement weather and express personality), apparel will be able to provide entirely new functions that have not previously been associated with clothing. Of course, it remains to be seen whether the associated technologies (such as cyclodextrins) can actually deliver what they promise. But the important thing is that technical success merely provides a necessary, but not sufficient condition for innovation success. The basic success factors are great benefit to the customer and successful communication of same to the target group (Trommsdorff and Steinhoff 2013) .

In a long-term, empirical, cross-sector study examining product innovations at 116 companies, only 0.6 % of the 1919 recorded product innovation ideas proved to be marketable and successful. Innovations run through a tight selection funnel: less than 10 % of initial ideas were actually turned into products that reached the market, and market failure eliminated 70 % of those that did. Of the products that actually remained on the market, 46 % resulted in losses, 33 % did not produce noteworthy profits and only 21 % (0.6 % of the original total—11 of 1919) were profitable (Berth 1993).

These findings on failure rates emphasize how important success factors research is for the business world. What ultimately determines whether or not an innovation is successful on the market? The key factor to success is the CIA–competitive innovation advantage. Ultimately, acceptance by customers is the decisive point. No matter how perfectly information and communication technologies are integrated in clothing, if these innovations are not articulated or do not address the latent needs of the target customers, they will ultimately be market failures.

This chapter provides an introduction to innovation marketing. It first examines innovation from the object, subject and process-related perspectives, as well as defines and delimits innovation marketing. The subsequent description of CIA will prove that its core conditions mean "customer focus". This focus on the target customers and their needs is the ultimate bottleneck in practice, one that can be overcome using the intelligent methods of innovation marketing.

10.2 Innovation Dimensions: Object, Subject and Process

The phenomenon of innovation is a topic in numerous scientific disciplines, although no standard, generally accepted definition of innovation exists to date. The term dates back to Saint Augustine (ca. 400 C.E.), who used the Church Latin term "innovation" when speaking of reformation or change. The term became widespread in Germany through the German translation of Joseph Schumpeter's book "Business Cycles" (1939), one chapter of which dealt with the "Theory of Innovation" in detail (Quadbeck-Seeger 1998).

Hauschildt and Salomo (2010) analyze a classification of existing definitions and conclude that innovations are qualitatively novel products or processes that are markedly different from the status quo. This approach is based on the business science theorem of the end/means relationship: New technologies offer new means. Demand drives the fulfillment of new ends. Innovation is the novel end/means combination. But the idea alone is not enough. In addition to an idea/invention, innovation also includes its exploitation (Roberts 1988). From a business perspective, innovations differ from inventions as a result of the business exploitation or internal company utilization of the latter.

To better understand innovation as a concept, the object, subject and process-related dimensions of innovation are described below. The object-related dimension of innovation concerns the question: "What is new?" In this context, the literature differentiates between product innovation and process innovation (Utterback and Abernathy 1975). Product innovations are focused on new solutions to customer issues. They offer performance that meets new ends or meets existing ends through novel means. Process innovations describe new combinations of factors in a company's internal production process. Their goal is to increase efficiency by producing a good at lower cost, at higher quality, more quickly or more reliably. The marketing perspective particularly deals with product innovations. In many cases, however, they cannot be detached from the corresponding process innovations. A product innovation could require a previous process innovation in the manufacturer's factory. At the same time, a new product such as an innovative communications system is not only a product innovation, but also–for the customer—a process innovation.

A further aspect of the object-related dimension is the issue of how the innovation is induced. When market pull innovations are involved, the needs of the demanders are the starting point for the vendor's innovation activities, whereas

technology push innovations are initiated by technical improvements, for which potential applications are then sought (Hauschildt and Salomo 2010). It is not always easy to determine which type of innovation is involved. Were cell phones, personal computers, the Internet, superglue, polystyrene, instant whipped cream from a can and opaque contact lenses for aggressive chickens in coops market pull innovations or technology push innovations? From today's perspective, how the innovation was induced is less relevant than how technology and market potential can be reconciled in a synergetic relationship (Herstatt and Lettl 2004).

Ultimately, the degree of novelty of an innovation can be taken as an aspect of the object-related dimension of that innovation. Innovation typologies represent an initial approach to a scientific analysis of the degree of novelty. For example, the novelty dimensions defined by Cooper (1994)—(1) market = purpose = function = customer issue and (2) technology = means = solution = technical realization—make it possible to classify innovation in four categories (Hauschildt and Salomo 2010). If both the purpose and the means are familiar (not new), then the innovation is considered marginal at best. The pharmaceutical development of a new migraine headache pill has a prerequisite technological innovation (new means/old end): a new molecular substance must be found that acts on this specific pain and has as few side-effects as possible. In contrast, the positioning of aspirin as a cardiovascular prophylaxis—as part of the discovery that this hundred-year-old substance can prevent cardiovascular diseases and help prevent heart attacks—is a market innovation (old means, new end). Combined market and technology innovations indicate radical innovations, because everything is "new"—that is, the novelty is especially high. The novelty of an innovation is not just a yes/no determination; there are several shades of gray: an innovation is more or less novel and has a "degree of innovation" on the continuum between smallest (incremental) change and total (radical) change (for more details, see Hauschildt and Salomo 2010).

The subject-related dimension of innovation concerns the question: "For whom is the innovation new?" Novelty is subjective: an innovation can be considered more or less novel, depending on one's perspective. The novelty concept can be externalized by asking about the objective uniqueness of the innovation: is this a world premiere? But externalization is not expedient from the management perspective. When Mannesmann entered the mobile telephony market with its D2 brand, mobile phones already existed. The innovation for Mannesmann was to use a technology that was new for the company to capture customer groups that were not previously served. Therefore, from the perspective of the innovative company, it is irrelevant whether or not other innovating companies consider the innovation to be novel. The subjectively perceived novelty results in company-specific challenges.

Even more than the market supply side, the issue of subjectivity impacts the demand side. A product that the company considers old could still be an innovation for certain customer segments. This perceived novelty of the innovation has a decisive impact on the information processing and absorption process among the target customers (Binsack 2003). In innovation research, the subjective definition

of innovation dominates. Specifically, this means the measure for classifying novelty does not lie within the innovation itself, but instead with the individual (company or target customer) who perceives it.

The process-related dimension of the innovation aims at specific characteristics during the development of an innovation. The innovation process can be characterized by temporal phases and encompasses the full range of activities associated with creating and implementing an innovation: The (1) recognition of the problem can develop within the company (analysis of potential and technology) or from externally (analysis of market and environment). The (2) generation of ideas demands (market and/or technical) creativity, which can be supported through creativity techniques. Aside from internal sources, external sources—particularly customers—can also be used for the generation of ideas. (3) Selection and valuation means reducing the existing innovation ideas to those that are potentially profitable. To estimate the technical/economic feasibility, it is important to determine whether and when the innovation will be accepted by the target customers. During (4) strategic development, the budget information must be verified by R&D controlling or modified based on new information. On the market side, the positioning analysis must show how the target customers perceive the innovation in relation to substitute products, and thus how the innovation is to be positioned. During the (5) operative development phase, both marketing tests and technical function tests should be carried out, making it possible to eliminate discrepancies in customer needs and barriers to acceptance even shortly before the planned market launch. In the (6) launch/implementation phase, the marketing mix (product, pricing, communication and distribution policies) must be coordinated and implemented in line with the strategy followed by the innovation. Marketing communication plays a special role here: the innovation will not succeed unless and until target customers recognize the advantages offered by the product and find them beneficial.

This phase model—like every model—is a simplified, idealized model of reality to identify the major steps in the process among the complexity. In reality, the process is characterized by overlapping, parallel and feedback subprocesses aimed at analysis, decision-making, execution and control and interwoven in a complex way. The success of the project and profitability of the new product on the market must be questioned over the entire innovation process, since the losses in case of failure increase progressively along the development timeline. Early decisions as to whether to continue (GO) or terminate (NO) are a constant challenge throughout the innovation process.

10.3 Definition and Delimitation of Innovation Marketing

An exploration of the concept of innovation marketing first requires delimitation from related terms and concepts. Innovation management encompasses the analyses, the decisions stemming from these analyses and communication activities

involving the innovation project, as well as its implementation and control. The management of innovation projects entails the integration of all functions and areas involved in the innovation process, making it a typical cross-area discipline—perpendicular to the specialized functions—of a company based on the division of labor. Subcomponents of innovation management include R&D (research and development) management, technology management and innovation marketing.

R&D management controls the technological processes that are required for innovation—namely basic research, technology development and (early) product development (Brockhoff 1998). Technology management is part of R&D management. It is intended to ensure the company's technological competitiveness. To this end, it steers the technological resources—that is, not only the development of new technologies, but also the further development and enhancement of existing ones. Technologies must be developed or purchased, and existing technologies improved, in line with available potential and with a focus on market opportunities (Specht et al. 2002).

Innovation marketing encompasses all market-oriented activities of innovation management—that is, all strategic and operative decisions for marketing new products. On the one hand, innovation management implies innovation marketing, since numerous analytical, strategic and planning marketing activities occur between the situation analysis and support of the new product on the market. On the other hand, marketing implies innovation marketing as the specific task of discovering, detailing and implementing competitive advantages through new products. Therefore, innovation marketing as a whole is not equivalent to innovation management, just as marketing is not the same as management in general. The activities of innovation marketing concentrate on creating and implementing potentially and effectively new offers, compared to existing and potential markets.

10.4 The Competitive Innovation Advantage (CIA) as the Key Construct of Innovation Marketing

Innovation management aims for success (Hauschildt 1991). Although the appropriate management activities cannot guarantee the success of an innovation, they can increase the chances of success significantly (Lynn et al. 1996). Accordingly, both theory and practice are highly interested in the question of what is responsible for the success of innovations.

Factors for success originate from an empirical direction of research that was founded in the 1960s and continues even today. This research into success factors aims at both strategic effectiveness and operational efficiency. The decision to establish an idea for an innovation as a project is an effectiveness decision ("doing the right thing"). In addition to the question of "whether or not" the priority of the project also impacts its effectiveness: the intensity with which it is pursued, in

contrast to other activities, can also be right or wrong. This decision of resource allocation must be supported by suitable analysis methods. In contrast, how product development and marketing take place within the available resource budget is not a question of effectiveness, but rather efficiency ("doing things right"; Cooper 1999).

An examination of research into success factors shows that a large portion of the success/failure variance is caused by factors that are assigned to an aspect of innovation marketing in the broad sense. This includes strategic and operative marketing decisions, as well as the underlying information for these decisions from (innovation) market research. In any case, these are factors that involve the behavior of target customers and competitors; factors of the technology itself or internal business factors are much less relevant (for more detailed information on the results of success factors research, see Trommsdorff and Steinhoff 2013).

The dominating factor for success is what Cooper (1994) calls "product uniqueness and superiority". This property of a product has many other names, each with slightly different nuances: (Backhaus and Voeth 2009) calls it the "comparative competitive advantage – CCA" (which is somewhat redundant, since an advantage is always comparatively better); American literature sometimes refers to it as the "(strategic) competitive advantage – SCA"; marketing practice speaks of the "unique selling proposition – USP". To emphasize the fact that we are concerned with advantages through innovation and to define this property precisely enough, we call it "competitive innovation advantage – CIA".

The CIA has five conditions, all of which are necessary, but not sufficient:

(1) A superior performance among the competition
(2) That delivers a crucial benefit to the customer
(3) That the customer perceives as such
(4) That the competition cannot catch up to easily
(5) That can hardly be invalidated in its environment

Definition elements 1 through 4 of this definition of the CIA are based on those of the "comparative competitive advantage – CCA" (Backhaus and Voeth 2009). In innovation marketing the influences on success and failure that go beyond the customer benefit and involve other opportunities and—especially—risks from the environment (such as legal developments) are on the rise. Accordingly, we have extended the CCA with condition 05: no counteraction from the environment.

The CIA explains innovation success to a large degree. A study of failures, for example, showed that 80 % of the examined flops were missing one or more characteristics of the CIA (Cooper and Calantone 1981). Innovations with a CIA are much more likely to succeed than imitations or innovations with low benefit, because target customers perceive them to be subjectively advantageous compared to conventional products (the company's own or competitors'), deliver a relatively large benefit and are perceived to have superior quality to competing offerings.

Therefore, an innovation must be associated with a distinct customer benefit that makes the product appear to be superior to the competition. This perceived

uniqueness is particularly decisive for product categories of high technological development. The uniqueness of technical products can be achieved through uniqueness of a single performance characteristic (for example, "only step motor with a 10–12 % failure risk"). However, it is crucial that this characteristic be the purchase factor for potential customers and that the uniqueness is also perceived as such. Likewise, it plays a crucial role in determining the potential price level.

Therefore, the importance of a CIA to the success of an innovation is beyond dispute. In practice, the difficulty is not in the comprehension or estimation of the concept, but instead in its implementation. Why is this the case? An analysis of the CIA definition elements shows that the CIA is, to a large extent, the result of customer-oriented innovation processes. Conditions 2 (crucial benefit for the customer) and 3 (communicating the customer benefit properly) of the CIA are factors of customer focus—namely intelligent market research (2) and professional communication (3). Condition 4 (not easy for the competition to imitate) also belongs to the customer focus, at least in part, since only a relatively small portion of this condition can be fulfilled through patents and utility models; far more important are the barriers to market entry in the minds of the customers (who were won over by the innovator). These barriers are primarily subjective—built through trust in the business relationship or strong association or through subjectively perceived (and of course at least partially existent) barriers to change, such as software compatibility. Accordingly, two to three of the five CIA conditions can be subsumed under customer focus.

10.5 Eliminating the Bottleneck Factor of Customer Focus

The need for new products to focus consistently on the needs of target customers is undisputed in both business practice and scientific research. The importance of focusing on customers has achieved broader acceptance than nearly any other assertion in the past. Nonetheless, companies find it difficult to implement in practice. Studies repeatedly point out significant shortcomings in the implementation of a customer focus agenda (Mason and Harris 2005).

A major reason likely is the high market uncertainty that is immanent in innovations, along with the difficulties of overcoming it. Market uncertainties are based on lack of knowledge of the market and of users' requirements. They can result in two types of incorrect decisions (Eliashberg et al. 1997). The first type of incorrect decision occurs when management invests (or continues to invest) in an innovation project, although the expected profit potential is classified as low. The consequence is disappointing market performance of the innovation; if the deviation from expectations is large, a classic innovation flop has occurred. Incorrect decisions of the second type mean a product idea with the potential for market success exists, but management does not (continue to) invest in the corresponding innovation project. The objectively high potential for success is not identified and the option for market profit is incorrectly not taken.

A real customer focus, above all else, requires the generation and interpretation of information: who are the target customers of the innovation and what are their specific needs? Finding the answers to these questions can significantly increase the information base and forecasting accuracy of the expected market potential of the innovation. Consistent decisions make it possible to pursue potentially successful innovation projects as effectively as possible, while discontinuing potential failures as early as possible (Eliashberg et al. 1997).

This is far from a trivial task, however. Due to the many varying and/or unexpected events and the lack of internal problem-solving routines (Daft and Lengel 1986), the information requirements of innovation projects are seldom structured and often even unknown (Gales and Mansour-Cole 1995). As a consequence, the innovation team quickly reaches the limits of its own information base (Moenaert et al. 1994). Empirical findings in high-technology sectors show that the use of external information sources (particularly customers) increases significantly as the perceived insecurity grows (McGee and Sawyerr 2003). At the same time, however, it is clear that many methods of conventional market research are not well-suited to estimating the market potential of innovative products and services (Trott 2002; Wind and Mahajan 1997).

Still, a variety of "intelligent" methods are available to provide reliable market information. It is here, the purvey of strategic innovation market research, that the greatest contribution to the development of scientifically-based, practical innovation marketing is made. Gone is the unsatisfactory, often counterproductive, conventional survey-based research, whose caricature is the naïve innovation acceptance question: "would you buy it if …" Because innovation market research cannot work with conventional (survey) methods, which are designed primarily to support tactical/operative decisions. For innovations often address future needs that target customers are not (yet) aware of or which they cannot (yet) articulate (Rosenthal and Capper 2006).

Numerous new product flops, some of them spectacular, show how poorly conventional methods can support strategic decisions. One example (see Trommsdorff and Steinhoff 2013): BASF developed leaf springs made of glass-fiber reinforced plastic, for heavy trucks, which were lighter than conventional steel leaf springs. If overstressed, the springs did not break, but only individual fibers. At the start of product development, BASF asked the target customers (truck manufacturers) whether they would install these improved BASF leaf springs. The responses were positive, so BASF began the expensive development process. When the product had reached market maturity, however, none of the target customers accepted it. The development engineers, who were used to using steel as a matter of course, rejected the new technology—contrary to the early survey results. BASF failed to identify—or at least vastly underestimated—the psychological barriers to acceptance.

Today's innovation research has "intelligent" methods at its disposal, however, that enable a focus on target customers even in early phases. This includes a versatile toolkit of survey and analysis procedures (for more details, see Trommsdorff and Steinhoff 2013). The suitable qualitative, exploratory methods include in-depth

interviews as well as various types of customer workshops—such as idealized customer design, projective techniques, role-playing games and the looking-glass method—in which ideas for new product concepts can be derived within the framework of discussions with customers (Durgee et al. 1998). Other qualitatively focused, ethnographic methods aim to achieve the broadest, deepest possible understanding of the customer through observing target customers in their natural environment. The emphasis lies on the identification of latent customer needs that are difficult to articulate (Perry et al. 2004). Aside from the most well-known method, empathic design, the similarly rooted methods of day-in-the-life visits and Japanese Gemba research are also available. Customer visits, in which a cross-functional team enters the customers' world through systematic calls to customers, also belong to the family of ethnographic methods (Ekström andKarlsson 2001).

Simulation methods, such as the "information acceleration" method developed at the Massachusetts Institute of Technology (Urban et al. 1997), are also available. This method targets the fact that the valid assessment and adoption of particularly novel innovations demand learning processes (Binsack 2003). Its aim is to accelerate these learning processes by providing comprehensive information about the innovation and future framework conditions before preferences are measured.

Another interesting option for generating information in the context of innovative methods is the lead user method. Instead of aiming to generate a representative model of the overall population, this method aspires to include only specific innovative customers in the innovation process (von Hippel 1986). The toolkits for user innovation represent a related approach. These user-friendly design tools enable customers to develop their own product innovations. The increased involvement of target customers in the development process helps to reduce the transfer costs of customer-specific information that is otherwise difficult to convey (von Hippel and Katz 2002).

By generating valid information, intelligent methods for innovation market research help to increase forecast accuracy and thus minimize both the first and second types of errors. If BASF had included visionary lead users from the heavy truck industry in an early stage of their product development process, for example, then (1) more differentiated, more reliable market research results would have been available and (2) these key customers would likely have developed a commitment to the project that would have at least established a supply relationship with these customers, which might even have brought about a breakthrough to the overall market.

Overall, however, the knowledge of general success factors is an insufficient information base for innovation marketing. The CIA takes a key position as the overreaching factor for success. Intelligent innovation market research must provide project-specific information, particularly about the expected response of target customers, partners and competitors. Such a customer focus deeply embedded in the innovation process is a major factor in supporting the realization of a promising CIA.

10.6 Conclusions

New technologies await implementation in new product development and trigger high pressure to innovate on business. Future apparel with integrated information and communication functions or made from "intelligent" substances, for example, harbor high potential for fundamental change in the textile industry. But in all technological progress, customer acceptance is ultimately decisive. The basic question is whether the target customers actually have a current, latent (or at least future) need for clothing with additional "intelligent" functions.

Specifically, can a CIA be established? That is, a competition-beating performance that delivers benefit to the customer, is perceived by the customer as such, that the competition cannot catch up to easily, and that can hardly be invalidated in its environment? Ultimately, innovation marketing aims to provide early, intelligent answers to this question and support the subsequent market launch. Methods of innovation market research enable in-depth understanding of customers, their needs and their usage situations. In other words, the CIA is the result of professional innovation marketing.

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Chapter 11
The Role of Social Capital, Strategic Networking and Word of Mouth Communication in the Commercialisation of Innovation

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Abstract Commercialisation is the end point of the innovation management process. It needs to be recognised as being as much a social process as an economic one. Critical to the success of commercialisation is social capital, which is a nebulous and ill-defined concept, but one that has not been given sufficient recognition within the mainstream literature relating to the commercialisation of innovation. Connected with this is the role of word of mouth (WOM) communication that serves as a means of transferring information about new products and services throughout a market. This chapter examines the nature of social capital and WOM within the context of commercialisation. It argues that both have not been given sufficient attention in the role they play in the commercialisation process.

11.1 Introduction

The diffusion of innovation has been viewed as a social process (Rogers and Shoemaker 1971). This was a concept originally proposed by Tarde (1903) who viewed innovation diffusion as a process of imitation by one individual of another, with new ideas or practices passed on from the originator of the invention to the imitator and then from imitator to imitator (Kinnunen 1996). This social process of innovation sees the interrelationship between these individuals as playing a very significant role in the way new ideas and also products or processes are adopted within society and commercial markets (Rogers 1976). The success of an

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innovation is not so much its novelty or even the merits of its technological sophistication or economic value. What is critical to its success is the ability for the invention to be imitated or adopted on a significant scale and for this to be diffused as widely as possible (Grubler 2000).

The social nature of innovation diffusion highlights an important role for word of mouth (WOM) communication as a mechanism for the transfer of ideas. For firms seeking to bring a new product or service to market, the importance of WOM within their marketing communications process should not be overlooked. Opinion leaders can play a key role in facilitating the diffusion process, but key factors likely to influence their behaviour and enhance its effectiveness are the richness, strength and valency of the message, plus the credibility of the source and the brand equity of the firm that is commercialising the product or service (Mazzarol 2010). Yet attention also needs to be given to the role played by social capital in this process, which is an important foundation for the development of interpersonal and intergroup relationships that serve as the social networks through which new ideas can pass via WOM communication.

This chapter examines the interrelationship between social capital, strategic networking and word-of-mouth (WOM) communication in the commercialisation of innovation. Each of these areas has been examined in detail within other research but little has been done to draw these elements together. The chapter commences with an overview of each of these concepts and then an examination of the possible links that exist between them and the implications this has for policy, practice and future research. It contains some new work that has been undertaken in the field of WOM research in recent years and builds on the extant literature in the other fields.

11.2 Commercialisation as a Social Process

Commercialisation is the end point of invention and is where the value of the innovation—if the process is successful—can be realised. The concept of commercialisation is poorly defined and developed within the academic literature despite being one of the most important parts of the process of innovation (Adams, Bessant and Phelps 2006). It is generally recognised as a process of bringing to market new products or services, and doing so via marketing, selling or licensing of these products or services and/or their related technologies. As a process it is generally systematic, coordinated and involves both technical and business decisions that can successfully transform an innovation from a concept to a finished product or service that is actively sold within the market (Cobbenhagen 2000; McCoy et al. 2010). From a business perspective the commercialisation process must result in a profitable return to the firm's investment in an innovation (Chakravorti 2004). This ability for the firm to recover any investment in the innovation and the development of new products is why the process of commercialisation is so important (Akgun, Lynn and Byrne 2004).

The focus of commercialisation has tended to be on the economic rather than the social aspects of the process. However, the diffusion of innovation has long been recognised as a social process involving the four key elements of: (i) the innovation; (ii) channels of communication; (iii) time; and (iv) the social system in which the diffusion occurs (Mahajan, Muller and Bass 1990). This was a key focus of the work undertaken by Rogers (1995). In fact the importance of a firm's engagement with key suppliers and lead customers as a source of new ideas and innovation has been understood for some time (von Hippel 1978, 1986). This has included the recognition of a nexus existing between the adoption and diffusion of new products and social interaction via WOM communication within consumer markets (Arndt 1967a). The role played by social networks was also highlighted by Czepiel (1974). His study of the diffusion of an innovation within steel mills highlighted the importance of viewing the diffusion, and by default the ability to commercialise an invention, as a social or "behavioural" process. An important finding within this study was that a social network between managers from the steel mills was connecting these firms together and was an important transfer system for new ideas. As one of the managers interviewed for the study commented:

> We watch what firm X does. We talk to them and find out how it might work for us. We generally do the things they do (Czepiel 1974, p. 179).

This reflects the notion of imitation as proposed by Tarde (1903) and the interpersonal nature of innovation diffusion proposed by Rogers (1995). However, Czepiel (1974) cautioned that the steel industry that he studied possessed some unique characteristics (e.g. uniformity among firms in terms of production techniques, a culture of ideas sharing). He suggested that this pattern of social networking would be less likely to emerge within more competitive and differentiated industries such as chemicals or electronics.

The characteristics of the social network are therefore as important as the presence of this network, with social structure and culture playing a key role in how effective the interpersonal channels of communication are as a medium of diffusion for innovation. In their review of the diffusion process Katz, Levin and Hamilton (1963) observed that the social structure provides the boundaries within which any diffusion of items (e.g. ideas, technologies, products, processes) will take place. They also suggested that it defines the nature of the interpersonal communication that occurs. For example, hierarchical social structures in which there are more influential or powerful individuals or groups can either facilitate or impede the diffusion of innovation. This will depend on the level of acceptance or resistance to the new ideas or practices by these more socially dominant actors.

Research by Midgley, Morrison and Roberts (1992) undertaken using simulation studies suggested that the structure of a social network between actors can have a significant impact on the process of innovation diffusion. Their study also found evidence that the establishment of new social linkages relevant to innovation were likely to take longer to form than existing links used for more routine interactions. This capacity for social structure to influence the diffusion of

innovation not only reflects the role of WOM communication in the process, but also the importance of social capital. Communication and cooperation have been acknowledged as playing an important role in the successful commercialisation of R&D (Griffin and Hauser 1996). However, there has been less recognition of the broader role played by social capital at the firm, industry and national levels.

11.3 The Nature of Social Capital

Social capital has been a subject of academic study for decades yet it remains a somewhat poorly defined and nebulous concept (Fine 2001). Although difficult to define and measure, it deals with issues of trust, the norms of reciprocity between people and the flow of information (Woolcock 1998; Winter 2000; Adler and Kwon 2002). The concept of social capital refers to interpersonal relationships that exist within a community and their patterns and qualities (ABS 2002). For the OECD (2002) social capital relates to the formation of networks that share norms, values and understandings that help to facilitate cooperation within or amongst groups. A perspective held by Fukuyama (2001) who defines social capital as follows:

> Social capital is an instantiated informal norm that promotes co-operation between two or more individuals. The norms that constitute social capital can range from a norm of reciprocity between two friends all the way up to complex and elaborately articulated doctrines like Christianity and Confucianism (Fukuyama 2001, p. 7).

There is a distinction between social capital and physical or human capital. The nature of physical capital is generally clear. It comprises tangible assets such as property, goods and money. The concept of human capital, pioneered by Schultz (1961), relates to the development of people's skills and knowledge, usually facilitated by education and training (Becker 1975). By comparison social capital deals with the relationships and shared values that are created and used by individuals, groups or organisations to collectively solve problems (Ostrom 2009).

Social capital is both an outcome of social relations and networks, and a necessary condition for their formation (Burt 1997). It has been viewed as taking place at a variety of levels, ranging from the individual through to the group, organisation, community and finally national level (Leana and van Buren 1999). Social capital is recognised as a valuable element in the field of economic development where it is understood to represent the conditions that enable enhanced cooperation between people, it is…

> …a vital yet under-appreciated development asset, which refers to a class of assets that inhere in social relationships, such as social bonding and bridging, makes those with access to it more effective and can be enhanced for lasting effects (Chase and Christensen 2009, p. 428).

11.3.1 The Role of Trust

An important element in the creation and sustainability of social capital is trust, which is often viewed as the "glue" that binds social networks together (Liewicki and Brinsfield 2009). Mayer, Davis and Schoorman (1995) suggested that trust between people or between organisations are built on the foundations of integrity, ability and benevolence. They defined trust in the following terms:

> The definition of trust…is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party (Mayer et al. 1995, p. 712).

Integrity is the recognition that a commitment by two or more parties to an agreed course of action will be adhered to without the risk of one party reneging on the agreement or seeking to cheat or free ride on the other members of the social network (Johnson-George and Swap 1982; McFall 1987). The ability or competence of the actors within the social network is also important to trust. This is because it implies that the actions of any given actor will be less likely to have negative impacts on the others if all have equal or complimentary abilities (Lieberman 1981; Stikin and Roth 1993). Finally, there must also be a sense of benevolence, in which the various actors in the social network seek to do well to the others within their network rather than just personal economic or social gain (Strickland 1958; Solomon, 1960; Larzelere and Huston 1980). Trust must exist within the social network in order to help facilitate the development of social capital, and it should be reinforced by the history and culture of the network and the formal and informal rules that govern its activities (Zucker 1986). Any deterioration of trust within the social network is likely to threaten the network's ability to serve as a cohesive and effective mechanism for the diffusion of innovation (Knight 1933).

11.3.2 The Role of Networks and Structural Holes

However, while trust is necessary to create and sustain social capital it is not sufficient by itself to do this. Trust forms a sort of "reservoir" of confidence in another person or group of persons, but not one that will necessarily lead to social exchanges that are required to foster social capital (Lewicki and Brinsfield 2009). For example, people can trust their neighbours or those they work with, that they will treat them well, but they might not feel comfortable asking them for assistance. What is required for trust to work as a mechanism for social capital building is the existence of productive social networks.

Effective social networks consist of a "series of connected or tied nodes" (Narayan and Pritchett 1999). Most people exist within networks that have strong ties between them based on such things as family, professional, religious, ethnic or

national characteristics. These relationships are based on a high degree of shared norms, values, beliefs, culture and understandings and create a high degree of similarity referred to as "homophily". Such networks are likely to be highly stable and the engagement between members more frequent. However, such homophilous networks are likely to suffer from a knowledge exchange that is isomorphic in nature. Isomorphism is a situation in which the actors in the network tend to resemble each other and this is unlikely to result in innovation due to the redundancy of the information that is circulated (Steward and Conway 1996).

For social networks to serve as mechanisms for the diffusion of innovation there is a need to create "structural holes" between otherwise homophilous groups that can allow the transfer of new information between them via a "bridge". When some individuals who serve as "gatekeepers" on these holes receive this information they have a greater opportunity to get good ideas (Burt 1992a). These gatekeepers are often influential people (e.g. managers, leaders) who have the ability to boundary span beyond their homophilous network which has strong ties, to more hetrophilous networks with higher diversity weaker social ties. However, due to the "structural hole theory" individuals who can secure new and less redundant information have a greater opportunity to identify new ideas and entrepreneurial opportunities (Burt 1992b). The relationships that exist between individuals in hetrophilous networks are weaker, but the value of the information that is exchanged across these networks is usually greater, suggesting there is a "strength of weak ties" (Granovetter 1973, 1983) phenomena.

Social networks are therefore recognised as comprising either a "bonding" or a "bridging" relationship. The first of these relates to the homophilous network with high tie strength and dense connectivity. The second is associated with the hetrophilous network with weak tie strength but the opportunity to bridge the structural holes and take advantage of less redundant information (De Carolis and Saparito 2006).

11.3.3 The Role of Reciprocity

A third element in the forces required to generate and sustain social capital is reciprocity, which is closely associated with the concept of trust. This is due to the need for there to be trust between individuals that if they do something (e.g. give information of value) they will receive reciprocal value in exchange (Nahapiet 2009). Reciprocity can be direct, indirect or spatial in nature (Nowak and Sigmund 2000). Direct reciprocity involves direct "give and get" exchanges in response to actions. Indirect or generalised reciprocity involves giving without getting a direct response from the person to who the initial information or benefit is provided (Putnam 1993). Any benefit this individual might receive is likely to return to them indirectly via the social network and might be in the form of an enhancement of their reputation within the community (Leimar and Hammerstein 2001). Spatial reciprocity relates to the proximity of the actors within the social network. For

example, in close knit, stable communities any inappropriate behaviour by network members is generally punished by "tit-for-tat" responses (Axelrod and Hamilton 1981; Axelrod and Dion 1988; Axelrod 1997). However, where the individual is able to avoid this negative response—as is common in highly transient populations or unstable communities—it is possible for network members to misbehave via free riding or malfeasance (Nowak and Sigmund 2000). According to Granovetter (1985) the key to discouraging such misbehaviour and encouraging trust within social networks is "embeddedness" where the more individualistic and economically self-interested behaviour of an individual is constrained by their being embedded in a social network.

Social capital is therefore a complex but fundamental construct that has been examined from a range of perspectives but continues to be overlooked as a critical resource requirement in determining the success of innovation commercialisation. Part of the reason why social capital has not been given the attention that it deserves is found in Coleman's (1988) analysis of the role played by social capital in the creation of human capital. As he notes:

> Unlike other forms of capital, social capital inheres in the structure of relations between actors and among actors. It is not lodged either in the actors themselves or in physical implements of production. Because purposive organizations can be actors ("corporate actors") just as persons can, relations among corporate actors can constitute social capital for them as well (with perhaps the best-known example being the sharing of information that allows price-fixing in an industry) (Coleman 1988, p. S98).

The nature of social capital as a resource that lies between individuals, groups and organisations, owned by everyone but not easily measured or appropriated by anyone may explain why it has been overlooked. Physical capital can be readily observed and measured, and ownership rights to it can be applied. Human capital is less tangible in nature but even here there are opportunities to measure education and skills, knowledge and growth or decline of the population. Wages, employment, productivity and workforce participation are all well-established measures of human capital. By contrast social capital is not so easily measured. It exists within the social networks and relationships that take place between people and organisations. Trust, networks and reciprocity are all part of the building blocks of social capital but they are difficult to measure and are rarely found listed in the balance sheets and asset registers of business organisations.

11.4 WOM Communication in the Commercialisation Process

Interpersonal world of mouth (WOM) communication has been recognised for decades as a potentially powerful medium of promotion for new products and services (Brooks 1957; Arndt 1967a, b). It involves an informal interpersonal communication between individuals in which products or services are discussed

and evaluated (Anderson 1998). As a process of interpersonal communication WOM requires a giver and a receiver as well as a context in which the discussion takes place. Within a consumer market environment WOM communication provides the receiver with an opportunity to reduce the risk associated with purchase due to the ability of the information to enhance their understanding of the product or service. However, for the giver to be willing to transfer information to the receiver via WOM communication they need to feel that the product or service offers value. They also may need to have a degree of social affinity with the receiver and the self-confidence that their opinion is worth giving (Mazzarol et al. 2007).

On the receiver side the overall impact of the WOM message is likely to be influenced by the perceived credibility and trustworthiness of the giver, the level of tie strength and homophily existing between the two, and the characteristics of the message itself. The vividness of the message and strength and richness of the verbal and non-verbal communication that transmits it are also likely to be important (Sweeney et al. 2008). This combination of the logical appeal of the message that is being transferred, the emotive content or appeal of the message, and the power with which it is transmitted are important to the overall effectiveness of the WOM communication (Sweeney et al. 2012).

The role of WOM communication in the commercialisation process has been recognised within the field of marketing science, with a particular focus on the capacity for WOM to help facilitate the diffusion of innovation and the adoption of new products (Mahajan and Muller 1979). It has also been recognised that WOM communication about new products and services can be both positive and negative in nature; demonstrating the importance of supportive advertising to help mitigate any negative WOM (Mahajan, Muller and Kerin 1984). There has also been a body of work designed to develop quantitative adoption and diffusion models that might be used by marketing professionals to estimate rates of market diffusion in various contingencies (Mahajan et al. 1990).

A key feature of the commercialisation process for innovations that are novel or radical in nature is the uncertainty of the market's acceptance, and the risk that this imposes on the firm seeking to make the investment. Case study research undertaken by Mason (2008) suggests that WOM can be an effective promotional tool where market environments are complex and turbulent. However, in simple and stable environments it is of less value because the information it provides is less valuable and less sought by prospective adopters. According to Williams and Buttle (2011) firms seeking to make use of WOM for marketing communications purposes need to consider "eight pillars" that form the foundation of a coherent WOM management strategy. These include: (i) the customer; (ii) the product/service; (iii) communications; (iv) the key influencer network; (v) referral networks; (vi) supplier/alliance partner networks; (vii) employee network; and (viii) organisational factors.

With respect to the social networks that are contained in this model the following explanation is provided. The "key influencer network" comprises the regulatory agencies, industry and consumer associations, trades unions and a range

of other actors that can endorse or reject a new innovation. In some circumstances competitors can play this type of role. Managers seeking to commercialise a new innovation will need to consider such actors within this network and take steps to mitigate any risk that might be posed by them. This might include the proactive engagement and communication with these groups or the use of publicity and public relations in the event of opposition. The "referral network" comprises the loyal customers, industry partners and others in the firm's circle of contacts that can help to generate a flow of WOM referrals to feed directly into the sales activity. By contrast the "supplier/alliance partner network" comprises third-party actors such as suppliers and financial services firms (e.g. banks, venture capital firms) who can assist the innovation diffusion process by facilitating WOM communication. This network is less likely to feed directly into the sales process, but it can be effective in providing endorsement and influence in strategic terms. Finally, the "employee network" is important, particularly for service firms, as the commercialisation of this type of innovation will require the employees to play a key part in its market diffusion. While these "pillars" sound logical Williams and Buttle (2011) in summarising their findings of three large Australian case study firms noted that:

> Not one of our sample organisations had a coherent, integrated strategy for the promotion of Positive WOM. Each departmental unit interprets WOM differently. There is no clear, shared, understanding of how WOM fits into customer service, sales, marketing or communications programs, or of the value that WOM contributes to the organisation as a whole (Williams and Buttle 2011, p. 89).

These observations highlight the relative lack of systematic awareness, measurement and use of WOM communication in the marketing communications process. This is a situation common in industry despite the recognition of the importance of WOM communication for nearly 60 years (Katz and Lazarsfeld 1955). There are also benefits from WOM communication in industrial or business-to-business (B2B) markets (Godes 2012, Godes and Mayzlin 2009). However, even here systematic management is also scarce.

11.4.1 The Rise of e-WOM

The advent of online marketing and communications systems, in particular social media via Web 2.0 platforms (e.g. MySpace, YouTube, Facebook, LinkedIn, Twitter), has given rise to an emerging focus on e-WOM or online social exchanges between consumers (Coulter and Roggeveen 2012). The speed with which such online and now mobile social media can disseminate information and the potential for this to be diffused globally, makes e-WOM of particular interest to commercialisation.

A study of Japanese consumers' adoption of portable gaming platforms found that there are differences between e-WOM and conventional WOM in the diffusion

of innovation (Kawakami et al. 2013). This study's findings suggest that conventional WOM can help to stimulate intensity and variety of product use so as to encourage product upgrades and the purchase of complementary products. However, e-WOM influences consumer decision making pre and post purchase. Prior to purchase consumers use online forums and social media to evaluate products and assess the risks of acquiring the device. Post-purchase they use these online channels to resolve usage issues and may not use e-WOM to find new uses of the innovation. This post-purchase user environment is important as a potential source of innovation diffusion because it can help or hinder the commercialisation process. As the authors of this study noted in their advice to managers seeking to make use of e-WOM:

> To harness these benefits, managers can invest in the development of Web sites (or areas within existing sites) that enables users to share their product use experiences. In addition, managers may want to develop promotional programs that encourage users to visit use-related Web sites, read content generated by other users, and add their own content to use-related Web sites (Kawakami et al. 2013, p. 27).

This distinction between e-WOM and WOM has been highlighted in earlier research (Godes and Mayzlin 2004). There is evidence that consumers' use of online information is influential to making offline decisions and so the imperative is on managers in firms seeking to commercialise their innovations to actively engage e-WOM through online news groups, forums and other social media.

Online social media offers a new and rapid mechanism for the diffusion of innovation and this has potentially beneficial impacts on the process of commercialisation. This can take the form of viral marketing campaigns (van der Lans et al. 2010), or online product reviews (Cole et al. 2011). For the adoption of new technologies recent research suggests that e-WOM can be as effective as more conventional WOM in influencing consumer purchasing decisions, particularly in the area of perceived usefulness and ease of use (Parry et al. 2012).

11.4.2 Word of Mouth in Commercialisation

Whether WOM is conducted virtually or physically it is important to the commercialisation process. For example, in a study of European biotechnology firms engaged in commercialisation, Costa et al. (2004) found that WOM communication played a key role in their success. When faced with initial resistance by consumers to the adoption of new products, the use of strong WOM communication with one firm's social network enabled this company to overcome the obstacle:

> Taking advantage of strong market knowledge and assistance from technical support and regulatory bodies and benefiting from strong word-of-mouth communication, company C quickly managed to prevail over the initial resistance of the consumers and became leader in several niches (Costa et al. 2004, p. 411).

Other firms examined in that study were identified as having successfully used positive WOM within their networks to diffuse their innovations into the market moving beyond early adopters and innovators and onto the mainstream consumers. The creation of a "word-of-mouth effect" as a "very effective communication tool" in an otherwise restricted market was also noted by the study as a successful marketing strategy by several firms.

Another study by Chiesa and Frattini (2011) examined the application of WOM communication as a mechanism to address commercialisation problems in circumstances within high-tech markets where the initial launch of a new technology has failed. This can be a major problem in such markets where the failure of a new product or technology triggers a negative WOM response from the early adopters who may also be strong opinion leaders for late adopters within their social networks. Their study suggested that negative WOM amongst early adopters was likely to be due to factors such as the launch of a product that is not finished, but where a pre-launch promotional campaign has raised expectations. When the product is supplied it is not targeted specifically at early adopters but is shipped without many features and functions either supplied or in working condition. This is further exacerbated by pre-launch promotions that have promised enhanced features and functions (not supplied), or that suggest the new technology is an improvement on the existing technology.

By contrast where positive WOM is generated the innovation is launched in a completed state and any pre-launch announcements focus on this, and position the new product as a revolutionary technology. This also sees the new product targeted specifically at early adopters, and that it carries features and functions that are known to be of particular interest to them. In the case where the innovation needs to be integrated into an existing system, success is likely to depend on the firm's ability to develop long-term strategic partnerships with key individuals within the adopting network. The conclusions drawn by Chiesa and Frattini (2011) from their study highlighted the role that positive or negative WOM from early adopters plays in influencing late adopters:

> Whereas lack of support from the innovation's adoption network is a critical reason for failure especially for systemic innovations, a negative attitude of early adopters can determine market failure especially for radical innovations (Chiesa and Frattini 2011, p. 452).

Interestingly they also raise doubts about the validity of the well-publicised concept of there being a "chasm" between early and late adopters as originally proposed by Moore (1996). They dispute the notion that early and late adopters are highly dissimilar, and that this makes communications between them uncommon so that acceptance of a product by early adopters does not impact on late adopters. Instead they side with Rogers (2003) who suggests that Moore is wrong in proposing the existence of "chasm". Instead they suggest:

> …that the diffusion process, even within high-tech markets, is a continuous one, whereby innovations diffuse in a social system as a result of complex patterns of communications between adopters and potential adopters (Chiesa and Frattini 2011, p. 453).

11.5 Social Capital as a Key Element in Commercialisation

Governments around the world invest substantially in publicly funded research and development (R&D), and offer incentives to industry to do the same (OECD 2010). There is evidence that the commercialisation of innovation is enhanced through inter-firm networking and clustering (Hamdouch 2009). The concept of a National Innovation System (NIS) has also emerged over the past 30 years in which the intersection of publicly funded institutions such as universities and public investment in R&D flows through to industry and enhances the overall level of innovation within a country (Lundvall 1998). At the heart of this NIS concept is the existence of networks between individuals and organisations that can help to facilitate innovation and its diffusion (Nelson 1992; Freeman 1987, 2002).

An important aspect of the NIS concept is the ability to transfer scientific research findings into patented inventions that can be commercialised through a process of technology transfer (Laredo and Mustar 2001; Van Looy et al. 2011). However, research into the successful commercialisation of university inventions is contingent on the interpersonal relationships that form between the academic researchers and the industry partners (Boehm and Hogan 2013). Trust between the researchers and industry partners playes a significant role along with the commitment of both parties to work together to see the commercialisation process through. As one study highlighted:

> Success was directly related to the degree of commitment of the scientific researchers and the commercial collaborators to achieve a deal. In the case of the failed transaction, there was an internal climate of conflict, with powerful players being antagonistic to commercial outcomes. In one of the transactions, the lead academic was responsible for championing the technology into a commercial enterprise, and in the other a number of the players had a long history of past collaboration and a firm basis of personal trust (Martin 1991, p. 369).

A further study of university-industry collaboration in applied research and commercialisation projects also highlighted the importance of strong social capital between the network partners and the consequences of not having it. This included cultural divides and poor communication between academics and their industry partners, which could only be overcome by individuals from both sides taking the necessary action to actively communicate and build trust (Berman 2008). Similar findings emerge from other studies into the same phenomena of university-industry linkages. Critical drivers of success were effective communication, understanding and trust between the individuals engaged in the collaboration (Plewa et al. 2013). As one participant in the study observed about the importance of building strong social relationships:

> I guess there's this identification…you identify that you want to work with each other. Then there's…the whole phase of determining how you work together and if you can work together (Plewa et al. 2013, p. 27).

There are many obstacles to effective collaboration between universities and industry in the field of commercialisation. These can relate to conflicts over intellectual property (IP) rights, bureaucratic administration, equity sharing and incentives for academics to engage. However, these barriers can be mitigated through the fostering of stronger social capital between the academic and business community. Experience of collaboration, wider social networks and inter-organisational trust between all members of the collaborating network are also likely to play important roles (Bruneel et al. 2010).

As another study of university technology transfer practices by Siegel et al. (2004) found, the reasons for success or failure in the process is often the cultural divide that exists between the academic and industry communities. Where the academic community is focused on the generation of knowledge from research as a public good that needs to be published, the business community is seeking to generate commercially valuable IP that can be appropriated for profit. What was required to overcome these barriers was enhanced networking and social exchange between the two communities and the generation of social capital. These examples of universities engaged in technology transfer and commercialisation are used here to highlight the importance of social capital in the commercialisation process. However, they can equally apply to collaboration between firms seeking to commercialise new products, particularly relationships between small and large firms (Alvarez and Barney 2001).

11.5.1 Social Capital and Innovation at the National Level

In a study of the innovation system in Denmark over the period 1996–1999 Lundvall et al. (2002) found six key "lessons" that suggested why that nation had succeeded in fostering a healthy climate of innovation. First, the Danish economy was found to be "highly egalitarian" with a high per capita GNP income distribution. It also possessed a flexible labour market, but one that also provided a good level of job security for employees. A third lesson was that the Danish NIS had built its competitiveness around low-tech industry sectors where innovation was incremental rather than radical, drawing on human experience and learning rather than scientific or technological breakthrough. The formation of social networks within Denmark's NIS was found to be influenced by people and their career patterns. For example, there was an "intense interaction" between firms, but a weak interaction between firms and universities. The general conclusion from this was that if policy makers want to encourage more interaction between universities and business they must tackle the problem through the career paths of academics that are generally not provided with career-based incentives to work within industry.

Another lesson from the Danish NIS study was that the system secured significant benefits from the enhancement of human capital via education and training that encouraged people to learn and taught them how to learn. Finally, the study

found that social capital played a significant role in the overall growth of the system. This helped to explain why the Danish economy was able to compete without a substantial high-technology sector. The key outcome of this high social capital was its ability to foster learning:

> The only way to explain the strong economic performance of Denmark and other small economies with a weak specialisation in high technology products is to take into account the social capital that makes it easier for people to learn, collaborate and trade. The most important threat to this mode of production and innovation is the growing polarisation and exclusion of those who do not fit into the learning economy. To give those a stronger learning capability and access to the networks where learning takes place is crucial for the sustainability of the learning economy (Lundvall et al. 2002, p. 219).

According to Lundvall (2007) why social capital appears to play such an important role in the fostering and diffusion of innovation at a national level is the existence of a "knowledge infrastructure" within an economy. This is comprised of the education and training system and the role it plays in facilitating the flow of ideas and the creation of a "learning economy" that requires both intellectual and social capital to sustain it. According to this view intellectual capital formation is "fundamentally dependent on social capital", and any economic development strategy that fails to recognise the importance of social capital is unsustainable.

This knowledge infrastructure is a building block of a strong innovation focused economy and it is the communication between firms and their customers that can help to generate new innovation and promote the commercialisation of new products and services (Athaide et al. 1996). This pattern of evidence was further identified in a study by the European Commission's "European Innovation Scoreboard" (EIS) (EC 2008). This examines the innovation performance of all 27 countries that are members of the European Union (EU). In an examination of the findings from the EIS the importance of social capital was highlighted:

> Social capital and knowledge flows are potential key factors in innovation performance…beyond GDP, differences in social capital and technology flows have the greatest power to explain differing levels of innovation performance (Bavec 2009, p. 24).

For innovation to be fostered within an industry or national economy there is the need to generate at least three key drivers. The first of these is "knowledge integration", which involves the ability to take knowledge or the novel configuration of existing pieces of knowledge and apply them to new purposes. The second driver is that of the "co-evolution of business and social relationships". This relates to the "embeddedness" of the firm within its social network and how willing that network is to the adoption of new ideas and innovation, plus the willingness to exchange ideas. Finally, there is the third driver of "technological development", which relates to the firm's ability to invest in R&D and its commercialisation (Corsaro et al. 2012).

11.6 Conclusions

As outline in this chapter the process of commercialisation involves the sale and adoption of new products, processes and services generated from an investment in R&D and new product development. It is a process that will benefit from the commercialising firm having a social network that enables it to secure information and knowledge in a timely manner. This network should allow it to engage freely with lead customers, key suppliers and other network actors to exchange information and secure positive WOM. Because the diffusion of innovation is a social process, the roles played by social networks, WOM communication and social capital are important for successful commercialisation. They create what some have described as a "commercialisation net" (Aarikka-Stenroos and Sandberg 2009). This refers to the formal and informal network of relationships that are required to bring a product successfully to market.

At the firm level the existence of a strong social network and the ability to generate positive WOM communication is likely to benefit the commercialisation process. Holmlund and Tornroos (1997) note that a firm networks that operate on three layers or levels. The first is the "production network" layer, which is the vertical supply or value chain network linking suppliers to the firm and the firm to its customers. The second is the "resource network" layer that comprises the horizontal supporting network of complementary actors such as financial institutions, chambers of commerce, regulatory agencies and other businesses. Finally, the third layer is that of the "social network". This is the interpersonal relationships that its managers and employees have with other individuals across the other two networks.

Firms seeking to undertake commercialisation will need to possess strong networks at all three levels. They will need to work closely with lead customers and in some cases key suppliers to develop their new product and bring it to market. Relationships here must be based on trust and a willingness to share ideas and assist with the co-creation of the new product or service. The ability to acquire much needed resources and indirectly promote the innovation may also be enhanced if the firm has a strong resource network. However, it is the ability of each of the firm's managers, in particular the owner or senior leadership team responsible for the innovation's commercialisation, to use the social network that will be decisive. This suggests that the innovative firm needs to possess not only the physical and human capital it needs for commercialisation, but also the social capital.

At the macro level the strength of a nation's innovation system is contingent on the strength of its social capital. Without sufficient social capital to help foster information sharing, collaboration and connectivity, it will be less likely that innovation will be created and diffused. The development of social capital requires that the society recognises the mutuality that is essential to encourage collaboration and networking. It needs to foster a culture of mutual trust and reciprocity within social networks so as to provide the foundations for the creation and sustaining of social capital.

11.6.1 Implications for Policy and Practice

Governments that seek to encourage innovation and commercialisation of inventions will miss a major component within the development of their NIS if they ignore social capital. The findings from the extant literature suggest that investment in physical and human capital is insufficient. What is required is investment in mechanisms that help build social capital. These include public goods such as education systems and the encouragement of share values and beliefs. If a nation is viewed as a large social network, there is a need to ensure that all members of the network (e.g. all citizens of the nation) feel that they can actively participate. Further, there is a need for all network participants to feel that their participation is welcome and rewarded. The marginalisation of individuals and groups within the broader society or the creation of too many isomorphic groups that cannot be bridged to other groups in the network will diminish the power of the nation's innovative capacity.

For managers and entrepreneurs engaged in innovation commercialisation within firms, the message is clear. Social capital is as important as physical and human capital. There is a need to recognise and map the social network within which the firm is embedded. Of particular interest should be how open or closed the network is to change, new ideas and innovation. The importance of developing strong social networks has been well recognised within the academic literature (Birley 1985; Ostgaard and Birley 1994). The value of social networks to the growth and performance of small firms has also been acknowledged (Komulainen 2006). However, the recognition of social capital as a critical resource alongside physical and human capital has not been so widely accepted.

Managers, particularly of small firms that typically lack sufficient resources to commercialise innovations alone, need to leverage their stocks of social capital to assist them in securing the necessary resources. Active management of social capital would involve a review of the three network layers proposed by Holmlund and Tornroos (1997), in particular the "social network" layer. How is it constructed, who has what contacts and what are the dynamics of it? Of importance here are the levels of trust and reciprocity that can be found within these networks as well as their strength and value. Know-who is often as important as know-how in the commercialisation process.

If commercialisation and the diffusion of innovation are social processes then managers need to pay more attention to the role of WOM communication and social capital in their planning and strategic thinking. What has been a focus for marketing communications researchers and sociologists should be brought into the mainstream within the strategic management, innovation and entrepreneurship literature.

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Chapter 12
Managing Emotions Matters: A Balanced Framework for Communicating Innovations in Companies

Claudia Mast

Abstract Nowadays, innovations are crucial for nations, the progress of societies and the success of companies. But only if they are noticed and appreciated by people in their daily lives, employees, customers, experts, academics, journalists and other opinion leaders, they can be fully effective. Therefore, communication management has to take into consideration, that the advantages of innovations can be re-evaluated from different points of view—employees worrying about their jobs, companies struggling for sustaining their competitiveness or customers who mistrust products with the label "innovative". It is the balance between facts and figures on the one hand, and emotions on the other, which is often neglected in internal and external corporate communication. The article presents a balanced framework for creating a communication strategy for innovations and discusses results of surveys from communication directors in the top 500 companies in Germany.

12.1 Introduction

The global economic crisis has caused a major rift for the communication experts in the companies. The conditions for the communication management have changed dramatically. More and more companies have to cope with negative media coverage and a sceptical public atmosphere. Employees, customers, journalists and politicians have begun to question the social and ecological responsibility of the companies and they care about whether the technologies, products and services offered by companies are truly an advantage to them. In addition, editorial offices have emphasized the arising uncertainties of innovations and the consequences more than the opportunities.

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That means innovation communication poses more and more particular challenges. In this article innovation communication is defined as two way interactions between organizations and their stakeholders, dealing with new products, services and technologies. These innovations are often novel and complex. Their positive and negative implications may be hidden for some time and their concrete applications may be explained later on. Therefore, the environment for the emerging field of innovation communication has changed and the most important stakeholders in this field (employees, customers and journalists) have to deal with growing uncertainty, mistrust and sometimes fear. In their eyes innovations and developments of change often go together. Many innovations initiate a change process or are an essential part of it. So far, some experiences made in the wide field of change communication can be transferred to communicating innovations (Mast 2011). This is essentially the management of emotions, time and the way of reporting news to stakeholders who are emotionally affected and involved.

12.2 Creating a Communication Strategy for Innovations

The accelerating process of innovations causes the fear of individual, organizational and social risks, which may dominate the hope, the confidence and the chances in parts of societies and companies as well. In this case, the communication system is critical to business success as long as it enables a constant process of change and manages the balance between cognitions and emotions. On the opposite side, communication can destroy the company's values, including support, involvement and employee commitment.

Strong companies are those which manage innovations and change quickly, without public trouble or damaging the motivation of stakeholders. But, first of all they have to win the hearts, minds and participation of their employees who are more and more worried about the individual and social impact of new products, services and technologies. Some examples are job cuts, increasing stress in the office, media coverage of dangerous products, environmental pollution and unfair trade. People tend to re-evaluate who is taking advantage of an innovation, which kind of innovations are acceptable and the social costs of new products or procedures.

Changes and innovations (from the employee's point of view) have become nearly one in the same. Here are some reasons why it is so difficult to communicate innovations:

- *Lack of insight:* If people do not understand why a certain innovation is necessary for their company, they are not motivated. They will resist the change process: Why change?

- *Lack of acceptance:* People emotionally desire a break in the never ending process of change. Most of them feel that they are captured by anonymous forces and cannot really participate: Who benefits from this innovation?
- *Lack of trust:* The trust of many employees in their managers has become fragile. In some companies the trust and the credibility has been decreasing dramatically for several years. Many people do not believe any longer that the public announcements and reasons for the flood of changing projects are really true: Why should we trust the managers this time?

The crucial point for a successful communication strategy is: How can communication support the ability of companies and employees to innovate? How can communication contribute to the "innovation readiness" (Zerfaß 2005, p. 7)? No doubt, one important influential factor is corporate communication. But there is no doubt, that the topicality, comprehensibility and meaning of the messages are just as important as the basic attitude of the communicators towards the stakeholder's interests and needs. And one of the main interests of the stakeholders is to be well informed in a trustful way with meaningful concrete statements from their executives.

Therefore, using buzz words is not a solution. But "innovation" and "change" are buzz words of our time. Nobody knows exactly what they mean. Nevertheless, these terms are constantly used in our daily business lives. Many authors emphasize the importance and impact of innovations for the economic and the social system of countries. Others stress the aspect, that an innovation must be something really new and successful in the market (Zerfaß et al. 2009). This is—from their point of view—the difference between an idea and an innovation. The survey INNOVATE (Mast et al. 2005) however highlights: it is the inflation of buzz words like innovation which causes a general mistrust amongst stakeholders. The misuse of these terms has increased the stakeholders' scepticism about technologies and products which are described as "innovative".

Similar effects can be seen when analyzing change processes. What comes to mind when employees hear the word "change"? Is it "Yes, we can" or rather "Please, not another change project"? Employees and executives all have their own perspectives on changes affecting the daily routine in their companies (Deekeling and Barghop 2009). Literature is full of advice about what can go wrong in change management and how people should act (Klewes and Langen 2008; Pfannenberg 2013). There is, however, very little empirical evidence about how the change processes actually proceed and how they affect people's emotions (Mast 2010, 2011).

But consistently over the past years roughly two-thirds of all change projects have had little or no success (Houben et al. 2007). Of course, communication is only one of the many drivers for organizational change within companies. But even well planned communication management fails almost half of the time. The most important success factors for change communication are (these are the results of the survey among communication directors in the top 250 companies in Germany) a

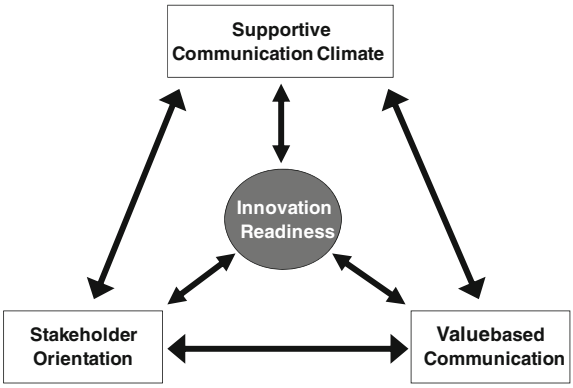


Fig. 12.1 Framework for creating a communication strategy for innovations

strategic concept with a clear focus on stakeholders, organizational conditions which foster cooperation and a quick flow of information (Mast 2009, 2011).

To get better results in communicating innovations in our time there is some work to be done on creating new and adequate strategies. Taking the current results of studies on change communication into account innovation communication management from now on should stress the following three factors (see Fig. 12.1).

Value-based communication: Are tangible and especially intangible corporate values points of reference for the communication practice (Mast 2013)? Do employees really understand the corporate vision, mission and current objectives? And do they know the written and unwritten rules of how to behave in case of struggling corporate values? Could they produce their own picture of how the value innovation applies to their job and can they contribute to the creation of new products or procedures? And the most important point: What about "Making the Connections" (Quirke 2008) and turning strategy into action? Does communication really paint pictures of a "strategic alignment" (Van Riel and Fombrun 2007, p. 209) so that employees understand and are able to enact their company's objectives?

Stakeholder orientation: What kind of image crosses the mind of communication managers when they are planning communication activities and talking to employees, customers and journalists? In their eyes are they just "target" groups which are easy to handle if the right "tool" has been chosen? Are they purely considered as "objects" for certain applications of "tools" or furthermore as "subjects" who are balancing the rational and emotional side of communication? Above all, stakeholder orientation means that innovation communication reflects two sides of the coin—the rational and emotional needs of stakeholders—especially when communicating complex innovations.

Supportive climate: Companies are often unaware of the fact that how they communicate is as important as what they say. Stakeholders who are unsure or even mistrusting are very sensitive to the tonality of corporate communication, to the nuances of statements and the choice of which person says something in which

channel and especially when. Stakeholders, including employees, feel like a seismograph whether they are respected by a communicator and told the truth. Managers in their role as communicators can change the climate in a company more quickly and sustainably than media ever could (Kinter et al. 2009). This kind of micro-climate has a great effect on business nowadays and is often neglected. Reasons why managers have problems in reaching their stakeholders are quite different. One reason can be seen in prejudices against the company. In addition clichés and misinformation play a decisive role when stakeholders don't feel up to paying attention to the company's messages. These results, gathered by a survey[1] among communication directors in the top 500 companies in Germany, emphasise once more the ability of communicators to identify negative emotions like mistrust and their capability of dealing with them.

Recent surveys (Mast 2009, 2011; Houben et al. 2007) have revealed that most of the change projects have failed because the communication managers misjudged the emotional state of mind of the stakeholders that they wanted to convince. Major reasons were: The messages were not translated for the needs and questions of employees, relevant information was transmitted late and the employees could not paint a picture of how they should behave, whom they could trust and rely on and whether they could feel as a part of the company going forward. There was no dialogue with stakeholders, too much media communication and too few conversations, insufficient management communication or cultural characteristics were ignored. All together—the strategic communication of innovations neglected the most important point: Managing emotions matters.

12.3 Success Factors of Strategic Communication of Innovations

Stakeholders are weighing up manifest and latent messages, time lags, symbolic functions of communication channels and especially, meaningful statements being addressed without using buzz words. Their daily balanced decisions are based on the following factors:

- *Consistency:* Messages should signal an alignment to corporate values like innovations and current objectives alike. Otherwise, stakeholders perceive mixed signals and watch more carefully to see how these inconsistencies will be resolved.
- *Credibility:* Leaders are credible when their communication behavior is seen as open, honest and reliable and when they are telling the truth and the "whole story" of an innovation, not just the good news.

[1] Sample: TOP 500 enterprises (turnover) and DAX enterprises of Germany; n = 121, survey period: December 2012/January 2013.

- *Orientation:* People want to see a clear direction, where a company is going and how it is doing. Stakeholders want to understand how they fit in, how they can contribute or how they are affected by innovations.
- *General attitude and esteem towards stakeholders:* Do stakeholders play an active or passive role in the practice of innovation communication? Are they estimated as partners, sources of ideas and experiences or even handled as "target" groups which are only expected to show desired "reactions"?
- *Participation:* Innovation Communication has to avoid producing feelings of being captured or subjected to anonymous processes or procedures. Communication is challenged to make the connections between the concerns, preoccupations and agendas of stakeholders and those of the company and also to keep its finger on the pulse of stakeholder's sentiment. And finally it should explain apparent and hidden contradictions between the desires of people and the realities of business processes.

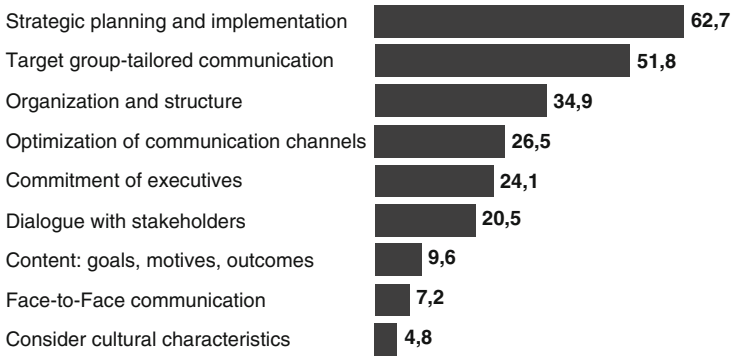
12.4 Transferring Experiences from Change Communication

These, and more, are key success factors for innovation communication, which can be transferred from the change communication. These factors play a role in the background when the top 250 companies in Germany think about their experience as to why communication was successful (Mast 2011) (see Fig. 12.2).

12.4.1 Success Factor 1

Almost two-thirds of the companies point out the need for a long-term strategy including precise goals and consistent implementation. This includes thorough preparation of all measures, the right timing ("as early as possible") as well as detailed implementation plans and—in the case of campaigns—an elaborate dramaturgy of all the elements. Formulating a consistent, intelligible and vivid "change" or "innovation" story is considered to be as important as issues management which reduces complex issues to core statements and clear and simple messages. It is also vital to truly involve all stakeholders in the concept and not to forget anybody.

In the communication directors' self-critical judgment clear strategies are rarely established in the bustle of everyday life. This, communications experts claim, is often due to inconsistent decisions the management surprises them with. Others admit they simply underestimated the challenges of change communication or communicating innovations. Thus, a strategic approach, including a concept, is missing, resulting in erratic issues planning without "one-voice-policy" or "key speaker". When the top management is quick in laying the blame for bad news on



Sample: DAX enterprises and TOP-250 enterprises (turnover) of Germany;
n = 83; percentage values. Question: „Thinking about your experience with change communication: In your opinion why was communication successful? " (multiple answers permitted).

Fig. 12.2 Success factors of change communication; *Source* Mast 2011

others the effects on the communication climate can be disastrous. One out of four companies admits that bad timing resulted in the creation of rumors. Some companies start too late, others plan communication programs which do not last long enough. Stakeholders are still interested in news, but can no longer learn about them through official media channels.

12.4.2 Success Factor 2

Target group aligned communication—a matter of course—is identified as the reason why about half of the companies succeeded change projects or innovations. This implies a continuous information process including all employees and their respective cognitive and—even more importantly—emotional needs. Even the news that there is no news is important information in change processes. Whether trust and confidence can develop depends on openness, honesty and transparency. Feedback channels and especially the quickness in which questions are answered, are important measures which create trust.

Even though one should communicate consistently via all channels many companies underline the importance of personal communication by executives and the top management's commitment as a decisive stimulus. According to one company the "direct, simple approach including an emotional element" is the pivotal factor of success, or—in other words—the communicative integration of employees into effective communication networks, as well as managers operating as communicators often leads to success. The culture of management is under suspicion when a company self-critically admits: "The employees have been treated as objects and not as subjects". It is no surprise, then, that change encounters resistance and innovations are not accepted.

12.4.3 Success Factor 3

One out of three companies polled pointed out that organizational processes, responsibilities and structures of cooperation between human resources, public relations, marketing and investor relations are important. This coordination and the quick transfer of information between departments are just as critical for success as the early integration of communication experts in the top management's planning process. The adoption of project teams is generally judged positively.

12.5 Innovation Communication in a Changing Media Landscape

A changing media landscape holds opportunities as well as risks. While at the beginning of the year 2013, nearly 85 % of the Communication directors in the surveyed top 500 companies[2] in Germany announced that it is easy to communicate innovations, this appraisal could be totally different in the years to come. In spite of this quite significant number, companies should not rest on their laurels. The increasing importance of the internet, especially with regard to the rising relevance of social media, poses a challenge for many companies. Today already 44 % of the surveyed top 500 companies have problems in reaching opinion leaders via the world wide web. At the same time 59 % have noticed that it is important to invest in new media and to communicate e.g. via Facebook or Twitter.

Besides the appropriate choice of the right medium, it is important to meet the needs of the stakeholders when composing the message. According to the survey INNOVATE (Mast et al. 2005) emotional news value and dramaturgy are crucial in media relations when innovations are hard to explain. Storytelling, personalization and visualization are preconditions for a positive media image of innovations. Because of this, media relations for new products, services and technologies need to work—much more than other kinds of communication—with illustrations and examples, stories, personalization, and concrete benefits for the individual. Innovations have to be prepared for journalists and other stakeholders in such a way that they can be experienced and felt. This is especially of importance since the internet asks for information which is easy to understand and gather as well as eye-catching and attention-grabbing. 18 % of the surveyed communication directors mention that one reason why stakeholders are difficult to reach is the complexity of a topic. In addition, 16 % announce that it is a success factor if you meet the needs of the stakeholders concerning the way you are communicating.

[2] Sample: TOP 500 enterprises (turnover) and DAX enterprises of Germany; n = 121, survey period: December 2012/January 2013.

To date the emerging field of management communication as an essential part in communicating innovations has been underestimated. Zerfaß et al. (2007, p. 112) identified four different types of promoters: "Expert promoters" who have an intensive knowledge about the topic concerned, "authority promoters" who have power and resources as a result of their hierarchical position, "process promoters" who have an excellent organizational knowledge to foster the collaboration of people and the "relationship promoters" who have a large personal network and know the right people. These are only some roles of managers communicating innovations.

In summary: Managers as communicators should be analyzed in further research. How do they see themselves as communicators? What is their view of stakeholders' roles? What about their ability to tell stories? Do they appreciate that their communicator role is a central duty in order to create a supportive climate?

Strange as it may sound, developing stakeholder aligned change or innovation communication continues to be the most important challenge for the near future—for managers in their role as communicators as well as for communication experts. It is a paradox, however, that on the one hand executives believe that innovation communication programs can be planned and need to be managed, while on the other hand there is a lack of intuition and knowledge about stakeholders' interests, desires and emotional needs. The orientation towards stakeholders often called for in science and business practice is implemented rather slowly in innovation communication.

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Chapter 13
The Scent of Innovation: Towards an Integrated Management Framework for Innovation Communication

Nicole Pfeffermann

Abstract Innovation is a broad range of new digital technologies, necessity for almost every organization involved in global business. In the age of information and digital technologies, the way of innovating, however, has changed and attaining a better understanding of communicating and informing for innovation is exceedingly decisive to strategic success. This chapter answers the question: How can companies re-think and re-design corporate communication to manage several new and traditional communication tools to successfully inform and communicate for innovation in the digital information age? After presenting a theoretical approach of innovation communication integrated into existing management concepts and frameworks, this book chapter introduces a new capability-based management framework of innovation communication. This framework is composed of three main phases: *Phase 1. Re-/Design*: Linking innovation communication management to a firm's business model, organizational design & IT systems; *Phase 2. Implementation*: Implementing innovation communication planning, innovation communication tools, standards, and guidelines; and *Phase 3. Controlling*: Measuring & reporting innovation communication. In addition, the frame of this chapter Visual and Scent Communication will be described as a state-of-the-art communication tool to address stakeholder's needs and desires for successful innovation in the information age.

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13.1 The Scent of Innovation—An Introduction into Visual and Scent Communication for Innovation

Innovations can represent a valuable, rare, and inimitable resource of a corporation and, thus, lead to strategic competitiveness according to the resource-based view (e.g., Barney 1991; Grant 1991; Hall 1992, 1993). A deeper look at the facts and numbers related to innovation show, however, an increased rate of different types of innovations caused by an enormous organizational pressure to continuously re-invent themselves in order to seize entrepreneurial opportunities and operate in innovation ecosystems, where they need to rapidly offer innovative customer solutions involving consumers and partners in open innovation processes.

The digital information age, an "era of world shrinking, time shrinking, and constant, instantaneous contact" (Brumfield et al. 2008, p. xviii), places significant demands on organizations to successfully innovate in terms of discovering new ways in information & communication to capture stakeholder attention, to valuably interact with various known and unknown stakeholders to build reputation and brand awareness, and to positively influence innovation adoption and diffusion.

The key issue, then, is the understanding of information & communication in digital innovation ecosystems. It is neither simply using a social media platform nor presenting a new business idea via a crowdfunding platform. Connecting with people and carrying on an interactive dialogue with stakeholders in online communities cannot result from sending out message upon message, impression upon impression; this strategy may instead trigger information overload and avoidance. Companies "have overzealously exhausted traditional forms of communication, achieving poor results from print, TV, radio, and online advertising" and "inadvertently ignore or have not yet become enlightened to this secret, ancient tool of communication; the silent key that unlocks the inner recesses of our mind, breaking through our fortified barriers with its eloquently muted message." (Brumfield et al. 2008, p. xx). Purposefully managing *visuals* and this 'silent key' *scents* can overcome information overload and trigger an individual's emotions and thereby alter his/her mood or behaviour.

Visuals can be used to offer a means to overcome an individual's information overload and to communicate new product/innovation characteristics (Esch and Michel 2008; Kroeber-Riel 1993).

> Visual communication is the 'communication through visual aid [and]… includes art, signs, typography, drawing, graphic design, illustration, colour, and electronic resources […] to explore the idea that a visual message with text has a greater power to inform, educate or persuade a person' (Martin 2008, p. 1).

Relating to innovation, the use of ***visual communication*** also plays a central role in complex information transmission (Kroeber-Riel and Weinberg 2003) and imagery communication can be used to trigger direct and indirect image associations, such as free associations as an instrument for innovative product launches (Esch and Michel 2008; Morgan and Welton 1992). People usually tend to trust their emotions linked to what they already think they know, when they are introduced to unfamiliar ideas, conceptions, practices, etc.—innovation understood as anything perceived as new—or should follow new paths to create and adopt innovations. Visual communication can transmit information to trigger emotions and create a world of experiences for consumers in marketing (Esch and Michel 2008; Kroeber-Riel and Esch 2004). Regarding the implementation visual stimuli requires strategic planning in order to be effective (Esch and Michel 2008).

In addition to visual communication, though, there is yet another means to communicate, targeted at an individual's primary senses, using smell. The sense of smell is the slowest, most emotional and primitive human sense—the "silent" key. Although it is the oldest human sense, it is only in recent years that scholars have studied the phenomenon ***scent*** and its psychological effects (Herz 2010; Krishna 2010; Rempel and Esch 2008) and find that "the sense of smell is the quickest way to tap into someone's emotional responses and memory [, which] makes scents an excellent tool for many different kinds of communication" (Brumfield et al. 2008, p. xv). To touch the emotions of consumers, innovative companies have understood that "the simple element of scent is in itself a very dynamic form of information, so they are studying, testing, and implementing ways to use scent to communicate more effectively with consumers" (Brumfield et al. 2008, p. xx; see also Knoblich et al. 2003).

> ***Scent communication*** can be understood as interactions through the aid of scent stimuli to address an individual's sense of smell and alter recognition, mood and behavior with positive effects for an organization.

If practical, physiological, and psychological factors are considered in scent communication, 'an ambient fragrance that is emotionally and thematically associated to a product [or innovation] should be able to alter perception, cognition, and behaviour with positive consequences for revenue' (Herz 2010, p. 103). However, as with visual communication, the implementation of scent communication has to be strategically planned in sensory communication to achieve positive effects.

Consequently, both visual communication and scent communication for innovation play a vital role in the digital information age but implies strategic planning to be effective. The question, then, should be posed: **How can companies re-think and re-design corporate communication to manage several new and traditional communication tools to successfully inform and communicate for innovation in the digital information age?** This chapter provides an answer to

this question for forward-thinking companies and start-ups, who re-structure open innovation communication management to capture stakeholder attention, to valuably interact with various known and unknown stakeholders to build reputation and brand awareness, and to positively influence innovation adoption and diffusion, which in turn leads to competitive advantage and business growth in the long-run. The objective of this chapter is to present a new capability-based management framework of innovation communication including specific innovation communication tools, such as visual and scent communication for innovation.

13.2 A Capability-based Management Framework of Innovation Communication in Corporate Communication

13.2.1 Innovation Communication Management: A Theoretical View

From a theoretical view, innovation communication management can be integrated into existing management concepts and corporate communication frameworks. According to the definition of innovation communication management as a strategic capability (see also Chap. 15 in this book), the following three management concepts and corporate communication frameworks represent a basis to integrate innovation communication in corporate communication from a strategic management perspective:

- Competing value framework for corporate communication (CVFCC) (Belasen 2008)
- Strategic management concept (Grant 2008)
- St. Gallen Management Model and extended versions of it (Bleicher 1991, 1999; Müller-Stewens and Lechner 2001; Ulrich and Krieg 1972)

These concepts and frameworks are selected because they provide a differentiated, balanced view (four perspectives) and focus on value creation, resources/structures, stakeholders/transactions, and strategic management, which are essential aspects of innovation communication management.

Figure 13.1 shows the **elements of the theoretical management approach of innovation communication (ICOMM)**:

- Four main system perspectives based on the CVFCC by Belasen (2008): Change/re-configuration & innovation (transform), knowledge & value creation (perform); regulation & standards/policies (conform); integration & profile/positioning (reform).
- Basic framework of the linkage between a company's structures/resource base and its stakeholders/environment adapted from Grant (2008): structures/resource base; strategy and goals; stakeholder and transactions.

- Three horizontal levels based on the St. Gallen Management Model by Bleicher (1991, 1999): Structures level; activities level; and behavior level for strategic management and operational management; the normative management could be added but here it is understood as an integral factor in corporate communication management.

Beginning with the ***ICOMM activities*** dimension, illustrated in the center of Fig. 13.1, the theoretical management approach of innovation communication consists of strategic ICOMM management, operational ICOMM management, and ICOMM performance measurement. From the top, these levels are indirectly influenced by the corporate vision and strategy including corporate philosophy and values, corporate communication strategy and goals, and directly from the ICOM strategy and goals. From the bottom, the dynamics of three types of markets (resource markets, communication markets, and sales markets) and several environmental factors have an impact on *ICOMM activities*. For instance, new legal and political requirements in transport logistic chains can affect ICOMM in logistic companies as well as stakeholder adoption of an innovation (Daschkovska et al. 2010).

On the left-hand side, the ***structures and resource-base*** dimension encompasses three basic elements related to the three levels of ICOMM:

(1) The organizational structure and management system dimension in strategic ICOMM management, such as a web-based management system;
(2) The process-oriented dimension in operational ICOMM management, such as cross-functional information processes of ICOMM; and
(3) The communication controlling system incl. ICOMM controlling.

The ***stakeholder and transaction*** dimension is shown on the right-hand of the *ICOMM activities* dimension in Fig. 13.1. Different stakeholder behaviors regarding various transactional procedures of information transmission between an organization and its stakeholders are enumerated in this dimension. For example, on the operational ICOMM management level employees should be communicative, open-minded and collaborative to execute, monitor and coordinate ICOMM.

Based on the CVFCC by Belasen (2008), ***four main communication perspectives represent the four basic quadrants*** for ICOMM that reflect sociological paradigms (Burrell and Morgan 1979) and serve as a fundamental basis for the construct of corporate communication; in this context, a fundamental basis for the ICOMM construct. These four communication perspectives are:

(1) Functionalism: concentrates on the process and measurement of communication performance, roles, and behaviors (e.g. external image, goals, strategy, performance, accountability);
(2) Interpretivism: concentrates on the regularization of systems of interactions (e.g., identity, coordination, symbolic convergence, compliance);

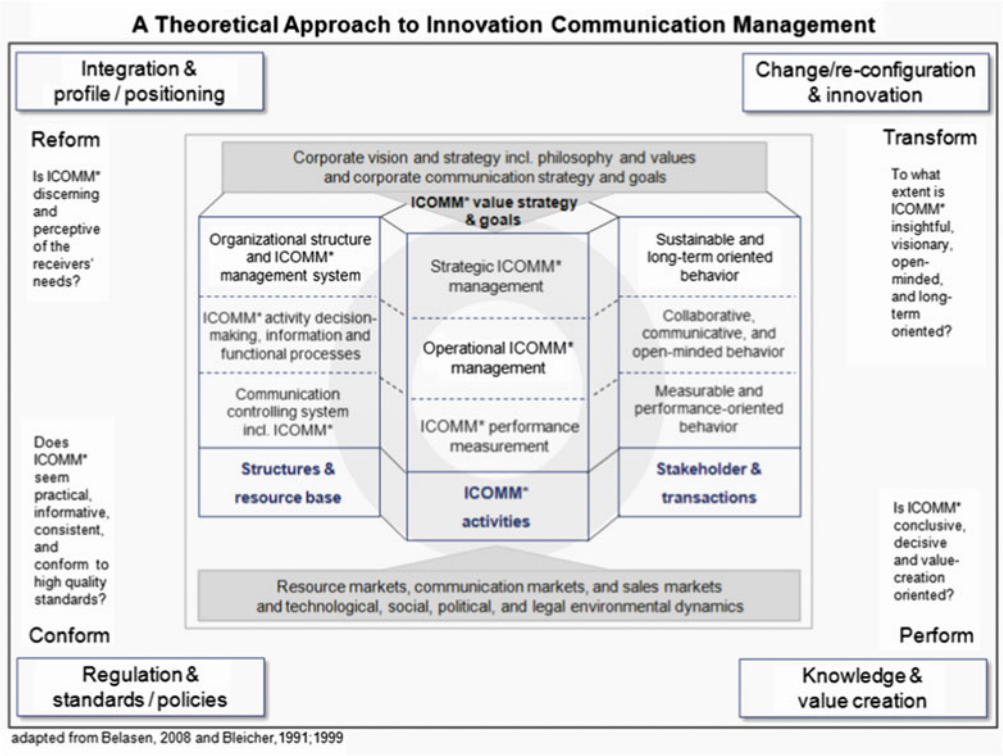


Fig. 13.1 A theoretical approach to innovation communication management. *Source* adapted from Belasen 2008; Bleicher 1991, 1999

(3) Radical humanism: concentrates on relational-inter-personal communication and human communication (e.g., culture, shared beliefs, concerns of human resources);
(4) Radical structuralism: concentrates on alignment of communication activities with external requirements through innovative and informative systems of communication (e.g., markets, reputation management).

According to the four quadrants, the following four main system perspectives can be identified to represent ICOMM in corporate communication:

(1) **Change/re-configuration and innovation (transform):** The innovative system aims at maintaining the organizational ability to adapt to change and re-configure its resource base, such as the human resource base, through knowledge creation related to innovations or emerging issues. *The key question is: "To what extent is ICOMM insightful, visionary, open-minded, and long-term oriented?!"*
(2) **Knowledge and value creation (perform):** The information/knowledge and value creation system aims at performing productively and meeting stakeholders expectations related to ICOMM, such as information transparency to strengthen innovation reputation and global ICOMM strategy to create knowledge world-wide. *The key question is: "Is ICOMM conclusive, decisive and value-creation oriented?!"*
(3) **Regulation and standards/policies (conform):** The regulative system aims at supporting the flow and dissemination of structured administrative ICOMM, such as the use of ICOMM standards and policies. *The key question is: "Does ICOMM seem practical, informative, consistent, and conform to high quality standards?!"*
(4) **Integration and profile/positioning (reform):** The integrative and profile/positioning system aims at providing formal structures and information communication network platforms within an organization or network and creating opportunities to exchange regarding the alignment of corporate strategy/goals and receivers' needs in the Open Innovation economy (Davenport et al. 2006). *The key question is: "Is ICOMM discerning and perceptive of the receivers'needs?!"*

To understand ICOMM in the four-system perspective, the interdependencies of all perspectives have to be considered; effective innovation communication management can only be realized through a balance among the four-system perspective based on the requirements of effective corporate communication (see Belasen 2008).

13.2.2 A Capability-Based Management Framework of Innovation Communication from a Practitioner's View

In order to design and implement innovation communication management, this section presents a new capability-based management framework of innovation communication from a practitioner's view.

Figure 13.2 illustrates the three phases of the management framework of innovation communication to design, implement, and measure innovation communication:

- Phase 1. Re-/Design: Linking innovation communication management to a firm's business model, organizational design and IT systems.
- Phase 2. Implementation: Implementing innovation communication planning, innovation communication tools, standards, and guidelines.
- Phase 3. Controlling: Measuring & reporting innovation communication.

Phase 1. Re-/Design

The ***first phase*** (Fig. 13.3) encompasses four main layers considering four main steps to re-/design innovation communication management as a strategic capability from a strategic management perspective:

Step 1. Business Model: Integrating innovation communication management into a company's business model and analyzing stakeholder relationship management (key partners and customers/target groups), intelligent information management (e-business model; digital technologies), strategic communication management (channels), capabilities management (linkage between key resources & capabilities and key activities), and design management (business model innovation).

Step 2. Organization: Integrating innovation communication management in a company's organizational design to delineate: Top management commitment, organizational structure (see Chap. 15, in this book), organizational processes, organizational culture, and employee skills.

Step 3. Innovation Communication Management Capability: Designing innovation communication management as a strategic capability encompasses five key design principles to build up the eight dimensions of the innovation communication capability (see Chap. 15, in this book).

After analyzing the five key principles in Step 1 linked to the business model, this step includes designing and implementing five management functions, illustrated in Fig. 13.4:

1. Stakeholder Relationship Management > Open Innovation Dialogue
2. Intelligent Information Management incl. Knowledge Management & ICT > Information Transmission, Knowledge Creation and Corporate Reputation
3. Strategic Communication Management > Intelligent Information Management, Stakeholder Relationship Management

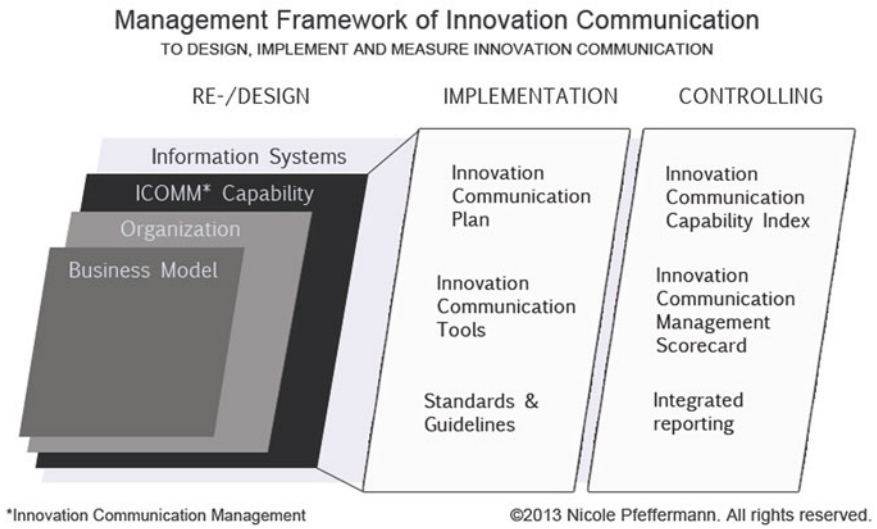


Fig. 13.2 Capability-based management framework of innovation communication. *Source* By the author

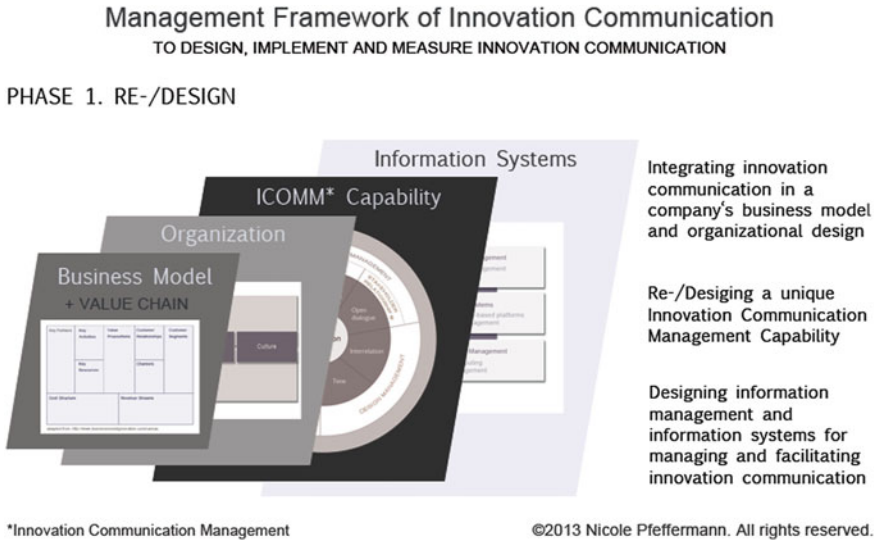


Fig. 13.3 Capability-based management framework of innovation communication, *Phase 1*. *Source* By the author

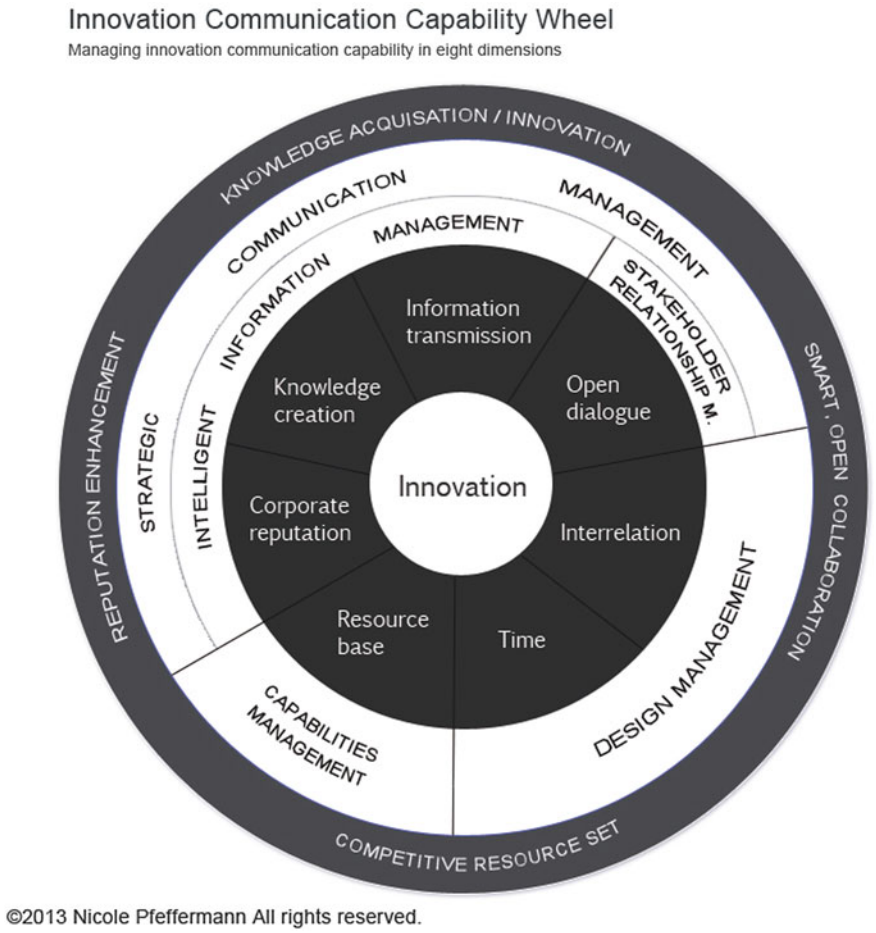


Fig. 13.4 Innovation *communication capability wheel. Source* By the author

4. Design Management > Interrelation and Time
5. Capabilities Management > Resource base

The effects of the five key principles of managing innovation communication as a strategic capability are: knowledge acquisition & innovation; smart, open collaboration, a competitive resource set, and reputation enhancement.

Step 4. Information Systems: Designing information management focusing on information systems (applications, mobile technologies, web-based platforms) to full-fill the needs of managing and facilitating innovation communication.

Phase 2. Implementation

The ***second phase*** (Fig. 13.5) focuses on the three main management areas:

1. **Innovation Communication Plan:** Developing an innovation communication plan includes defining a strategic innovation communication process (strategy,

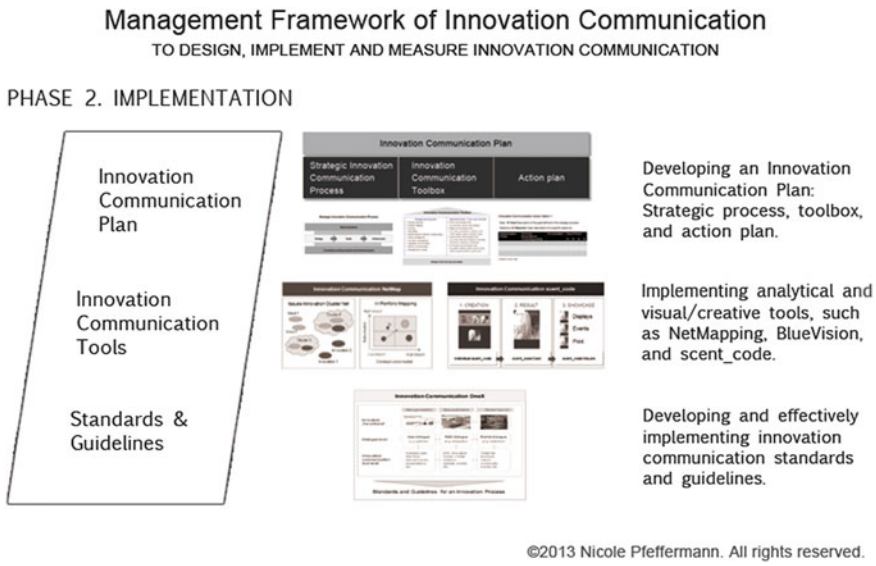


Fig. 13.5 Capability-based management framework of innovation communication, *Phase 2*. *Source* By the author

goals, infrastructure, ethical standards, controlling system), developing the innovation communication toolbox (strategic and operational tools), and developing an action plan (matrix with activities, responsibilities, documentation, report period, etc.).

2. **Innovation Communication Tools:** Implementing specific innovation communication tools and adapting tools from traditional communication fields, such as innovation communication netmapping, innovation communication bluevision, innovative branding, issues management, storytelling, and press releases.
3. **Innovation Communication Standards and Guidelines:** Designing and implementing standards and guidelines for communicating ideas and innovations to internal and external stakeholders and managing processes, tools, and activities in a company or collaborative network.

Phase 3. Controlling

The ***third phase*** (Fig. 13.6) encompasses controlling instruments for measuring the innovation communication capability on eight dimensions (benchmarking) and developing and implementing an innovation communication management scorecard to measure innovation communication outcomes (KPIs). This phase also involves incorporating innovation communication in a company's integrated reporting system.

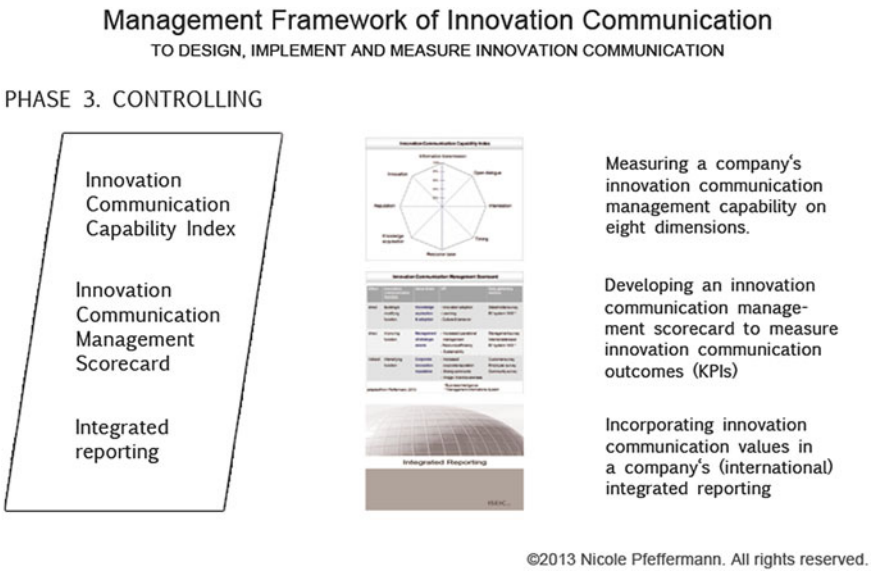


Fig. 13.6 Capability-based management framework of innovation communication, *Phase 3*. *Source* By the author

13.3 Innovation Communication Management Tools

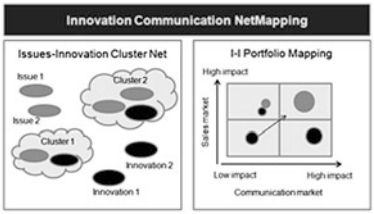
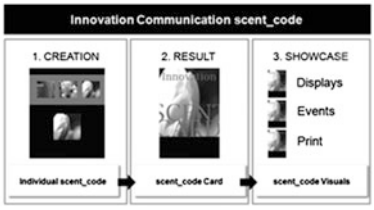
The following table describes specific analytical and visual-creative tools for managing innovation communication (Table 13.1):

Table 13.1 Innovation communication management tools. *Source* By the author

Illustration of a tool	Description of a tool
	*Strategic Communication* Innovation Communication Toolbox This tool consists of both strategic and operational planning tools for designing a unique innovation communication portfolio related to a company's strategic innovation communication process, innovation portfolio, innovation process, business model, and organizational design (see Appendix A)

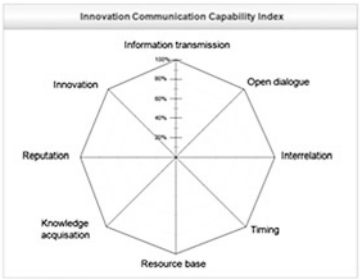
(continued)

Table 13.1 (continued)

Illustration of a tool	Description of a tool
 ©2013 Nicole Pfeffermann	*Portfolio Mapping* Innovation Communication NetMapping This tool helps to identify and visualize those innovations/ideas and their context-issues as well as innovation clusters, which can be framed and categorised for a better understanding of innovation (instead of presenting many single ideas and/or innovations). Second, portfolio mapping supports the visualization of the impacts of issues/ideas/innovations on communication and sales markets incl. strategic implications
 ©2013 Nicole Pfeffermann	*Scenario Planning* Innovation Communication BlueVision BlueVision represents a strategic visualization tool to scan, show, and shape the future of an idea/innovation. The three steps SCAN (new insights), SHOW (visualization of the future in scenarios over various channels), and SHAPE (create a new future) support diving into a new area and opening up new possibilities through ideas and innovations
 ©2013 Nicole Pfeffermann	*Scent Communication* Innovation Communication scent_code This creative tool focuses on visual and scent communication and helps to design a unique scent code. This scent code includes individual scent creation, a scent card and effective scent communication visuals
 ©2013 Nicole Pfeffermann	*Standards & Guidelines* Innovation Communication OneX OneX facilitates professional communication from idea to market launch in collaborative networks. OneX offers standardization and guidelines for effective communication in open innovation processes (with collaborative partners) on a professional level

(continued)

Table 13.1 (continued)

Illustration of a tool	Description of a tool
 ©2013 Nicole Pfeffermann	*Index* Innovation Communication Capability Index This measurement tool shows the eight dimensions of the innovation communication capability. The methods include a/n (online) questionnaire and translation of answers into a percentage score for each dimension
 ©2013 Nicole Pfeffermann	*Balanced Scorecard* Innovation Communication Management Scorecard Based on the direct and indirect effects of innovation communication on company value (Pfeffermann, this book), this scorecard defines value drivers, KPIs, and data gathering methods incl. measures and analyses to measure outcomes of innovation communication

13.4 Implications for Visual and Scent-based Innovation Communication

Visual and scent communication represent a state-of-the art means of communicating innovation, which can be designed and strategically used to capture stakeholder attention and create emotional ties.

The different uses of scents in marketing are (Morrin 2010):

(1) **Primary or secondary product attributes** (e.g. perfumes, room deodorizers, and added-value of products through distinguishable scents);
(2) **Advertising and sales promotion** (use of scent communication e.g., PoS; public relations; trade fairs, etc.);
(3) **Ambient scents** (e.g. more favourable stores, hotels, retail rooms, etc.; and product evaluation for an increase in sales revenues); and
(4) **Signature scents** (e.g. unique combinations of scents as a potential competitive differentiator)

In particular, the third and fourth uses are growing fields of interest in scent marketing because of the positive effects on sales revenues and competitive differentiations (Morrin 2010).

Positive effects of odour impacts on an individual's behaviour

- If a congruent scent is correctly used in a specific retail environment, purchase behaviour and sales were found to increase (Herz 2010; Rempel and Esch 2008; Spangenberg et al. 2006)
- Positive associations with scents can trigger specific positive or negative emotions that have a direct influence on an individual's mood and behaviour (Ehrlichman and Bastone 1988, 1992; Herz 2010; Rempel and Esch 2008)
- Branding-related advantages of scent communication are as follows (Rempel and Esch 2008): strong emotional ties to brands; improved learning and efficiency in branding; improved clear, attractive, and active mental imagery of brands; and consumer disposition to buy and pay a price premium

Negative effects of odour impacts on an individual's behaviour

- When an odour is below the level of perceptual detection there are no behavioural or psychological consequences (Herz 2010)
- A lack of attention to odours can lead to a decrease of the odour detection ability (Herz 2010; Plailly et al. 2008; Zelano et al. 2005)
- The phenomenon of cross-adaptation can affect the recognition of specific odours, such as the differentiation of scents after several samples (Herz 2010)

From a literature review of the effects of visual and scent stimuli on consumer behaviour in (sensory) marketing, theoretically-driven implications for communicating innovation can be deduced.

Visual innovation communication

- Using framing in visual communication to create a "*frame of reference*" can improve the understanding of an innovation (Huck 2009)
- Imagery communication offers a means for transmitting complex information (Kroeber-Riel 1993; Kroeber-Riel and Weinberg 2003), through such means as videos, exhibitions, and animations for radical innovations
- Free associations and imagery analogies in systematic interrelations can support introducing new products and services (Esch and Michel 2008; Morgan and Welton 1992), such as innovation clusters

Scent innovation communication

- Congruent scents of innovative products, services, issues, etc., or scents in stores, showrooms, etc., can lead to higher attraction and mental imagery, which in turn tend to positively affect innovation adoption through mental application (for mental application see Rogers 2003)
- Ambient fragrance (Herz 2010; Morrin 2010), which is emotionally and thematically associated to an innovation, can positively change the perception and thus tends to influence an individual's decision-making to adopt an innovation

- Scent communication can be used to introduce new products through the improvement of learning (Brumfield et al. 2008; Rempel and Esch 2008), through positive associations and changes to knowledge schemata to influence innovation adoption

Hence, both visual and scent-based innovation communication can influence stakeholder attention and enhance an individual's mental application through mental imagery, through strong emotional recalls and by tapping into learning processes. This positively affects innovation adoption through the activation and modification of schemas (for schema theory: Bartlett 1932; Brewer and Nakamura 1984; Rumelhart and Ortony 977; Rumelhart and Norman 1988; Waldmann 1990; in a communication context: Bruhn 2009; Esch 2006; Kroeber-Riel 1993).

From the operational management view, a combination of visual and scent-based innovation communication can be implemented in the following areas:

- **Exhibitions**: Exhibitions represent a communication means that offers a dialog platform for organizations and stakeholders (e.g. the broader public, employees or customers) for inter-personal discussions regarding the presented innovations. A mixture of visual design elements and scent communication technologies can be used to transmit complex information related to innovation, innovation clusters, context-issues of innovations and the innovative capability of an organization or collaborative network.
- **Showrooms/shows/cinemas/live entertainment**: Showrooms and shows are communication platforms for interactions among organizations and their stakeholder groups. Brumfield et al. (2008) also identifies several possibilities to apply scent communication, such as in stores, theatres, cinemas, concerts, and hotels because all possibilities "share the common intention to elicit emotion from the viewer" (Brumfield et al. 2008, p. 247; see also Drobnick 2009; Knoblich et al. 2003). For example, product placement of perfumes in scent cinemas can effectively communicate the emotional positioning of perfumes in movies (Knoblich et al. 2003; for scent-based movies see Story of Adventure 2013).
- **Trade fairs/displays**: The tool *trade fairs* are commonly used in marketing to present new products and services as well as the innovative capability of an organization. Knoblich et al. (2003) mention the implementation of scent communication in a trade fair, for instance, to trigger a positive emotional mood for a product (innovation) or the complete presentation of a corporation. Among other things, creative displays can be implemented as a combination of visual stimuli and scent stimuli (e.g. expected or unexpected scent) in order to attract visitor attention and create interest in a product or services (Knoblich et al. 2003). According to Knoblich et al. (2003) the communication tool *displays* used in combination with scent communication can positively influence the emotional product/innovation's positioning. This development can lead to new advertising and film formats and new means to communicate innovative brands as well as innovations.

- **Creative workshops/seminars**: "Among other cognitive benefits, aroma can increase comprehension, learning, and recall"; thus education is a "natural application for scent" (Brumfield et al. 2008, p. 255), and new creative techniques can be developed to facilitate learning in seminars based on scent communication effects on memory and recall functions. Moreover, a combination of visual and scent communication can create new associations in innovation workshops and information events.

13.5 Conclusions and Outlook

After presenting a theoretical approach to innovation communication integrated into existing management concepts and frameworks, this book chapter introduced a new capability-based management framework of innovation communication. The frame of this chapter was given by the introduction of visual communication and scent communication as state-of-the-art communication tools in the digital information age including implications for visual and scent-based innovation communication.

The new capability-based management framework of innovation communication supports companies as they re-think and re-design their corporate communication in the open innovation economy for managing several new and traditional communication tools to successfully inform and communicate for innovation in the digital information age. To apply this framework, three phases are necessary to consider: *Phase 1. Re-/Design*: Linking innovation communication management to a firm's business model, organizational design & IT systems; *Phase 2. Implementation*: Implementing innovation communication planning, innovation communication tools, standards, and guidelines; and *Phase 3. Controlling*: Measuring & reporting innovation communication. The Innovation Communication Capability Wheel including its five key principles helps companies to design and build up the innovation communication capability. Seven new tools were presented to manage innovation communication.

As for future research, scent communication on the corporate level is still in an emergent phase and scholars can examine "whether and under what conditions […] behaviours do indeed tend to result from scent [communication] efforts" (Morrin 2010, p. 77). Future research can also investigate the effects and limitations of the presented management framework and innovation communication management tools to further develop this management approach and tools in corporate communication management research (see literature review Chap. 15, in this book).

Appendix A

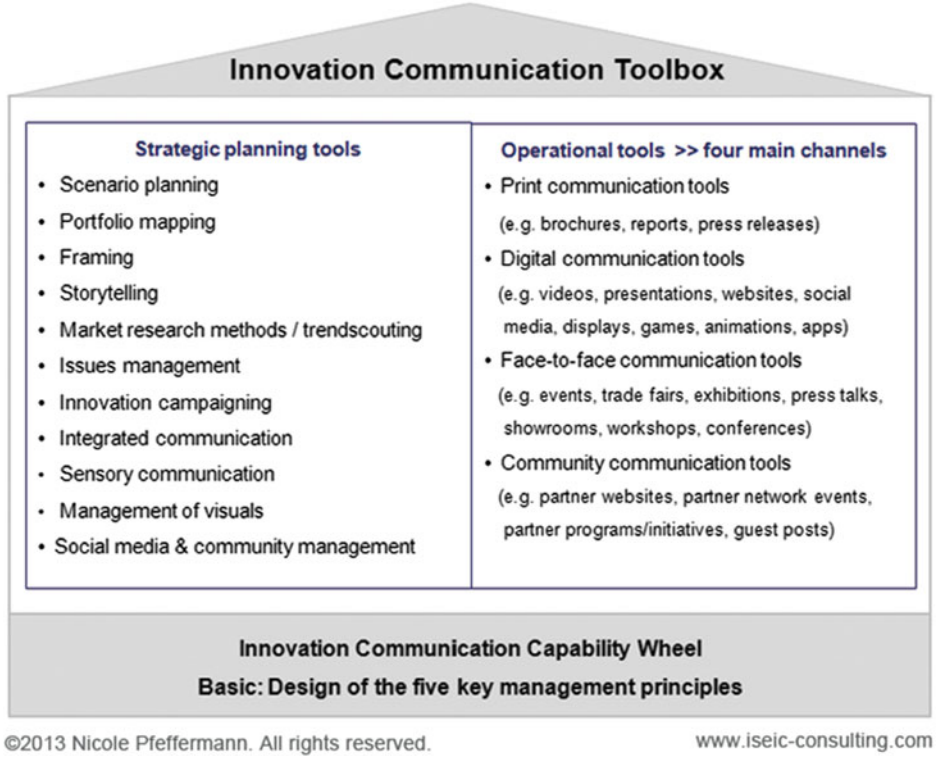


Fig. A.1 Innovation communication toolbox. *Source* By the author

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Part III
Integrated Perspectives on Innovation

Chapter 14
Innovation Communication and Inter-Functional Collaboration: A View from the Competing Values Framework for Corporate Communication

Alan Belasen and Rosalyn Rufer

Abstract Firms in intensive-technology industries need to constantly innovate and rapidly commercialize innovations to capture consumer needs and preferences, create value for shareholders, and sustain competitive advantage. Consistent with *disruptive innovation theory*, which places a great emphasis on the power of organizational processes and enabling technology to deliver products and services at lower costs than incumbent firms, innovative firms transform their markets by pulling in new customers (Christensen and Raynor 2003). Key organizational functions with important synergistic effects for successful innovation include marketing, R&D, and operations/production. However, it has long been recognized that without open communication and joint accountability, the tension among these functions that often is also triggered by conflicting communications with external stakeholders, might lead to lower levels of organizational performance. Indeed, resources and capabilities that are not translated into well-synchronized activities, best practices, or business processes cannot have a positive impact on a firm's performance (Ray et al. 2004). Using the Competing Values Framework for Corporate Communication to examine communication relationships within and outside organizations (Belasen 2008), this chapter will focus on identifying characteristics of adaptive culture and innovation communication that contribute to effective inter-functional collaboration.

14.1 Introduction

Shorter product life cycles, coupled with market dynamics (e.g., maturity or when products become mainstream) and rising operational costs in product development and manufacturing, allow firms with faster innovation to sustain their competitive

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advantage (Agarwal and Selen 2011; Huang et al. 2010; Peters and Rufer 1998). Successful firms employ open innovation strategy and external technology sourcing to accelerate the pace of development and delivery of new products to the market (Chesbrough and Appleyard 2007). Hence, market knowledge acquisition and internal knowledge sharing through cross-functional collaboration are two fundamental resources for successful product innovation (De Luca and Atuahene-Gima 2007). This is especially true in global markets where greater access to information increases the intensity of completion and the need for supply-chain visibility, higher integration of business processes, and faster innovation.

In this chapter we propose that increased collaboration through communication and the development of processes and projects to support the current and future activities of innovative organizations (Chinta and Kloppenborg 2010) should create a sustainable competitive advantage for firms operating in global environments. As globalization increases so does the level of complexity across the value chain of highly interconnected firms (business-to-business) as well as the complexity of highly interdependent processes (development, production, distribution) within the firms, requiring effective internal and external communications. The chapter centers on how the Competing Values Framework for Corporate Communication (CVFCC) can be used to identify internal and external stakeholders as well as facilitate understanding across functional lines to improve interdepartmental coordination. Ultimately the purpose is to improve the innovation process through better communication practices.

14.2 The Dynamics of Innovation and Inter-Functional Collaboration

While the importance of applying tacit knowledge in organizational learning and innovation to create a sustainable competitive advantage has become the focus of considerable attention in recent literature, it has been hindered by poor integration across functional lines (Atuahene-Gima 2005; Lam 2000; Newell et al. 2006; Rumelt et al. 1991). Even if codified knowledge can be transferred across functional units efficiently, it relies on embedded or implicit knowledge that is carried in the minds of employees or in the collective memory of organizational members (Belasen 2000). Often, however, disagreements over goals and objectives, turf battles, stiff competition over internal allocation of resources, and influence over the strategic direction of the organization lead to intra-organizational conflicts, which make *situated learning* difficult to accomplish. For example, the marketing department is typically measured on changes in market share, customer preferences, fending off competitive threats, and the creation of value. Meanwhile, R&D is measured on cost efficiency, success rates of new innovations, and ways in which it can work with the operations/production to lower marginal costs, which may or may not be consistent with the interests of the marketing department. As a

result, information sharing and exchange systems between the two departments are often hampered, and without effective *bi-directional communication*, the motivation to learn slows down—further fueling a vicious cycle of resistance and negative emotions that tend to erode the innovation process. Bi-directional communication is an important enabler which leads to developing a shared vision, trusting relationships, and information sharing between interdependent units (Le Meunier-FitzHugh and Piercy 2010).

Consistent with Macpherson and Clark (2012), we argue that effective innovation communication or the ability to interpret, apply, and transfer knowledge in organizations depends largely on effective integration of organizational functions. In high-technology industries such as telecommunications, which are faced with rapidly shrinking product life cycles, success is dependent on the unique characteristics of the industry but also on choosing the right mix of organizational structures, business processes, corporate goals and communications and how well they fit with the new product strategy (Barczak 1995). In most organizations, however, the success of inter-functional collaboration also depends on instilling a sense of organizational identity and developing trusting relationships among interdependent units (Belasen 2000; Massey and Kyriazis 2007). This is even more important in global environments characterized with fierce competition in which firms develop and launch new products and services quickly. The marketing group can use various marketing mechanisms (promotion and pricing) to set (or change) customer expectations quickly, while the operations group may find it challenging to meet these expectations (Tang 2010). Driving growth through research, go-to-market strategy, and execution for introducing new products and services can occur effectively if product/market coordination, organizational knowledge, and innovation communication can be linked through continuous, collaborative, customer-specific, and problem-focused communications (McDonough et al. 2008). Such was the case of Buckman Laboratory, when it shifted its strategic positioning in treating slime in paper mills. In this case continuous innovation meant not only innovating products but also a change in organizational structure and processes. The latter helped to build a customer relationship marketing strategy by improving knowledge and communication across Buckman Laboratory's global operations. Hence, the elimination of departmental silos and the execution of strategy following leading indicators and performance drivers that align with the strategy in addition to using effective internal and external communications are the centerpiece of sustained organizational performance.

Radical innovations tend to emerge from R&D in complex, decentralized organizations, increasing the degree of value-add to the organization and the degree of newness to the market, while at the same time making imitation costly for competitors (Arend 2009). *Incremental innovations*, on the other hand, tend to be promoted in high volume operations that have long term, market dominated growth strategies (Ettlie et al. 1984). Advances in technology and broadband wireless access, however, have made incremental innovations easily imitated by competitors and consequently put pressures on large companies to revert to short term innovations. Others, especially in high-technology industries, have adopted

the strategy of *open innovation* (De Wit et al. 2007). With knowledge so widely distributed and easily accessible, companies move to acquire inventions or intellectual property from other companies when they match their strategy and business model.

Open innovation is the transfer of technology or shared experiences from one organization to another to hasten the time to bring new products to the market. In fact, open innovation has been used by many high technology firms to cut R&D costs, reduce risk, accelerate time to market, and increase their competitiveness (Huang et al. 2010). For open innovation to be successful, it has to be distributed both internally and externally through collaborative networks or ecosystems that co-exist along the supply chain (Chesbrough and Appleyard 2007; De Wit et al. 2007; Dooley 2007). Many well recited stories of open innovation such as open source code of Sun Microsystems, licensing operation and open source code of IBM, open exploratory research of Intel, global innovation network of Procter and Gamble, joint venture and R&D of Philips, merges and acquisitions of Cisco, licensing operation of DuPont, are examples of companies which shrunk their internal R&D inputs and successfully tapped into external sources of innovation.

Cross functional integration facilitates communications, interactions, information sharing, coordination, and collaboration among functions in new product development (Hirunyawipada et al. 2010). Improved communication supports the sharing of knowledge, which, in turn, enables the firm to improve innovation. This has been shown to be particularly important in the process of open innovation, where firms form networks within and outside the organization. To successfully share knowledge across functional boundaries, create learning opportunities between specialized units, and access or integrate complementary technology from one organization to another (Chiu and Chang 2009), it is important to *elevate inter-functional coordination to an organizational strategic level* (Chinta and Kloppenborg 2010; Le Meunier-FitzHugh and Piercy 2010; Luo et al. 2006). Furthermore, complicates cross functional collaboration implies increased resource dependency among functional units and, thus, a greater need for enhanced information-processing capability to coordinate the acquired knowledge (de Luca and Atuahene-Gima 2007).

To achieve sustainable competitive advantage organizations must focus on many of the factors identified by Rumelt et al. (1991): learning, tacit knowledge, non-imitable resources and skills, the sharing of core competencies, and mutual commitment. Impediments to organizational learning occur when inter-functional collaboration is not working optimally due to unnecessary conflicts or disagreements over organizational goals. What further complicates these tensions are the unique relationships of functional units with external stakeholders. For example, marketing is heavily influenced by the organization's customers; operations by its suppliers; and, R&D is busy with the organization's technology partners. When integration activities within the organization are strong through interlinks and common activities, these activities are also well coordinated. Seldom, however, units and departments adopt different goals and work separately with organizational stakeholders, making the task of intra-organizational coordination especially

challenging. It is important to note that while firms operating in technology-intensive industries need to constantly innovate and commercialize these innovations into products and services that capture consumer needs and preferences, they also need to reduce the likelihood for breakdowns and possible conflicts between key functional units (Dutta et al. 1999). Some of these conflicts are triggered by differences in goals, time orientation, occupational skills, demographics, education, and in the case of international operations, even gender (Belasen 2012; Williams and Gurtoo 2011).

According to Sherman et al. (2000), R&D and marketing personnel tend to draw demarcation lines between their units as a result of differing educational and professional backgrounds. For example, R&D personnel tend to have a longer competitiveness time orientation, favor advanced or more radical innovations, and tend to be more scientifically and less market oriented. In contrast, marketing personnel tend to have shorter competitiveness time orientations, favor incremental product innovations, and tend to be more market oriented. Marketing might find increased pressure to respond to customer and competitive demands while R&D and even production might be slow to respond to pressures from suppliers and partners. Similarly, operations might be sensitive to pressures from suppliers and regulators, especially those associated with foreign partners (Horn 2005). These differences result in greater difficulty in achieving effective organizational integration. An important moderator is the presence of *adaptive culture* that underpins knowledge management by influencing how members learn and share knowledge (Gray and Densten 2005; Amir-Aslani 2009). This is particularly important when implementing an open innovation strategy.

Open innovation often requires a change in organizational processes in order to adapt the radical innovation. Reger et al. (1994) identified two barriers to organizational change. The first is passive resistance that emanates from the introduction of ideas unfamiliar to organizational members and, in the absence of strong, sustained accompanying steps; these ideas are not likely to be fully understood. The second barrier is active resistance that emanates from the belief that changes, though they are understood, do not comply with the definition of organizational identity, resulting in negative responses and cognitive opposition. A partial answer to the problem may lie in improving organizational communications. Another response is to create a culture that supports collaboration and open communications. Indeed, competitiveness begins with creating a *culture of collaboration* (Snyder 2004).

14.3 The Importance of Adaptive Culture

Corporate culture reflects a system of shared values that create distinct identity for the organization. Cultural variability reflects the work of heterogeneous groups or departments within the organization with fewer interactions. The groups are highly differentiated and seldom able to bridge their differences in goals and message

orientations. Coordination is provided through vertical forms of communication such as direct supervision by higher managerial levels or through formal mechanisms of communication such as procedural specifications and policies. Cultural synergy, on the other hand, is the cooperative or combined action that occurs when diverse groups work together with increased effectiveness using lateral forms communication, common understandings, and norms that guide team members. Coordination is achieved through mutual adjustment, trust, and commitment to the values of the organization.

Lateral communication in organizations with adaptive cultures facilitates the flow of information and best practices across functional boundaries and, therefore, is the most effective medium to support inter-functional coordination. The dynamics that help balance the simultaneous role of cooperation and competition within firms is what Luo et al. (2006) labeled "cross-functional coopetition". Coopetition appears to draw on the combined characteristics of the 'achievement' and 'clan' cultures identified by Cameron (2004). The achievement culture is characterized by a focus on the external environment and transactions with external constituencies including investors, business partners, and regulators. The organization is a results-oriented workplace. Leaders are hard driving producers and competitors. Value is placed on competitive actions and meeting external goals and targets. The glue that holds the organization together is an emphasis on winning. The clan culture is characterized by a workplace that is supportive and interactive. The organization dominated by a clan culture is like an extended family to its members. Leaders act as and are thought of as mentors and even parental figures. The elements that hold the organization together are loyalty and tradition. Individual development, high cohesion, morale, teamwork and consensus are valued. Success is defined in terms of the internal climate and concern for organizational members. *Cultural synergy, the cooperative or combined action that can occur when diverse or disparate groups of people with varying skills and viewpoints work together, can be promoted through clan/achievement attributes and championing an adaptive culture in the organization* (Belasen 2008). Because values and goals are vitally linked to cooperation, through a supportive culture that stimulates intrinsic interest in and identification with the group; culture becomes key to sustaining organizational competitiveness (Tyler 2002).

Adaptive cultures facilitate integration and cooperative agreements that result in greater trust, stronger relationship, mutual commitment, and positive outcomes satisfactory to both parties. Other researchers have also made compelling arguments that organizational survival and competitive advantage require constant change and the presence of followers' commitment and adaptive culture (Herold et al. 2008). Yet, this evidence notwithstanding, the failure of organizational change efforts remain very high. As a result, cooperation between and among organizational functions is more important than ever as organizations are faced with new economic challenges. Indeed, adaptive or cooperative cultures are associated with the promotion of learning and innovation in organizations (Laforet 2008).

Global organizations that rely on global teams to deliver performance must also become *inter-culturally competent* when relating to expatriates or in closing deals (Schmidt et al. 2007). The following vignette illustrates this point:

> You're a marketing director for a large pharmaceutical company and are preparing a presentation of forecasts for a new product that will be introduced into the East Asian market. You put together your information and determine that you will support your message with facts, figures, and the research results of the latest clinical trials. Your information is current, statistical, and objective. You meet with your prospective Chinese counterparts and begin the presentation stating your forecasts for the market are accurate projections and that, since this drug will do well on the foreign market, you need business partners overseas. You want your Chinese partners to provide resources to help pave the way and eventually produce mutual profitability. This method of organization and support is typical of low-context cultures, which tend to be direct and verbalize objective facts. This is a form of linear, analytic reasoning in which you offer a major and minor premise and then draw a valid (and, let us hope, irrefutable) conclusion. In other words, you put the general issue up front and then move to a specific conclusion. ("This firm can partner with us to provide the proper level of promotion and distribution. Therefore, together we can succeed with this drug.") This method of reasoning, which relies on linear analytics and objectively verifiable facts, is a Western-style organization pattern. However, it is not necessarily compatible with "Guanxi" which means "relationships" and that is based on quid-pro-quo or trade relationships. By getting the right "Guanxi", the partners to the exchange relationships increase the likelihood for acceptance and mutual commitment. Chinese prefer to deal with partners they know and trust since the cooperation is between individuals, not entities. If group members or company representatives start and build on the trustworthiness of the members; if they prove that they are dependable and reliable—that should strengthen the relationships.

When interacting with international partners, innovation communication becomes increasingly complex endeavor (Williams et al. 2007). Communicators must contextualize their objectives and choose appropriate styles and message orientations, in effect becoming cosmopolitan communicators. *Cosmopolitan or 'transcultural' communicators show respect for all cultures, demonstrate an understanding of what individuals in other cultures think, feel and believe, and appreciate the differences among cultures.* They possess a number of specific qualities which include behavioral flexibility and cognitive complexity to perceive and consider alternative interpretations of events (Belasen 2012), the mindfulness need for active information processing, and the rhetorical sensitivity required for adapting messages to diverse audiences (Schmidt et al. 2007).

We propose that it is through the discourse of the CVFCC, inter-functional coordination and innovation communication can be improved, reducing tensions between the functional groups, and enhancing organizational effectiveness. Moreover, applying this framework removes the focus of the conflict from the individual or work unit and, instead, draws attention to ways by which departments adds value and improve organizational performance.

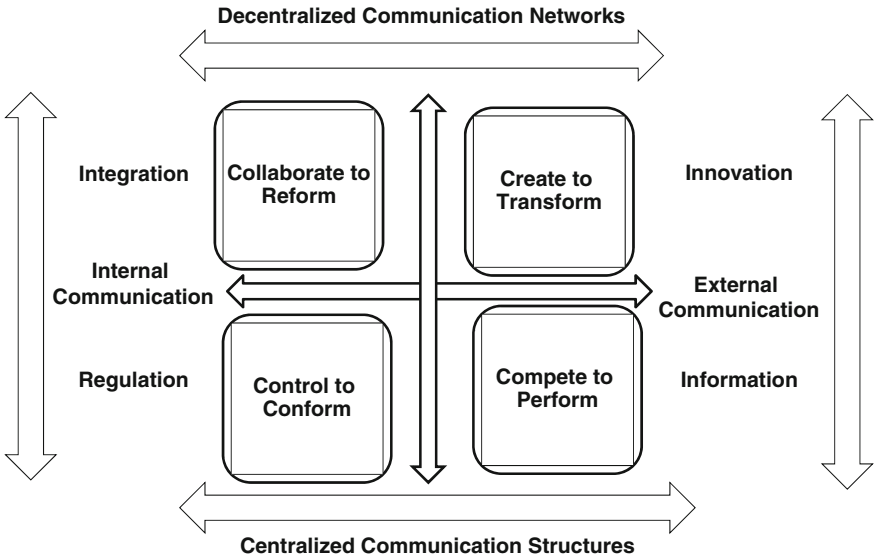

Fig. 14.1 Competing values framework for corporate communication: systems and goals. Adapted from: Belasen (2008)

14.4 Communication Through the Lens of the Competing Values Framework for Corporate Communication

The competing values framework (Cameron et al. 2006; Quinn 1988) has been used to assess communication dynamics inside the chain of command (Belasen 1998, 2010), interactions between members of cross-functional, self-directed work teams (Belasen 1997), coordination across functional lines (Belasen 2000), communication audits and interactions with stakeholders (Belasen 2008), and communication training and development for managers preparing for international assignments (Belasen 2012). An adapted view of the CVFCC is used in this chapter to look at the roles of the functional groups, in creating value for the organization and, in their relationships with internal and external stakeholders (see Fig. 14.1).

The Collaborate and Control quadrants include the socio-technical systems of the organization or internal resources and capabilities (e.g., HR, legal, finance, operations, accounting functions); while the Create and Compete quadrants are geared toward meeting external requirements and customers' needs through R&D initiatives and a focus on strategy, market/product positioning, and long range planning. The Collaborate and Create quadrants share a focus on organizational flexibility while the Control and Compete quadrants are critical for sustaining organizational stability and credibility. Performance credibility is an important organizational outcome that helps organizations retain customers, establish trust,

and augment their reputation as reliable and trustworthy organizations. Flexibility is of enormous importance in fostering inter-functional collaboration through cultural change. Flexibility is also important in dynamic environments as it enhances business competitiveness (Chiu and Chang 2009; Peters and Rufer 1998, 1999). Flexibility allows firms to overcome entry barriers in growth industries and exit barriers in declining industries and unprofitable markets (Kettinger et al. 1994).

As a theoretical framework, the CVFCC highlights the unique interests and objectives associated with each quadrant while also encouraging communication responses that consider the interdependence among the domains of corporate communication. Each quadrant in the framework represents a message orientation with significant differences that must be reconciled into a corporate 'single voice', irrespective of the target audience, in order to dovetail with overall strategic planning goals: relational in the Collaborate quadrant, hierarchical (Control), promotional (Compete), and transformational (Create quadrant).

According to Belasen (2008), the innovative communication system deals with transformational communication roles and activities (the Create quadrant) in which network architects and brokers use communication instruments to advance the image and the reputation of the corporation for better alignment with external constituencies. The self-directed teams, formed to transfer the technology from the R&D department of the developing organization to the R&D department of the adopting organization, require an open communication process for successful technology transfer. At the same time, hierarchical forms of communication (the Control quadrant) are needed to divert attention to internal consistency and the need to stabilize and integrate the system. This is essential for the implementation of the open source technology into existing organizational processes. Similarly, employing relational communication and paying attention to employees' needs via teamwork and collaborative efforts (the Collaborate quadrant) may foster commitment and a sense of belonging, as well as promote the construction of shared reality and the social identify of organizational members. This in turn will support any organizational change needed to successfully commercialize the shared technology. Promotional communication roles (the Compete quadrant) help enhance the performance credibility of the organization through financial reporting and messages that clarify the vision and strategic goals as they relate to open innovation.

Together, the quadrants form a framework that illustrates some of the potential conflicts or competing values that decision makers or corporate communicators may experience in addressing a diverse set of stakeholders with different goals, interests, and values (see Fig. 14.2). For example, the finance department deals with communication directed at boards of directors, regulators, stockholders, and the chief operating officers of each partner organizations in the technology transfer process (Control quadrant); Operations handles communications with suppliers and the R&D departments in the partnering organizations in order to transfer the technology (Collaborate quadrant); Marketing deals with distributors, stockholders, and customers (Compete quadrant) as part of the commercialization of the

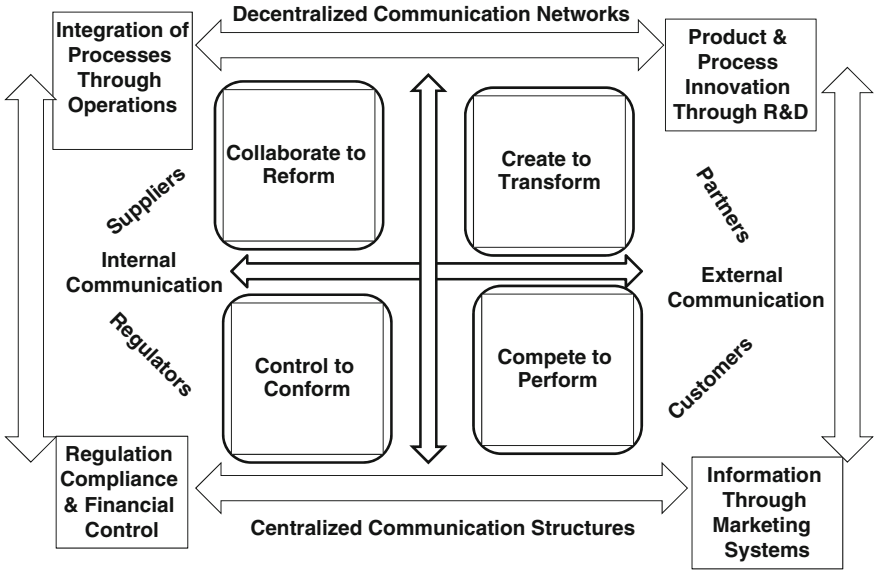

Fig. 14.2 Competing values framework: Roles, functions and relationships. Adapted from: Belasen (2008)

innovation; R&D's stakeholders include government, industry, academia, and standard institutions (Create quadrant) as strategic partners in the open innovation process. In addition, many internal stakeholders are influenced by the messages delivered by or filtered through any or all functions to support self-directed teams. The modified CVFCC that appears in Fig. 14.2 provides a model for appreciating the tensions associated with simultaneous collaboration and competition, creation and control, as well as indicating the communication roles that must be assumed by organizational leaders.

Research and development is the function within the organization responsible for the creation of products/services to sustain organizational performance. The nature of the work is creative, change-based, innovative and adaptive. The value creation roles of R&D within the organization are those of innovator and broker (Belasen 2000; Quinn 1988). They innovate using internally developed technologies but need to assume broker roles when adopting external sources of innovation (open innovation). The skills and competencies associated with these roles include creative thinking, managing and living with change (innovator role) and building and managing networks, negotiating agreements and commitments and presenting ideas effectively (broker role).

The operations/production's function creates value by responding responsively to changes in the business environment. By facilitating adaptive processes, effectively mentoring individuals within groups and teams, facilitating group processes, and orchestrating effective work design, an organization's operations can create value. Some level of operations/production resources is allocated to the

development of team members and managing conflict (Collaborate quadrant) so that employees can ensure adaptation of open innovation technologies. Collaboration is also important for the operations/production managers as they rely on suppliers to provide resources that ultimately lead to the development of competitive advantage. These resources can also include 'just in time' shipment of inventory for lower costs. They can also include market and product knowledge that help the firm position its products competitively.

Marketing pays close attention to the marketplace, ongoing customer needs, and trends in consumer behaviors. Marketing managers and professionals need to communicate and coordinate their efforts with R&D (Create quadrant) and those monitoring and delivering the outputs (Control/Collaborate) to optimize organizational performance. The finance department deals with finance and accounting activities including purchasing and accounts payables, as well as complying with regulations and ensuring the financial strength of the company. The finance department in conjunction with the legal department oversees the fiduciary agreements that guide the implementation of open innovation strategy. Most of the roles across these three quadrants are interface communication roles including director, monitor, coordinator, and facilitator roles with competencies ranging from project management to problem solving communications, goal setting, along with process improvement competencies (Belasen 2000).

Viewing internal and external communication as interconnected functions shifts the focus of corporate communication towards answering questions of how an organization can communicate consistently to its many stakeholders in a way that represents a coherent sense of "self". That sense of self is needed to maintain credibility and reputation inside and outside of the organization through strong organizational identity and a positive external image. Corporate identity is projected to stakeholders using a variety of cues and represents how the organization would like to be perceived. By delivering a consistent message to target audiences, an organization's particular objective is more likely to be achieved (Belasen 2008).

14.5 Conclusion

In this chapter we proposed that increased collaboration through communication and the development of processes and projects to support the current and future activities of innovative organizations should create a sustainable competitive advantage for firms operating in global environments. Using a modified CVFCC, we identified roles, relationships, and communication patterns to successfully commercialize technology through open innovation. Lateral communication in organizations with adaptive cultures facilitates the flow of information and best practices across functional boundaries and, therefore, is the most effective medium to support inter-functional coordination. Because values and goals are vitally linked to cooperation, culture becomes a key in sustaining organizational competitiveness.

The dynamics that help balance the simultaneous role of cooperation and competition within organizations draw on the combined characteristics of the 'achievement' and 'clan' cultures. Cultural synergy, the cooperative or combined action that can occur when diverse or disparate groups of people with varying skills and viewpoints work together, can be promoted through clan/achievement attributes and championing an adaptive culture in the organization.

Exploratory research can look further at the relationship between dimensions of organizational design, technology, modes of coordination, and innovation communication processes to optimize inter-functional collaboration and knowledge transfer within and outside organizations. A cross-sectional study that includes global organizations can help validate patterns of supportive communication between the developing and adapting functions of organizations, as well as identify best practices of interdependent work units such as R&D and operations, operations and marketing, and marketing and finance.

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Chapter 15
Innovation Communication as an Integrative Management Capability in Digital Innovation Ecosystems

Nicole Pfeffermann

Abstract Dynamics in communication and innovation environments, such as new online communication channels, new corporate innovation tools, and access to and availability of information via digital technologies world-wide, are catalysts for the expanding interest of communication as an underpinning success factor in innovation management. From a theoretical perspective, the literature, however, has not fully acknowledged management of innovation communication as a new management function in corporate communication and has fallen short of comprehensively explaining the *How?* of managing innovation communication as a strategic capability for effective idea generation to idea conversion in the open innovation economy. This chapter provides a new approach: Innovation communication as an integrative management capability from a strategic management perspective. After presenting a literature review on communicating innovations and corporate communication management, a new understanding of innovation communication as a dynamic capability from in corporate communication management research is provided. Second, the direct and indirect effects of innovation communication—as an integrative management capability—on company value are illustrated and propositions are set up to further develop theory. Finally, a conclusion provides implications and a brief outlook on future research directions.

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15.1 Communication in Digital Innovation Ecosystems

The Social Web and new digital technologies have changed information exchange worldwide. The simultaneous consumption of content on multi-channels and active, on-demand stakeholder involvement in interactions with organizations alter communication behaviour and knowledge transfer. Related to innovation management, the depletion of information asymmetries due to the ubiquitous availability of information and rapidly changing knowledge via digital technologies among people world-wide lead to knowledge-empowered stakeholders, who are consequently, a valuable knowledge source. Hence, crowd-powered innovation has become a new corporate innovation tool that engages knowledge-empowered stakeholders in knowledge creation and transfer processes. For instance, contents and collaborative communities are two crowd-powered innovation tools (Boudreau and Lakhani 2013, p. 64). Company leaders have thus become "community organizers" (Gouillart and Billings 2013, p. 71) in digital innovation ecosystems. Ecosystems are "the collaborative arrangements through which firms combine their individual offerings into coherent, customer-facing solutions" (Adner 2006, p. 98). Many Fortune 500 companies, such as P&G, Microsoft, Dell, and Johnson & Johnson, have integrated social media channels and community & co-creation platforms in their innovation portfolio to actively build up and interact in digital innovation ecosystems. Some examples include the global initiative "care inspires care™" by Johnson and Johnson (2013), the P&G Co-Creation Channel – the "new crowd-sourcing community platform running multiple open innovation contests" by Procter and Gamble (2013) or the idea platform "mystarbucksideas.com" by Starbucks (2013).

In this context, *innovation is understood as progress at a corporate level* to survive in changing environments and to achieve competitive advantage. Crowd-powered innovation & co-creation via open exchange and collaboration in online (business) communities is then an effective corporate innovation tool to address market needs and effectively engage knowledge-empowered stakeholders, such as employees, customers, and partners/suppliers, in an open innovation process. For instance, a brand community is involved in new product development, for instance, the case "Vorwerk Thermomix Research Community" (see book Chap. 24 in this book).

The use of various social media platforms and crowd-powered innovation in innovation management, however, leads to new challenges in communication management. Communication management is no longer just a task of marketing and corporate communication in the traditional logic, but rather a central task in marketing, corporate communication, idea/innovation management, and corporate development and all involved parties—based on a digital business design. The fragmentation in marketing and corporate communication, involving "silos" mainly related to different communication fields (employee communication, finance communication, product communication, etc.), can no longer exist. Instead, management practice shows that cross-functional activities and

cross-border thinking are key for successful open innovation and communication in digital innovation ecosystems (Keyword: *Open Innovation-Communication View*). For instance, Dell has implemented an integrative social media board and open platform "to listen, learn and engage with [their] customers" including social media policy and guidelines (Dell 2013; see also Henning-Thurau et al. 2012). SAP has launched the press release that communication and marketing have been melded into one management function (SAP 2013).

"What interests me is new paradigms in communication …" says TED Founder Richard Saul Wurman

Interview by Samantha Murphy 2013/06/04

In management practice, therefore, there is a growing need for new, integrative corporate communication management approaches related to innovation and cross-border thinking, i.e. re-thinking and re-designing corporate communication management for innovation on cross-functional, cross-organizational and *cross-industrial levels* (Vatier 2013).

15.2 Need for a New Management Function in Corporate Communication

15.2.1 Communication of Innovations: A Review

Communication of innovations is of expanding interest to business and science (e.g., Hofbauer et al. 2009; Huck 2006; Mast and Zerfaß 2005; Mast et al. 2005, 2006; Mohr et al. 2009; Zerfaß and Ernst 2008; Zerfaß and Möslein 2009). This is true nowadays in particular due to the increasing demand for innovation and corporate innovation approaches, the breadth of enterprises' innovation portfolios, the ubiquitous availability of information, knowledge-empowered stakeholders, new business models and digital business transformation.

Three main streams of research can be identified in the field *communication of innovations*:

(1) Marketing of innovations/innovation marketing in marketing research;
(2) Communication in marketing diffusion research;
(3) Innovation communication in corporate communication research linked to innovation management research.

First, research in marketing including consumer behaviour and psychology encompasses scientific investigations regarding the antecedents and consequences in marketing of innovations. Marketing is an essential part in the innovation process (Crosby and Johnson 2006). Communication can inform consumers about the advantages and characteristics of an innovation by using mass media and individual communication throughout the adoption process (Hofbauer et al. 2009). Theoretical findings and managerial implications provide essential information

concerning strategies and mechanisms to introduce innovations successfully. Marketing of innovation includes both the commercialization of radical innovations, technologies and services (e.g., Mohr et al. 2009; Sandberg 2008; Sowter 2000) and strategic innovation marketing (e.g., Talke 2005; Trommsdorff and Steinhoff 2007). Various useful definitions are provided in the literature, for instance, 'innovation marketing encompasses all market-oriented activities of innovation management—that is, all strategic and operative decisions for marketing new products' (Steinhoff and Trommsdorff 2011).

Second, 'diffusion research seeks to understand the spread of innovations by modeling their entire life cycle from the perspective of communications and consumer interactions' (Peres et al. 2010, p. 91). Several innovation diffusion models have been introduced mainly in the marketing diffusion literature (e.g., Mahajan et al. 2000; Peres et al. 2010) related to specific industries, adopter groups or steps in the adoption process (e.g., Arndt 1967; Hesse 1987; Mahajan et al. 1990, 1995; Pae and Lehmann 2003; Rohlfs 2001). Currently research interest has shifted in its focus from the forecasting focus to the managerial diagnostic focus in order to provide answers in marketing management (Peres et al. 2010). Three social influence factors are mentioned as drivers of communication in innovation diffusion: (1) word-of-mouth communication (e.g., Martilla 1971; Mazzarol 2011), (2) network externalities (e.g., Rohlfs 2001; Tomochi et al. 2005), and (3) social signals (e.g., van den Bulte and Stremersch 2004; Berger and Heath 2008). These social influence factors, referred to as *interdependencies among consumers,* 'affect various market players with or without their explicit knowledge' (Peres et al. 2010, p. 91) and thus have to be considered in marketing of innovations. Future research in this field requires the consideration of online communities, web services and complex types of product-services categories in innovation diffusion (Peres et al. 2010).

Third, researchers have focused on innovation communication[1] and its impact on the innovation process from idea to launch as a part of corporate communication and constitutive element in innovation management (e.g., Huck 2006; Mast and Zerfaß 2005; Mast et al. 2005, 2006; Zerfaß 2009; Zerfaß and Ernst 2008; Zerfaß and Möslein 2009; Zerfaß et al. 2004). Three communication fields are as follows: (1) internal communication; (2) external communication; and (3) *public relations* (innovation journalism: Nordfors 2009). *Innovation communication* is defined as "symbolic interaction between organizations and their stakeholders about innovative products, services, technologies, and ideas" (Mast et al. 2005, p. 4; Huck (2006, p. 3) repeats this quote). Zerfaß (2009) defines innovation communication as a systematic initiation of communication processes with internal and external stakeholders to support technical, economic and social novelties through (a) the interest-led construction, revision, and destruction of socially dependent conceptual patterns and communication resources, including

[1] Innovation communication was mentioned the first time by Johnson, J. D. and Chang, H.-J. (2000). Internal and external communication, boundary spanning, and innovation adoption: An over-time comparison of three explanations of internal and external innovation communication in a new organizational form. *The Journal of Business Communication*, 37, 238–263.

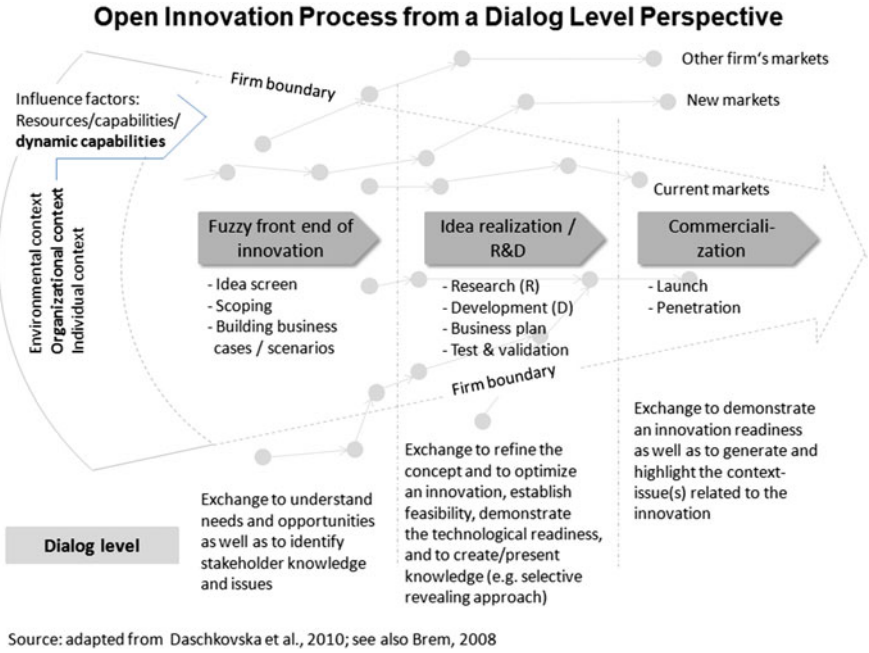

Fig. 15.1 Open innovation process from a dialog perspective

professional promotion, and (b) by stimulating content-related catalysts for the development of novelties. The object of communication is primarily the innovation itself, but in many cases it is also the organization behind the innovation (Zerfaß 2009, p. 42 translated into English).

The first and second research streams focus primarily on market-related activities, first, to attract consumer attention and, second, to facilitate an innovation's adoption process by driving social influences. In contrast, the third research area conceives communicating innovations from idea to launch as a constitutive element in innovation management (Zerfaß 2009) and as a part of corporate communication management (Zerfaß et al. 2004).

In the open innovation view (Chesbrough 2003, 2006; Chesbrough and Appleyard 2007), companies have to be flexible in outsourcing and find new ways to respond to increasing changes in market structures and technologies (Chesbrough and Appleyard 2007). In this view, 'successful companies will be those that transform information into value-creating knowledge, and […] use this knowledge to innovate and capture additional profit' (Davenport et al. 2006, p. 17). The construct open innovation can be understood as '… the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation […]' (Chesbrough 2006, p. 1). Based on this current approach to innovation management (for different understandings of open innovation see Chap. 3, in this book), the diagram (Fig. 15.1) shows an open innovation

process and the dialog level perspective with several communication management tasks throughout an open innovation process (based on Daschkovska et al. 2010).

In order to enjoy sustained success, however, enterprises have to manage several open innovation processes at the same time and over time. Thus, they have to coordinate various communication processes, tools and activities related to a broad range of types of innovations and collaborative arrangements to attract, inform and engage knowledge-empowered stakeholders and to address resource markets, communication markets, and sales markets (in the real economy and net economy/digital channels). Moreover, these valuable interactions need to support the innovation process from idea to launch and beyond. Hence, efficient corporate communication management related to innovation is crucial to manage various communication activities in digital innovation ecosystems.

15.2.2 Corporate Communication Management: A Review

Increasing competition in communication markets, developments in media consumption and new communication channels, are a catalyst for the expanding interest in corporate communication management (Argenti 2007; Donsbach 2006; Töhlke et al. 2001).

According to Hübner's review (Hübner 2007), corporate communication management primarily represents a process to build up stakeholder relationships. Corporate communication can be understood as "a management function that is responsible for overseeing and coordinating the work done by communication practitioners in different specialist disciplines, such as media, public affairs, and internal communication" (Cornelissen 2008, p. 5). It is "…a management function that offers a framework for the effective coordination of all internal and external communication with the overall purpose of establishing and maintaining favourable reputations with stakeholder groups upon which the organization is dependent" (ibid.). This *function-oriented perspective* has also been adopted by other scholars in corporate communication management research, including Bruhn (2006), Argenti (2007), van Riel and Fombrun (2008), and Belasen (2008). Bruhn (2006) defines integrated marketing communication as "a process of analysis, planning, organization, implementation and monitoring that is oriented toward creating unity from diverse sources of internal and external communication with target groups to convey a consistent impression of the company or the company's reference object" (Bruhn 2006, p. 17; Bruhn 2008, p. 15; Bruhn 2009). The result of managing this process is a "uniform image" contributing to the company's credibility (ibid.). In contrast, Hübner's behavioural perspective (2007) defines corporate communication as a company's ongoing negotiation process with its stakeholders so as to achieve legitimation. He describes this discourse as a process "to bring peers together…in order to create strategic thinking in an ongoing communicative and collaborative process" (Hübner 2007, pp. 165–166).

In sum, the literature, however, has not fully acknowledged management of innovation communication as a management function in corporate communication and has fallen short of comprehensively explaining the *How?* of managing various communication processes, tools, and activities related to innovation for efficient corporate communication management in the open innovation economy. Moreover, a new management approach is missing to understand how corporate communication management related to innovation management and marketing can positively facilitate both idea generation to idea conversion and beyond and to build up a strategic, dynamic capability to interact with knowledge-empowered known and unknown stakeholders in innovation communities as well as strengthen a firm's resource set for innovation in the long-run—all of which are critical success factors in the open innovation economy.

15.3 Innovation Communication as a New Management Function from a Strategic Management Perspective

Innovation communication emerges as a new cross-functional management function in *corporate communication from a strategic management perspective* due to dynamics in communication and innovation caused by changing environments in the *open innovation economy and digital information age.* Many organizations, independent from size and industry, are currently struggling with the question "How can research transfer results from academic research into marketable ideas and, in general, transfer ideas into successful products and services be designed?" The global innovation 1,000 Study 2012 by Booz and Company shows that only 25 % of respondents (innovative companies) agree that they are effective in both idea generation and idea conversion. Hence, capabilities in innovation communication will bridge this gap between innovative ideas and their commercialization.

First of all, innovation communication management (ICOMM) implies two basic assumptions: (1) Companies invest in strategic open innovation and thus in fostering innovation capability and innovation portfolios so as to compete in current and future digital innovation ecosystems; (2) Companies interact with knowledge-empowered stakeholders across organizational boundaries throughout the open innovation processes, from idea generation to idea conversion, and, in other words from idea and knowledge transfer of marketable ideas and beyond to create new knowledge for innovation.

Innovation is defined as ideas, concepts, prototypes, polices, practices, objects, programs/initiatives, models, design, issues, technologies, services, products, etc. that are perceived as new by individuals (based on Rogers 2003).

Communication is defined as a process in which messages are sent by a sender to receiver(s) through channels and its receiver(s) decode/s information using an individual's senses and give/s feedback (e.g., Argenti 2009; Zaremba 2003) in a

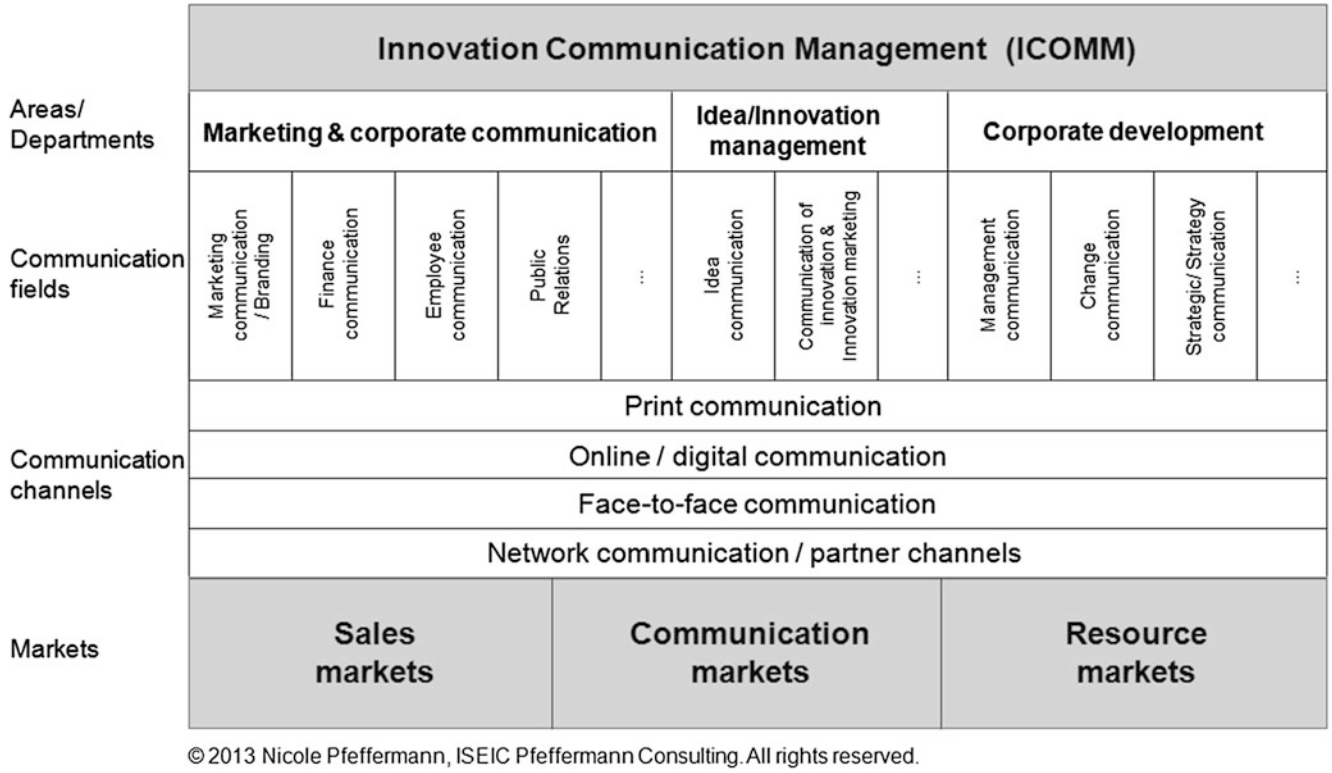

Fig. 15.2 Innovation communication management—a functional perspective

'constant mutual influence of communication participants' (Miller 2005, p. 6; see also Bittner 1985; Burgoon and Ruffner 1978; de Vito 1997). In this *transactional conceptualization of communication* related to complex systemic environments, an '… organization as an entity […] must link internal departments and be linked to its environment' (Zaremba 2006, p. 60).

ICOMM represents a new way of orchestrating new innovation communication tools and traditional communication tools of various communication fields related to innovation to effectively communicate *for* innovation. ICOMM generates benefits from synergy effects among a broad range of communication channels related to sales markets, communication markets, and resource markets, as illustrated in Fig. 15.2. Finally, as a cross-functional management function in corporate communication, ICOMM integrates the main areas of: marketing & corporate communication, idea management and innovation management, and corporate development including different communication fields related to innovation, such as an integrative view of social media and community management to present innovation, which involves several internal departments to benefit from social media effects. ICOMM addresses sales/consumer markets, communication markets, and resource markets over four main channels: print, online/digital, face-to-face, network/partner.

15.3.1 Innovation Communication Capability

The *How?* of managing innovation communication is crucial to achieve an impact. For instance, crowdfunding via digital platforms can represent an effective way for creative industry entrepreneurs or startups to raise money to execute their creative ideas/business ideas; however, presenting the idea and manage information exchange to positively influence viral communication and action is not a trivial process. Not all communication strategies, tools, and activities can lead to recognition, innovation adoption or idea exchange in vibrant innovation communities. The *How? in efficiently and effectively managing communicating for innovation to create value*, such as reputation and *knowledge networks*, therefore, makes the difference and varies among companies, creative professionals, and startups. For instance, selective revealing of *knowledge* as a strategic mechanism can effectively be used to enhance collaborative innovation in terms of re-shaping collaborative arrangements and improving market and technologies access (Alexy et al. 2013).

Consequently, **the ability to manage innovation communication on a cross-functional level is a strategic capability in the *open innovation-communication economy* influencing the outcome** *of strategic efforts* to achieve competitive advantage, for instance, being effective in both idea generation and idea conversion.

From the strategic management perspective, *dynamic capabilities* (Teece 2007; Schreyögg and Kliesch-Eberl 2007; Teece et al. 1997) influence a corporation's value creation by the impact on its resource base, which in turn represents a source

of competitive advantage (Ambrosini and Bowman 2009). "A **dynamic capability** is the capacity of an organization to purposefully create, extend, or modify its resource base" (Helfat et al. 2007, p. 4). If ICOMM is understood as a dynamic capability, ICOMM can purposefully create, extend, or modify an organization's resource base, such as its information and knowledge management, stakeholder/customer relationship management, and idea management.

Based on relevant literature, a conceptual definition (for types of definition see Pozzi 2001) of the ICOMM construct is as follows:

ICOMM* is a *dynamic capability to manage transactional procedures for *transmitting information* between the organization and its stakeholders (community, innovation networks, partners, customers, employees, government, etc.) in terms of

(1) Introducing ideas, concepts, prototypes, polices, practices, objects, programs/initiatives, models, design, issues, technologies, services, products, etc. or a combination of them, referred to as clusters, which are perceived as new by receivers;
(2) Generating and highlighting *context-issues* for (1), referred to as framing topics;
(3) Presenting *innovation capability*; and
(4) Considering *interrelation*, *time*, and *openness* used to increase *company value* by *intensifying corporate innovation reputation*, *building up* new stakeholder *knowledge schemata*, *modifying* existing ones, and *improving* its *management of strategic assets* (adapted from Pfeffermann 2011).

In order to ensure construct clarity in management research (Suddaby 2010) for improving management theorizing and achieving consensus which affects efficient communication among scholars and decreased barriers to collaboration (Pfeffer 1993), the key constructs embedded in the conceptual definition of ICOMM—i.e. the eight dimensions of ICOMM—are defined in Appendix A.

Openness is key in the *open innovation economy*. Therefore, strategic openness as one dimension of ICOMM should be described in detail to present an example for managing innovation communication considering openness (for managing innovation communication see also Chap. 13, in this book):

Enlarging the corporate growth zone (adapted from Luckner & Nadler* 1997, 1995*)

Risk and uncertainty are influence factors for resistance and defending comfort zones, and can therefore impede innovation. ICOMM helps companies to get out of their comfort zones and to strategically extend their growth zones in terms of driving connectivity/collaboration, innovation, and learning/self-reflection/knowledge creation and knowledge adoption to strategically influence knowledge networks. ICOMM's focus then is on accelerating innovation and breakthrough

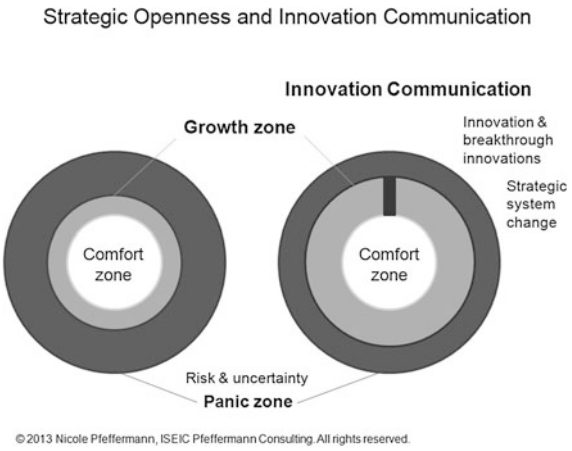

Fig. 15.3 Innovation communication—Growth zone

innovations, as illustrated in Fig. 15.3. As a result, companies and economic systems reach new dimensions of growth and new business opportunities for long-term market success.

Understanding and positively balancing promotion- & prevention-focused motivation

"One of the greatest benefits of understanding how promotion and prevention focus work is that it will give you a genuine, evidence-based window into strengths and weaknesses—the kind that translate into demonstrable differences in performance" (Halvorson and Higgins 2013, p. 35).

Promotion-focused motivation is in general more conducive to creative ideas including out-of-the-ordinary ideas. This is explained by the fact that promotion-focused individuals—i.e., creative, innovative, risk-taking, "thinking outside the box" people—are much more comfortable with taking chances and open to more possibilities. They enthusiastically support ideas. In contrast, prevention-focused people—i.e. efficiency-oriented, low-risk takers—like ideas that are foolproof and most of the time their critical mindset hinders the creation process. "When successful companies fail to innovate, what looks like complacency is often really a prevention-focused strategic defensiveness—a desire to protect the company's gains by avoiding risks" (ibid., p. 36).

The most effective companies are those who respect input from both creative thinkers (promotion-focused) and critical, analytical thinkers with a view on details and accuracy (prevention-focused) in different stages of an innovation process in order to be both effective in idea generation and idea conversion. In this context, strategic openness of ICOMM covers understanding and balancing promotion- and prevention-focused individuals to successfully innovate and be *open* across boundaries for new business opportunities. Innovation communication is also a prerequisite for improving strategic openness in terms of understanding both types so as to positively influence promotion and prevention motivation when

appropriate. Innovation communication tools can bridge the gap, for instance, by using scenarios (scenario planning) to visualize future gains to address promotion-focus, while (see also Pfeffermann and Breuer 2013), on the other hand, using framing as a tool to provide a 'frame of reference' for prevention-focused individuals. Strategic innovation communication planning implies designing innovation communication tools for both types of motivational behaviour (see "innovation communication toolbox" by Pfeffermann, in this book).

15.3.2 *Effects of Innovation Communication on Company Value*

The conceptual definition of innovation communication calls theorists to think about the direct and indirect effects of innovation communication on company value to further develop and test theory.

The *overarching research hypothesis* states: The more effective ICOMM as an organizational dynamic capability is exploited, the more ICOMM will contribute to company value (CV).

Figure 15.4 illustrates the direct and indirect effects of innovation communication (ICOMM) on company value [measured by Economic Value Added (EVA)]. Beginning from the left-hand side, ICOMM has four main effects on value creation (see conceptual definition), which are divided into two direct effects and one indirect effect: the *building and modifying* function (the *knowledge creation* direct effect—LEARN), the *improving* function (the *management of strategic assets* direct effect—INNOVATE), and the *intensifying* function (the *corporate innovation reputation* indirect effect and dependent mediator variable—CONNECT). In order to explain the positive effects of the three main functions of ICOMM on company value CV/EVA arrows are drawn from the left-hand side to the right-hand side.

The following propositions can be made based on the conceptual definition and a literature review, as detailed in Fig. 15.4 from left to right:

→P1 (general proposition): The ICOMM dynamic capability of managing innovation communication has a positive impact on company value through knowledge creation, management of strategic assets, and reputation enhancement

→P2: ICOMM positively influences knowledge creation by building up new stakeholder knowledge schemata or modifying existing ones; this leads to knowledge adoption and innovation adoption that directly affects company value [measured by Economic Value Added]

→P3: ICOMM positively influences the management of strategic assets by improving management of strategic assets, such as information management, innovation management, and stakeholder relationship management, which leads to advancement of operational management that directly affects company value [measured by Economic Value Added]

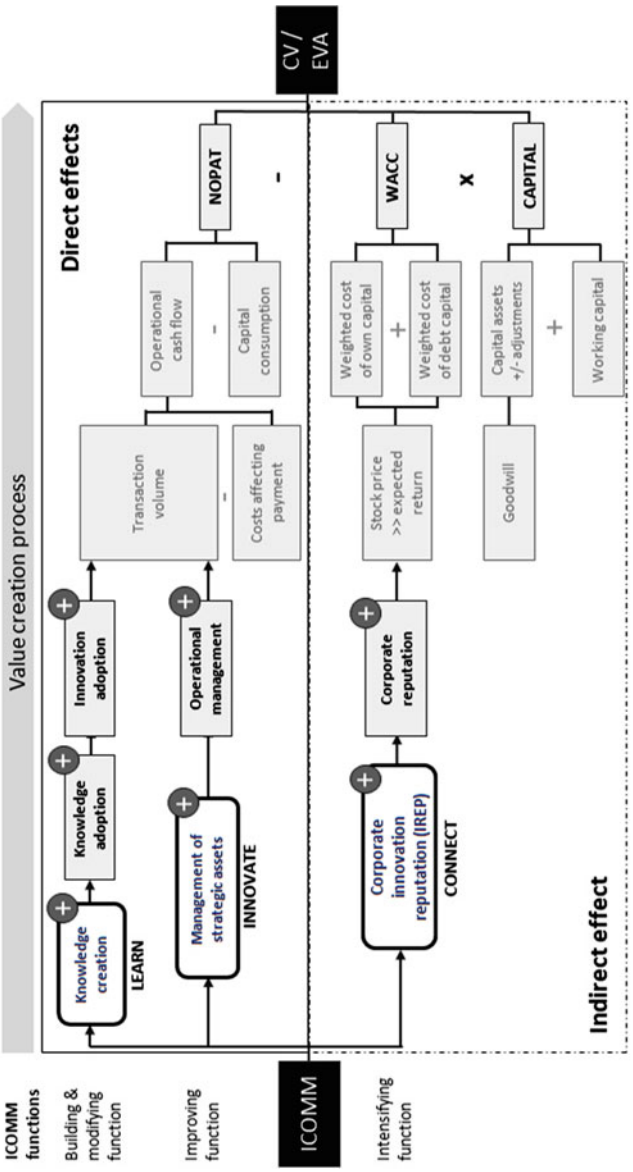

Fig. 15.4 Effects of innovation communication on company value

→P4: ICOMM positively influences intensifying corporate innovation reputation (IREP), leading to corporate reputation, which indirectly affects company value [measured by Economic Value Added]

15.4 Conclusions and Outlook

New mobile and web technologies drive smart marketing and innovation concepts, such as mass customization and crowd-powered innovation, to engage knowledge-empowered stakeholders in corporate innovation. Company leaders have thus become "community organizers" in managing communication related to innovation with various stakeholders in the open innovation view. The broad range of communication activities as well as information systems, however, has to be managed in order to facilitate both effective idea generation and idea conversation and to build vibrant innovation communities. The *How?* of managing communication related to innovation is thereby crucial to achieve the desired impact. There is, hence, a necessity for new corporate communication management approaches related to innovation and cross-border thinking, i.e., re-thinking and re-designing corporate communication management for innovation on a cross-functional management level.

This book chapter provides a **new corporate communication management approach from a strategic management perspective: Innovation Communication Management Capability**. Innovation communication management (ICOMM) can represent a new integrative management capability to plan, execute, monitor, and evaluate information transmissions related to innovation and context-issues of innovations considering interrelatedness, time, and openness to accelerate innovation (e.g. digital business transformation, new products and services), corporate reputation, and management of strategic assets (e.g., collaborative innovation, knowledge networks); which in turn leads to value creation. ICOMM focuses on a corporate innovation portfolio or just an innovation process from an entrepreneurial perspective. This approach explains the *How?*—the understanding of innovation communication as an organizational ability with eight dimensions—for managing communication for innovation in digital innovation ecosystems to achieve the desired impact, such as being both effective in idea generation and idea conversation. Moreover, this approach can be applied for collaborative networks to understand innovation communication management as a meta-level capability on a network/cluster level.

Implemented as an integrative management capability, innovation communication drives value creation through strategic openness, among others: (1) Enlarging a corporate growth zone, and (2) Understanding and positively balancing promotion- and prevention-focused motivation.

How does ICOMM affect value creation? This book chapter also provides an illustration including propositions of how ICOMM directly and indirectly affects company value through its *building & modifying function* (knowledge creation),

improving function (management of strategic assets) and *intensifying function* (corporate innovation reputation).

To conclude and at the same time present an outlook for future directions in management practice and research, ICOMM needs to become a top priority for managers in innovation management, communication management and corporate development. It is not about what you do, but rather how you do it. The ability to manage innovation communication can influence the impact of communication in the *open innovation economy*, which in turn might lead to competitive advantage and business growth.

A smart communicator for innovation (organization or entrepreneur) is able to both: (1) Inspire and carry on innovation dialogues with various stakeholder groups to both create knowledge (LEARN) and enhance reputation through trustful relationships—the "right" connections—(CONNECT); and (2) Build up and re-configure a resource base for innovation (INNOVATE), for example, for digital business transformation, successful business startup, and sustainable innovation success. To begin, a new innovation communication plan and innovation communication guidelines can be developed as a common standard for an open innovation process, where collaborative partners have different communication policies/behaviour, use different communication tools and channels. Second, over the long-term, re-structuring corporate communication management and re-designing processes based on standards are necessary to manage ICOMM as a strategic capability (for management tools of innovation communication see also Chap. 13, in this book).

Providing an outlook on future research, the new ICOMM theory can be further developed by generating and testing hypotheses and measuring the status quo in management practice. For instance, using a mixed method approach from a pragmatic view in terms of conducting qualitative interviews to explore new issues and an online survey to get quantitative results; finally comparing both analyses.

A.1 15.5 Appendix A

The eight dimensions of ICOMM, understood as key constructs to develop and test theory and, thus, measure ICOMM in management practice, illustrated in Fig. A.1 and described below-state:

Information transmission is defined as an organizational ability to transfer information between organizations and *stakeholders* in terms of introducing ideas, issues, concepts, prototypes, practices, objects, or combinations of these, which are perceived as new by receivers; generating and highlighting *context-issues* related to innovation (= framing topics); and presenting *innovative capability* considering interrelation, timing, and openness.

Fig. A.1 Eight dimensions of innovation communication capability

Stakeholders are groups related to a company, for instance, financial analysts, customers, suppliers, media, or investors (Freeman and McVea 2005; Freeman 1999). First developed in the mid-1980s by Freeman (1984), the stakeholder approach is linked to strategy for strategy formulation and implementation (Freeman and McVea 2005).

A context-issue is defined as a "frame of reference" of an innovation or innovation cluster, which integrates the innovation or cluster into a topic of concern to grasp stakeholders' attention and to lead to a better understanding of an innovation (Huck, 2006).

Innovation capability reflects human capital, social capital and the cognition of managers involved in the creation, use and integration of market knowledge and innovation resources in order to match and create market and technological change (adapted from Bruni and Verona 2009). This calls for an organizational ability for innovative thinking and behaviour, such as fostering breakthrough innovations, developing new products and technologies, and changing mindsets for new business opportunities and growth.

Interrelation is defined as the ability to manage several interrelated managerial tasks, communication processes, communication tools, and communication activities as follows. The Interrelation among tasks, processes, tools, and activities of innovation communication:

- Taking place at the same time and over a period of time;
- And innovation/idea management taking place at the same time and over a period of time (interface of communication management and innovation management);

- And organizational communication (corporate communication and marketing) taking place at the same time and over a period of time;
- And information management (IT management) taking place at the same time and over a period of time;
- Considering different communication channels and three types of markets [resource markets, sales markets, and communication markets].

Time refers to *at the same time* and *over a period of time*; i.e. this dimension encompasses the ability to plan, coordinate, execute, monitor and evaluate time-related information transmission considering the linkage among past-related, present-related and future-related information at the same time and over a period of time.

Openness is defined as the ability to plan, coordinate, execute, monitor and evaluate the use of purposefully knowledge creation across *boundaries* (e.g. firm's boundaries, cultural and disciplinary boundaries, mindsets, and comfort zones) to accelerate innovation in terms of constant, active interactions with stakeholders (innovation dialogue).

Boundaries are defined as internal and external rules, limits or borders, which organizations are attempting to overcome in the open innovation view. In the open innovation view (Chesbrough 2003; 2006; Lichtenthaler and Lichtenthaler 2009) "successful companies will be those that transform information into value-creating knowledge, and […] use this knowledge to innovate and capture additional profit" (Davenport et al. 2006, p. 17). The construct "Open Innovation" can be understood as "… the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation…" (Chesbrough, 2006, p. 1). Studies on openness and interaction, which investigate networks of relationships between organizations and external environment, show the impact on firm's performance (e.g., Shan et al. 1994; Ahuja 2000; Rosenkopf and Nerkar 2001).

Knowledge creation is defined as the ability to plan, coordinate, execute, monitor and evaluate learning of organizations and individuals for innovation and change. *Learning* means revising existing knowledge and building new schemata (Miller 2005). A schema, interrelated with other schemata, will be activated and developed if, for instance, stakeholders have made their first experiences with a new product or received information about it that they perceive as a new situation. New information or experiences change and develop existing knowledge domains into a complex schemata system (e.g., Bruhn 2009; Miller 2005; Brewer and Nakamura 1984). Hence, knowledge creation leads to knowledge adoption to positively influence innovation adoption.

Corporate innovation reputation is defined as the stakeholders' collective positive judgments of a company's innovativeness over time (based on Barnett et al. 2006), which is addressed in this dimension by the ability to plan, coordinate,

execute, monitor and evaluate processes, tools and activities of innovation communication to strengthen corporate innovation reputation. The interrelation between innovation communication and corporate innovation reputation leads to the construct of credibility. For instance, consumers do not only pay attention to messages, but also to the credibility of the source of the message. Higher credibility leads to higher acceptance of a new product (Maathuis et al. 2004). Moreover, the definition of corporate reputation consists of both (1) the stakeholder relationship perspective in the creation of trustful stakeholder relationships (the enterprise's behaviour towards stakeholders in the past, present and expected future) and (2) the information transmission perspective (the degree of informative transparency). Information transmission is crucial for enhancing trust/credibility and stakeholder satisfaction and, hence, corporate reputation (de la Fuente Sabate and de Quevedo Puente 2003). As far as innovation communication is concerned, of the three communication objects information transmission plays a central role in establishing trust and stakeholder satisfaction, and leads to a strengthened corporate innovation reputation.

Management of strategic assets is defined as the planning, coordination, execution, monitoring, and evaluation of operationally managing specific resources and capabilities aimed at creating, extending and/or modifying a unique resource base of an organization for achieving competitive advantage. A company coordinates and implements its strategic assets in concert with other specific resources and capabilities, which leads to the inherent value of strategic assets (McGee et al. 2005). In fact, innovation communication has to manage other specific resources and capabilities including other strategic assets of a company. Such strategic assets might include the resource 'management techniques' that might consist of information management, innovation management as well as reputation management. Other strategic assets might be innovative capability or marketing capability; for examples of capabilities see Appendix B.

Company value is defined as *Economic Value Added* (EVA), which means the net operating profit after tax (NOPAT) minus the sum of capital (CAPITAL) and weighted average cost of capital (WACC) (Schaefer 2002; Stern et al. 1995). Constituting one of a company's dynamic capabilities, the cross-functional dynamic innovation communication capability is unique to an enterprise or a collaborative network in terms of the designing in the eight dimensions of ICOMM to increase company value considering dynamics in the value creation process (see Fig. 4).

A.2 15.6 Appendix B

Table B.1 Definitions of organizational communication competence and marketing capability (sorted in chronological and then alphabetical order and is not to be understood as a complete review)

Type	Definition	Source
Marketing capabilities	'The marketing capabilities include product development, the process to develop and manage product and service offerings; pricing, the strategy to extract the optimal revenue from firm's sales; channel management, the course of action to establish and maintain the channels of distribution that effectively and efficiently deliver value to end-user customers; marketing communications, the ability to manage customer value perceptions; selling, the activity to fulfill customer orders; market information management, the practice to acquire and use market knowledge; marketing planning, the ability to create marketing strategies that optimize the match between the firm's resources and its marketplace; marketing implementation, the process to transform marketing strategy into realized resource deployments.' (p. 153; based on Vorhies and Morgan 2005)	Akdeniz et al. (2010)
Marketing capability	'… marketing capability to be firm's ability derived from two prominent components: marketing planning ability and marketing implementation ability." (p. 850)	Chang et al. (2010)
Marketing capability	'Marketing capability is defined as the integrative process, in which a firm uses its tangible and intangible resources to understand complex consumer specific needs, achieve product differentiation relative to competition, and achieve superior brand equity.' (p. 319; based on Day, 1994).	Nath et al. (2010)

(continued)

Table B.1 (continued)

Type	Definition	Source
Dynamic marketing capabilities	'Dynamic marketing capabilities reflect human capital, social capital and the cognition of managers involved in the creation, use and integration of market knowledge and marketing resources in order to match and create market and technological change.' (p. 103)	Bruni and Verona (2009)
Marketing capability model	'… we focus on capabilities that are consistent with both Day's (1994) marketing capability model […].' = market-sensing capability; CRM capabilities, and brand management capabilities (p. 285)	Morgan et al. (2009a)
Two interrelated marketing capability areas	'Two interrelated marketing capability areas have been identified: capabilities concerning individual 'marketing mix' processes, such as product development and management, pricing, selling, marketing communications, and channel management (e.g., Vorhies and Morgan 2005), and capabilities concerned with the processes of marketing strategy development and execution (e.g., Morgan et al. 2003). These capabilities may be rare, valuable, non-substitutable, and inimitable sources of advantage that can lead to superior firm performance (e.g., Vorhies and Morgan 2005). Further, as knowledge-based processes that become embedded over time, such capabilities may be difficult for competitors to imitate (e.g., Teece et al. 1997).' (pp. 910–911)	Morgan et al. (2009b)
Architectural marketing capabilities and marketing capability integration	'… to simultaneously model the ways that product-market strategy influences specialized and architectural marketing capabilities and marketing capability integration.' (p. 1321)	Vorhies et al. (2009)

(continued)

Table B.1 (continued)

Type	Definition	Source
Marketing capabilities	Marketing capabilities are divided into inside-out capabilities, spanning capabilities, and outside-in capabilities. (based on Day 1994)	Jones and Tollin (2008)
	'Marketing capabilities—such as skill in segmentation, Organizational Capabilities Information Technology Capabilities and Strategic Types 9 targeting, pricing, and advertising—enable the organization to take advantage of its market-sensing and technological capabilities and to implement effective marketing programs.' (pp. 8–9).	Song et al. (2008)
Marketing-mix capabilities	'… the capabilities used to orchestrate marketing-mix capabilities and their resource inputs involving market information management and marketing strategy development and execution.' (p. 82)	Vorhies and Morgan (2005)
Marketing planning capability	'… marketing planning capability, we focus on specific elements fundamental to the overall marketing planning process.' (p. 372)	Slotegraaf and Dickson (2004)
Organizational communication competence along three dimensions (and an overview of several conceptuali-zations/definitions)	'… conceptualize organizational communication competence along three dimensions: competence assessment criteria, competence levels, and ecological systems. Such a conceptualization acknowledges the cognitive and behavioural components of communication competence, the developmental nature of communication competence, and the embeddedness of communication competence at various levels of analysis.' (p. 833)	Jablin and Sias (2004)
Architectural marketing capabilities	'Architectural marketing capabilities are defined in the literature as the processes by which firms plan appropriate combinations of available knowledge and other resources to deploy into their marketplace(s) and execute these planned resource deployments, transforming them into realized value offerings for target market(s).' (p. 293)	Morgan et al. (2003)

(continued)

Table B.1 (continued)

Type	Definition	Source
Two types of marketing capabilities	'We identified and assessed two types of marketing capabilities: specialized capabilities regarding the specific marketing mix-based work routines used to transform available resources into valuable outputs […] and architectural capabilities regarding the marketing strategy formulation and execution work routines used to develop and coordinate specialized capabilities and their resource inputs…' (p. 106)	Vorhies and Morgan (2003)
Marketing capability	'… marketing capability is defined as integrative processes designed to apply the collective knowledge, skills, and resources of the firm to the market-related needs of the business, enabling the business to add value to its goods and services and meet competitive demands.' (p. 19)	Weerawardena (2003)
Four functional export marketing capabilities	'… we focus on four functional export marketing capabilities: pricing capability, product development capability, distribution capability, and communication capability.' (p. 36)	Zou et al. (2003)
External marketing capability and internal marketing capability	MAC = Marketing Capability '… External MAC is a function of the extension of a firm's network positions and weak ties, and of such more individual competencies like the networking ability of key managers (or the owner-manager in micro firms), and their ability to develop valid cognitive maps of interrelated nets.' '… second MAC is labelled Strategic marketing capability. It is composed of two principal sub-capabilities, (1) market targeting and positioning capabilities, and (2) relationship developing capability.' (p. 20)	Ayväir and Möller (1999)
Marketing capability	'Marketing Capability. A firm with a strong marketing capability—exhibiting superiority in identifying customer's needs and in understanding the factors that influence consumer choice behaviour—will be able to achieve better targeting and positioning of its brands relative to competing brands.' (p. 8)	Dutta et al. (1999)

(continued)

Table B.1 (continued)

Type	Definition	Source
Marketing capabilities	'… marketing capabilities are the integrative processes designed to apply the collective knowledge, skills and resources of the firm to the market-related needs of the business, enabling the business to add value to its goods and services, adapt to market conditions, take advantage of market opportunities and meet competitive threats (Day 1994).' (p. 4)	Vorhies (1998)
Marketing capability (inside-out, outside-in, and spanning processes)	'… marketing capability represents both the upstream or outside-in processes as well as the downstream or inside-out and spanning processes in regard tp business processes.' (p. 73)	Tuominen (1997)
Inside-out capability, outside-in capability, and spanning capabilities	'Capabilities can be usefully sorted into three categories, depending on the orientation and focus of the defining processes […]. At one end of the spectrum are those that are deployed from the inside out and activated by market requirements, competitive challenges, and external opportunities […]. At the other end of the spectrum are those capabilities whose focal point is almost exclusively outside the organization. The purpose of these outside-in capabilities is to connect the processes that define the other organizational capabilities to the external environment and enable the business to compete by anticipating market requirements ahead of competitors and creating durable relationships with customers, channel members, and suppliers. Finally, spanning capabilities are needed to integrate the inside-out and outside-in capabilities.' (p. 41)	Day (1994)

(continued)

Table B.1 (continued)

Type	Definition	Source
Organizational communication competence	Conceptual definition of organizational communication competence consists of 13 related categories based on telephone interviews listing: friends; personal manner; successful behaviours; good leadership skills; understanding human nature; motivation; professionalism; organizational involvement; organized; feedback; interaction skills; effective verbal style; demonstration of knowledge (pp. 524–529)	Wellmon (1988)
Marketing capability	'The marketing capability of a firm is a multi-faceted phenomenon. It is a complex combination of the human resources or assets, market assets, and organisational assets of a firm.' (p. 187)	Möller and Anttila (1987)

Source By the author

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Chapter 16
A Relational Communication Strategy for Successful Collaborative Innovation in Business-to-Business Markets

Thomas O'Toole and Mary T. Holden

Abstract This chapter contributes to our understanding of interorganisational relationships (IORs) through the presentation of a relational communication strategy that incorporates a set of propositions about the features and mechanisms of the communication process in successful collaborative innovation. We propose that relational communication provides the lubrication to the process of collaborative innovation facilitating border-less interaction between parties. We examine the nature of collaborative innovation and the importance of communication to collaborative innovation's effective functioning in relationships. Features of our relational communication strategy in densely knit partnerships considered to be important in a successful collaborative innovation setting, include: (1) high frequency, bidirectionality, informality, and indirect modalities; (2) high communication quality, dense participation, and openness of information sharing of tacit and implicit knowledge; and (3) a shared meaning base and an open communication climate. The mechanisms that we propose that firms can and do use to increase the effectiveness of communication in successful collaborative innovation include: (1) interpersonal modes of communication and affiliation; (2) loose team structures; (3) electronic virtual communities and open information repositories; and (4) interorganisational communities of practice. Numerous examples and case vignettes are presented in order to support the need to focus attention on these issues.

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16.1 Introduction

Research on understanding relationships between firms has grown as we attempt to increase our understanding of how business–to-business relationships actually work. We aim to contribute to this understanding of interorganisational relationships (IORs) by exploring the communication process, its features and mechanisms in the context of successful collaborative innovation in business-to-business relationships. When parties come together to innovate it clearly involves communication but this is almost taken for granted. Hence, it is not overtly detailed in the literature. This follows a pattern of extant work on relational communication which also underplays communication as a core variable in determining how parties interact in interorganisational settings. We address this imbalance, and the chapter is structured by first understanding how communication provides the lubrication to the process of collaborative innovation, then we draw out the features and mechanisms of communication in successful collaborative innovation. We concentrate on communication in innovative relationships specifically where parties come together to add joint value to their products/services, business processes or models. The context is business-to-business where firms tend to be interdependent or embedded in rather complex interorganisational activities so examples and case studies are used as realistic examples of current practice. Interorganisational partnership is critical to joint decision-making and firms involved in collaborative innovation must integrate to seamlessly cooperate. They must also manage product development complexity through sharing of tacit information, high quality communication and interpersonal relationships. Relationships evolve over time and some of the character of a relationship is marked by how the partners handle major changes in interaction, one of which is a product or service innovation event. Interoganisational new product development can be dominated by either party in the dyad. In this chapter we focus on a type of innovation–collaborative, joint or co-innovation.

16.2 The Communication Process in Collaborative Innovation

Collaborative innovation is a bi-party exchange where actors participate collectively to add mutual benefit. Early work in social exchange theory identified cohesiveness (anything that attracts people to take part in a group) and communication (frequency of interaction) as crucial determinants of collaboration (Homans 1958). We define collaborative innovation as the type of innovation generated in process, product, technology or business system created via potentializing interdependencies between companies at a dyad or network level (Håkansson and Eriksson 1993; Andersen and Drejer 2009). Business-to-business innovation can be dominated by a powerful party or emerge from the relationship that uses its mutual dependence and cooperates for joint advantage—a

collaborative solution. These types of solutions are a natural evolution from the lead user method of new product development (von Hippel 1988) and are especially applicable in business-to-business markets where, for example, in effect, customers such as manufacturers are already highly involved with innovative suppliers (Johnsen 2009; Athaide and Zhang 2011). In business markets buyers and suppliers are integrated in value chains. For example, Autoeuropa, a Volkswagen (VW) subsidiary, is a production plant in Portugal for VW models Scirocco, Eos, Sharan and SEAT Alhambra producing 112,500 vehicles per annum. VW have invested over €3.5 billion in the plant since it opened, and the group strategy to 2018 is aimed at becoming an economic and environmental leader in the global automotive industry (Volkswagen 2011). To achieve this they have pursued long-term relationships with suppliers based on mutual trust and embracing intensive exchange of know-how and skills. These relationships have become more intensive over-time as Volkswagen pursues a strategy of sharing similar product components across a range of its brands increasing the volume and importance of suppliers as the strategy is fully implemented. Typically some of these suppliers will work in the manufacturer's plant and have dense ties across the organisation and supply chain, and honed cross organisation problem solving capabilities (Hillebrand and Biemans 2004; Wynstra et al. 2010). Volkswagen cannot maintain an intense relationship with all suppliers and have a tiered system. First tier suppliers are expected to assume responsibility for second and third tier suppliers. Naturally in such a scheme the role of the supplier in the network and the level of knowledge shared and communicated is dependent on their tier.

Collaborative innovation does not work for everyone but in the context of mutual interdependence is a natural outcome of the long term relationship (van Echtelt et al. 2008; Athaide and Klink 2009). It does have the advantages of lowering transaction costs and risks that would be associated with involving outsiders in new projects. Additionally, collaborative innovation is a fluid problem-oriented mode which can adapt easier to the demands of the parties and does not require a highly structured new product development approach to function. Most costs and eventual benefits are readily understood by the parties and they are ready to work together immediately on any problem.

Collaborative innovation is messy and unstructured. It requires deep communication at all levels within the cooperating firms to work; communication acts as an essential coordinating mechanism. Communication is the process of sharing knowledge and of building up a shared understanding and expectation of the partnership. In collaborative relationships, communication processes and systems are already in place which facilitate a seamless knowledge exchange—little effort needs to be put into it to happen. One apt metaphor to describe communication in relationships is 'the glue that holds organisations together'. Communication has not always received the attention in marketing that it deserves. This was highlighted by Duncan and Moriarty (1998) who argued for communication to be the 4th P of marketing underlying the product, price and distribution (place) mix due to the growth and development of relationship marketing. This is even more

obvious in business-to-business markets where firms are interdependent and information sharing is at the heart of the way exchange processes are managed.

Communication theory is built on the structure and flow of information and knowledge exchange between parties. A starting point for understanding it is the basic model of communication which includes a source, a medium or channel, a receiver, and crucially, feedback and noise (interruption) (Krone et al. 1987). The components of relational communication strategy for successful collaborative innovation as outlined in Table 16.1 concern aspects of this model albeit applied to individuals and groups in organisations, between organisations, and in wider systems. The power of communication in collaborative innovation is in the process but also in the dialogue between the partners. Rich communication between partners conveys and creates explicit and tacit knowledge. In relationships, a lot of explicit knowledge is readily accessible due to its codification but it is tacit knowledge that is created through interaction, dialogue, idea sharing, and jointness which is where the real power of communication in a collaborative innovation setting comes into play. Relationships, with deeply embedded routines and systems, have a major opportunity to use communication to create new knowledge that can be exploited by the parties.

From Table 16.1 the authors are proposing that for the successful management of collaborative innovation, a relational communication strategy encompasses:

a. frequent and two-way communication
b. indirectness and informal modes
c. high in quality—accurate, complete, adequate, timely, credible
d. participative with the open sharing of tacit and explicit knowledge
e. shared meaning base
f. open organisational and interorganisational communication climate
g. frequent face-to-face interactions
h. affiliative interpersonal relationships
i. loose interorganisational teams
j. electronic virtual communities and open information repositories
k. interorganisational communities of practice

A–f represent the features and h–k the mechanisms of a relational communication strategy in successful collaborative innovation. Each of these elements will be developed in the second half of the chapter.

Mechanistic and behaviour communication perspective have been applied to relationships in a number of studies as shown in Table 16.1 (see, for literature review of extant research, Holden and O'Toole 2004a, b). The implication from the mechanistic perspective in a collaborative innovation space is that these relationships would involve highly frequent communication, be bi-directional and, given its problem solving nature, there would be a strong element of informality, and non-directedness or jointly formed solutions rather than imposed ones. In terms of behaviour, the quality of communication would be high with dense participation among a range of actors across both organisations. Open information sharing of tacit and explicit knowledge is a feature of collaborative relationships,

Table 16.1 Components of relational communication strategy

Components	Sample application	Dimensions	To collaborative innovation relationships	Component type
Mechanistic	Mohr and Nevin (1990)	Frequency, direction, modality, context	High frequency, bidirectional, informality, indirect (discussion)	Feature
Behaviour	Mohr and Spekman (1994)	Quality, participation, information sharing	High quality, dense participation, open information sharing of tacit and explicit knowledge	Feature
Interpretive symbolic	Barnett (1988), Hatch (1993)	Communication culture and climate	Shared meaning base, open organisational and interorganisational communication climate	Feature
Information richness	Daft and Lengel (1984, 1986), Barry and Crant (2000), Mason and Leek (2012)	Range of media assessed by richness—face-to-face highest	Interpersonal, face-to-face, proximate	Mechanism
Topoi of relational communication	Burgoon and Hale (1984), Salomonson, Åberg, and Allwood (2012)	Range of interpersonal elements	Affiliate interpersonal relationships	Mechanism
Knowledge networks	Brown and Duguid (2001), Uzzi and Lancaster (2003), Hansen, Mors, and Løvås (2005), Tagliaventi and Mattarelli (2006)	Formal and informal teams, on-line communities, information repositories, communities of practice	Loose teams, virtual communities, shared information repositories, and intergorganisational communities of practice	Mechanism

including proprietary information, and is likely to be essential in collaborative innovation as it is the very basis of open innovation systems (Gassmann et al. 2010). The development of the open source software model has led to the adoption of resulting technologies as users have found superior performance from these over rival closed-developed solutions, for example, the Linux operating system (von Hippel 2005). The third component of a relational communication strategy referred to in Table 16.1 is interpretative symbolic. It is centred on social interaction and social context and develops over time a pattern of shared meaning from common events, behaviours and actions (Krone et al. 1987). The shared meaning base is accompanied by an open organisational and interorganisational communication climate—a system of communication which differentiates a particular set of collaborating parties. This system is a characteristic of the relationship that makes possible the open and rich tacit knowledge exchange at the heart of successful collaborative innovation.

The first component of our relational communication strategy in Table 16.1 that forms part of the mechanism of the strategy is information richness. Information rich media are proposed to be those that are interpersonal, face-to-face and proximate. Information rich media is readily applicable to collaborative innovation due to its need for deep interaction. This must be rich and purposeful to develop better solutions than those arrived at independently. The information rich mechanism for achieving this is interpersonal and face-to-face communication. These mechanisms of communication tend to reduce any potential for equivocality. Indeed, alternative approaches to developing innovation with third parties would have to specify, for example, in a new product alliance agreement, strict communication guidelines and protocols to avoid equivocality. The topoi of relational communication provide further specificity on the nature of interpersonal relationships needed in successful collaborative innovation, for example, mutual liking and affiliation are likely to be part of the social fabric of the relationship. These types of personal relationships between the core boundary spanners in the innovation context will keep the project going and facilitate risk taking behaviour in the partnership.

It is the authors' belief that maintaining strong ties across both organisations is an essential component of relational communication in collaborative innovation—knowledge networks. One essential aspect of a knowledge network in collaborative innovation is the team. In a relational setting it is self-governed and loose which allows maximum sharing of tacit knowledge without the typical boundaries prescribed to teams. The interfirm innovation research literature is beginning to incorporate into studies electronic virtual communities and open information repositories which can complement interpersonal mechanisms particularly where geographic boundaries impede physical meetings. The mechanisms often associated with a more social oriented approach to communication are boundary roles, as specified, and communities of practice. The establishment of a community of practice for collaborative innovation is a mechanism used more in a wider network

of innovation rather than at the interorganisational level. However, the concept of communities of practice to inspire constant innovation might warrant more attention where likeminded people across both organisations are encouraged to develop practice communities that share all types of knowledge.

Table 16.1 presents a relational communication strategy for successful collaborative innovation. Obviously for it to work it must do so at individual, group and organisation levels. Although the literature is replete with reference to communication, it is often assumed rather than acknowledged explicitly in IORs perhaps because it is subsumed as part of the 'atmosphere' in relationships and networks. Yet, due to the interfaces that exist in complex networks and because we are talking about individual human beings interacting, communication is essential to lubricate the process between seller and buyer at a human contact level and via technology. Innovation can be driven by changes in the external environment which requires effective communication between individuals in the same organisation, between team members and within the organisation more generally which, in turn, must be complemented with communication between individuals and teams in a partner organisation. In collaborative relationships, there is likely to be symmetry between all these levels and if any change happens at one level it can be accommodated by the next or mitigated by it, if adverse. Communication in a relationship is multi-layered and multi-level and comes alive in the interactive processes between the parties.

16.2.1 Communication Between Individuals

In collaborative innovation, communication between individuals is likely to be fluid, open-ended and problem-oriented. The history of past cooperation will have created a communication climate and a set of embedded relationships which makes communication between individuals in the partnering organisations effortless. Communication of this type is not easy to replicate. In effect, it is not a feature of the competitive market situation faced by most companies. In this context, communication is an asset as it has a rare quality only sustainable where parties have a history of unique trading relationships. Indeed, the possible risks of information sharing between individuals across companies can be what most preoccupies organisations. Will proprietary company information be revealed? Will advantage be taken? In a collaborative setting, these risks are set aside for mutual gain. In a business-to-business relationship, the locus of innovation is often a problem to be solved for the partner in which case the ownership of the innovation remains with the partner who brings the expertise. In terms of non-product/technology based innovation, the knowledge rests in people whom can bring it to other situations. One of the biggest risks is often the potential that people might leave to go to another job.

16.2.2 Communication Between Teams

Given that new product development (NPD) in general requires inter-functional coordination, much focus has been placed on how this originates, develops and is managed. Numerous studies have examined the interface between research and development and marketing but, in interorganisational NPD, these interfaces are more pronounced encapsulating complex relationships. The NPD team in collaborative innovation incorporates people who work for independent organisations. How these teams emerge, work and produce desired outcomes is crucial. This has called into question the relevance of the stage-gate model and the assumption of a linear and sequential process to NPD in which one party can manage and conduct the processes needed to complete the product development cycle. Instead, the reality is one of complex interaction within networks in dynamic and changing environments. To understand communication within and between teams requires investigating not only the beliefs and actions of individuals but of the group encompassing issues of status, power and socialisation processes amongst others. What makes collaborative innovation teams different is that they can eschew the need for formality and work quite independent of organisational control to get the job done. An individual's contribution depends on the task at hand and who is needed from both organisations. If others are needed, they can be called in as the work dictates. This informality can lead to knowledge-rich solutions.

16.2.3 Communication within and Between Organisations

While organisational learning has become a catch-all for the process of how organisations acquire, disseminate and apply information, involvement in NPD at the organisational level can take many forms varying by size (number of participants), formality, number of organisational levels involved, the nature of the development—radical versus incremental. Much of what an organisation can do in the collaborative innovation space is bounded by its internal communication climate. If it is not open then it cannot be so with another partner. Effective organisation and management of communication at individual, team and organisational levels is crucial to successful outcomes. The managerial challenge is to ensure the most appropriate structure to effect the required solution. To misquote the management theorist, Peter Drucker (1909–2005), the right organisational structure will not guarantee success but the wrong one will ensure failure. Task forces, matrix structures and venture groups have been advocated to avoid such failure. At an organisational level, managers have to balance loss of control with the autonomy needed to be collaborative. Rather than controlling the process, managers need to focus on the outcomes and freeing up process blockages. Organisational level signals should be directed at open communication and interaction with the partner. The emphasis on the social-oriented relationship in collaborative

innovation is in the creation of the interdependent entity—a shared system of beliefs and purpose across collaborating organisations.

16.3 Features of Communication in Collaborative Innovation

16.3.1 Frequency, Bidirectionality, Informality and Indirect

The authors are proposing that for the successful management of collaborative innovation, a relational communication strategy encompasses frequent and two-way communication, indirectness and informal modes. These features mark out the intensive nature of communication between the collaborators.

Part of the features of relational communication in an IOR context is high frequency especially in a collaborative innovation project; obviously, information will travel in both directions—a core feature of close relationships; communication will not be procedural and rule bound but will be free flowing and also high in social content; indirectness will be favoured over power dictates and discussion and debate used to resolve problems. These stratagems will be reflected in all the levels previously mentioned—individual, team, and organisation. Enabling this type of communication necessitates deep interorganisational trust and commitment. Often in buyer–supplier relationships where strategic sourcing is prevalent, you might expect intense communication in innovative activity but this may rarely be the case as the underlying cooperative base is not there. For example, powerful, large scale firms may control the exchange and much of the network. Even in cases where they don't, intense communication may not be part of a firm's strategy for knowledge creation.

Dominant firms play major roles in the UK oil and gas industry in the North Sea—large global operators like BP and Shell. In line with a network industry perspective, the innovation process can incorporate these operators, integrated large global contractors, and smaller technology, service and support suppliers. As in most industries, suppliers are divided into tiers, for example, suppliers of drilling equipment might be first tier and suppliers of drilling equipment technology such as closed circuit television might be second tier. The industry is characterised by complexity due to the nature of its operations and its impact on the natural, political and economic environment. In complex oil and gas firm networks, one would expect communication to be intense but collaborative innovation is still rare even in a scenario where huge complex innovations are often inherent in the way firms operate. These innovations are largely prescribed and formalised by a powerful party, either the operators or integrated contractors which means that intense communication as described here is mitigated; the communication culture and climate at the organisational level does not support

collaborative innovation. Collaborative innovation seems to only happen in pockets. Much of the technology developed in the industry is custom, therefore communication of information, knowledge transfer and integrated processes is complex due to the newness of the challenge. The operator may start the process by seeking an innovative solution to a problem, a drilling problem for example, and invite tenders or a formal process for submission and evaluation of proposals, but it is the individuals from both the integrated contractors and smaller technology suppliers that manage the relationship and are primarily involved in communication with the network. Communication is thus dependent on the operator to provide the opportunities (the problem to be solved) but relies on a close relationship with the other partners to apply and exploit the knowledge. By getting together via brainstorming, individuals in these firms identify missing products or that which would be useful to have in order to improve their drilling and exploration performance. As it was put to us innovation is not about people in white coats developing things—it is much more complex—trying to get people together with varying perspectives from different disciplines in order to develop a cohesive team to deliver the product solution. The individuals from the cooperating organisations communicate with intense frequency and exchange of information is two-way but requires clearance for proprietary information. This mode of innovation is on the collaborative scale but not truly co-innovation because communication is more formally mediated by the dominant larger firms than intense and self-directed. In collaborative innovation, partners know each other so well that the need for formality in documentation and systems is only necessary when there is a crisis but, even here, past experience will direct that solutions will be found through the relationship. It can be hard for outsiders to the relationship to understand the informality–boundaries are not placed on communication and social relationships are encouraged. The risks inherent in the relationship are just not present or perceived. Returning to the oil and gas example, the operator who triggered the process values more formal communication and formal reports of progress although they are happy to be kept informed at other times via e-mail. They need to know what was going on and be able to report on progress to more senior management who are not directly involved in the NPD activity. Part of this formality is due to the safety requirements in this industrial context (risk of an environmental disaster) with proof of a formal paper trail should it be required. Thus both formal and informal communication is essential to progress.

The global nature of the oil and gas industry makes such formality an imperative in many situations but reduces the potential of informality to produce innovative ideas. Even through communication was frequent and bidirectional between the partners, the rules of engagement were set by the dominant partner and the individuals involved chosen by both parties and tightly time managed. Informal communication features are closely related to indirect methods of communication, that is, the use of influence and persuasion rather than power in a relationship. Trying to persuade a partner to try a solution or following and making suggestions about how processes could improve facilitates better performance in

collaborative situations. The nature of our insight provided into the oil and gas industry would seem to suggest an under-utilisation of this feature of communication due to organisational-level restrictions and a greater reliance on formality and direct requests and recommendations with implied consequences of not doing same.

16.3.2 Quality and Dense Participation

For the successful management of collaborative innovation the authors are proposing that a relational communication strategy also encompasses one that is high in quality (accurate, complete, adequate, timely, credible) and participative.

There are many communication barriers that block quality information transmission across organisations. In a relational context, collaborative innovation is taking place between organisations without boundaries making it possible for high quality information to flow between the partners. Knowledge exchange that is accurate, complete, adequate, timely and credible is a major advantage to the speed and richness of the dialogue between organisations. The kind of information search and request difficulties that can occur and problems with information asymmetry are just not there. Running side by side with quality is participation which enhances the amount of tacit knowledge shared between the partners. Dense participation across the structural levels of both organisations is a feature of relational communication in collaborative innovation.

Our relational communication strategy proposals here can be implied from studies that have investigated hierarchical relationships in an organisational context. Results suggest that in many of these types of relationships, communication is one-way as the hierarchical structure restrains the upward flow of communication and, if low levels of trust exist in these relationships, information is distorted and poor in quality (Jablin 1979; Stohl and Redding 1987). The exchange of information high in quality occurs when the relationship is characterised by a high level of trust. Dominance can cause withdrawal which can manifest itself in many ways such as infrequent, if any, communication, no feedback, the use of more formal channels, no participation in planning or forecasting, and limited information sharing—in other words, a limited functional approach to communication. Furthermore, because communication is the means by which power is exercised, dominance may result in a pursuit of self-interest over mutual interest, hence dominance can result in manipulation of communication and its media. This type of hierarchical communication is the antithesis of that needed for collaborative innovation.

Participation in a relational communication strategy is one which facilitates those who need to be. Density of participation across both organisations is likely to see much mutual interaction between firms, equivalent to strong relational ties. Strong ties between individuals enhance information stickiness from a knowledge network perspective (Bush and Tiwana 2005) and ‘unstick’ information from an

innovation perspective (von Hippel 1994), and are ideal for transferring complex knowledge (Hansen 1999). Mutual cooperation over time and joint problem solving means that a range of people have built up collaborative experience and can participate in any new product project. The ties that bind members in both organisations together are the result of frequent interaction on important issues and are at multiple levels across both organisations. This dense participation involving strongly tied actors from both organisations is a huge relational communication strategy resource for successful collaborative innovation.

16.3.3 Openness of Information Sharing of Tacit and Implicit Knowledge

From Table 16.1 the authors are proposing that for the successful management of collaborative innovation, a relational communication strategy involves, as part of its features, the open sharing of tacit and explicit knowledge. That is, sharing of information up to and including that which would not be shared with others (proprietary) and keeping each other informed of developments and trends; the sharing of ideas is unrestrained. In collaborative innovation, open sharing of information is what makes for superior new products. If information sharing is open, then it can be translated into knowledge in the partnership which would not be available where release and exchange of information is strictly controlled by either partner.

Increased information sharing is now taken for granted in product development settings and open information sharing is viewed as a potential relational competence (Cousins et al. 2011; Athaide and Klink 2009). Even in consumer goods companies with large internal research and development departments, managers have realised that they cannot meet their new product growth targets without bringing in others to their new product development hub. This is done by releasing product information to users and peer communities and encouraging them to collaborate in the company's development process. The risk of losing proprietary information is higher in this approach but companies can put in place safeguards to ensure they minimise risks of information loss and maximise the development opportunities gained from a wider and more diverse network of participants in the process. Total openness of information sharing between parties in a business-to-business setting is reliant on trust. Many business-to-business relationships have a base of information sharing that could easily transfer to an innovation setting due to their already integrated buyer–supplier processes and systems. Business services firms are starting to realize the benefit of service process collaborative innovation. For example, a leading UK law firm, with a major high street bank as a client, developed a bespoke IT system to serve their customer's customer. Dealing with law issues for the bank's clients, the law firm has a dedicated intranet to link their

legal dealings to the bank so that the Bank's Relationship Manager keeps up-to-date with their client's affairs. Any deadlines that pass are flagged in red to alert not only the lawyer but also the Bank. They can then decide to inform the client or take whatever action they deem appropriate. Obviously, given the sensitive nature of clients' finances this has to be done with their permission.

To realise fully the potential of sharing tacit and explicit knowledge in collaborative innovation, an openness and willingness to share must exist between partners. This will only happen in a relationship characterised by high trust and reciprocity. It is the mix of open explicit and tacit knowledge sharing that has the potential to contribute to successful collaborative innovation.

16.3.4 Shared Meaning Base and Open Communication Climate

The final feature of our relational communication strategy for successful collaborative innovation proposed is a shared meaning base and open organisational and interorganisational communication climate.

The interpretative symbolic approach underlies this relational communication strategy feature, see, Table 16.1, and is an apt way of describing a communication system that is unique to the parties. It is centralised on social interaction and social context. The communication of information to another cannot occur without both individuals sharing a common meaning base, that is, a shared "symbol-referent system". Mutual understanding is formed through bonding with others via social interaction which leads to the creation of shared meanings and behaviour and is influenced and changed by an altering social context (Krone et al. 1987). Organisational culture develops from this and shapes how a particular company might interact with another. If its internal communication climate is not open, it is difficult to see how it can use an alternative strategy in its relationships, hence the choice of a collaborative partner is crucial. A culture and climate of communication is learned and resistant to change, it is part of an organisation's identity. A strong history of shared meaning developed through individuals and systems over time predicates the type of communication climate now present in the relationship. Macneil's (1980) classic description of relational contracting norms presents one situation where, when parties have developed a unique close management structure, norms are akin to those of 'mini-societies', or 'mini-states'. This is a powerful position for collaboration innovation to prosper. It is likely to produce solutions much richer than either party acting alone or as a dominant actor. Firms cede power to the relationship but create added joint value. Most organisations have different values and cultures so merging these for collaboration isn't easy. Communication is the driver of integration as it involves understanding of difference and a dialogue on what the partnership can deliver.

16.4 Mechanisms for Effective Communication in Collaborative Innovation

16.4.1 Interpersonal Modes of Communication and Affiliation

From Table 16.1 the authors are proposing that for the successful management of collaborative innovation, a relational communication strategy will have among its mechanisms frequent face-to-face interactions and affiliate interpersonal relationships.

Daft and Lengel (1984) developed a communication model utilising media richness as its framework. They suggested that face-to-face medium usage is the richest due to immediate feedback and ability to read the other person's expressions. It has been found to be important in new product development but, crucially, when combined with a strong relationship can differentiate success (Ganesan et al. 2005). The type of relationship needed is well described in Burgoon and Hale's topoi of affiliate interpersonal behaviours. The collaborating partner could be considered as a friend or as having a rare working relationship. In an IOR, boundary spanners perform key roles in the continued maintenance of affiliate interpersonal relationships.

Inter-functional integration within organisations and interorganisational integration between members within a NPD network is critical to integrated decision making in innovation. Partners must integrate and cooperate to manage the complexity arising from an ever changing external environment. Traditionally, the salesperson/buyer performed this role, but this has long since proved inadequate to embrace the necessary skills to ensure successful communication and, ultimately, successful NPD. Part of the problem is the different culture and language spoken between engineers, accountants and marketing who have different backgrounds, knowledge and experience. Indeed engineers may prefer to speak with their counterparts in other organisations rather than functional colleagues in their own organisation. One solution is the business development manager whose role is to coordinate company resources behind customer solutions and this requires new skills and abilities not found in the traditional role of the salesperson. This new breed requires an understanding that the boundary spanning exchange role involves human interaction and focal to human interaction is communication. Numerous authors (Biemans 1992; Markham and Griffin 1998) refer to those individuals who are capable of marshalling support, overcoming obstacles and virtually pulling the development project to completion by their sheer will and energy, as product champions, mentors or relationship promoters. These individuals are characterised by energy and passion and will act as the driving force behind the collaboration (Walter and Gemünden 2000). Collaborative innovation requires champions in both organisations to push on and continue to have faith when all around them lose it. They become the arbitrators and architects of communication when all else fails.

Lynch and O'Toole (2010), in a case study on collaborative innovation between a food manufacturer and its packaging partner, found the IOR tied together by the strong bonds of friendship and trust between two key boundary spanners—the engineering manager in the food manufacturer and the technical director in the packaging supplier. The case revolved around a problem with wastage caused by the sealing layer in the packaging, when subsequent innovations failed to solve the problem, it was the affiliate relationship between the boundary spanners that got it across the line and eventually produced a solution that was not only beneficial to both partners but also had other market place applications.

We are proposing that personal modes of communication as practiced by a business development manager or other boundary spanners and their interaction with partnering organisations are ideal mechanisms for collaborative innovation. Face-to-face communication works as the best medium for transmitting complex information and for problem solving in innovation. Interpersonal communication and face-to-face media are most associated with collaborative, people-centred forms of knowledge creation which uses interorganisational talent to its optimum. All other modes of communication are also relevant but it is a matter of emphasis. Interpersonal modes, especially, face-to-face, will be prominent in collaborative innovation.

16.4.2 Loose Teams

The authors are proposing that for the successful management of collaborative innovation, part of the mechanisms of a relational communication strategy include loose interorganisational teams.

Communication in collaborative innovation is supported by looser structures; ones that are not over-regulated. In the type of open system we describe in this chapter, the people on both sides of the relationship are basically self-governed. The teams are made up of those that need to be there. They are not devoid of politics or conflict but can resolve problems through the goodwill and interdependence characteristics of the relationship.

Teams that are formulated to solve new product development problems are common. The issues in getting such teams to cooperate together within an organisation and its units are well documented. Often previous ties and personal relationships can inhibit the flow of information in organisational settings. There are many people articulating the need for more open teams to mirror what is happening in, for example, the open source software development movement so as to capture ideas at the boundaries and to involve more people in the hope of getting richer solutions (Baldwin and von Hippel 2011). Given this background, the creation of teams to solve interorganisational NPD projects might seem a daunting managerial task. The creation of fluid structures can only emerge where a relational communication strategy is pursued. In business-to-business relationships, partners can respond to a problem and solve it; in parallel a whole host of related solutions can emerge to provide further quality and cost savings. This mode of

development only thrives where loose structures can be put in place, resources found, and the contacts across the organisation brought together to solve the problem. The opposite–more planned product, process, technology, or management improvements–will be targeted through review, but can form a similar structure for optimal solutions to emerge. Loose team approaches seem impossible to manage, but their beauty is their self-governance. They only last as long as they need to and dissolve again once the problem is solved. The process, even when conflictual, can deepen the relationship. The self-governing nature of these types of interorganisational teams puts no barrier in the way of information exchange and communication and, as such, is ideal for collaborative innovation—the best ideas will surface where people are given the freedom to act and engage creatively with others.

16.4.3 Electronic Virtual Communities and Open Information Repositories

We are proposing that for the successful management of collaborative innovation, another major mechanism of our relational communication strategy is electronic virtual communities and open information repositories.

Virtual communities link individuals, teams and organisations who share common interests using electronic media. As such, they form a community of interest rather than the more permanent community of practice described below. The use of electronic media to create knowledge sharing platforms for innovation or as a resource to draw from in the case of an information repository cannot be underestimated. Monge and Contractor (2003) found that, in organisations where information repositories existed, it increased the flow of information as people where able to draw on the expert or source a particular piece of knowledge. The range of electronic tools for information exchange is extensive; as a communication mechanism for collaborative innovation, its usage is for the creation and maintenance of dialogue across organisations and as a platform for information sharing.

Buyer–supplier relationships with high degrees of involvement in collaborative innovation are often proximate and will have people and other resources in each others' plants and premises. This interchange will be relatively fluid during project development. Direct face-to-face contact will be complemented by other forms of communication including traditional electronic forms of communication such as e-mail and mobile telephony message exchange (texting), and using information generated in information systems controlled by either party for production, supply and logistics. It is not always possible to enjoy the face-to-face contact given the geographic separation of many businesses which is where virtual communities and information repositories can be used as a supplement to other mechanisms of communication.

The increase in bandwidth and the reduction in cost of Internet connection and the ease of video conferencing across the Net enables a virtual face-to-face communication channel. On-line communities are present in many markets and across many services and products. Their use in certain innovation settings is prevalent, for example, the open source software community is one practical exemplar of a virtual community of practice. In business-to-consumer markets, companies have tried to use the Web to engage customers more actively in new product development and demonstrate the impact of their inputs. The potential for business-to-business virtual communities of innovation is growing from the sharing of information through interorganisational information systems to the use of simple on-line repositories to share and work together in a seamless real time virtual way. Huge ranges of technical and process information is now shared on-line. This enables design and engineering problems to be discussed and options shared on-line. In a collaborative setting, virtual communities can be doing this on a continuous basis. Sharing technical and other information can also occur through an information repository. Information repositories are becoming more a feature of business-to-business exchanges having started as internal systems in complex service organisations, like consultancies, which had a need to share methodologies and previous projects with everyone inside their organisation. Shared information in this way can create a historical record of what was tried in the past and reflect on the lessons learned, thus strengthening the embedded problem solving capability between the partners.

16.4.4 Interorganisational Communities of Practice

The final mechanism of our relational communication strategy proposed by the authors to impact on successful collaborative innovation is interorganisational communities of practice.

A community of practice is a group of people who engage with each other over a sustained period of time to develop a skill or area of knowledge through collaboration, conversation, and exchange. Tacit knowledge is often transferred through direct interaction within a community of practice environment (Hienerth and Lettl 2011). Its members take stewardship for the learning of newcomers and of the development of the subject matter itself. In successful collaborative innovation, partners have built up an interorganisational community of practice which has shared resources, developed problem solving routines and has learned together. This community is linked to many others to which members are part of, thus widening out the network resources available to the partners.

In effect, communities of practice can connect organisations to the outside world. Without this connection, IORs can suffer from insularity and block out information and communication that is inconsistent with their views and, in this

way, could actually stymie creativity. One external community that organisational members are part of is their professional body which, by definition, can link knowledge workers on a global basis. Many knowledge workers are required to be members of a professional body which are in themselves communities of practice but of course the self sustained community of practice such as that among a group of research and development managers or engineers in a particular field is often much richer in terms of information exchange and knowledge creation. These networks are essential to new ideas but also may bring in outside knowledge to a collaborative innovation project. On-line networks that support communities of practice are prevalent, for example, the growth of the professional network 'LinkedIn' has been phenomenal. Communities of practice created by interfirm connections are more formalised in that they arise from a formal structure but are sustained on the same basis as regular communities of practice. An interfirm community of practice might be a group of engineers across different tiers in the supply chain and their counterparts in the buying organisation. These communities, in a collaborative system, bring hidden solutions and creativity which could not be accessed or planned through any other communication mechanism. On a dyadic level, interaction of this type is routinized in long evolved mutual cooperation between like minded individuals. Communities of practice as nodes in a wider network and those directly involved in a particular collaborative project are essential portals to connected worlds which bring a multiple of actors directly and indirectly to a problem situation. The attraction of collaborative innovation, albeit a rare form of innovation as implied in the definition of this chapter, is that it inherently avoids many of the risks associated with information asymmetries in such communities.

The authors and colleagues (Kelliher et al. 2009; Bugge et al. 2010; McGrath and O'Toole 2012; Lynch et al. 2013) have been engaged in using their university to create knowledge networks which, in part, share a collaborative innovation objective across a range of businesses in tourism and small-to-medium sized enterprises (SMEs). Using the university as a hub for knowledge exchange, learning communities are developed into communities of practice which have been engaged to share ideas, solve business problems, create opportunities and promote innovation. On the innovation side, the main impact has been in service innovation in the tourism sector such as in joint marketing and bundled products and services, and in the SME arena, access to innovation resources through the networks created and to potential innovation partners. Creating 'live' communities of practice, and developing skills in knowledge creation and sharing in enterprises with a predominantly independent mindset, has added value to the participants and created sustained innovation after the university-led knowledge exchange initiatives ended. The university is now an invited innovation partner by some of the past participants in its created communities. Communities of practice as mechanisms to foster innovation can work and can be nurtured.

16.5 Conclusion

The features and mechanisms of our relational communication strategy are often overlooked in collaborative innovation because they are taken for granted. The aim of this chapter was to match the work done on relational communication with collaborative innovation; it begins to answer the question as to what type of relational communication strategy is appropriate for successful collaborative innovation. It borrows from work done on communication in closely coupled, mutually-oriented relationships and applies it to innovation. Features and mechanisms for communication in collaborative innovation projects are sketched out in some detail in the chapter. Whilst these will need empirical testing, they follow from case work by the authors and case evidence from extant research literature. Managers should be aware of the potential effect communication can have on an innovation project. Successful collaborative innovation can only flourish if the communication culture and climate is open and shared between the partners. The features and mechanisms of a relational communication strategy in this chapter provide the toolkit to enable it to happen.

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Chapter 17
Achieving Market Leadership with Collaborative Innovation: The Case of Technology-Driven Companies

Eric Viardot

Abstract In the last few years, there has been a major paradigm shift in the innovation process with the rise of a "collaborative innovation" process where an increasing proportion of innovative firms now rely heavily on external support for innovation. Technology companies are at the forefront of this revolution and this chapter analyzes how those firms have dramatically modified their communication strategy within the innovation process. The priority is now on a "pull" communication strategy in order to get new ideas from different sources in the environment but there is also a change in the "push" communication strategy with the offering of open access technology in order to help external partners to develop complementary solutions. The collaborative innovation is also redefining the branding strategy for innovation, which has often been the favorite communication strategy of successful technology companies. Finally collaborative innovation is impacting the global commercialization strategy of innovative technology companies, another proven way to accelerate market dominance. The chapter concludes on the managerial implications of the new collaborative innovation trend with the dominant role of communication.

17.1 Introduction

Companies are increasingly putting more emphasis on innovation. In a recent survey of large global companies by Capgemini, 76 % of executives indicated that innovation is among the top three priorities of their organization and the main lever for growth (Klokgieters and Chu 2013).

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Innovating is not an easy path to market success as illustrated by the fact than more than 90 % of new products introduced in the market usually failed within their first year of introduction (Nielsen 2012). One reason is that it is difficult to anticipate the market potential of an innovation as many inventions proceed to solve a specific problem but often turn out to have unexpected uses in unexpected conditions (Klein and Tornatzky 1982). Another cause is that very often, the impact of an innovation relies on complementary inventions, which contribute to a full system solution that will add to its performance and, consequently, its demand (Chesbrough and Teece 1996). An extra source of uncertainty is that development time for these complementary innovations can fluctuate very significantly (Viardot 2011). For example, the first patent for a solar collector was actually given in 1886 to the Italian Alessandro Battaglia in Genoa, Italy but it took almost one century to have all the equipment to build and operate the first concentrating—solar plant in 1968 (Butti and Perlin 1980).

But the failure to innovate is much riskier than the alternative of doing nothing while a successful innovation can be the source of a unique and sustainable differentiation which provides a competitive edge and generates a significant profitability. Some companies have even managed to achieve a "winner-takes-all" position (Frick and Torres 2002) for a given innovative product category with a very dominant market share.

This is especially notable in technology driven industries like telecommunications, electronics, or information technologies and services, where the pace of technology innovation is quite substantial with the consequence of the rapid introduction of new products and the reducing of the products' life cycle. Technology firms are emblematic of the way to attain success in the business thanks to an innovation strategy. In fact, in a survey done by the BCG every year since 2004, where more than 1,500 executives are polled about the most innovative companies, the technology and telecom companies constantly dominate the top-ten list, with Apple being number one every year since 2005 and Google being number two every year since 2006 while Microsoft has been in the top ten every year since 2005 and IBM and Sony have been in the top ten nearly every year since 2005 (Boston Consulting Group 2012).

Table 17.1 provides a list of those market leaders in the technology sector. The name of the company is usually associated with its major successful innovation, even though the company may be diversified in other businesses. For example, Google is closely related to web search engine, as Microsoft is with PC software, or Apple and Samsung with smartphones.

An analysis of the various case studies shows that all those winning companies rely less on technology than on their marketing capacities to transform a successful idea into a product or a service which is valuable to customers (Viardot 2004). Among the marketing skills which those firms have developed, communication is extremely important in order to create awareness for the new product in the market and to convince "early adopters" to buy the innovation (Frattini et al. 2013).

This ability to communicate externally has become even more fundamental as in the recent years, there has been a major paradigm shift in the innovation process

Table 17.1 Dominant companies in various innovative product categories (Market share 2012)

Industry	Market share of the dominant players (%)	Names of the dominant players
Mainframe	90	IBM
Browser	90	Google, Microsoft, Mozilla
Operating systems	85	Microsoft
Digital map	85	Navteq
PC microprocessors (notebooks)	83	Intel
PC microprocessors (desktops)	74	Intel
Database software	72	Oracle, IBM, Microsoft
Smart phones OS	68	Android
Networks systems (routers)	68	Cisco
Search engine	67	Google
Social networks	61	Facebook
Personal computer	59	HP, Lenovo, Dell, Acer, Asus
Custom chips	49	TSMC
Cell phones	48	Samsung, Apple
ERP software	47	SAP, Oracle, Microsoft Dynamics
GPS systems	38	Tom Tom

Source Companies annual reports, press release, Reuters, Blooberg, MedAd news, IDC, Gartner group

with the rise of collaborative innovation (Baldwin and von Hippel 2009) as the proportion of large innovative firms that rely heavily on external support for innovation has increased dramatically in the last few years (Roberts 2001). This trend will certainly go on in the future as companies consider that the world is substantially more volatile, uncertain, and complex than before. Thus regarding innovation, top executives believe that their organizations will no longer succeed alone when faced with the complexity of the world and they have to engage and collaborate with the external world system of customers, partners, governments, and institutions (IBM 2011).

The logic of collaborating with customers and other partners to innovate is not particularly new, but the trend toward open innovation has been dramatically accelerated with the development of information technology like the Internet which offers real-time communication that fosters external and internal learning networks by establishing and enhancing the quantity and quality of communications (Inauen and Schenker-Wicki 2012).

Various studies have shown the value generating effects of integrating a broad range of external parties which are bringing a large range of resources, skills, as well as technical and commercial competences in the innovation process (Love and Roper 1999; Tether and Tajar 2008). Other works have underlined that companies relying on external parties have better innovation performance than endocentric companies (Miotti and Sachwald 2003; Nieto and Santamaria 2007).

A recent research has also shown that companies that emphasize innovation are more likely to create radical innovations while firms pursuing closed innovation are more likely to exhibit a higher incremental product innovation performance (Bigliardi et al. 2012).

The collaborative innovation process can be of different kinds. Gassmann and Enkel (2004) have made a useful distinction between the flows between a company and the many external innovation stakeholders. There is the "outside-in" process where ideas, knowledge, technology and are obtained from the outside and brought into the company. There is the "inside-out" process where the innovation is put on the market from the company to its various external partners. Finally there is the "coupled" process which is a combination of the two previous processes.

While communication has always played an important role in the innovation process in order to beat the uncertainties associated with innovation, collaborative innovation is now changing and expanding the role of communication. The traditional way of communicating innovation was placing a heavy emphasis on "pushing" the innovation to the external partners and the customers in order to accelerate its diffusion (inside-out). But collaborative innovation is completely changing the perspective as we are going to consider in this paper. First, we will show that the priority is now on a "pull" communication strategy in order to get new ideas from different sources in the environment (outside-in). Secondly, we will analyze how the collaborative innovation process is also heightening the importance of a push communication strategy at a very early stage of the process with the offering of open access technology which will help external partners to develop complementary solutions. Moreover, we will examine the fact that collaborative innovation is also redefining the branding strategy for innovation which has often been the favorite communication strategy of successful technology companies at the time to push their innovation on the market. Finally, we will consider in what way collaborative innovation is impacting the ultimate avenue for a firm to communicate an innovation, which is its global commercialization strategy in order to reach as fast as possible the maximum volume of users for an innovation.

17.2 Leveraging the "Outside-In" Innovation Effect with a Forceful "Pull" Communication Approach

Open innovation has drastically change the way companies are communicating with their environment as they are now trying to pull all potential contributors to their innovation process in order to get new ideas, feedback, or technologies. Indeed, many researches recognize now that creativity is a social process: when communicating with others, ideas are exchanged, knowledge is pooled, new insights are inspired, and ideas can be evaluated according to standards valid in the social context (Ohly et al. 2010).

There is a wide variety of potential external partners available for companies which are looking to initiate collaborative innovation. They are the customers, the suppliers, the competitors, the universities the private research institutes, the government research organizations, the "complementors" that provide the product and services around the technology, the consultants, acting as carriers of the innovation or facilitators to the markets.

There are two ways to activate a "pull" communication strategy with all those potential contributors to innovation, depending if the company wants to have frequent or intermittent contacts. In the first case the pull communication is aiming at the building of a structured eco-system of identified partners with as much interaction as possible while in the second case the communication strategy is based essentially on discontinuous connections with a multitude of potential participants, a process commonly defined as crowdsourcing (Howe 2006).

17.2.1 Building an Eco-System for Co-Creation with Partners

Some companies are pushing aggressively the forming of an external innovation network with various partners in order not only to get new ideas but also to develop the products or services in the way which will be the more adapted to each element of the industry value chain. Thus new inputs with constant feed-back for improvement are constantly searched from the network participants and they are nurtured by a communication flow which is forcefully managed by the firm. Moreover the addition of more participants to a group creates an incentive for others to join in. Such a snowball effect may provide the necessary momentum to make an innovation successful enough to become a de facto standard and eliminate other competitive solutions.

For instance, SAP, or IBM have forged an entire ecosystem around their solutions, namely Windows, R/3, and Notes, with application developers, system integrators, trainers, and hardware companies working together to provide solutions to end users. SAP, the leader in ERP software for business-to business applications, has more than 10,000 partners all over the world—which the company describes as the SAP Ecosystem—working with and around its software solutions. This "co-innovation" allows SAP to offer an extensive range of industry specific solutions for its professional customers (SAP 2013). In the same line, IBM is now offering to its customers or business partners to connect directly with its 11 worldwide IBM Innovation Center. It has also relocated some of its R&D facilities closer to its main customers in order to enhance the communication with them, such as its new R&D center recently opened in Beijing which is completely dedicated to meet the growing demand for smart-grid infrastructure development in China (IBM 2013).

Similarly, another innovation driven company, Samsung has decided to put the principles of Open Innovation into operation in addition to its existing overseas

research centres. It has adopted a multi-pronged approach that involves participation in global consortia, forging links between the industry and top universities as well as cooperation with its vendors (Samsung 2013). The group maintain tight relationship with all partners. In Korea, it has even acquired a public university—the SKK—in order to get a better control in the training of the next generation of researchers who could work for Samsung in Korea (Oh 2013). Those companies are dealing mostly with business customers. But in consumers markets, the same route has been adopted by Google. Notwithstanding its numerous acquisitions, Google has also been teaming constantly with various public and private organizations in order to consolidate its leadership position in the search engine industry. Through a mix of distribution agreements, partnerships, and alliances which are listed in Table 17.2 Google aims to make its search engine and other services such as YouTube widely available for all categories of applications.

Apple offers another interesting example of "outside–in" communication for innovation, with its iTunes site which is a collaboration of music artists, publishers, movies and TV shows producers, etc. iTunes was launched in 1998 as a simple music player, but over time it has developed into a sophisticated multimedia content manager which support not only the iPod, which is a range of portable media, but the other Apple devices as well, including the iPhone and the iPad.

The communication for building an ecosystem of external innovators is based on the setting of strong ties which involve a strong degree of trust and are characterized by frequent contacts over a longer period. Those interpersonal ties that are built through frequent communication can lead to more effective interactions (Uzzi 1997) but conversely they may provide redundant information, especially as they occur among a small group of people in which almost everyone knows what the others know. That is the reason why some firms are also trying to enlarge their reach of innovation contributors far outside than their regular business environment.

17.2.2 Opening to Everyone: Crowdsourcing

Beyond the structured networks of external partners, some innovative companies are going after almost any kind of outside source of ideas. This move has been facilitated with the rise of the Internet and the social applications which are tremendously easing the way for companies to engage and collaborate with mainstream users or contributors (Prandelli et al. 2006).

For instance, the old way of idea contest has been rejuvenated with the internet which is used to distribute the "call for ideas" among a wide target group (Bilgram 2013). Based on crowdsourcing principles and using the reward structures of tournaments (Morgan and Wang 2010), a challenge is posted to a large public and the contributions are evaluated by a jury to select and reward the winning ideas. For example, Cisco has launched an external innovation competition called the

Table 17.2 Google partnerships since its foundation

Year	Company/organization	Type of relation	Official goal
2001	Yahoo!	Partnership	Become Yahoo's default search provider
2001	Universo Online (UOL)	Partnership	Search service (for the Brazilian leading online service provider)
2002	AOL	Partnership	Offer Google search and sponsored links to 34 million customers
2004	Libraries of Harvard, Stanford, University of Michigan, Oxford, and New York Public Library	Partnership	Digital scanning
2005	NASA Ames Research Center	Partnerships	Research projects involving large-scale data management, nanotechnology, distributed computing, and the entrepreneurial space industry
2005	Sun Microsystem	Partnership	Share and distribute each other's technologies
2005	Time Warner's AOL	Partnership	Enhance each other's video search services
2005	Websites	Service: "Adsense for Mobile"	Provides the ability to monetize mobile websites through the targeted placement of mobile text ads
2006	News Corp.'s Fox Interactive Media	Agreement US$900 million	Provide search and advertising on the social networking site, myspace
2006	eBay	Partnership	Advertising partnership
2006	Adobe	Distribution agreement	Toolbar distribution
2006	Intuit	Strategic alliance	Offer a variety of Google services to Intuit small business customers
2006	Dell	Partnership	Install search software on Dell computers
2007	China Mobile	Partnership	Provide CM users with Google mobile search
2007	Samsung	Collaboration	Put Google products and services on selected Samsung phones
2007	Salesforce.com	Partnership	Combini on-demand CRM applications with AdWords
2007	The University of Texas at Austin library and the Princeton University library	Partnership	Library Project: digitize and make available approximately 15 million volumes on line before 2015

(continued)

Table 17.2 (continued)

Year	Company/organization	Type of relation	Official goal
2007	Google, HTC, Intel, Motorola, Qualcomm, Samsung, LG, T-Mobile, Nvidia, Wind River Systems, TI, etc.	Open Handset Alliance	Develop an open platform for mobile services called Android.
2007	NORAD	Sponsorship and partnership	Use of Google earth to track Santa Claus in 3-D and on YouTube
2007	IBM	Partnership	Supercomputing initiative so that students can learn to work at Internet scale on computing challenges.
2008	Publishers	Partnership	Digitize millions of magazine articles and make them available on Google Book Search.
2008	GeoEye	Partnership	Launch a satellite providing Google with high-resolution (0.41 m monochrome, 1.65 m color) imagery for Google Earth
2009	Open Technology Institute from the New America Foundation	Partnership	M-Lab: open platform with testing tools for broadband connections.
2009	Twitter	Partnership	to include updates in searching results
2009	The New York Times and The Washington Post	Partnership	Living Stories (app): prototype for online news
2010	Oregon State (USA)	Partnership	Distribution of Google Apps for Education
2010	Guggenheim Museum	Partnership	For developing YouTube Play: creative video biennial
2011	Bing & Yahoo!	Partnership	Schema.org: supports a common vocabulary for structured data markup on the entire Web

Source Adapted from Google.com

I-Prize to help the company identify promising business platforms for future growth and with a prize of $250,000 prize for the winner (Jouret 2009). In its last edition, 2,900 participants representing more than 156 countries submitted 824 ideas to the competition. Ideas were narrowed down to 32 semifinalist ideas and nine teams representing 14 countries in six continents reached the final phase of the competition (Cisco 2010).

Smaller companies are also using this communication strategy to get new ideas, new technologies or even new funds for a potential project. A company like Kickstarter founded in 2009 provides tools to raise funds for creative projects via crowd-funding through its website. That is how Ouya, a new low-price home video game console based on Android has managed to be funded in 2012. The $8 million development budget was raised within 8 hours after being posted on the Kickstarter website (Strickler 2012). The Ouya Kickstarter page featured an introduction video, which explained various aspects of the console, showcased the process of designing of the 3″ touchpad-sporting controller, and gave viewers a glimpse of the motherboard. It also presented the first looks of the console's game store, showing several games from independents developers which had shown interest in the Ouya. Such an innovative communication strategy enabled the Ouya project team to lower the high financial entry barriers in the video game console and to challenge the three dominant players that are Nintendo, Microsoft, and Sony.

Thus the key benefit of crowdsourcing is to reach out an undefined mass and a wider variety of user types than the traditional external partners; it provides a more heterogeneous background favorable to highly creative and "out of the book" suggestions. Furthermore, crowdsourcing is based on mostly weak ties with the participants of the network which are built on loose emotional tendencies and are maintained via infrequent communication. This kind of relationship is considered to increase the probability of stimulating creativity because they bridge otherwise disconnected groups and individuals (Tsai 2001), they are providing access to original information (Granovetter 1973), and they encourage autonomous thinking (Perry-Smith 2006).

Ultimately, one goal of the "outside-in" process in collaborative innovation process is to find the most creative and effective contribution. This means that a company must be able to articulate its propositions in a clear, credible, and attractive manner when communicating either with some preferred partners or with an unfamiliar multitude.

17.3 Powering the "Inside-Out" Innovation Effect with an Effective "Push" Strategy

Using a push communication strategy at the early stage of the "inside-out" innovation process has been used for a long time now by technology based successful companies because the development of complementary innovations is so

often crucial for the market success of an original innovation. In the old days, the push communication was to communicate "inside-out" at a very early stage in the innovation process about the technical features of an innovative technology and to share them with the key market players in order to get a prior agreement of what would become the future technology standard so that all those complementary solutions will work well together (Farrell and Saloner 1985).

For instance, in the personal computer industry, compatibility is required to ensure that computers, software, modems, printers, and other peripherals interface easily. Similarly, in the cellular telecommunications market, compatibility demands a common set of technological standards for the design of cellular base stations, digital switches, and handsets to ensure maximum geographical coverage for users. The larger is the coverage, the greater is the value for customers and the bigger is the future demand, leading more customers and other market players to invest in the expansion of the network (Mc Gee et al. 2002).

Traditionally, the discussions about compatibility have taken place in the various standardization committees like the International Telecommunication Union (ITU), the Institute of Electrical and Electronics Engineers (IEEE), or the European Telecommunications Standards Institute (ETSI). This compatibility approach has very effective when the market was mostly dominated by the large suppliers. For instance in the 1990s the European mobile telecom vendors and operators companies managed to agree on one compatible technology, the Global System for Mobile Communications (GSM) developed by the ETSI while there were four different and non compatible technologies in the US. The value for the cellular phone users clearly was much bigger in Europe than in the US and the cellular phone caught up more quickly in Europe than in the US. At the same time, Nokia was able to surf on this mobile phone innovation wave and manage to build a strong market share, in Europe and to run over Motorola.

Another key element of an "inside-out" innovation strategy is the ability to engage with the very influent external contributors that are the "lead users" through a push communication directed specially toward them (Salah et al. 2010). Lead users are dissatisfied users ahead of the market trends who are willing to develop their own solutions or to collaborate with the provider (Franke and Piller 2003) because they enjoy the problem solving techniques (Bilgram et al. 2008). Some innovative companies have managed to develop a "toolkit approach" (von Hippel and Katz 2002) that transfers most of the product and service development tasks from the research and development department to pre-qualified lead users (Piller and Walcher 2006). Such an approach minimizes the "sticky information" transfer costs since the customers are participating directly in most of the stages of the product development process (Prűg and Schreier 2006). Furthermore this method facilitates the development of new products that are accepted by the market (Henkel and von Hippel 2005) and contribute to an accelerated rate of diffusion in comparison with the traditional internal innovation method (van Oast et al. 2009). A recent comparative study has shown that the impact of lead users on the performance of new product development is superior to any other external

agents including the external product development partners (Al-Zu'bi and Tsinopoulos 2012).

More recently, the ultimate communication "push strategy" is to make the technology available for free to all potential "innovators" or "complementors" which are ready to suggest an develop an improved or complementary application which is adding value to the exposed innovation. This inside-out "open collaboration" process has been made possible with the rise of the Internet and the increased experience of industrial customers.

It started with the development of new application software. Compatibility left the way to the "open source" software such as Linux, Apache or Mozilla for instance which were developed in a collaborative manner with a free access to an end product's design and implementation details as well as a free redistribution. The success of 'open-source' software was achieved by making the software architecture widely available for free, so that it could benefit from the value co-creation (sometimes also called user generated content) with the complementors, the customers and any other third party.

However, the "open-source" model suffered from a lack of effective communication and control of the full compatibility of the new software version over time. This is known as 'forking' in the software industry when a single software project is split between various development teams which are making increasingly different versions of the original. It ends up into a fragmentation of the solutions available on the market, i.e. the exact opposite of a universal standard which may accelerate the adoption of an innovation. The most famous example is the original Unix computer operating system which was developed in the 1970s by AT&T's Bell Labs but is now sold in many different and often incompatible versions, including HP/UX, AIX (IBM), Berkeley BSD, SINIX (Siemens), Solaris (Sun), Inx (Silicon Graphics), etc. Consequently an application developed originally for the Unix market could run only on one of the versions and required a substantial adaptation to run on another version. Such an absence of compatibility has ultimately limited the value of Unix as a market standard for PCs and servers.

One key lesson from the "open source" software is that opening the innovation process does not guarantee the full compatibility of an innovation over time. It requires an aggressive stand from a company to make sure that this will happen and will last in order to make the innovation widely available to external parties who will adopt it and fine-tune it. For instance, in 2008, Apple launched its App Store, based on open collaboration with thousands of independent third party software suppliers who could design and create a variety of software applications for iPhone users, though within certain parameters only, while getting a 70 % share of the price of their application. One driver of the success of the iPhone, stands in the number of third party applications available that consumers can purchase and download from the App Store. In January 2013, in the US only there were more than 800,000 applications available with over two billion downloads during the month of December 2012 and 20 billion downloads for the whole year of 2012 (Apple 2013).

Likewise, in the early months of 2013 Google has made public the technical specifications of its future "Google glasses", a wearable computer with a head-mounted display. It has shipped prototypes to developers so that they could start to develop applications. It has also reserved 8,000 samples to non developers and future users which were selected over an internet contest asking people to say on Twitter and Google+ how they would use the glasses if they were given a set.

Such a push communication strategy is not reserved to large companies. Ouya, the young start up which has been mentioned earlier, has made its specification widely available to any would-be independent developers of video game. The move has been paying off as in March 2013, there were currently more than 450 confirmed games being developed for the Ouya, of which 80 games had been confirmed by Ouya or a developer (Ouya forum 2013).

Finally, when the time comes to commercialize an innovation, successful innovative companies are also aware of the importance to push directly this innovation towards the opinion leaders. They are usually among the first adopters of new products and, as they represent a reliable source of information, their word-of-mouth power is strong enough to influence the behaviour of other people in terms of search, purchasing and usage of new products (Goldsmith et al. 2003). Thus marketers work to create communication channels to reach opinion leaders in order to encourage them to spread a positive word-of-mouth (Lyons and Henderson 2005).

17.4 Developing a Dominant Brand Name

Open collaborative innovation has also reinforced the importance for a company to have a strong brand image and to communicate it forcefully and effectively outside in order to rally the maximum of external parties around an innovation (Corkindale and Belder 2009). One major issue associated with the uncertainties of any innovation is the anxiety of many customers, developers or external parties (Boyd and Mason 1999). Some are intimidated by the task of learning how to use the innovation, some are risk averse to any novelty, and others are afraid that the innovation will become obsolete quickly; all are always postponing their decision to take it on. What is true for consumers is also true for organizations. Many managers fret about innovations and try to assess the balance on the risk/return relationship of such investment more than considering the sheer novelty of an innovation.

A brand is a name, a set of words, a sign, a symbol, a design, or a combination that identifies a seller's goods or services (Keller 1993). Consequently, a well-known and familiar brand helps to reassure individuals or industrial buyers when they consider the purchase of an innovative solution which represents always a leap into the unknown. In that case, one of the main criteria that determine a customer's choice is confidence in a company and its products (Temporal and Lee 2000).

Table 17.3 Ranking of the top most valuable marketing brands in 2012

Ranking	Company	Value ($M)[a]	Industry
1	Apple	182.951	Technology
2	IBM	115.985	Information technology
3	Google	107.857	Internet search
4	McDonald	95.188	Fast food
5	Microsoft	76.651	Software
6	Coca Cola	74.286	Soft Drink
7	Marlboro	73.612	Tobacco
8	AT&T	68.87	Telecommunication
9	Verizon	49.151	Telecommunication
10	China Mobile	47.041	Telecommunication
11	GE	45.81	Conglomerate
12	Vodafone	43.033	Telecommunication
13	ICBC	41.518	Finance
14	Wells Fargo	39.754	Finance
15	Visa	38.284	Finance
16	UPS	37.129	Logistics
17	Walmart	37.129	Retail
18	Amazon	34.077	e-retail
19	Facebook	33.233	Social network
20	Deutsche Telekom	26.837	Telecommunication
21	Yves St Laurent	25.92	Luxury
22	SAP	25.715	Software
23	BMW	24.623	Cars
24	China Construction Bank	24.517	Finance
25	Baidu	24.326	Internet Search

Source Milward Brown, Brand Z top most valuable marketing brands report, www.millwardbrown.com/brandz

[a] Brand value represents the fractions of intangible corporate earnings of a company which is attributable to the brand multiplied by an earning multiple, depending on the brand market valuation and the brand growth

A strong brand facilitates the identification of the innovation while attaching a quality image and a personality that establish a bond with the customers and facilitate their loyalty (Urde 1999). For instance, Google is perceived as a clean, friendly but credible path to accessing the tremendous wealth of the Internet. Cisco's image is associated with being a visionary and an expert in Internet telecommunication as well as a partner with its clients. And the Apple brand personality is about lifestyle, imagination, innovation, passion, and aspirations. It suggests also power-to-the-people through innovation thanks to simplicity and the removal of complexity from people's lives (Marketingminds 2013).

In general, dominant brands which come first in customers' minds enjoy greater market and financial success than their competitors (Burke and Schoeffler 1980). This is also true for innovative products and companies. In the ranking of the first 25 major corporate brands according to their brand value in 2012, 14 are closely associated with innovative product or industries, as illustrated in Table 17.3.

This preeminent position of innovation driven brands does not come by accident. One may argue that their brand value reflects their market success. Actually part of their hit performance has been achieved through a very forceful branding strategy which they have started very early in their corporate life.

For sure, some of the companies listed in the ranking above are now spending huge amounts of money to promote their brand. For example, in 2012, Microsoft spent US$ 1.6 billion (2.2 % of its total revenues), while Dell invested US$ 860 million (1.30 %) and Apple devoted US$ 933 million (0.86 %) in advertising (Forbes 2012).

But the building of a strong brand image for an innovation does not always require big amounts of money. Some highly successful innovative companies have managed to achieve recognition essentially through creativity, quality and word-of-mouth. Intel, Microsoft, Intel, Compaq, Cisco, and others were first talked about in the pages of the Wall Street Journal, the Financial Times, Business Week, Forbes and Fortune magazines. Only once their brand image was made, then they spend money in advertising to maintain their image and notoriety. More recently a new generation of web based firms such as Google, E-bay, Amazon, or Facebook have also got top of mind recognition on a low advertising budget. By making an effective use of the internet, those companies have been able to generate "buzz" among "influencers" instead of relying solely on traditional advertising. The excitement and passion they have generated has translated into sales afterwards.

Collaborative innovation provides additional ways to enhance brand awareness and brand image like by developing and tightening deep relationships when hundreds of consumers spend significant amounts of time interacting with companies and their brands on idea contest platforms (Nambisan 2008). Furthermore usually consumers share their experiences with a brand over the social network and spread positive word-of-mouth in their networks extending the reach of simple open collaboration platforms or initiatives (Füller et al. 2010). For instance, Microsoft has created the *Imagine Cup* to give the opportunity for students to turn their ideas into reality, as well as to solve challenges and problems provided to them. On the average, more than 165,000 students are participating every year, but on a given day on the facebook page of the Imagine cup there were 227,936 followers who liked the topic and 2,562 persons actively discussing the subject.

When promoting an innovation, the use of branding is not exclusive to private companies. It has been used very effectively by some alliances to promote an innovation in order to make it a standard like for instance HDMI, a compact audio/video interface which was initiated in 2002 by a handful of companies, and has now more than 1,300 adopters (Hdmi 2013). Another successful example is Bluetooth, a short-range networking protocol for connecting different types of digital devices (mobile phone, computer, GPS, etc.) or accessing the Internet by wireless signals within a 35-foot or 10 m range. In 1998, five companies founded the Bluetooth Special Interest Group (SIG), Ericsson, IBM Corporation, Intel Corporation, Nokia and Toshiba Corporation. Its goal was to promote the development of the new protocol as the standard solution for wireless connections. Very early the decision was made to develop a strong brand so as to communicate with

the end—consumers in order to accelerate its recognition and to step up its adoption by other industrial companies. Today, the Bluetooth SIG has more than 10,000 member companies and an astonishing 91 percentage of brand awareness among end users (Bluetooth.com 2013).

17.5 Communicating with the World by Going Global

A final way to ensure the market acceptance of an innovative product is to open it up to the world market as innovation is becoming increasingly global from the supply perspective and from the demand side. This is a direct consequence of the explosion of the Internet, the rise of globalized financial markets, the spiralling foreign direct investment by multinational companies, and the emergence of China and India on the world scene.

The collaborative innovation process is combining with the globalization of business so that technology companies increasingly go abroad to interact with their most demanding customers, get the most competent or cheapest suppliers, and seek ideas or knowledge with leading research environments which are getting more geographically dispersed. Consequently, the proportion of corporate R&D performed outside domestic countries is increasing rapidly (Herstad et al. 2008) while some companies are even relocating their headquarters in order to be more collaborative such as Nokia which has moved the head office for feature phones to China and the one for Smartphones to the Silicon Valley in the US.

Consequently, going global becomes a natural way to ensure the commercial triumph of an innovation. It comes as another extension of the push communication strategy in order to promote innovations towards all the external market participants as increasing returns follow the firms that penetrate one large geographical market after another.

Innovation driven companies serving business customers were the first to embrace globalization as organizations all over the world have more or less the same needs and expectations. Consequently, opening up globally an innovation was relatively easy and not too costly. For instance, in the software industry, the swift growth of the German SAP resulted from the increasing acceptance of its ERP (Enterprise Resource Planning) software in various part of the western world: in 1980, SAP had only 50 customers, all Germans companies; in 1996, it had 9,000 customers worldwide, and in 2013, it has more than 238,000 customers in over 180 countries. Today, SAP makes more than 85 % of its turnover outside the German market.

But globalization has also proven to be effective to push innovative solutions towards consumers markets. For example, Nokia's globalization strategy has provided a major push to ratchet up the adoption rate of mobile phones in the world. In the 1980s Nokia was selling to the Finnish market only; it became the market leader in Europe in the early 1990s. Then, it went truly global and achieved market leadership in 1998 as its sales had expanded dramatically.

Table 17.4 Global reach of some innovative technology firms in 2012

Company	Country	% of annual revenues made outside the country of origin
Accenture	Ireland	99.7
Nokia	Finland	99.6
Infosys	India	98.3
Tata Consulting (TCS)	India	91.5
Vodafone	UK	88.4
SAP	Germany	85.5
Intel	US	84.3
Samsung	South Korea	83.9
Movistar	Spain	72.5
Sony	Japan	70.3
HP	US	66.0
Huawei	China	66.0
IBM	US	60.7
Apple	US	60.1
Oracle	US	57.4
Deutsche Telekom	Germany	55.6
Google	US	54.2
Lenovo	China	53.0
Dell	US	52.4
e-Bay	US	52.4
Cisco	US	50.9
Facebook	US	49.4
Microsoft	US	47.9
Amazon	US	43.0
France Telecom	France	42.5
Yahoo	US	30.6

Source annual reports and press releases compiled by the author

In 1990, Nokia shipped around 1 million units in 1990, over 77 million units in 1999 (Ahonen 2010) and 335 million units in 2012, the year where it lost its market leadership to Samsung which managed to ship 384 million units out of a total of 1,746 million units sold worldwide (Gartner 2013).

Table 17.4 shows how some innovation driven companies have managed to grow their leadership by promoting their solution outside of their native markets. Of particular interest is the growing presence of Chinese and Indian innovative technology companies which have managed to increase significantly their business outside of their native countries in recent years. The large internationalization of Samsung has also help the company to overcome Apple in the smartphone business. Apple has made up some of its gap as it has increased its share of international revenues from 60 to 66 %, but it success is still mostly driven by the US market. Another telling example is the case of Yahoo which has a smaller degree of internationalization compared to some of its rivals, such as Google and

Microsoft. This is probably one of the reasons, among others, why Yahoo has not been able to maintain its leadership position in search engine and other internet services.

17.6 Conclusion

Ultimately, some technology companies are actually combining the different types of communication strategies that we have detailed as they are now relying on collaborative innovation. They are not only using their own innovation teams but they are also working with a network of structured partners as the same time as they are tapping on the creativity of outside creative individuals or organizations, whilst they are promoting their brand and they are expanding globally.

Google provides a typical example of such an inclusive communication strategy. For instance Google has its own internal collaboration of software developers who work to improve its search engine and develop other offerings. Those new services are made available to consumers in beta-test format in order to have their feed-back and suggestion for improvements or even the development of additional features. In 2010, using a push communication approach, Google has launched a website called Demo Slam to demonstrate the technology of Google Products into new contexts. But, as the main source of revenues for Google is coming from its targeted advertising placement, Google also collaborate with its main partners—the advertising agencies, advertisers and research firms—to find out innovative ways to gain the attention of consumers. It has also launched in 2012 the "Google Apps Developer Challenge" where entrants can submit an application that showcases innovation, relevance to their target audience, and creativity with regard to use of Google products or services (Google 2012). But Google relies also on crowdsourcing for innovation with special projects, such as its "Project 10 to the 100," which presented a problem to the virtual world via Google and screened the ideas to fund solutions.

We have analyzed how the open collaborative innovation process has redefined the communication of technology companies towards the outside. This does not come automatically and requires an effective management because collaborative innovation is redesigning completely the flows of information—and power—inside the company, as the innovation team is no longer the only source of input. Today many innovation teams understand the value of collaboration, at least in a large majority technology firms. However, a more pressing challenge is making the rest of the company fully understand and engage into collaborative innovation so that all employees may fully support open innovation and benefit from it. This is an important condition for innovative companies if they want to increase their absorptive capacity of external information (Cohen and Levinthal 1990) with collaborative innovation.

This often requires changing the employees' mindset and behaviors through an effective internal communication which is aligning innovation to strategy and is rising above organizational silos. The most important is to promote collaborative innovation with ongoing communication to reach, tell, and support people to participate; then it is equally important to sustain the momentum with continuing messages about successes, current actions, platform improvement or other innovation initiatives (Lindegaard 2012).

Ultimately collaborative communication leads to the emergence of a new category of managers, the "network orchestrators" (Fung et al. 2007) who are able to deal with a large diversity of contributors. They have to develop a specific set of management skill, because their role is not the same as managing internal collaboration; it requires a more fluid approach with a network centric perspective and not only a firm centric or a market centric viewpoint (Thomas and Wind 2013). In any case, network orchestrators must have considerable communication skills and they must be able to communicate clearly, simply, effectively, and consistently with all innovation partners in order to find them and then to keep them motivated and engaged. As an increasing number of companies in various industries are opening their innovation out, one key lesson they can learn from successful innovative technology firms is that communication is an indispensable key success factor to achieve an effective collaborative innovation.

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Chapter 18
Audience-Centered Approaches to Strategic Planning: Accessing Social Capital Through Sharing Platforms on Social Media

Sherry Devereaux Ferguson

Abstract This chapter responds to the question "What are the strategic considerations in using social media platforms and open source practices such as crowdsourcing as tools in innovating organizations?" The following arguments are put forward in response to this question: (1) Organizations have moved from a learning to a sharing paradigm. (2) The most valuable organizational asset is social capital, accessible through social media and open source practices such as crowdsourcing. (3) Communicators have a role to play in accessing this social capital for purposes of innovation. (4) Changing conceptions of audiences underlie strategic communication planning. (5) Strategic planning for innovation must reflect the character of audiences fashioned by social media. In responding to this last question, the chapter explores seven characteristics of audiences that should be taken into account in planning for innovation and suggests theories that support a user orientation.

18.1 Introduction

Mired in an economic recession of yet unknown parameters, organizations face an unpredictable future. In an environment where the old paradigms have failed, innovation acquires a high value and the communication technologies undergirding innovation become critical organizational resources. In this environment, the users of Facebook, Twitter, Skype, blogs, wikis, Second Life, YouTube, Flickr, mobile technologies, LinkedIn, and other sharing platforms constitute the social capital of an information society (Bourdieu 1986; Coleman 1988; Frank et al. 2004); and practices such as crowdsourcing enable innovating organizations to access this social capital.

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This chapter responds to the question "What are the strategic considerations in using social media platforms and open source practices such as crowdsourcing as tools in innovating organizations?" The following arguments are put forward in response to this question: (1) Organizations have moved from a learning to a sharing paradigm. (2) The most valuable organizational asset is social capital, accessible through social media and open source practices such as crowdsourcing. (3) Communicators have a role to play in accessing this social capital for purposes of innovation. (4) Changing conceptions of audiences underlie strategic communication planning. (5) Strategic planning for innovation must reflect the character of audiences fashioned by social media. In responding to this last question, the chapter explores seven characteristics of audiences that should be taken into account in planning for innovation and suggests theories that support a user orientation.

18.2 From Learning to Sharing Organizations

Fostering and sharing creative insights through group interactions or the idea of co-creation has a long history in the social sciences in the form of activities such as brainstorming and brainsketching, synectics, lateral thinking, fantasy chaining, and mind mapping. In the same way, businesses have long relied on Delphi and nominal group techniques for extracting knowledge from expert or other populations (Ferguson and Ferguson 1988). In the late 1980s, former General Electric President Jack Welch instituted "work-outs" (akin to New England town hall meetings) with employees, designed to elicit solutions to organizational problems (Krames 2002). Soon after, the innovation literature became peppered with talk of "boundaryless" and "learning" organizations—organizations with no clearly defined boundaries that engage in an ongoing quest for knowledge, value experimentation and improvisation, encourage critical thinking and risk-taking, tolerate mistakes, and value impermanence.

According to Redding and Catalanello (1994), the above characteristics enable the organization to innovate sufficiently fast to survive and prosper in a rapidly changing environment. The concept of the learning organization can be traced back to the double-loop learning advocated by Argyris and Schon (1974). So the movement in the direction of open source practices did not come from a conceptual vacuum. In fact, their main forerunner was open systems theory, which continues to influence scholarship across the spectrum of the social and physical sciences. Open innovation and open source approaches confirm the viability of the open systems model and the "boundaryless" organization, which is said to be characterized by speed, flexibility, and innovation.

Social media have further collapsed the boundaries between organizations and their publics and between content and technology. When we draw upon the collective intelligence through social media platforms and sharing practices, we are accessing what has come to be known as *social capital*. By *social capital*, we mean the value (economic or otherwise) that resides in social relationships and

networks (Putnam 2002; Bourdieu 1986). Antikainen and Väätäjä (2009) agree that the new age capital resides in people, not in material goods. Von Hippel (1994) explained the importance of social capital to innovating organizations in the following way:

> An inherent tension that plagues knowledge utilisation research is the fuzzy, informal and context-dependent nature of much of the knowledge associated with organizational innovations. This knowledge… is not easily transferable because it is often embodied as know-how or practical wisdom in the person or organization that has it (a phenomenon known as *stickiness*.) (cited in Greenhalgh et al. 2005, p. 426)

Rass and colleagues (2013) argue that open innovation practices generate not only new ideas and concepts for products and services, but also allow the organization to accrue social capital upon which it can draw when needed. Olson and Trimi (2012) attach the term *co-innovation* to this process of value creation through convergence, collaboration, and co-creation with stakeholders.

18.3 Accessing Social Capital through Social Media

This new age capital can be most easily located in the rapidly developing Web 2.0 phenomenon, first named by Tim Reilly in 2005 (Everitt and Mills 2009). Between 2005 and 2012, the percentage of Internet users with a social media profile catapulted from less than 8 % to 72 %—a nine-fold increase (Pew Internet 2013). According to the Paris-based analytics firm Semiocast (2013), Twitter had over 500 million members by 2012, up from 27 million in 2009 (Patton 2009). About three million were active tweeters in 2009 (Rose 2009); by 2013, 170 million were active tweeters (Semiocast 2013). Pew Internet (2013) reported that 18 % of all Internet users were tweeting by 2012. Skype ended 2010 with 663 million users. BBC statistics (2010) suggested that 450,000 new blogs appear each day.

More than one billion unique users sign into YouTube each month (2013). As of January 9, 2013, LinkedIn counted more than 200 million users (Nishar 2013), up from 55 million in 2010 (Baker 2010). In 2013, Facebook reported 1.11 billion active users, up from one million in 2004. MySpace registered over 33 million unique visitors in the first 6 months of 2013 (Weismann 2013). Constantly in flux, these statistics change minute by minute in an upward direction. The likelihood that social media will further extend their influence into all areas of our lives (business, interpersonal, health, and other) drives the present need to understand the potential contributions of the new communication technologies.

Social media differ from earlier efforts at gathering collective intelligence in terms of quantity of contributions, the uncontrolled nature of the input, and the often anonymous and voluntary nature of the sources—the essence of a phenomenon called *crowdsourcing* (Hudson-Smith et al. 2009). The term *crowdsourcing* (coined in 2006 by *Wired* magazine contributing editor Jeff Howe 2008) refers to open source methods of data creation where large groups of users generate content that is shared. The organization makes a deliberate effort through an

open call to outsource a task to a community or group (Ekins and Williams 2010; Tapscott and Williams 2006; Seltzer and Mahmoudi 2012). Others, however, view crowdsourcing as a less centralized happening, where the content appears spontaneously in the form of videos, blogs, wikis, or other sharing platforms. In the context of innovation, this mega trend implies "opening the door to allow more people—your customers, your employees or the public at large—into your innovation process to help improve your products, services, Web site or marketing efforts with the idea that two heads—or 2,000 or 20,000—are better than one" (Sullivan 2010).

Applying the potential in crowdsourcing to innovation, Chesbrough and Appleyard (2007) summarized four requirements for using open source practices such as crowdsourcing: the need to engage a broad range of stakeholders over a sustained period of time, to compete effectively for these limited resources, to provide leadership and agendas capable of setting the tone and establishing expectations for meaningful participation, and to identify ways to profit from these policies. Despite its potential for garnering interest and ideas, scholars such as Brabham (2013) urge that organizations should consider open source practices such as crowdsourcing as one (not the only) means to engage or gather ideas for innovation.

In discussing the role of open source practices in innovating organizations, is useful to recognize that *innovation* as a term comes with different definitions in different disciplines and different contexts—sometimes implying products, at other times processes. Sometimes the term suggests recent developments; at other times, it implies new awareness of existing developments. In the same way, adoption of an innovation has a range of meanings, which can relate to individuals or organizations. In terms of corporate or business entities, the concept of adoption can imply full-scale adoption, contracting out the development of an innovation, or purchasing another company with the required innovative skills (Rye and Kimberly 2007). Kastelle and Steen (2011) argue that innovation is more about the managing than the creation of ideas. In other words, any discussion of communication of innovations can have a range of interpretations and implications.

18.4 Role of Communicators in Strategic Planning for Innovation

Both academics and practitioners agree that strategic planning is necessary for the successful integration of new technologies into a corporate vision (Nambisan and Sawhney 2010; Barnes 2010; Sullivan 2010). They also agree communicators have a significant role to play in these strategic processes. Seltzer and Mahmoudi (2012), for example, reference the collaborative planning literature in claiming that "the most active territory for planning theorizing today is 'communicative planning'" (p. 4).

How then can communicators contribute to these strategic planning processes? The communicator looks for ways to support the corporate mission, mandate, and objectives through the framing of communication goals, messages, strategies, and tactics. Without reference to the larger strategic plan, communication planning loses focus; and without a supporting communication plan, the organization has no coordinated way to convey its mission, mandate, or vision or to promote its programs, products, and services.

Despite the importance of including a communication element in strategic planning for innovation, a survey involving 1087 PR practitioners in 22 European countries found that communication personnel are rarely involved in planning for innovation within their organizations. Only one out of every three PR professionals, for example, have any involvement with innovation in their companies; and only one in five communication managers considers innovation to be a strategic issue for communicators (Zerfass et al. 2007).

Cook (2008) proposed a communication model with applications specific to social media and also applicable to innovating organizations. He said that social media perform four functions of relevance to organizations: communication, cooperation, collaboration, and connection. Some argue the need to hire a social media administrator to coordinate these functions (Bradley 2008).

18.5 Changing Conceptions of Audiences

The starting point for any strategic communication plan must be the analysis of audience needs and expectations—a dedicated area of research in communication studies. In the context of this discussion, the term *audiences* will refer to employees, as well as external publics, as social capital resides in both groups.

Following World War II, four major changes occurred in how psychologists, political scientists, and communicators viewed audiences. First, communication studies moved from an emphasis on audiences as passive recipients of information to audiences as active processors of information. The limited effects and two flow models of opinion leadership, which stressed human agency, replaced the hypodermic needle model, which saw audiences as passive and highly susceptible to persuasion (Lazarsfeld et al. 1968).

Much like the early communication models, one of the most popular early innovation models—the Innovation-Decision Process, for example—portrayed "adopters" as passive recipients, who could choose to act or not act on information. This classic model involved five steps: knowledge, persuasion, decision, implementation, and confirmation (Rogers 1995)—none of which required an active contribution to the direction of change. According to Haider and Kreps (2004), over 5000 articles focusing on the distribution process had been published by the 40th anniversary of diffusion research. Nonetheless, as happened in the field of communication, innovation studies have shifted over time to a new and more participatory view of consumers and contributors.

Second, communication theorists began to see senders and receivers as constantly exchanging roles; and the Aristotelian model, which depicted communication flow as one-way and linear, fell into disuse. One of the most popular replacements was the transactional model, which sees communication as a dynamic process, involving continuous changes in the communicators and in the environment in which they operate (Barnlund 1970).

Third, the new models saw audiences as culturally diverse, active, and individualistic in their responses. Talk of *the public* yielded to discussion of *publics*. Uses and gratifications theory (Katz et al. 1974; McQuail 1983) attributed even higher levels of initiative to audiences. This theory argues that audiences actively select media that meet their need for information, entertainment, social interaction, or recognition, among others. Applying these ideas to open innovation, Antikainen et al. (2010) add categories such as personal learning, knowledge exchange, social capital, and enhancement of professional status.

Finally, post-war models moved from views of communicators as conveyers of information (e.g., Hovland et al. 1953) to communicators as builders of social relationships (e.g., Grunig et al. 1992). In support of this view, Paulini et al. (2011) note that social communication increases credibility for organizations when it shows sensitivity to user needs. This idea of building collaborative relationships becomes extremely important when we move into the area of innovation, where motivation to participate becomes extremely important (Antikainen et al. 2010).

18.6 Seven Trends with Implications for Communication Planning for Innovation

The development of social media has further changed and elevated the status of audiences. Thus, this final section of the chapter seeks to identify how social media have influenced the character of twenty-first century audiences and established their status as significant sources of social capital in an information society (see Mandarano et al. 2010). More specifically, I will identify seven trends with the potential to impact upon strategic planning for innovation.

First, the dominant characteristic of all social media is their potential for—and encouragement of—audience participation. An audience member climbs onstage at a Bourbon Street establishment to become a part of the entertainment. Contestants on *American Idol* and *Dancing with the Stars* plead for audience votes that will enable them to continue in the competition. CNN and Deutsche Well invite and publish feedback on online news articles generated by staff members. Artists gain acclaim on the basis of number of YouTube views. Court TV shows and crime stopper infomercials invite questions and feedback from viewers. Citizen journalists and I-reporters publish photographs of tsunamis, tornados, and volcano eruptions; and best-selling author James Patterson invites fledgling writers to pen most of the chapters for his book *Airborne*.

In short, the boundaries between senders and receivers of messages and content and technology have becoming increasingly blurred as audiences demand an active, participative role in the communication process. Recognizing the new user-generated and reflexive technoculture (Han 2010), *Time* magazine named "You" the "Person of the Year" in 2006. Citing Lev Grossman, author of the article accompanying the *Time* cover, Han explains that "the Internet that has allowed 'You' to win the recognition… does not resemble the Internet of the 1990s dot-com boom nor the ARPANET developed by the U.S. Department of Defence 20 years before that" (pp. 200-201). In other words, Web 2.0 is a radical innovation in itself, leaving disruptive change in its wake but creating an environment for "radical inclusion" (Han 2010, p. 201).

Second, social media have encouraged audiences to become active seekers of information. An orthopedic patient arrives at the surgeon's office, armed with information on the latest procedure for resurfacing the hip joint. Potential buyers turn to online reviews in researching the latest innovations in hybrid cars. Interested individuals go to *Britannica Online* to learn more about recent developments in DNA research. The increasing fragmentation and difficulty of using mass media to reach twenty-first century audiences is a well-established finding in communication research (e.g., Webster 2006). For that reason, organizations should not ignore the potential in open source platforms, which allow audiences to seek out the organization.

Third, social media have encouraged a critical mindset in audiences. Users have come to expect a feedback option with every communication. So the possibility to provide critiques of people, organizations, and ideas appears across the spectrum—in online journalism, Twitter, blogs, TV news and entertainment features, and print media.

Whereas the top-down flow of information, dominating the years preceding the development of satellite TV, nurtured a mindset that did not encourage criticism of authority figures in organizations or government, the current flow of information in every direction (upward, sideways, and downward) encourages people to express their points of view and to challenge authority. Even a cursory look at feedback links confirms the critical and cynical nature of much of this feedback (Rice 2010). As a consequence, many organizations have instituted a policy of pulling objectionable comments from the dialogue; and some kinds of software allow users to bring unacceptable responses to the attention of the host organization. The struggle of countries such as China to maintain control over social media has led to even stronger policies and practices, such as the demand to censor access points on foreign search engines—an action that caused Google to withdraw services from that country. As illustrated above, the censorship may be initiated at the point of the user, the host organization, or even a national entity.

Fourth, social media draw audiences who seek attention and recognition. As one blogger noted, "There's not a lot I won't put on there" because "I love to be the center of attention" (Miller and Shepherd, n.d.). Some studies have demonstrated that audiences stop using sites that fail to acknowledge their presence (Huberman et al. 2009). For that reason, organizations offer a variety of monetary

and non-monetary rewards to motivate users to participate in open innovation communities. Common non-monetary techniques include allotting points for valued contributions, listing top innovators on the websites, acknowledging the most active members, and introducing active community members (Antikainen and Väätäjä 2010). Other websites offer financial compensation for ideas; however, people are often willing to forego financial gain to obtain notice from peers or a firm (Huberman et al. 2009).

Fifth, social media encourage audiences to disclose freely, and audiences expect similar levels of openness and transparency in others. High levels of personal disclosure on Facebook, blogs, and websites such as Postsecret.com have created a generation of consumers who expect the same high levels of disclosure from others, including celebrities, politicians, and corporate leaders (Miller and Shepherd, n.d.). In the last several years, a number of American and Canadian politicians and generals have resigned from public office after having affairs exposed in the national media and widely discussed on social media. Those facing public demands for accountability not infrequently go on national television to apologize to family, supporters, and a largely anonymous public.

The new level of interconnectedness, offered by social media, has nurtured a culture of voyeurism and incursions into the lives of others. More importantly for organizations, however, the connections do not stop with the personal. Publics expect corporate entities and their leaders to share knowledge and information, including the negative, and to conduct business in the most transparent fashion. In other words, they demand reciprocity: we will share with you, but you must also share with us. As Crescenzo (2010) observed, "Corporate communication—that whitewashed, sterilized, sanitized form of communicating that so many organizations rely on—doesn't really work in the SM space" (p. 11).

Like many other ideas, the recognition of the importance of transparency in communication is not a novel concept. Cleveland wrote an article in 1985 titled "The Twilight of Hierarchy: Speculations on the Global Information Society," in which he discussed the leakiness of information and its impact on hierarchy. In 1988, Ferguson and Ferguson discussed the futility of talking about organizational boundaries and introduced the simultaneous access model as a replacement for the top-down communication model; and in 2001, former GE President Jack Welch (2001) observed:

> Hierarchy is dead. The organization of the future will be virtually layerless and increasingly boundaryless, a series of information networks in which more electrons and fewer people will manage processes. Information will become transparent. No leader will be able to hoard the facts that once made the corner office so powerful. (p. 433)

Sixth, social media have created audiences who expect responses in real time. Instant conversations and instant updates typify interactions on social media. Whereas consumers used to be satisfied with a letter received three or four weeks after an inquiry, they now expect a response within 24 h of receipt of an email. No place or time is sacred space, and meeting the needs of contemporary audiences means accepting their terms of engagement. Yet few organizations are equipped to handle the demands:

> As traditional business intelligence systems and technology intersect with new systems such as Facebook, Twitter, and Google Wave, a conflict arises between traditional information retrieval and discovery of new information available via newsfeeds, blog articles, short text messages from Twitter users, and user-generated videos posted to sites such as YouTube and Vimeo. Most business intelligence systems are not well-equipped to handle real-time information. The future of real time lies in creating applications that require no searching. (Arnold 2009, p. 40)

For governments and organizations that require multiple levels of approval for responses or revelation of information, the problem is serious—and still further aggravated in countries like Canada with requirements for bilingual communications. In speaking of organizational uses of ICTs, Sørnes et al. (2005) note: "Given the apparent significance of time in structuring organizational reality, future research should examine more thoroughly the temporal elements that affect members' sensemaking, their communication with one another" (p. 137).

Seventh, social media require a mix of language competencies in audiences, as well as in those who seek to interact with them. Transliteracy is "the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and film, to digital social networks" (Thomas et al. 2007). In response to Twitter's demand for 140 word messages, microbloggers employ a vocabulary of acronyms, abbreviations, and icons to offer brief and to-the-point information to their audiences (Defebbo 2009). The website blog, on the other hand, encourages a different form of literacy, more akin to the traditional essay or diary. On Instant Messenger, the conversations proceed through the use of multiple and often discontinuous threads. The Social Media Release (SMR), a new public relations tool, provides content to bloggers and other social media users, who may or may not publish or transmit the information to their personal network of friends and acquaintances (Steyn et al. 2010). Even if bloggers choose to share the SMR, they may repackage it or add comments or links to other sources (Bradley 2008).

18.7 Toward a New Paradigm: Connecting Audiences, Social Media, Open Source Policies, and Innovation

The proliferation of social media in the new century has fueled the need for a new paradigm to guide innovation studies and practices—one that sees audiences as participative, active, critical, open, attention-seeking and self-aware, time-sensitive, and transliterate. Some of the theories and concepts relevant to an audience- or user-orientation include open innovation, symbiosis, social constructionism (also social constructivism), sense-making, and reflexive modernity. Others (already mentioned) include open systems theory, uses and gratifications, and social influence models such as opinion leadership.

The research into opinion leadership may have new applications in a Web 2.0 world. Jeppesen and Laursen (2009) found that "lead users" (the most active

contributors) in online communities possess more relevant solution knowledge than others; and Parvanta, Ross, and Keller (2013) warn that organizations need to identify the most motivated, expert, and creative users to obtain full benefits from crowdsourcing. They claim that only 9 % of contributors have the motivation and experience and only 1 % the creativity to make a meaningful contribution. Saxton et al. (2013) also point to the importance of identifying "wise" sources.

The extent to which organizations can engage these more sophisticated and "lead users" can also influence commitment to diffuse the innovations.

Christensen (1997) described the reasons that "great firms" fail when faced with disruptive technologies. Unlike sustaining technologies, which involve incremental improvement of established technologies, disruptive innovations typically call for new ways of thinking about products, services, and markets. In these circumstances, large firms rarely cope well, as illustrated by the case of social media:

> The socially transformative innovations in information technology such as email, the World-wide Web, Google, e-commerce, Linux, and eBay have emerged not from the traditional powerhouses of IT innovation such as IBM, Intel, Bell Labs, or Microsoft, but from users of their technologies—business innovators, user groups, and communities of practice outside of the original centers of innovation. (Bers 2005, p. 3)

Accepting that knowledge no longer resides in a few large organizations, Chesbrough (2003) introduced the term *open innovation*, which stresses the importance of going outside the boundaries of the organization to harvest and—and in some cases—develop or out-license innovative ideas and intellectual property. Open innovation theory assumes that knowledge no longer resides in a few large organizations. According to Christensen and Overdorf (2000), viable options for improving the coping potential of larger firms include creating new structures within the corporation, birthing an independent organization that comes from the parent, or acquiring a new company whose processes and values mesh with the demands of the new task. Symbiotic models build on the open innovation concept (Yang and Shyu 2010; Castiaux 2007).

Social constructionist and social constructivist theories also offer user-oriented ways of thinking about social media and innovation (Berger and Luckmann 1966; Bers 2005). In the spirit of postmodernism, social constructionists argue that media technologies have created the reality in which contemporary society moves; however, these scholars do not distinguish between developers and users of the technologies. As in the case of the Linux open source movement, the users are also the developers of the technology, and no one person or organization holds the rights to Linux. In this sense, individuals and groups participate in co-creation of their perceived social realities. Social constructionists such as Bers (2005) argue that recombining and identifying new social ends for existing products and services should be the emphasis of open-source innovation research. Even if not applied to every organization, this approach would seem to fit well with large companies that experience difficulty in coping with disruptive innovations.

A psychologically-based variation of *social constructionism*, *social constructivism* asserts that we create our own social reality through interaction with the media. Similarly, sense-making models (Weick 2005; Dervin 1992) are concerned with how we reduce uncertainty and make sense out of our experiences. Moved into the organizational sphere, sense-making models incorporate concepts related to attribution of meaning in shared and collaborative contexts and help us to understand what motivates people. Theories of reflexive modernity propose that, over time, people become more self-aware and reflective. The focus on "YOU" in modern society would seem to validate the presence of reflexivity in contemporary society, along with its relevance for innovating organizations. Citing Lane (2005), Seltzer and Mahmoudi (2012) assert that all modern schools of thought about planning for innovation regard stakeholder engagement as "a fundamental characteristic of the planning process, not just an adjunct to decision making" (p. 4).

18.8 Conclusion

All of the above models and theories place an important emphasis on audiences—their needs, expectations, and potential to contribute to the collective intelligence through crowdsourcing. Key words in any formula for success will be trust, respect, transparency, openness, sharing, recognition, and timeliness. With the proliferation of related practices such as crowdfunding of business enterprises and even health care (see organizations such as WATSI), little doubt remains that open source platforms and practices will characterize the operations of many different organizations in the coming years; and organizations (innovating or otherwise) risk joining the ranks of endangered species if they do not compete for the new age social capital. In brief, strategic planning for communication of innovations must build on existing knowledge of audiences, social media, crowdsourcing, communication theories, and innovation theories.

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Chapter 19
Communicating for Innovation: The "Social" Enterprise and the Translation of Novel Ideas

Eduardo Rodriguez-Montemayor

Abstract The process of innovation involves at least three stages: leveraging knowledge to generate ideas (idea creation), communicating about the adequacy of novel ideas to the top management based on the firm's strategic objectives (idea translation) and actually making innovative products and processes a reality (idea implementation). This chapter explores the channels and the conditions under which social media can improve the innovation process in enterprises. The analysis is based on a multi-disciplinary review of academic literature to explore how social media can impact the first two stages of innovation: the creation and the translation of ideas. The findings are complemented by data collected from a survey about the uses of social media in private companies and by insights drawn from case studies of multinational companies that analyze the readiness of organizations to benefit from social media use. The central argument of this chapter is that social media help create "narratives" of innovation that provide companies with a common and clear innovation strategy for realizing the maximum potential from novel ideas. Organizations can be understood as 'networks of conversations' and much of the actual doing of strategy and innovation in organizations takes place via the process of sense-making across teams and business networks and communities. There are at least three channels in which the corporate use of social media can help the innovation process: by connecting people, which helps produce and communicate knowledge; by creating a new mindset, in which people are more engaged and willing to innovate; and by making sense of knowledge in the context of the firm overall strategy. These benefits can only occur when the use of social media is complemented with organizational enablers such as structural decentralization and individual empowerment.

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19.1 Introduction

Innovation has historically been a strong driver of company success. It refers to the use of novel ideas or methods in order to create new products that bring value to customers and also more efficient business processes within the organization. While some innovations involve fundamental scientific breakthroughs, many innovations are the result of recombinations of existing ideas in new contexts. Since the knowledge that produces new ideas is usually dispersed across organizational and geographical boundaries (either embodied in human minds or in firm processes), an important part of the innovation process involves the use of communication channels for identifying ideas that have business potential.

Social media represent one of the latest triggers of rapid change in the way people work, interact and consume. These media include a wide range of digital technologies that facilitate communication and that foster user participation and user-generated content. Blogs, social networks or online customer communities are all social media. Some applications were originally the reserve of individuals outside of work (e.g. Facebook) but organizations have seen the potential benefits of social media and are leveraging these applications not only to communicate externally with customers and partners, but also to connect their own employees and to facilitate communications and collaboration between them and with external stakeholders (e.g. industry practitioners and other experts such as academics).

The rising use of social media in enterprises is taking place in a context where the process of innovation has been opening up to more actors. Social media are reinforcing that trend. Open-source collaboration had already changed our conceptions of how innovation in society may occur since "open" innovations (e.g. the Linux Kernel project in the software industry) often do not have owners and collaboration among diverse stakeholders occurs without the structural mechanisms traditionally associated with organizational teams.[1] The innovation process within firm boundaries, i.e. for innovations owned by specific companies, is also "opening" in its own way by incorporating ideas from a wider range of actors and sources, some of them internal to the firm (e.g. employees) and some of them external.[2] Social media is accelerating this. Customers, for instance, are increasingly engaged with companies in the co-creation of new products through online customer communities,[3] a process that departs from traditional models in which

[1] For instance, stable membership, goal-sharing, interdependence among group members.

[2] Chesbrough (2003) argues that open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology.

[3] Some early examples include Procter & Gamble's Connect+Develop website, where people submit innovations, and Best Buy's IdeaX, a social platform that collects ideas from shoppers, then allows other shoppers to vote those ideas up or down.

key innovation processes such as new product development were built and managed solely inside the firm.

The use of social media in the workplace has given birth to the notion of Enterprise 2.0, which is a combination of the new social technologies[4] and organizational practices that are "more social" such as flatter hierarchies and employee empowerment. Employees are increasingly regarded as a potential source of ideas. Andrew McAfee (2006) was the first author to introduce this concept and defines it as the "platforms that companies can buy or build in order to make visible the practices and outputs of their knowledge workers". These new organizational practices have emerged in parallel to the transformation of the Internet from website environments limited to the passive consumption of content to Web 2.0 environments that facilitate the connection of people and collective creation of content.

Despite these transformations, it is not yet clear whether social media is strengthening the process of innovation or not. The process of innovation involves at least three stages: leveraging knowledge to generate ideas (idea creation), communicating about the adequacy of novel ideas to the top management based on the firm's strategic objectives (idea translation) and actually making innovative products and processes a reality (idea implementation).[5] The current literature on social media focuses on the first stage, the process of idea creation, but opinions about the benefits are divergent. McAfee suggested that social media help exploit the "collective intelligence" of different actors, which results in more knowledge and ideas. However, when the concept of Enterprise 2.0 emerged, other academics and industry specialists believed that it was "old wine in new bottles"[6] given that its objectives are similar to what knowledge management practice had been trying to achieve for decades with no success.[7] In addition, multiple firms have expressed concerns that social media may lead employees to get distracted and waste time.

This chapter explores the channels and the conditions under which social media can improve the innovation process. The analysis is based on a multi-disciplinary review of academic literature in the areas of information systems, organizational knowledge and organizational communications in order to explore how social media can enhance the first two stages of innovation: the creation and the translation of ideas. The findings are complemented by data from a survey of more than 200 private companies about the uses of social media and by insights drawn from case studies of multinational companies that analyze the readiness of organizations

[4] In addition to social networks, other social technologies include wikis, podcasts, social bookmarking, etc.

[5] Although social media can also help during the diffusion of new products by creating a market pull effect within communities that spills over into the mass market (Hienerth and Lettl 2011), this issue is beyond the scope of this chapter.

[6] See, for instance, http://blogs.hbr.org/davenport/2008/02/enterprise_20_the_new_new_know.html

[7] Knowledge management (KM) comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences that comprise knowledge.

to benefit from social media use.[8] Section 19.2 discusses how social media can impact the stages of idea creation and idea translation. We propose three channels: the connection effect, the cognitive effect and the mindset effect. Section 19.3 highlights the key success factors for the use of social media in enterprises, particularly in the workplace. Section 19.4 concludes.

19.2 Idea Creation and Translation with Social Media

The first step in the innovation process is creating new ideas for solving existing problems or for exploiting new opportunities. Ideas emerge from a firm's existing knowledge sources. Knowledge can be embodied in individuals, either employees or external stakeholders, and in firm business processes. Previously, firms allocated the innovation effort to specialists and to R&D departments. However, the history of innovation is littered with discoveries that arise from fortuitous interactions between individuals who were unaware that their separate efforts had mutual relevance (Hargadon 2002).

Knowledge creation emerges when people engage in dialogical exchanges and transfer knowledge (Tsoukas 2009), usually through more social interaction and exchange relationships (Inkpen and Tsang 2005; Obstfeld 2005). Figure 19.1 presents the end-to-end innovation process, from the creation of novel ideas to the implementation of such ideas in innovative products and processes. In this model, interactions among knowledge sources involve more *horizontal* knowledge transfers between individuals and teams and thus more idea creation (channel *A* represents the process of knowledge creation). Dialogical exchanges are particularly important for tacit knowledge, which is not always easy to codify and store because it is rooted in actions, procedures, routines, ideals, values, and emotions (Alavi and Leidner 2001). Tacit knowledge must be converted into explicit knowledge in order to share it and make sense of it, which implies paying attention to the contextual and relational aspects of knowledge.[9]

Knowledge translation involves (i) making sense of knowledge and novel ideas and (ii) communicating to the firm's decision makers the ideas that are likely to bring business value (both process are represented in channel *B*). The latter implies *vertical* knowledge transfer of refined ideas. Knowledge creation does not necessarily lead to innovations or value creation; value is created only when knowledge is "actionable" and applied where it is needed (Alavi and Leidner 2001; Levine and Prietula 2012). Actual idea implementation depends on additional factors such as the availability of financial resources or organizational political power (channel *C*).

[8] The survey and the case studies were developed by a team at INSEAD eLab in 2012.

[9] The competence to do global product development, for instance, is both collective and distributed, grounded in the everyday practices of organizational members (Orlikowski 2002).

Social media have the potential to boost both the creation and translation of knowledge in firms by overcoming barriers to knowledge transfers such as limitations of an individual's cognition, motivation or obstacles emerging from characteristics of social networks and ties (Levine and Prietula 2012). The main channel by which this boost occurs is by improving the firm's *social capital*, which encompasses many aspects of a social context, such as social ties, trusting relations, and value systems that frame and facilitate individual actions (Tsai and Ghoshal 1998).[10] We identify three channels that social media can exploit: facilitating the proliferation of networks that connect people for the benefit of the firm (i.e. connection effect); helping actors to make sense of knowledge (i.e. cognitive effect); empowering employees and users to be innovative (i.e. mindset effect).[11] The connection effect involves connecting people from different teams and practice domains for the creation of knowledge (relevant for channel *A*) and connecting different management levels for communicating such knowledge (relevant for channel *B*).

19.2.1 Connection Effect (horizontal): Empowering the Collective Wisdom to Create Knowledge

The connection effect has to do with the benefits of connecting people in networks, which can either have an intra-corporate nature (i.e. groups/teams operating under a unified corporate identity) or involve externals (including alliances with partners and specialists for the exchange, sharing and co-development of products and technologies). Networks have been shown to enable knowledge creation and firm performance because they exploit the "collective wisdom", i.e. cognition distributed across people, teams, practice domains and innovation streams.[12] This, in turn, facilitates the recombination of ideas to generate novelty (Janhonen and Johanson 2011; Wagner and Majchrzak 2007).

Employing social media to generate and manage knowledge involves individual acts of offering knowledge to others as well as integrating knowledge that others

[10] Some scholars have conceptualized social capital as a set of social resources embedded in relationships; others have given a broader definition of social capital, including not only social relationships, but also the norms and values associated with them. Inkpen and Tsang (2005) identify three dimensions of social capital: structural, cognitive and relational. The conditions related to these three dimensions that facilitate knowledge transfer in an intra-corporate network involve the decentralization of the network (with no hierarchies), shared vision and collective goals, reward criteria to reduce mistrust among members.

[11] This is usually determined by the structure configuration in terms of hierarchies and flexibility.

[12] Faraj et al. (2011) show that online open communities generate knowledge through social interactions.

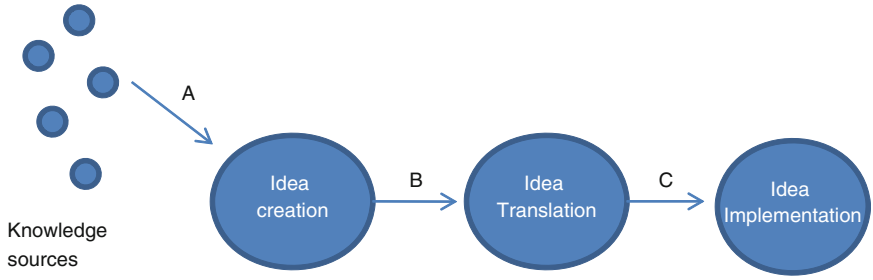

Fig. 19.1 The innovation process

have contributed (often through a process of crowdsourcing).[13] One benefit of social media identified by the multinational companies we interviewed is that it breaks down organizational silos, thus bridging "structural holes", i.e. gaps between groups or individuals who were not previously connected.[14] One example is Gemalto, a global provider of digital security solutions. Breaking down silos and enhancing information sharing across business units is crucial for this company because many of its products depend on several departments: for example, pay-by-phone products involve both the telephony and the financial services departments. The creation of new knowledge thus depends on connecting people and teams.

Social media can make the discovery of novel ideas more likely if they encourage interactions between people with different backgrounds and capabilities.[15] Whereas each interaction either with a colleague or with external people has the potential to yield new information, knowledge transfers bring more value when social interactions take place in teams and networks where people are more diverse (Cummings 2004). Also, interactions with people who are socially distant, beyond the close circle of collaborators, are more likely to bring novelty (Burt 1992; Frey et al. 2011). This is the case, in part, because individuals who interact infrequently are more likely to obtain information from different sources and because ongoing interactions among people within a group tend, over time, to reduce the variation in their knowledge and behavior (Gray et al. 2011).

New knowledge can particularly identify emerging needs across different parts of the organization. Unlike previous knowledge management initiatives, enterprise 2.0 practices linked to the corporate use of social media let content structures emerge from open social interactions (instead of imposing centralized structures in advance). This implies that only those ideas that are most relevant for the business

[13] Crowdsourcing is the practice of obtaining ideas or content from a large pool of people (especially in online communities).

[14] The concept of structural hole was introduced by Burt (1992).

[15] Previous INSEAD eLab research shows that companies that combine tools for employees and externals are also more agile. Agility is the firm's capability to detect opportunities for innovation and seize those competitive market opportunities by assembling requisite assets, knowledge, and relationships with speed and surprise (Sambamurthy et al. 2003).

would emerge at the top of conversations. Social bookmarking, for instance, allows individuals to easily discover what information sources other people in the firm find interesting and useful (Gray et al. 2011).

Social media are not a panacea, though. Literature in the anthropology of technology has shown that in certain cases technologies may reinforce or take the shape of existing social hierarchies and divisions, despite the rhetoric about breaking down silos. But even if they do break silos, the proliferation of digital social networks has some drawbacks. On the one hand, exposing people to too many platforms can create scarcity in users' time and effort so they are less likely to bring value to any single platform (Wang et al. 2013). Involving too many people in a given platform, on the other hand, might become counterproductive due to information overload (Laursen and Saltern 2006, find an inversed U shape for the link between the number of community participants and innovation). An executive from Lyonnaise des Eaux, a France-based utility company, suggested that the best way to break silos and enable collaborations between different divisions is to connect the right people, i.e. key people that take decisions. Otherwise, firms run the risk of facing a situation of "infobesity", where employees are overwhelmed by information overload.

19.2.2 Connection Effect (vertical): Communicating Knowledge and Innovations

In addition to connecting people horizontally across teams, social media can connect people vertically so that key people (usually the top management or other decision-makers) have access to the knowledge generated by lower management levels. At L'Oreal, a global cosmetics company, the enterprise social network (called ePop) is considered to be a time-saving tool for senior executives who can access knowledge more efficiently and also transmit their knowledge to other people by posting them on the social network instead of answering to each query individually.

People generating novel ideas, the "idea scouts", are often well-connected to knowledge sources outside and across the company but do not necessarily have strong connections and power inside the firm. Therefore, the "idea connectors", employees who know who is doing what inside the company and know how to overcome internal barriers to idea adoption,[16] need to have access to "idea scout" knowledge. MAPFRE, the Spain-based global insurance firm, has successfully connected these two axes of information flow via social media. The company has an idea "Incubator", an internal social platform where employees can participate and vote for the best ideas. A challenge is posted to the group, then participants propose ideas, critically discuss them, and vote on the best ones. The best ideas are presented to a committee that then decides which to fund and develop further.

[16] The notions of "idea scout" and "idea connector" were obtained from Whelan et al. (2011).

19.2.3 Cognitive Effect: Making Sense of Knowledge with Innovation Narratives

Innovations are not likely to occur if emerging knowledge is not properly understood and there is not a clear vision of the firm strategy. In a full cycle of knowledge translation, firms convert implicit knowledge into explicit knowledge, which is then 're-internalized' when people across different business units understand the new knowledge and identify the most relevant uses (Nonaka and von Krogh 2009). However, new knowledge often faces the challenge of interpretive barriers to innovation (Dougherty 1992). Ideas that come from different parts of the organization may remain underused to the extent that people are unable to see their relevance to their own work. Ideas are not always comprehensible and may not appear legitimate to others.

The company innovation "vision" and the activities related to such vision must be understood not only by the top management but by all employees in order to continuously translate ideas into actual innovation. Social media help track ideas because they leverage spontaneous moments of personal innovativeness, unlike the traditional workplace where casual problem solving may leave no memory of the event. In particular, social media have the potential to create a narrative that helps keep fluid participants informed of the state of the knowledge in the company. Organizational memory is a key component of organizational learning (Tippins and Sohi 2003). When companies are able to depict past innovations as well as project future developments in a structured manner, along with the contextual details surrounding their occurrence, they create innovation "narratives" that facilitate coordinated action.

Social media, along with fostering innovation narratives, can also improve the cognitive dimension that provides shared meaning and understanding between members (i.e. shared goals, shared culture). Organizations are formed by 'networks of conversations'[17] and organizational communication based on narratives helps members understand the practices of strategy and constitute an overall sense of direction or purpose, of refocusing organizational identity, and of enabling and constraining ongoing activities (Fenton and Langley 2011).[18]

Social media should not only focus on keeping trace of "Eureka" moments but also on keeping such ideas alive. 3M Corporation, a company that has been able to sustain innovation for over a century, has been encouraging employees to cultivate events driven by serendipity and opportune moments.[19] 3M realized that ideas that emerged during opportune moments could be lost amid daily routines.

[17] Blaschke et al. (2012) suggest that such networks define the nature of organizations and why they exist.

[18] Using the narratives argument, these authors link organizational communication theory and strategy as practice.

[19] This case study was developed by Garud et al. (2011).

Consequently, the company put in place mechanisms to keep ideas alive. In particular, the company has been developing innovation narratives that serve as memories linking the company's past, present and future.

19.2.4 Mindset Effect: Enhancing Individual Innovativeness

The mindset effect has to do with the creation of an employee mindset that is more "participative" and results in more *personal innovativeness*.[20] User-friendly social media platforms that leverage user-to-user interactions successfully engage users into core business processes, enhancing their readiness to create knowledge (Hienerth et al. 2011). However, individual knowledge creation also depends on having an innovation mindset. At Groupe ADEO, one of the biggest global companies in the Do-It-Yourself industry, employees started developing bottom-up social collaboration initiatives to promote innovation, particularly in terms of process efficiency (a project called Humaneo).[21] Humaneo's sponsors focused more on changing the mindset of employees rather than on the tools used for collaboration. Once empowered, network members could then look for company "sponsors" to help them nurture their ideas.

The results of our interviews with multinational companies, where questions about idea generation and innovation were posed, suggest that social media can generate a "feasibility mindset", i.e. employees of all levels have a better sense of how to convert innovations. If social media foster the process of knowledge translation through innovation narratives, then people gain an appreciation of the resources that exist in different parts of the organization and how to draw on them to generate new products and services or novel ways of solving problems. Innovation narratives can symbolize the boundaries of acceptable behavior in organizations, create a common ground for social action, and inspire new ideas (Bartel and Garud 2009). [22]

Research has also found a positive link between the use of social media and higher *emotional capital* in the organization, which involves both greater trust and bonds between employees and also a feel of attachment to the company's values. Both effects can enhance the personal innovativeness mindset. People that trust each other are more likely to let resources such as ideas, people's time and passions flow in and out of networks and communities.[23] Employees who have a

[20] Personal innovativeness refers to the extent to which an individual actively generates, discovers, and promotes creative ideas. Organizational factors such as managerial style, job complexity, and leader behaviors may affect employee innovativeness.

[21] Humaneo was initiated in 2008 by a group of employees who wanted to share new human resources practices they had witnessed in the Silicon Valley.

[22] Narratives are especially instrumental in socializing newcomers.

[23] Passion drives participation by enticing people to develop the community's knowledge base (Faraj et al. 2011).

feeling of "belonging" are also more likely to contribute their ideas.[24] These feelings are based on a collective identity, often bolstered by stories that identify the group's purpose and core practices (Koschmann 2013; Wry et al. 2011).

19.3 Key Social Media Success Factors

There are more and more stories in which companies using social media innovate and achieve business benefits. Danone, a global player in the food processing industry, has used an enterprise social platform (called Dan 2.0) to share best practices across business units so that new products launched in some national markets are more easily replicated in other markets. This allows the firm to save time and money that was previously spent on new product development. The Plazza enterprise social platform at France Telecom-Orange allows employees to test new products, which saves money on external testing for product innovation. GDF Suez Energy Services (GSES), a business line of the energy utility company GDF Suez, is using a global company-wide enterprise social network to develop ideas and projects proposals faster. Some projects invite employees to take part in participatory innovation processes (e.g. the project "Imagine"). This agility has helped the firm succeed in various calls for tender (e.g. energy efficiency contracts for airports).

However, not all companies succeed with the use of social media. The advantages of using new information technologies in enterprises come from embedding these technologies in the organization. Technologies need to be implemented through a set of enabling organizational assets and practices.[25] Providing "users" of digital technologies active roles in the creation of knowledge requires, in addition to the firm's technological competences,[26] the availability of adequate skills. People need the technical skills to work with new software but they are also increasingly expected to engage in more cognitively complex tasks such as generating their own knowledge and content. Moreover, developing social skills such as mediation and negotiation are also important for communicating with other co-workers in digital communities (O'Mahony and Ferraro 2007). Most importantly, companies need organizational and management triggers that prepare

[24] Huy and Shipilov (2012) found that executives who use social media to build emotional capital within their employees' communities reap real benefits in terms of improved information flows, collaboration and higher employee motivation.

[25] Following the resource-based view of the firm, companies compete on the basis of internal organizational resources that are heterogeneously distributed among firms. Aral and Weill (2007) show how differences in such IT capabilities or organizational enablers explain differences in firm performance (in dimensions such as profitability, market valuation, costs and innovation).

[26] Technological competences usually refer to flexible and integrated IT infrastructures and to mature IT governance.

them to do things in a more "social" way. Some of these organizational challenges are discussed below.

19.3.1 Transforming Contestation into Collaboration

Communicating through social media is not costless. People need to clarify and verify information. Also, the proliferation of contrasting ideas can create "tensions" between participants. Dysfunctional confrontation may make social interactions unproductive and undermine innovation (Dougherty 1992). However, tensions are not necessarily bad if they can be used as the catalyst for knowledge collaboration. Online communities have shown that it is possible to transform contestation into collaboration. Open-source projects often hold divergent interests but discover areas of convergent interest and are able to adapt their organizing practices (governance, membership, ownership, and control over production) to collaborate. Firms that respond to these tensions generatively (rather than in restrictive ways) are more able to realize the potentials from social media-enabled social interactions (Faraj et al. 2011).

19.3.2 People Empowerment and Leadership

The potential of social media to act as a lever for knowledge transfer depends on the degree of openness, freedom, and employee empowerment in corporate environments (Schneckenberg 2009). Organizations that adopt, instead, approaches that reduce interactions and lock people into 'thought worlds' (Dougherty 1992) or that institute rules and routines to govern employee interactions and insist on their rigid application may be dampening emergent dialogical processes (Tsoukas 2009).

People empowerment is important because it fosters personal innovativeness. For instance, ensuring anonymity may sometimes be an effective way to encourage people to contribute ideas (Faraj et al. 2011), yet creativity usually receives a boost when top management explicitly credits and recognizes individuals' contributions (Jeppesen and Frederiksen 2006). People are often driven by incentives such as pride of authorship and peer recognition (Franke et al. 2010; Hienerth et al. 2011).[27] The MAPFRE Incubator is a good example. The ideas generated either in the Incubator or through the content generated in blogs are personalized (a profile

[27] When members of online communities innovate, they do not do it anonymously or randomly in cyberspace, but with reference to identity, reputation, technologically derived status and collegial networks (Fleming and Waguespack 2007).

and picture of the person are presented along with the idea itself), creating incentives to participate.

Empowering people *per se* is not useful if the company does not have a clear common strategy for the business and its innovation efforts. Figure 19.2 shows that companies that reward individual efforts and ideas through recognition are more likely to realize benefits from social media in terms of the personal innovativeness of employees. However, individual recognition is not as effective if not complemented with a clear strategy for social media that is aligned with the corporate business strategy.

Although social media often remove preconceived notions about how knowledge should be created and structured and let structures emerge "bottom-up" over time as a result of users' interactions, the emergence of leaders and the involvement of the top management is important. The reason is that communication with social media is not free of frictions. As we saw above, people with different backgrounds (i.e. different professions or different business units) tend to discuss and disagree. Perhaps more relevant, people usually are not able to prioritize information and then act on it.

Collaboration through social media requires leaders who acquire individual expertise to select, reflect, and re-distribute content on the basis of the quality of the given information and to recognize patterns within information overload. Leaders also need the ability to develop holistic action frameworks out of contextualized information, to control information and shape collegial and managerial perceptions and to make reasoned and reflected decisions on the basis of specific information (Schneckenberg 2009).[28] Leaders in digital communities, usually the "idea connectors", raise dialogue between "idea scouts" and top management in charge of converting ideas into innovation and business value. If knowledge emerging from social media is costly to codify and the ability to make reasoned and reflected decisions can only be acquired through experience in the company, then the involvement of the top management becomes necessary to facilitate the matching between problems and solutions. This intensifies the utilization of knowledge (Garicano and Wu 2012).

The top management and the idea connectors are more effective when they assume a mediating rather than directing or monitoring role during virtual collaborations (Sutanto et al. 2011). At AkzoNobel, the largest decorative paints and performance coatings company in the world, the governance of social media is more about facilitating collaboration than about telling people what to do. The use of social media has grown organically, based on business needs, and the company supports whatever employees need to be productive, including training on core skills (such as team work, personal and team effectiveness, etc.) that are relevant for using social media effectively.

[28] Fleming and Waguespack (2007) discuss the role of leadership and brokerage in open innovation communities (beyond firm boundaries). Leaders deal with balkanization and cooptation by commercial interests.

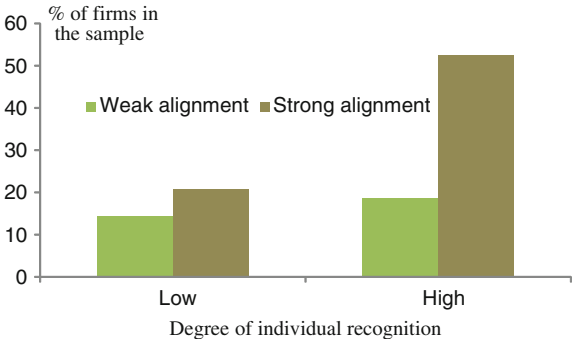

Fig. 19.2 % of firms that reported benefits from social media in terms of the personal innovativeness of employees: sample divided by degree of individual recognition and maturity of social media strategy alignment. (*Source* INSEAD eLab based on a survey of 203 companies around the world. Note: *Personal innovativeness* measures, using Likert scales, the extent to which employees create innovative ideas in a more entrepreneurial work environment. Alignment measures the extent to which the social media strategy of the firm is aligned with the corporate business strategy. The degree of recognition refers to the firm's culture of rewarding individual achievements)

19.3.3 Sustaining Organizational Change

Perhaps the most challenging part for firms adopting social media has to do with the accompanying organizational changes that are often required. Given that they foster horizontal communications and a greater reliance on people over processes and competencies over official positions, social media can indeed disturb hierarchical structures within firms and call for a new type of management. Firms are increasingly expected to adapt core elements of business models more centered in "users" of digital technologies (Hienerth et al. 2011). This involves giving a more active strategic role to people, either external (i.e. customers) or internal (i.e. employees).

As information technologies have become increasingly modular and recombinable, so have organizational processes and forms. Organizing no longer needs to take place around hierarchy as was the case with "command and control" models (Pentland and Feldman 2007). Our survey data shows that decentralization[29] makes firms more likely to report benefits from social media in terms of better information flow, more collaboration and, most interestingly, more employee innovation. Bayer Material Science, the chemical division of the pharmaceutical firm Bayer, reports that its enterprise social network has led to a more

[29] The specific question in the survey is: Please choose for each statement below the level of agreement: "Teams in our organization are empowered to make their own decisions about pace, direction and method of work". Those firms with more decentralization have a higher score.

open collaboration environment, where the content employees contribute is more important than where they are in the organizational diagram.

However, changing work practices is not easy as there is a certain degree of *organizational inertia*. People within the firm may fear the loss of familiar routines, status or power (Hannan and Freeman 1984). Organizational power struggles and conflicting goals sometimes represent a barrier to the successful implementation of new technologies (Denyer et al. 2011). In addition to power conflicts across management levels, barriers for the adoption of social media sometimes emerge across business units, as specific professionals may feel threatened by the "open innovation" process that social media enable. At GSES, some employees considered sharing information through social media as a potential loss of power and, for some cases (employees from R&D or Engineering who have an "internal" business), a loss of revenues. At Gemalto, salespeople often see information as a source of comparative advantage. Nevertheless, such barriers are decreasing over time. At Groupe ADEO, the Human Resources department initially showed some resistance to Humaneo because they viewed the innovation activities related to this project as part of their field of competence. Today, the HR department is one of the most dedicated sponsors of this project and the company is building the enterprise-wide ADEO Community Network, which spreads to multiple business functions and will host several communities, among which Humaneo.

19.4 Conclusions

Companies fear that investing in social media is a waste of resources and time. However, the emergence of enterprise 2.0 practices is more than a collection of software, bringing organizational changes that can be relevant for creating value. There are at least three channels through which the corporate use of social media can help the innovation process: by connecting people, which enhances knowledge production; by creating a new mindset, in which people are more engaged and willing to innovate; and by making sense of knowledge in the context of the overall firm strategy. The central argument is that social media help organizations create "narratives" of innovation that create a common and clear strategy for realizing the maximum potential from novel ideas. In addition to connecting and engaging people with novel ideas, social media can transform how companies innovate via a focus on storytelling that contributes to sense-making across teams and communities.

The literature about the benefits of the corporate use of social media on the process of innovation is still scarce. Little has been said about the role of social media on innovation communication. Using social media in enterprises has some drawbacks and assessing the benefits of the three channels proposed in this chapter requires empirical validation using firm-level or team-level data. Taking advantages of the benefits of social media requires new organizational practices. Initial evidence from case studies to date suggests that collaboration and employee

innovation with the use of social media are enabled by a certain degree of organizational decentralization ("breaking hierarchies") and by rewarding individual initiatives through recognition. Although specific business needs must be identified and basic guidelines are required, too much organizational control over communication and interaction processes may be detrimental: in many interviews we heard that governance is more about facilitating things and about people feeling free to collaborate than telling them what to do. Further research should shed more light on the organizational changes required for firm success with the use of social media.

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Chapter 20
There is Something Forgotten About the Customer in the State of Denmark's Finance: The Tale of Danske Bank's Misaligned Innovation and Communication Strategy

Jørn Bang Andersen

Abstract In the early 1990s the Nordic countries Sweden, Norway and Denmark went through a major financial crisis where for example the Swedish Krone was devalued with 26 % and both in Sweden and Norway did the governments have to rescue their banking sector by nationalizing it. In Denmark the banking crisis didn't go as deep as in the other Nordic countries. This meant that Danske Bank, one of Denmark's and the Nordic region's leading banks, had a special situation and an open window of opportunity for expansion to becoming one of Northern Europe's leading regional banks. In this chapter the story is about how Danske Bank's innovation focus from back in the late 1990s and later on with its communication strategy derailed the bank's leading market position in the Nordic region and Denmark. The case applies the Innovation Radar, a business model innovation framework, and reputation management to show how even a very focused innovation strategy neglecting the customer over time can be lethal if the strategy becomes static and is not reviewed. The case also looks into why a communication strategy in order to be effective should be an integrated part of a company's overall business innovation strategy.

20.1 Strategy and Innovation

> Mass advertising can help build brands, but authenticity is what makes them last. If people believe they share values with a company, they will stay loyal to the brand.
>
> Howard Schultz CEO Starbucks
> (Schultz and Yang 1997)

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In 'Playing to Win' A.G. Lafley former Chairman and CEO of Procter and Gamble and Roger Martin, Dean Rotman School of Management writes that strategy is about making choices. More precisely: 'strategy is an integrated set of choices that uniquely positions the firm in its industry so as to create sustainable advantage and superior value relative to the competition' (Lafley and Martin 2013). In line with this it can also be argued that corporate activities like innovation and communication are closely linked to the company's mission, vision, values and overall strategy.

To succeed over time an organization needs to have core competences and a certain set of capabilities to match them. If mastered this will enable the organization to position itself within the business activities where is can excel and pursue strategic choices made. Michael Porter wrote on strategy that core capabilities can be understood as an operating system of interrelated activities, and that sustainable competitive advantage is unlikely to arise from just one capability like for example a superior IT platform or having the best processes. The corporation's innovation strategy should not include objectives or strategies inconsistent with the general strategy and goals. The alignment of corporate goals and strategy should be known and shared across all functional areas from business development, sales, marketing, innovation, human resource and accountancy. As such innovation is just one among several corporate functional activities that have to be aligned in order to avoid the infamous corporate silos. And the corporate general strategic goals reveal the clout of various departments in the organization. If the goal is to increase sales of existing products with 20 % over the next two years and spent around 3 % or the same on innovation, clearly the weight between sales and innovation speaks in favor of the sales department (De Bes and Kotler 2011).

Likewise, if the company decides to increase communication and marketing budgets and freeze all other departmental budgets, these two former departments are obviously the chosen ones in the corporate strategy. The situation is however that most companies don't have an explicit innovation strategy. Another factor is that most of the companies that do have an innovation strategy tend to focus their innovation on either the product or process innovation. It is only a minority of companies are still mastering business model innovation and apply a holistic view on innovation (Johnson 2010).

20.2 Strategy, Communication and Trust

At the inaugural summit for Colorado Innovation Network in Denver 2012 Muhtar Kent Chairman and CEO of Coca Cola stated that 'a brand is a promise and a good brand is a promise kept' (Kent 2012). In the publication 'Reputation Rules—Strategies for Building Your Company's Most Valuable Asset' Daniel Diermeier introduces what is labeled the Trust Radar and he writes that the mis-conception about reputation management starts with the wrong mindset where most companies see reputation as corporate function and not a core capability (Diermeier

2011). This belief is partly based on a view that reputation management requires by and large common sense. And if there is a problem it can be dealt with by the communication or a PR bureau from outside or in worse cases legal advisors. This is according to Diermeier flawed, because challenges to a company's reputation typically arise in situations that require the involvement of the highest level of management as well as actions where the company's overall strategy and brand is involved. There are other factors at play as well. A company's brand and reputation is not only shaped and controlled by performance, business partners, customers and suppliers. There are always external constituent groups that can pop up in a time of crisis, and they can be unknown yet important influencers in the public, it can be unknown interest groups cropping up on social media and it can be regulators or politicians. A company's reputation is the sum of what people outside the company says about it. Its brand is therefore essentially shaped by public perceptions. To manage a company's reputation and brand calls for the ability to deeply understand external views and sentiments towards the company.

20.3 The Innovation Radar Framework

Within the Innovation Radar framework innovation is defined as an initiative in any dimension(s) of the business system to create substantial new value for customers and the firm (Sawhney et al. 2006). This innovation definition emphasizes three points: originality (an initiative to create new value), a holistic view (an initiative in any dimension(s) of the business system), and customer outcomes (the value generated by the initiative for customers and the firm). The Innovation Radar creates a visually compelling profile of the firm's current innovation strategy through our measurement of all twelve vectors. The Innovation Radar profile helps to create better alignment on innovation strategy across functional areas and seniority (Chen and Sawhney 2010).

The point to be considered in this context is that a company can innovate along any of 12 different dimensions shown in Fig. 20.1, and as explained in Table 20.1 below. The key message is that business models innovation is far broader than just product or technological innovation as demonstrated by successful companies in a number of industries. Starbucks is the classic case of a company who got consumers to pay $4 for a cup of coffee-latte, which before then typically would cost 50 cent. Not necessarily because of better tasting coffee from

Starbucks, but because the company created a special customer experience referred to as "the third place". Together, the 12 dimensions of innovation can be displayed in the framework called the Innovation Radar, which companies can use to manage the increasingly complex business systems through which they add value (Chen and Sawhney 2010). Finally, in order manage efforts efficiently and develop a focused innovation strategy companies should at a maximum focus its innovation effort at one to five Innovation Radar dimensions at any time, and always review and adapt them to changing circumstances (e.g. Wolcott and

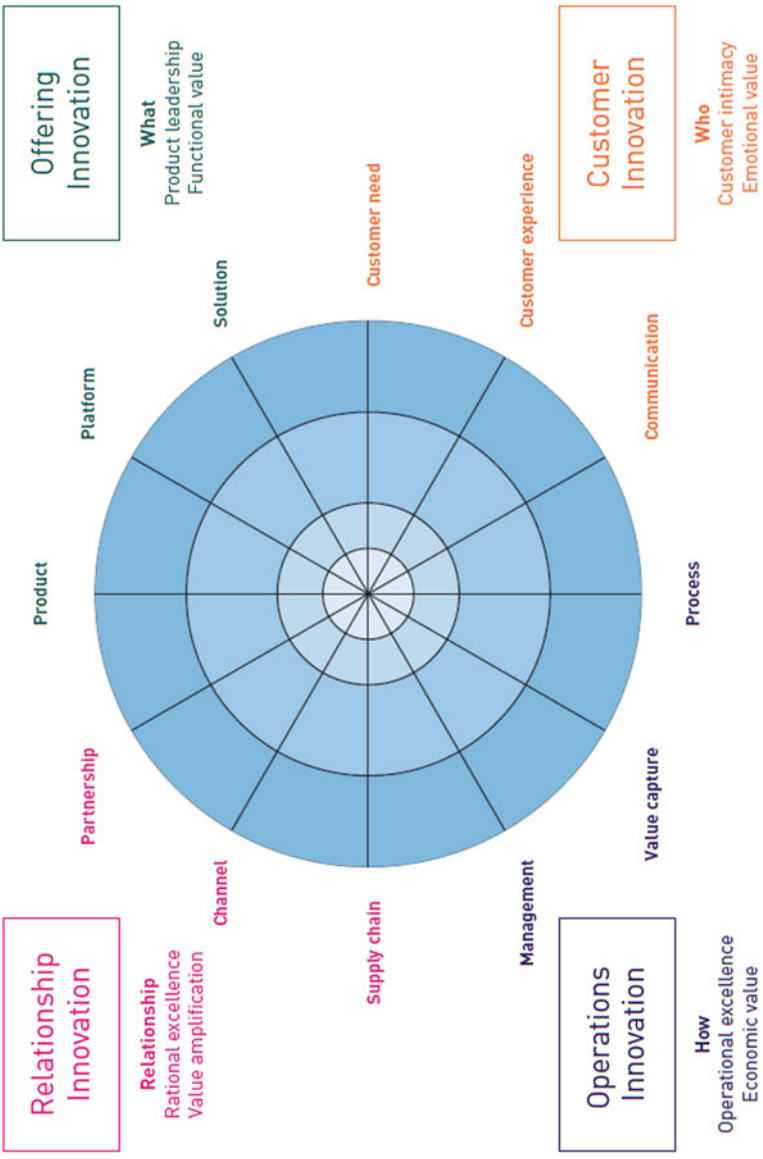

Fig. 20.1 The innovation radar

Table 20.1 Innovation radar 2.0, 12 dimensions explained

1. Offering	Development of new products or services
2. Platform	Use of common new components or building blocks to create derivative offerings
3. Solution	Creation of integrated and customised offerings that solve end-to-end consumer problems
4. Customer needs	Discover unmet customer needs or identify underserved customer segments
5. Customer experience	Redesign of interactions that customers have with the company in order to customer loyalty based on positive emotional response
6. Marketing/ communication	Implementation of creative marketing communications to position, promote or brand products and services
7. Process	Redesign of core operating processes to improve efficiency and effectiveness
8. Value capture	Creation of new ways to get paid for products and services
9. Management	Invention and implementation of a significant change in organization structure or management methods to further organizational goals
10. Supply chain	Thinking differently about sourcing and fulfilment
11. Channel	New routes to the marketplace or innovative points of presence for customers to find and buy products and services
12. Ecosystem/ partnership	Creation of innovative partnerships and collaborative relationships with suppliers, partners, vendors, resellers etc. to create joint offerings

Source Chen and Sawhney 2010

Lippitz 2010). It should be mentioned that the Innovation Radar has not been applied by the article's case company Danske Bank. However, in 2011 the author and professor Robert C. Wolcott from Kellogg School of Management advised on the Innovation Radar methodology to Deutsche Bank's Retail bank division. Deutsche Bank's retail division highlights its adaptation and work with the Innovation Radar in its publication 'Innovation Management—Deutsche Bank GT Retail' from January 2012. As such the relevance of the tool for analyzing innovation strategies in the financial industry should be quite clear.

As a rule of thumb companies will be likely to have a better return on their innovation and competitive performance over time if they single out 1–5 Innovation Radar dimensions to focus on, and differentiate themselves from the competition in order to remain agile and respond to market and consumer changes (e.g. Levitt 1986). Overall, there are four generic Innovation Radar profiles that a company can have. These four profiles are shown in Fig. 20.2.

The key message is that a high focused innovation radar profile denotes a coherent and well-defined innovation strategy. However, as it will be argued in the Sect. 20.4 and with the case of Danske Bank, a high focus and high effort innovation radar profile is not always a guarantee for stellar performance over time. This is especially the case if the strategy is not adjusted to changing circumstances. It should be noted that Danske Bank's innovation radar profiles are based on the author's own interpretation and insights from having applied the Innovation Radar to around 150 companies in the Nordic region and OECD countries (Fig. 20.3) (Nordic Innovation 2012).

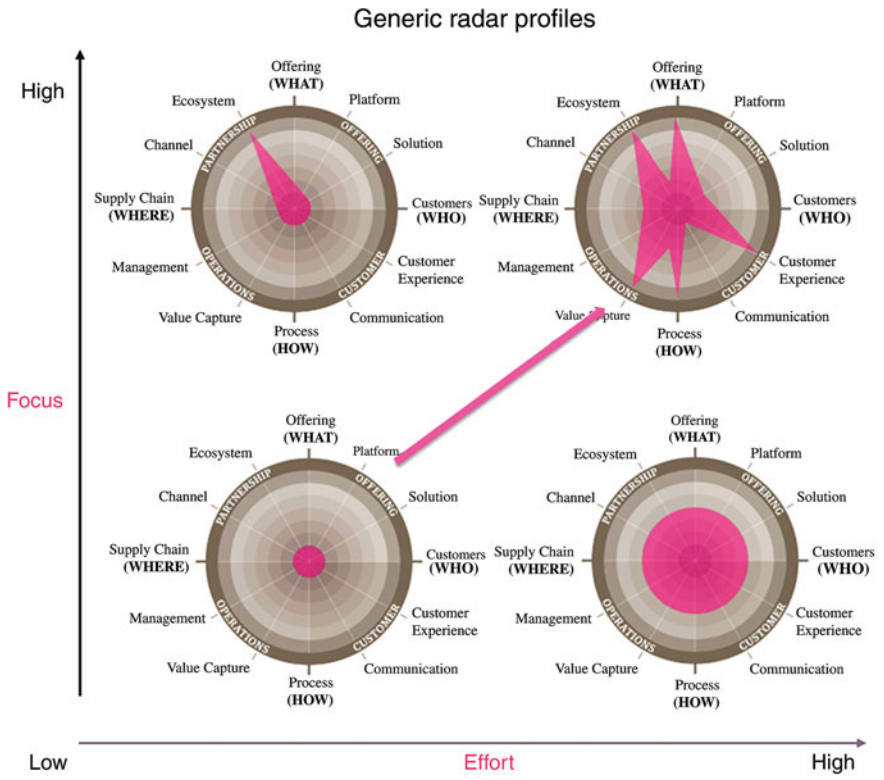

Fig. 20.2 Generic innovation radar profiles

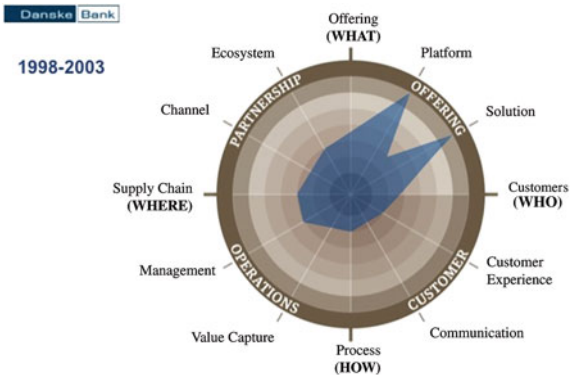

Fig. 20.3 Profiles Dansk Bank's innovation radar profile 1998–2003

In the 1990s Danske Bank went from traditional loans and savings bank to a financial supermarket offering mortgage loans, insurances, and it became a one-stop shop for the handling of peoples' matters within these varied field of finance,

insurance and mortgage loans. The Innovation Radar interpretation of Danske Bank's innovation strategy from late 1990s to early 00s shows that the company had its main focus on two Innovation Radar dimensions: namely that of their IT platform and on using this platform for launching new product solutions in their financial supermarket. Danske Bank's innovation radar profile from 1998–2003 shows a high innovation focus around developing a platform and related bank products (Andersen 2013).

20.4 Nordic Banking in the 1990s: Innovation and Reputation

20.4.1 Nordic Banking in the 1990s: Innovation and Reputation

In the late 1980s and early 1990s the Nordic and Danish banking sector was in trouble, and it had to be supported by the governments of Sweden, Norway and Denmark. Denmark avoided the actual financial systemic crisis experienced by Finland, Sweden and Norway, and in Denmark's case Danske Bank was primarily involved in a rescue of banking at the Faroe Islands in cooperation with the Danish government (Abildgren and Thomsen 2011). Danske Bank was the majority owner of the Faroe banks that had to be bailed out by the Danish government, and the process of the state taking over Danske Bank's billion kroner loses in 1992–1993 was later criticized by a special investigative commission (Den Store Danske 2013). Nevertheless, compared to the other Nordic countries the Danish government and the largest bank managed to steer Denmark clear of the Nordic banking crisis, and Danske Bank's public image was in the 1990s solid and never jeopardized. In fact, throughout the 1990s Danske Bank consolidated its public image and reputation as the leading Danish bank and as one of the strongest banks in the Nordic region. The 1990s is characterized by a number of bank fusions including Danske Bank's taking over the state owned Giro Bank and Bikuben known as BG Bank. More importantly Danske Bank merged with two other major banks namely Handelsbanken and Provinsbanken in 1990. And throughout the 1990s Danske Bank increased its international activities and established retail nets in Oslo, Stockholm and Helsinki. In 1997 it bought Östgöta Enskilda Bank in Sweden and in 1999 Fokus Bank in Norway. In terms of management Danske Bank changed its CEO in 1990 and 1998 (Fig. 20.4).

From at around year 2000 Danske Bank embarked on an international expansion strategy with the goal of becoming a regional leading Northern European bank. The expansion became manifested by the take over of the Northern Bank in Northern Ireland and National Irish Bank in Ireland in 2005. And in 2006 Danske Bank took over the Finnish bank Sampo Bank for the sum of 30 billion kroner or around 7 billion EUR. Danske Bank's international expansion and take over of

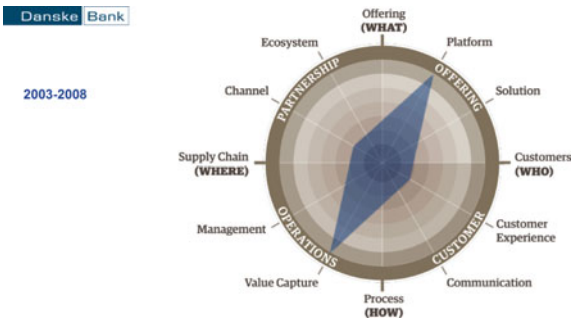

Fig. 20.4 Danske Bank's innovation radar profile 2003–2008

banks in Ireland and Finland was arguably strongly connected with the belief that Danske Bank had an IT-platform with net-banking and other solutions that was considered superior to the IT-platforms of other banks, and this allowed for higher value capture and profits than the competition. Hence, the Innovation Radar profile during the expansion period of 2003–2008 can be said to have been focused on the IT-platform and value capture or the making of money and profits from the platform technology. In fact, the expansion model of Danske Bank seems to be that once a new bank is bought, its existing technology platform and other solutions are un-plugged, and Danske Bank mounted its IT-platform, almost like a routine activity of replacing a hard disk on a computer.

In terms of innovation strategy it should be noted that Danske Bank apparently pays little attention to customer experience or customer need (e.g. Levitt 1986). This is probably so, because there is a seemingly very strong belief that the bank's IT-platform and net bank is unmatched by the competition. The top management could however, have learned from its takeover of the Finnish Sampo bank. It could have learned that Danske Bank's IT-platform was not necessarily as strong as anticipated.

What happened when Danske Bank took over Sampo Bank was that around 41,000 Finnish Sampo Bank customers simply voted with the feet and decided to change to other banks within a couple of months. They did so because of failure and breakdowns of Danske Bank's IT-platform (Bang 2009). On top of this, many of Sampo Bank's Finnish customers' experienced that Danske Bank's Internet banking solutions were outdated compared to Sampo Banks. A fact that easily will be verified if someone visits Finland and asks people about why 41,000 Finns left Sampo Bank when Danske Bank took over in 2006. In view of innovation strategy it is important to notice that Danske Bank shows no strong focus or effort out-side platform and value capture. There is no movement on the Innovation Radar or repositioning over time. It is especially interesting to notice how a service based company within finance showed so fairly small attention towards customer need and customer experience. This arguably near static innovation strategy by Danske Bank also shows little learning and dynamic capabilities in organizing for innovation and growth (e.g. Teece 2009).

20.4.1.1 Innovation, Communication and Reputation 2003-2008: The Competent Banker

Inspite of Danske Bank's problems in Finland, the bank's situation in Denmark was very strong in the first half of the 00s. Thus, in 2005 Danske Bank was voted the year's best brand within business-to-business marketing at a nomination of Super Brand Awards (Busch 2005). During those years Danske Bank is making record profits and a leading agent in offering interest free loans for housing. And the bank's then CEO Peter Straarup announced before the financial crisis that financial innovation like derivatives and subprime loans was key to understanding the general welfare of society and booming economy in general (Schrøder 2009). At around the same time the super investor Warren Buffet's had already in 2003 warned that derivatives were financial weapons of mass destruction that could prove to be lethal to the stability of the global economy. In spite of the good financial results and high level of respect for Danske Bank's expertise, there began to be some cracks in the surface at around 2005. The Bank is for example seen as exponent for the introduction of a special fee that ordinary Danish people will have to pay for using their credit card. In Denmark there was and is a national uniform credit card solution and it represents a kind of national historic agreement among all Danish banks, retailers, customers and government regulators. With the introduction of the credit card fee Danske Bank's CEO is put on the front page of the largest tabloid and labeled 'Gebyrgrib'. The word is difficult to translate, but means a kind of 'Fee Vulture or gatherer'. As it was commented no communication agency in the world could have come up with a better characterization for its worst enemy than this one for Danske Bank's CEO. Nevertheless, three years after and in 2008 Danske Bank received the third highest ranking in an annual business survey measuring Danish companies' image and reputation.

It seems that there is an increasing discrepancy between the bank's image among other businesses and the bank's image in the general public and among private customers. In terms of communication and reputation management it can be argued that Danske Bank scores high for its expertise and commitment to make money, but it scores low on general empathy, and is generally not seen as an open and transparent organization by an increasing number of people (Fig. 20.5).

The global financial services firm Lehman Brothers bankruptcy in September 2008 also meant the unfolding of the global financial crisis and freeze of the interbank market and a general economic meltdown. As mentioned Danske Bank had been at the forefront in the Danish housing boom and lobbied for the introduction of interest free-mortage loans in Denmark in 2003. When Lehman Brothers went bankrupt in 2008 the Danish government had to roll out a floor guarantee of several hundred billion Kroner. And according to the financial expert Jacob Funk Kirkegaard, Research Fellow at the American Peterson Institute for International Economics, this most likely rescued Danske Bank from going bankrupt (Pedersen 2012). In September 2013, five years after, a government investigative committee looking into the financial crisis in Denmark confirmed that Danske Bank indeed was close to going bankrupt in 2008.

Fig. 20.5 Danske Bank's innovation radar profile 2008–2013

In autumn 2008 Danske Bank had outstanding loans of 20 billion USD or 110 billion Kroner. This has to be seen in relation to the fact that (Danmarks Nationalbank) Denmark's National Bank's foreign currency reserves were at 100 billion Kroner. Given that Danske Bank was and is under the guarantee of the National Bank any default of timely payments by Danske Bank could have bankrupted the Danish State as well. This is so, because the Danish National Bank cannot print dollars. Hence, if Danske Bank had been asked to meet all its obligations neither bank could have met the demands. This was close to being a Nietzsche moment—i.e. when you look into an abyss, the abyss also looks into you—for both the Danish National Bank and Danske Bank.

Like in the USA and most other Western European countries the financial sector's image and reputation in the public and among other businesses dropped dramatically in the aftermath of the financial crunch (e.g. Harris Interactive 2012). But no other Danish financial institution experiences a bigger image drop than Danske Bank. Thus from being among the top three strongest brands and business images just before the financial crisis, Danske Bank slides down to number 138 in 2010. On top of the national governmental banking rescue packages, Denmark also decided to contribute with loans to the EU's financial rescue package for Ireland, although Denmark is not part of the Euro. This was so, because Danske Bank had bought two Irish banks one of which—Irish Bank—was one of the largest in Ireland. This made Danske Bank and Denmark's State vulnerable to the situation of the Irish and Northern Irleand's financial meltdown in 2010, because Danske Bank had registered its Irish Banks as sister companies and were not part of the Irish State banking guarantees.

20.4.2 Innovation, Communication and Reputation 2008–2013: The Yellow Campaign

In parallel with the substantial financial government support to Danske Bank, many ordinary people lost their jobs and have found it increasingly difficult to obtain loans or credit lines for their businesses. The general public sentiment

towards the financial sector and especially towards Danske Bank became very negative and is in 2013 clearly at a historical low.

In the course of events after 2008 it is obvious that Danske Bank is no longer focusing its business development and innovation on the IT-platform alone. In fact, the strong innovation focus on the IT-platform seems partly abandoned, and there is a clear shift and attempt to become more focused on using innovative communication in order to change the course of events and repair on a deteriorating image. Up until the financial crunch in 2008 Dansk Bank's slogan had been 'Do what you are best—that's what we do'. And the bank's logo had for a long time been conservative reliable dark blue colors.

Danske Bank seemingly realizes in 2010 that when you partly live on the taxpayers' money and public guarantees you need to show more than just commitment to making profit for your shareholders. You also need to build empathy among your new stakeholders, simply because they also have a stake in your business. In order to show more humility and present itself more in line with the economic recession Danske Bank launched an interim image campaign with a change of logo colors and slogan. The traditional blue colours are changed to yellow and black.

In Denmark the yellow and black color combination is associated with the most popular discount retail chain Netto. The yellow discount campaign ran for five weeks, and then the bank went back to its traditional blue logo and slogan. Some of Denmark's leading brand experts assessed the yellow campaign as improper for Denmark's biggest bank and that it signaled misplaced confidence, and was talking down to people and deemed an overtly opportunistic communication campaign.

From being the admired and competent bank in 2007 to become sort of 'soul-searching' in 2009 its yellow 2010 campaign was opportunistic and unworthy of the brand (e.g. Kraemer Jr. 2011). The verdict from brand experts was that Danske Bank had lost something very valuable namely the trustworthiness of its brand (Larsen 2010). What is generally overlooked in the discussion about Danske Bank, and the image of having high fees and being expensive for the customers, is that back in 2008 before the yellow discount campaign the Danish Consumer Council compared the fees and costs of all banks. This benchmark showed that Danske Bank had the most competitive prices for home owners and second most competitive for people renting their flat or house. Hence, in all fairness, when Danske Bank launched the yellow discount campaign they merely tried to inform about the facts. The problem is though, that facts are not always what matters most. What is of higher importance is often the perceived reality, and the perceived reality was and is that Danske Bank is charging high fees, is greedy and doesn't recognize the taxpayers' contribution to its rescue. The changed innovation focus towards communication was in other words not working well for Danske Bank in regard to this first attempt.

20.4.3 Innovation, Communication and Reputation 2008–2013: New Normal New Standards and New Strategy

Danske Bank is not only faced with image problems. The bank has also been losing money in especially Ireland and Northern Ireland, and it has been falling behind in the competition to its main competitor Nordea Bank. In February 2012 Danske announces that its CEO will retire and the new CEO will be Eivind Kolding, who has also been Member of the Board since 2001—and Chairman of the Board since 2011. The analysis of the situation in 2012 is that the new CEO's challenges can be summarized as turning Danske Bank into a sound business, rebuild the bank's image and use the Bank's leading market position offensively and positively (Schacht 2012).

After six months the new CEO announces that Danske Bank will have to raise the interest on loans, lay-off 2,000 employees and close 100 branch offices. Part of the new strategy is also to outsource activities to the low cost country Lithuania. A move which in view of the Innovation Radar can be interpreted as a new innovation focus on the bank's supply chain. Hence, in accordance with the new CEO's and the bank's innovation strategy, the changed focus for business development is now on communication (improving the bank's image), become better at earning money' (value capture) and cut costs by for example outsourcing to low cost countries like Lithuania (supply-chain).

2012 becomes an economic turnaround for Danske Bank, and the profit after tax shows a better annual result than in five years. The lay-off of employees is obviously not popular, but it has not necessarily damaged the bank's image significantly as it seemed fairly quickly forgotten in the public debate and news. The third leg of the turnaround strategy namely the communication part has proved to be a much bigger challenge. In 2013 less than two years after the yellow campaign, and being the cheap bank for customers, Dansk Bank introduces as the first bank in Denmark a subscription fee for just being customer in the Bank. Poorer customers or those with lesser bank engagements will have to pay a higher fee than more well-heeled and large customers. The introduction of a subscription fee receives a very negative reception in the press and general public. Rumors and surveys at the time suggested that 1/3 third of all private customers considered moving to another bank. This hasn't happened, and it is unlikely to happen, as it is not so simple and easy to move bank, mortgage loans, insurance etc. from one day to another. But Danske Bank lost customers in the 10s of thousands out of a customer base of about 2 million people.

Danske Bank launches in 2012 its third new communication plan and strategy within five years. This stands in contrast to the finding of what makes companies great by choice (Collins and Hansen 2011). The latest one is done by the advertising company Mensch and is build upon the thrust that the world is changing faster than ever before financially, technology and culturally. What was unthinkable yesterday is normal today. There is a New Normal and a new normal demands New Standards (Mensch 2012). Accordingly Danske Bank announces that their new strategy has the intention to restore confidence in the Bank, and to ensure that

it lives up to a new vision of being recognized as the most trusted financial partner (Danske Bank 2013, p. 2).

Danske Bank puts up big posters around in Copenhagen, Stockholm Airport and in other places with pictures of people and situations supporting this new normal with the headline New Standards. The communication campaign is clearly an innovative attempt. But as an image campaign it turns out to be close to a disaster. Firstly, Danish people don't' understand why the bank uses English language in a communication campaign in Denmark. Secondly, and much more troublesome, the Bank uses the Occupy Movement without having any IP or sort of agreement with the movement. Thirdly, some images try to create connotations to the bank, which turns out to be misleading.

The use of the anti-capitalist movement Occupy Wall Street in its New Normal—New Standards campaign was met with massive criticism in December 2012 by the Danish media and elsewhere. Consequently, Danske Bank's CEO invited the Danish representatives from the Occupy movement to a meeting and dialogue. Following this meeting the Occupy poster was removed from the campaign. In any case, it is reasonable to ask how Danske Bank thought it would make sense to use the Occupy movement as a billboard ad for the bank, unless the bank had been acting differently than other financial institutions (Danske Bank 2013, p. 3).

A second example from the New Normal—New Standards campaign is that of a businesswoman sitting at a meeting with a child and surrounded only by men. The problem with this image is that Danske Bank has no women on its own executive board, and it becomes therefore at best an empty statement or at worst a double standard. There are other examples from the communication campaign that don't resonate with the values of the bank. The posters about starving children in Africa or disabled athletes are problematic in the sense that Danske Bank doesn't have a tradition for donating or supporting charity organizations for hungry children in Africa or events like the Para Olympics (Munk 2012).

In the strategy related to the New Normal—New Standards campaign Danske Bank writes that the accompanying strategic focus will be; new focus on customer interaction and relations; transparency and financial strength and responsibility not only to its customers but also to society. It is here argued that Danske Bank's innovation focus and business growth strategy for more than a decade had its primary focus on the IT-platform and value capture. Innovation Radar dimensions like customer need was neglected. This has probably been one important reason behind how the bank became so much out of synchronicity with public sentiments. Yet, to be effective a strategy must be based in a real desire to meet customer needs in a way that creates value for both the company and the consumer. It remains to be seen how Danske Bank's strong focus on increasing revenues and profits almost single focus on value capture combines with the messages of the communication strategy (Danske Bank 2013, p. 4).

The stated values of Danske Bank are

1. **Expertise**—through high standards of quality and professionalism
2. **Integrity**—in business affairs and as part of society

3. **Value creation**—for shareholders, customers and employees
4. **Commitment**—to customers' financial affairs
5. **Accessibility**—electronic and physical

The goal is to be better at making money and this for example by abandoning lower income high cost customer segments. The closing of 100 branch offices and lay-offs of thousands of employees and outsourcing of jobs to low-cost countries are by and large beneficial to the shareholders, but it is difficult to see the benefit for society, or how stakeholder capitalism comes into the picture.

The massive criticism related to the strategy and communication around New Normal New Standards makes the CEO Eivind Kolding state at the bank's presentation of its annual result for 2012 that 'we have reached the point where I don't want to hear more rubbish. We will stick to our plan irrespective of the noise' (Jeppesen et al. 2013). The comment from Eivind Kolding bears a striking resemblance to the comment made by former BP CEO Tony Hayward after the BP oil spill in the Mexican Gulf. A situation where several workers had died, when he said "There is no one who wants this thing over more than I do, I'd like my life back" (Durando 2010). The comment from BP's Tony Hayward became quickly a reference case of disastrously handling of a company's reputation crisis. A crisis that almost cost BP's its life as an independent company. The fact that Danske Bank's new CEO a couple of years after Tony Hayward's comment goes public with a comment about how tired he is about hearing rubbish about the bank and its campaign indicates that communication is not integrated with the overall business strategy. Or it suggests that internal communication advise is not paying much attention to or trying to learn from out-side sector examples like BP.

Applying the Innovation Radar framework with the values stated in the communication strategy Danske Bank should have considered innovation around the innovation dimension partnership. Partnerships with for example some of the non-profit organizations that are engaged within the areas that the communication campaign claim to care about. The newly customer focus is also very much grounded in improved processes for e-banking which essentially is about optimizing the operational efficiency of Danske Bank's IT-platform. It therefore remains to be seen how the increased customer focus will play out in reality.

20.4.4 Legacy of Losing, Rebuilding and Losing Reputation

Danske Bank is Denmark's largest bank and in 2013 with more than 55 % of the market it is after the financial crunch in 2008 considered a systemic bank too big too fail for the Danish economy. In fact, in 2013 Dansk Bank's engagements amount close to 200 % of Denmark's GDP in 2013. This is a concentration only matched by Bank of Cyprus within the EU.

But it is not the first time that Danske Bank has been a challenge for the state of Denmark. The first time the bank was rescued by the Danish government was back in September 1922. The second time the bank received important government

support was in 1992 during the Nordic banking crisis. In other words, the legacy of Danske Bank is that within less than 100 years it have three times to be rescued by the government and general goodwill of society. Danske Bank managed after both 1922 and 1992 to rebuild its image, and to become a brand leader in Danish business and as a financial institution.

This time around (2013), however, Danske Bank has for more than a decade built it business operations around an IT-platform and capturing as much value as possible from this platform. Most organizations and companies are build to do certain things. Over time the way of doing certain activities become the core competencies, and operations becomes a matter of making supportive activities as efficient as possible. The longer a company has focus on the same business areas, cash cows and make small or no inroads into new adjacent business activities, the more difficult it becomes to change innovation focus and develop new and adequate routines. The jury is also out in regard to Danske Bank's ability to bounce back from its long path of a broken business platform. Thus, the German investment bank Berenberg Bank examined 29 of Europe's largest banks in 2013. They concluded that Danske Bank's New Standards strategy is unlikely to make Danske Bank generate the expected revenues and once again become a leader in Northern Europe. In conclusion Berenberg labeled Danske one of Europe's future financial losers, and only banks in Southern Europe ranks lower in the analysis. The French investment bank Exane BNP Paribas shares a similar outlook for the future of Danske Bank (Nielsen 2013).

> Nick Andersen, one of the financial analysists behind Berenberg Bank's analysis of Danske Bank commented in March 2013: "That a revolution is required. An evolutionary strategy will hardly release the underlying potential of the bank" (Op cit. Nielsen 2013).

A central question in relation to Danske Bank is why brand leaders lose their way? One of the common reasons for lost brand leadership is when the company starts to take the brand for granted. A phenomenon that often happens when the brand owners primarily treat the brand asset as a cash cow (Brymer 2004). This leads to the erosion of the original brand, and it tends to marginalize the customer experience. Jim Collins writes in the book' Good to Great' that in order to build a great company, you need to have strong values that you never compromise:

> If you are not willing to sacrifice your profits, if you are not willing to endure the pain for those values, then you will not build a great company (Collins 2001).

In a blog on Harvard Business Review on Danske Bank's communication campaign New Normal—New Standards, Jonah Sachs wrote in December 2012 'When an Ad-Campaign Goes Horribly Wrong' that Danske Bank should have remembered the grandfather of modern advertising John Powers' advice for companies in search of their soul that it comes down to: Be interesting, tell the truth, and live the truth. Jonah Sachs adds:

> Danske got the first two right. The ad beautifully caught the zeitgeist of the time in a way that was both entertaining and truthful. But it all fell apart, because the bank just couldn't claim that it was living that truth itself, proving that its story was nothing more than a cynical façade (Sachs 2012).

Just before this analysis of Dansk Bank went for its final edition, it was announced in September 2013 that the bank's CEO Eivind Kolding had been ousted. In the words of Financial Times:

> A fierce clash with the Danish regulator, a disastrous marketing campaign that ended in a public apology, tens of thousands of customers leaving, a battered brand: Eivind Kolding's 18 months in charge of Danske Bank have certainly been eventful. However, after the waves of unremittingly negative headlines, the board of Denmark's biggest lender decided enough was enough and ousted the former shipping boss as chief executive. In a strongly worded press release, the board decided they wanted somebody "with stronger qualifications within banking". (Milne 2013).

Financial analyst Nick Anderson, at Behrenberg, added that he was skeptical of Danske Bank's strong focus on growth rather than the competing focus of Swedish banks's on returns. "Danske Bank's seems very much on the growth path. I remain of the view that it's the strategy which is the issue, not the implementation". (Milne 2013).

According to Peter Drucker most strategies fail because assumptions about the future prove wrong. Successful strategies therefore require constant reviews and the challenging of the very assumptions behind the strategy. Customers will change their tastes and preferences, and technology will at some point render the existing business model obsolete.

20.5 Key Learnings for Strategy, Innovation, and Communication

A few learning points stand out in relation to the story told in this chapter about about Danske Bank.

Business in the twenty first century is far more complex than it was just ten or twenty years ago. Development is no longer linear—if it ever was—but rather exponential, and incumbent large corporations who were used to lead their national and international markets are being challenged from at least two corners.

The first corner is the threat that disruptive technologies and innovative entrepreneurs pose. Consider banking in general, today most of the banking is automated and IT-based. In many instances it is probably only regulatory and legal ramifications that prevent Amazon or the like to take over many banking services.

To remain competitive and agile especially large companies should work with innovation in a systematic way. To be a serious activity innovation has to be dealt with and supported at top management level, and it has to be integrated with strategy. The best way to do this is to work with innovation from the perspective of the company's business system like illustrated with the Innovation Radar in this article. Companies should review and revise their business model on a regular basis. They should play with the possibilities of moving focus from one dimension to another, and they should examine the possibilities for differentiation. In relation

to the Innovation Radar framework companies should not have high focus on more than five dimensions at a given time. If innovation focus and investment goes beyond five dimensions it will be too costly and ineffective (e.g. Ulwick 2005). In-house IT-platforms and competences can never become more important than the customers. Companies operate under a large degree of uncertainty and their management will come under stress from time to time. Companies that are willing to open up to external advice and input become better at: understanding their own needs; embarking on the required journeys for transformation and understanding how to differentiate from the competition.

Well performing organizations apply the mindset of business model innovation across units and functions within the company. This provides any business with the possibility to broaden the mindset from product/process innovation to that of additional activity dimensions that are all relevant for a business strategy.

The business model innovation perspective breaks down the corporate silos because it naturally requires discussion and alignment across the organization. The Innovation Radar framework is flexible in that it can be applied strategically at project, business unit or corporate level, and the framework integrates with communication and marketing.

Innovation and communication are important corporate activities that should be on par with finance and integrated with the overall strategy.

20.6 Conclusion and Outlook From a Research Perspective

Danske Bank's did in many ways set itself on the path of what Jim Collins wrote about in How The Mighty Fall (Collins 2009). The argument is that successful companies tend to get arrogant, and believe they can do more things than they actually can, and they start to pursue aggressive growth. The third step in the hubris is when companies ignore early signs of failure until they become known in the public and eventually go bankrupt.

Danske Bank's fits this bill in regard to over-stretching into new business expansion in Ireland, and its ignorance of unsatisfied customers in Finland points in the same direction. Oft shifting logos and communication campaigns should also be avoided. A strong brand can only be build upon a strong reputation. The two are interrelated but not the same.

Inconsistent identity is usually considered risky and a way of ruining a brand. As the line goes in Shel Silverstein's poem and later made popular by the singer Johnny Cash 'life ain't easy for a boy named Sue'.

Danske Bank has been in stormy waters before and yet managed to come back and regain a leading position in Danish and Northern European banking and finance. There is no reason why Danske cannot do it again. Ways of doing this would be for Danske to play with more dimensions for innovation, and to consider what a departure from the last many years focus on platform and value capture could mean in terms of differentiation.

Many companies, large, medium or small, still struggle with managing innovation and get a return on the innovation they invest in. There is a need for future research about how organizations can become better at managing innovation. Another area for research is to better understand how to build a culture for innovation within organizations.

Strategy can be defined as a plan for going from a present situation to a desired future situation. This requires the amassing of resources and to put them effectively to use. We still need more cases and knowledge about companies who have managed to put innovation and communication effectively into the equation of strategy. We need more research how companies work with innovation and communication in relation to strategy and what they see as main challenges and barriers.

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Part IV
Best Practices and Case Examples

Chapter 21
A Holistic Approach to Communicating Innovations: Siemens and Its Environmental Portfolio

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Abstract To communicate innovations successfully, it is vital to manage themes in a synchronized manner. Media relations, publications, Internet and multimedia, marketing, and internal communications must all speak with one voice. This objective has been achieved at Siemens in recent years, thanks to a central innovations communication team that uses and manages all of these media channels and serves all relevant target groups. One example of this success is the way it has dealt with the themes related to the Siemens environmental portfolio. The leading medium in this regard is the international research and innovation magazine *Pictures of the Future*, flanked by regular media services for the press, intranet and Internet websites, and contents delivered for marketing activities and special events. Innovation communications that is so broadly based can clearly show the close connections between the technological leadership of individual business units, their worldwide market position, the benefits that innovations bring for customers, and the creation of new jobs. As a result, it can make a major contribution to the company's success.

21.1 Introduction

Environmental technology has the potential to become the most important industry of the 21st century. This is indicated by numerous studies, such as those published by McKinsey or Roland Berger Strategy Consultants. On the world market for environmental technologies, companies are already posting revenues of more than one trillion euros annually—and in the next 10 years this market could triple. Government leaders are now talking about the need for a "green industrial

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revolution", and Germany has even made important steps to reach a fundamental energy transition. The goal is to shut down nuclear power plants in Germany by 2022 and to reach a 40 % reduction of CO_2 emissions by 2020—mostly by a huge increase of the percentage of renewable power.

But also China is determined to play a leading role in the development of environmental technologies: The country's macro-planning sets ambitious targets for renewable energy, energy efficiency, and environmental protection. For example, plans call for an 11.4 % share of non-fossil energy carriers in China's overall energy consumption mix by 2015 (2010: 8.3 %). To this end, 200 new hydroelectric power plants with a combined output of 120 GW are to be built in China's southwest. More wind energy will be used in coastal areas; already today, China is the largest global wind market. Nevertheless, Germany is still the number one country in environmental products, as it holds a 16 % share of the global market. Second place is occupied by the U.S., with a share of 15 %. Europe as a whole produces almost half of all products related to environmental technology worldwide.

That includes renewable energies such as wind and solar power, technologies for keeping air and water clean, the recycling industry, alternative drive systems, and energy-efficient devices of all kinds, ranging from energy-saving lamps and LEDs to building technology and power-saving industrial motors. All of these environmentally friendly products and solutions are also part of Siemens' environmental portfolio, which is the broadest and most comprehensive in the world.

This portfolio brought Siemens sales of €33 billion in business year 2012—around 42 % of its total sales. In fiscal 2012, green technologies from Siemens enabled customers to cut their greenhouse gas emissions by a total of 332 million tons—an amount equal to the total annual emissions of Berlin, Hong Kong, Jakarta, London, Melbourne, Moscow, New York, São Paulo and Tokyo combined. For the first time in its history, Siemens has also been named the world's most sustainable industrial company in the prestigious Dow Jones Sustainability Index 2012—capturing, as Super Sector Leader, the top position across nine industry sectors (Siemens Sustainability Report 2012).

With its environmental portfolio as well as with its other products, Siemens relies on its international presence in more than 190 countries, solutions that bring huge benefits to its customers, and its leadership in the field of innovations. The company invests around €4 billion annually in research and development, and well over one billion euros of that amount is invested in the further development of "green" technologies.

Closed laboratory doors are a thing of the past at Siemens—the current buzzword is "open innovation". Accordingly, Siemens' success is due in part to the more than 1,000 cooperative research projects in which it participates every year with top universities in the U.S., China, Russia, India, and Europe. As a result, the 27,500 R&D employees came up with some 8,900 invention applications in 2012—around 40 inventions per working day.

Innovative strength and top engineering have been part of the company's DNA ever since Werner von Siemens laid the foundation of modern telecommunication

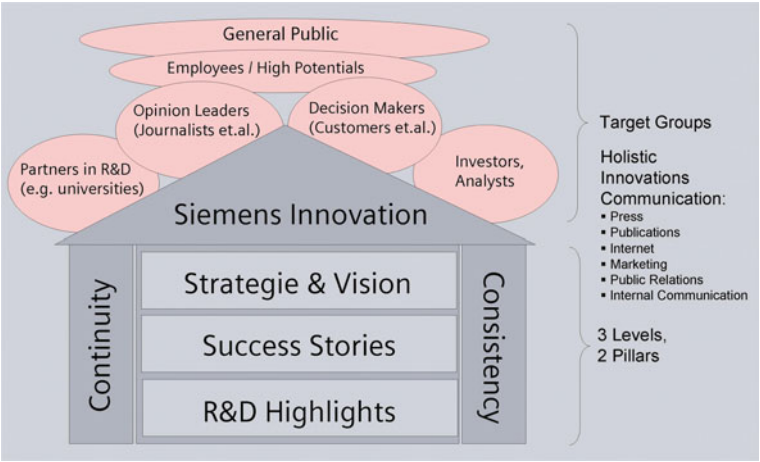

Fig. 21.1 The "House of Innovation Communication" at Siemens

with his pointer telegraph 166 years ago. Soon after that, in 1866, he performed the same service for electrical technology when he discovered the dynamo-electric principle, and thus the most economical method of generating electricity.

Innovations from Siemens have set the course for modern industrial society. They include the first electric railroad in 1879, the first power plant in 1881, the Electric Victoria—the first electric car in small-batch production—in 1905, the first electron microscope ready for series production in 1939, the first industrial automation system in 1959, and world records in LEDs, gas turbines, and wind turbines in recent years.

That is why innovations communication—ranging through all media, countries, and target groups—is one of the main pillars of Siemens' corporate communication. The aim is to attract new R&D partners, show customers the benefits of the company's innovative solutions, and demonstrate Siemens' technological leadership with convincing examples. Siemens' vision, strategy, results, and added value for the customer must be communicated in a sustainable and credible manner. The company's "House of Innovations Communication" is responsible for this task. It consists of the three levels "Strategy & Vision," "Success Stories," and "R&D Highlights," as well as the two pillars "Continuity" and "Consistency" (Fig. 21.1).

21.2 The Keys to Successful Innovation Communications

The "Strategy & Vision" level deals with questions such as: What are Siemens' ideas about the future? Which trends will have an impact on our lives in the coming years? And what does the company's R&D strategy look like? Over a decade ago, Siemens established its own method of strategically planning the

future—Pictures of the Future. This technique combines extrapolations of how today's business activities could develop in the future with holistic scenarios depicting what the world might look like in 10, 20 or 30 years. These visions are used as the basis for deriving future customer demands, new business options, and technologies that offer huge growth potential and great synergy effects and could therefore trigger revolutionary changes and paradigm shifts. The systematic and holistic approach of these Pictures of the Future makes them unique. They can therefore serve as an excellent leitmotif of the company's innovations communication, for example either in print form (www.siemens.com/pof) or on Siemens' innovation website www.siemens.com/innovation.

"Success Stories" are concrete demonstrations of the usefulness of these innovations. The customer magazines of the different Siemens sectors play an important role here, as do press releases, TV broadcasts, interviews, presentations, trade fairs, special events, and advertising campaigns. These are also the channels through which the third level of the "R&D Highlights" is communicated. This includes results from the R&D laboratories, which are so innovative that they promise to solve major problems and so appealing that they attract the interest of many media representatives.

Experience has revealed some key elements of successful innovations communication:

- Individual reports on successful developments are not enough. Image building requires the continuous and consistent utilization of a multitude of communication channels. This is why Siemens established a media service in 1996 to manage its relations with the media. Since then, the media service has been publishing two to three innovation bulletins every week, written in terms that can be easily understood by the general public (www.siemens.com/innovationnews). Since 2007, it has also published the media service PhotoNews (/photonews) every two weeks. It also regularly posts multimedia elements and innovative interactive 360° features of captivating photographs, films and audio statements on the Internet. A "message cockpit" on the Intranet is one of the elements that makes sure the messages are consistent and distributed worldwide. It contains tools and theme packages for the communicators in over 190 countries.
- Innovations communication must be factually correct, and it must also be presented in an easily understandable manner. Unless it is part of an advertising campaign, this communication should impress its audience as being objective rather than promotional in nature. The goal is not to emphasize how innovative a solution is but rather to demonstrate as vividly and objectively as possible the added value provided by the new product or the new technology.

The following six key criteria for success were compiled at Siemens to guide the selection of themes for innovations communication:

- A high level of topicality, resulting in high news value
- Relevance for everyone, resulting in great practical value
- Economic or social significance

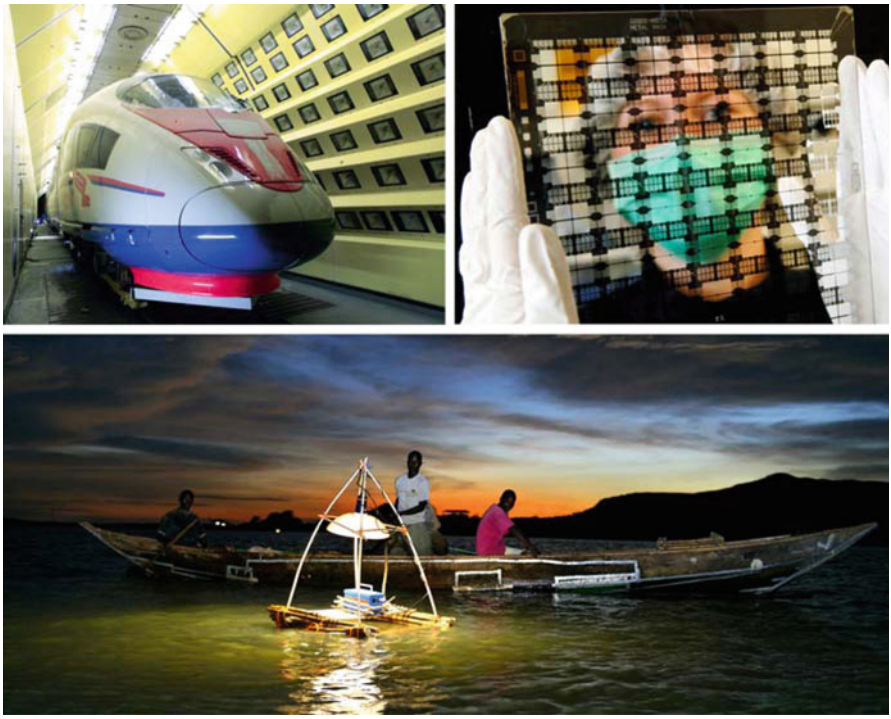

Fig. 21.2 A high-speed train in an icy wind tunnel, organic LEDs, and solar-powered lamps for fishermen on Lake Victoria—examples of appealing innovation photos from Siemens' photonews media service. The Lake Victoria picture won the prestigious OBS award (from Deutsche Presse Agentur) for press photography

- Surprise effects or records achieved
- Fascinating images (photographs/films) (Fig. 21.2)
- Themes that can be personalized or provide a look behind the scenes

The innovation themes are prioritized according to these criteria and harmonized with the overall aims of the communication strategy and planning, such as a focus on the megatrends of climate change and resource scarcity, demographic change, urbanization, and globalization. The result is a flow chart for the themes and their positioning in the communication channels.

21.3 Communication Channels, from Media to Marketing

In 1996—17 years ago—Siemens started its central innovation communications structure, which initially comprised just one employee in the media relations unit. The team and the tasks it deals with have grown continually since then, but the

focus has remained the same. Innovations communication is regarded as a cross-sectional function, whether it's a matter of media relations, internal communications, public relations or marketing. Today the central team consists of ten employees and dozens of freelance journalists specializing in science and technology and based in several countries. It covers the following areas:

- Media coverage of overall innovation themes and topics, in the print media as well as on radio, television and the online media.
- Publications such as the magazine *Pictures of the Future* (Eberl and Pease 2001) and the book *Innovative Minds*, which uses portraits of 30 researchers and developers to reveal how innovations are actually generated and what obstacles had to be overcome in the process (Eberl and Puma 2007).
- The book *Life in 2050—how we invent the future today*, which describes the major technological trends of the coming decades and the innovations which are already developed in the R&D labs today (Eberl 2011).
- The innovation website, a comprehensive set of slides about innovation, and articles for the Annual Report, the Sustainability Report, and other publications.
- Internal innovations communication, including articles in *SiemensWorld* and on the intranet, as well as communicating events such as Siemens' Innovation Day—an annual "innovation fair".

The team also is responsible for communicating innovations via the following channels:

- Presentations and signed articles by members of the Managing Board and other executives.
- The "Answers" program of the central marketing unit.
- Exhibitions such as EXPO 2010 in Shanghai and Max Planck Society's exhibition train "Science Express", which traveled through 60 German cities in 2009, and the "Science Tunnel", which travels around the world today.
- Studies carried out by Siemens, e.g. the series about sustainable urban development, which has so far dealt with more than 120 cities in Europe, Asia, Africa, Australia and the Americas (Economist Intelligence Unit and Siemens 2009), and special studies of London (McKinsey and Siemens 2008) and Munich (Wuppertal Institute and Siemens 2009).
- Special Siemens events such as "Pioneers of Electromobility, 1905–2010" on a huge stage on Potsdamer Platz in the center of Berlin, "Pioneers of the Electricity Age, 2011" in King Ludwig II.'s castle Linderhof, the "Future Dialogue 2013" in the innovation city of Skolkovo, Russia, and the 9 days of "Energy Transition Dialogue" in June 2013 in Berlin (Fig. 21.3).
- Cooperative projects such as the one with Disney in the EPCOT theme park in Florida, where the thousands of visitors who board Spaceship Earth every day can find out about crucial inventions and the trends of the future in an entertaining way. Siemens' Pictures of the Future were a major source of inspiration for the Walt Disney Imagineers who created Spaceship Earth.

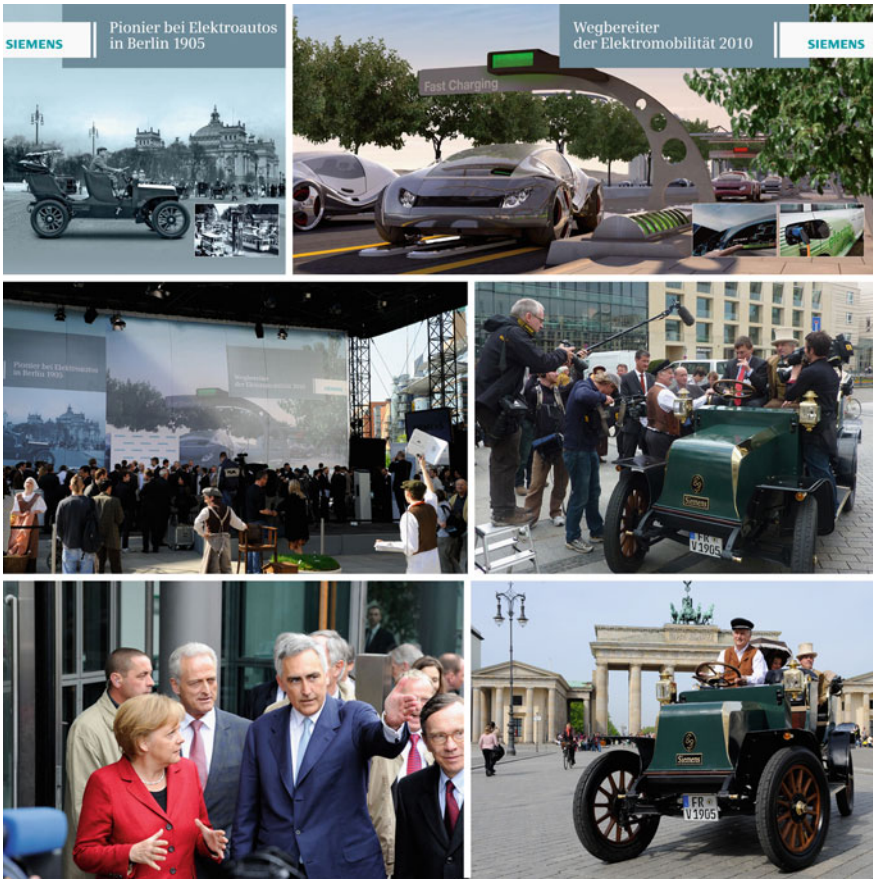

Fig. 21.3 The "Pioneers of Electromobility 1905–2010" event on Potsdamer Platz in Berlin featured not only ultramodern electric vehicles and infrastructure solutions (such as fast recharging for electric cars) but also the first-ever presentation of a perfect reconstruction of the Electric Victoria. This, the first series-produced electric vehicle, was used on a daily basis starting in 1905—at a time when horse-drawn carriages were still the main mode of transportation. With a range of 80 km per battery charge, it was used primarily as an elegant hotel taxi in Berlin

The magazine *Pictures of the Future* has been serving as Siemens' leading innovations communication medium since 2001. The magazine's objectives are to provide a comprehensive overview of the innovation activities at Siemens, describe the international context of these activities, provide experts from outside the company with a forum, present the customers' viewpoints, indicate the economic significance of innovative developments—and to be an exciting read for professionals and interested nonprofessionals alike.

Pictures of the Future is published twice a year in nine languages, currently with a run of almost 100,000 copies. Each issue is about 116 pages long. The magazine is sent to subscribers in more than 100 countries; anyone can order a

Fig. 21.4 Building and lighting technology, highly efficient gas turbines, wind farms and marine current turbines—examples of environmental themes from the Siemens magazine *Pictures of the Future*

subscription free of charge (www.siemens.com/pof). *Pictures of the Future* has several times received the Distinguished Award—the highest honor, in the Publications category, as well as the "Best of Show" prize of the Society for Technical Communication in Washington, D.C. (with 25,000 members, it is the world's largest English-language association of professional technical journalists).

The magazine's main target groups are Siemens' current and potential R&D partners in the context of the open innovation process. That primarily includes the technical community at top universities and research institutes all over the world, R&D experts and managers at other companies as well as government institutions and technical associations. *Pictures of the Future* also addresses multipliers in the area of popular opinion, especially science, technology, and business journalists, as well as members of the general public who are interested in innovations and students majoring in the natural sciences, technology, and business. The magazine is also used to establish and maintain contact with customers, even though it is not a traditional customer magazine that primarily focuses on a company's products (Fig. 21.4).

Back in 2001, the basic idea behind the magazine was just as new as Siemens' concept of strategic planning for the future. *Pictures of the Future* is not a mere compilation of interesting but unrelated articles. Instead, 80 or more pages of every issue deal with three main themes that illuminate an issue from every important perspective: in terms of Siemens' innovations, the international context, and the market trends and economic forecasts.

In addition, the magazine does not start out from the status quo as traditional magazines do, but instead uses the future as the starting point of its "retropolation." Each of three main themes is introduced by a story from the year 20XX (in most cases it's 2030 or 2040) that describes in a casual style all of the trends that will be dealt with in greater depth and with more technical details on subsequent pages of the issue. These introductory future scenarios are made even more vivid by illustrations specially drawn for them.

To ensure that the articles can be understood by the general reader, the authors are drawn from a group of in-house technical editors as well as a large pool of their colleagues outside the company. The team also includes engineers for the multimedia Internet presentations, freelance photographers specializing in technical themes, service companies for image editing, layout, graphics, and illustrations, and of course professionals for translation, printing, managing the mailing lists, and distribution.

For example, the ***six most recent issues*** deal with the following theme areas:

- Manufacturing and Innovation, Maximizing Efficiency, and the Future of Mobility (Spring 2013)
- The Energy Puzzle, the Internet of Things, and Technologies that Touch Lives (Fall 2012)
- The Next Economy, Mastering Complexity, and Formulas for Efficiency (Spring 2012)
- Quality of Life in Cities, Machine Learning, and Efficient Use of Resources (Fall 2011)
- The New Age of Electricity, Research without Borders, and Collective Intelligence (Spring 2011)
- Sustainable Mobility, Demographic Challenge, and Emerging Markets on the Move (Fall 2010)

21.4 Environmental Technology and Climate Protection: The Leading Theme of the Twenty-First Century

A good current example of how holistic innovations communication works at Siemens is the set of solutions in the company's environmental portfolio that help to reduce energy demand, CO_2 emissions and combat climate change. The in-depth communication concerning this environmental issue began in April 2007 with a focus in *Pictures of the Future* and continued thematically in subsequent issues of the magazine. In parallel, articles were generated for internal communication, culminating in a completely "green" issue of *SiemensWorld* in summer 2008.

The series was accompanied by a large number of in-house and external interviews of members of the Managing Board and experts from R&D units, as well as a focus in the international "Answers" marketing program on the question

"How can you power a planet hungry for electricity without damaging it?" As part of this program, advertisements were broadcast all over the world, TV spots, billboards, and displays were reserved, and the Siemens Internet pages were redesigned. The overall slogan was "Siemens provides answers to the toughest questions of our time."

A major element of the "Answers" program was a series of 12-page supplements that were simultaneously published in 2007 and 2008 in major European print media such as *Die ZEIT, F.A.Z., the Sunday Times, El Mundo, La Tribune, and La Repubblica*. For example, the supplement on climate change appeared shortly before the international climate change summit meeting in Bali. Intensified media activities were running in parallel.

The topics covered included energy-saving LEDs that won the German Future Prize in December 2007, the first ignition of the world's largest gas turbine, portraits of environmental innovators, wind farms and intelligent networks, energy-saving high-speed trains, energy recovery systems in industrial facilities, and new methods for producing drinking water. In the past 3 years, hundreds of articles about these and similar Siemens-related environmental topics have been published in many major media, from the *Süddeutsche Zeitung* to the magazines Focus and *Der SPIEGEL* and from Business Week to the New York Times.

In addition, the Science Express was accompanied in 2009 by several 8-page "advertorials" in *Der SPIEGEL* as well as articles in SPIEGEL.online and TV reports which backed up the argument that climate protection and the economic crisis should not be played off against each other. On the contrary, these articles pointed out that many environmental technologies save energy and costs in the long run—and in particular represent a tremendous opportunity for Germany, because German companies are the world leaders in these fields.

This campaign was continued at the climate conference in Copenhagen, where Siemens presented several projects, including its electromobility projects, to media representatives and also introduced the European Green City Index, which combines and evaluates the environmental achievements and activities of 30 major European cities. Afterwards, similar city indices have also been prepared for cities in the Americas, Africa, Australia and Asia (Fig. 21.5).

The communication of Siemens' environmental portfolio was continued in 2010 with examples from the area of renewable energies, such as the massive expansion of offshore wind farms, and the low-loss transmission of electricity over thousands of kilometers via high-voltage direct-current lines. Siemens is also focusing strongly on innovations in the area of energy-saving building technology and industrial production, efficient transportation systems as well as the rapid development of electromobility and the integration of electric cars into energy grids, where they can also serve as mobile power storage units.

In short, Siemens believes the world is on the brink of a new era of electricity, with electrical power as a universal energy carrier that is also especially environmentally friendly. That's because electric power can be generated without CO_2 emissions, transmitted with only minimal losses, and used with very high degrees

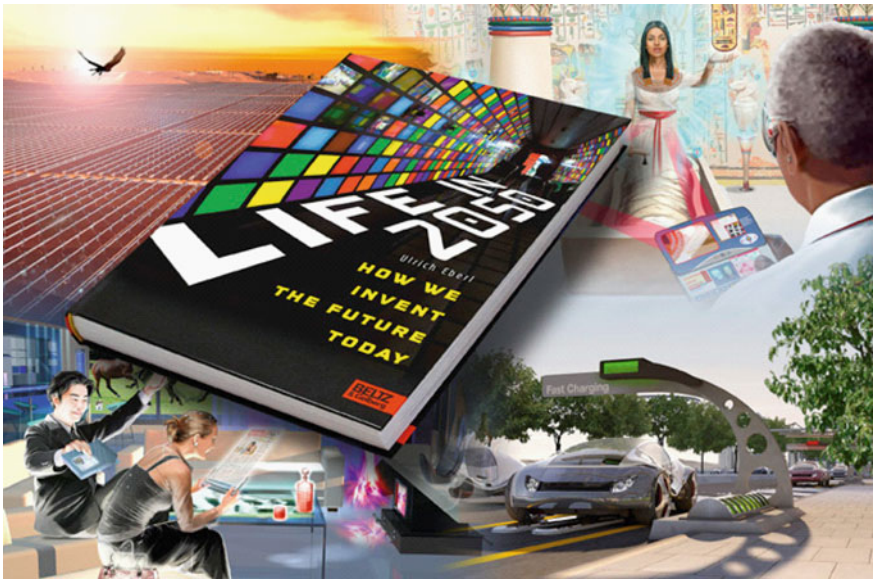

Fig. 21.5 The technological trends of the coming decades and future scenarios, especially covering sustainable energy systems, are the major topics of the book *Life in 2050—how we invent the future today*

of efficiency by consumers. That makes the new era of electricity an ideal topic for Siemens' innovations communication.

This is even more true as in recent years the world has been undergoing massive energy transitions, reaching from the new boom of natural gas in the U.S. to the huge increase of renewable power in some European countries. In Germany for example, Siemens started many communication activities covering the whole spectrum of sustainable energy systems—from renewables to smart grids, energy storage, and efficient energy usage in industry, buildings and transportation. This culminated in nine days of "Siemens' Energy Transition Dialogue" in June 2013 in Berlin—a series of events, a comprehensive exhibition, and discussions with politicians, scientists, managers, customers, partners and the broad public.

All of this shows that innovations communication works best when it is comprehensive and holistic. Its value for the company lies in its direct manner of addressing customers and partners and especially in its positive effects on the company's image. Some time ago, the media analysts at CARMA evaluated a total of 540,000 articles worldwide over a period of 3 years according to the criterion of "favorability." They concluded that articles dealing with new products, technologies, and innovations have much more positive results for the companies mentioned in the articles than do articles about mergers and acquisitions, straight business topics or financial reports.

After all, innovations include more than just solutions to major problems. At Siemens at least, there is also a very clear correlation between the technological leadership of business units, their position in the worldwide markets, their returns on investment, the added value of their innovations for customers, and the creation of new jobs. Clearly revealing these connections is one of the most important tasks of successful innovations communication.

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Chapter 22
User-Centered Radical Innovation at Telekom Innovation Laboratories: Tools and Methods to Generate New Propositions for Mobile Payment

Fee Steinhoff and Henning Breuer

Abstract Radical innovation may root its basic ideas in user values of unforeseen futures. Still, pursuing great opportunities with high risks creates new management challenges. Involving valuable sources of knowledge from the early phases of innovation projects into engaging interactions is a critical success factor for innovation strategy. The chapter describes and reinterprets the concept of user-centered radical innovation and how it is applied within the open innovation approach of Telekom Innovation Laboratories—the corporate research and innovation centre of Deutsche Telekom. The approach is based on tools tailored to three innovation phases: initiation, value proposition and market driving. An initiation project combining scenario analysis with futures workshops demonstrates methods to explore and ideas to address new solution beyond the beaten tracks in the design space of mobile payment.

22.1 Introduction

The telecommunication industry depends heavily on innovation: New products and services with high degrees of innovativeness turn out to be important sources of sustainable growth (Deloitte 2007). But despite all the exciting technological innovation there remains always the crucial question: what do users want and expect from new offerings?

The position of the user has successively changed over the last 30 years from a passive recipient to an active co-designer in the creation of value (Breuer 2002).

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Successful innovators use competence within an extended network which particularly includes the competence of users (Prahalad and Ramaswamy 2000; Gemünden et al. 1996). In this context, the ability to integrate users is decisive. Iansiti and Clark (1994) understand this to mean the ability to allow information about users and their needs to flow into the process of innovation on the basis of mutual learning processes.

Radical innovation projects present a particular challenge to management, owing to the different opportunity to risk ratio, when compared to incremental innovations (O'Connor and Veryzer 2001). However, conceptual literature refers to limits of user input in radical innovation projects. For example, users may not be able to imagine what is technologically possible, to provide new solutions and to anticipate and articulate future needs as a consequence of "functional fixedness" (Ulwick 2002). On the other hand, if the advice to "ignore your customers" (Martin 1995) is taken literally; there is a high danger of introducing radical innovations which do not fit users' needs and thus fail in the market (Danneels 2003). It can be assumed that the concept of user orientation must be considered in a balanced way. Positive effects may depend upon the research methods used and the type of users focused on.

In the following paragraphs we first set a common ground for understanding dimension of innovation in general and the impact of open innovation activities on radical innovation in particular. At Telekom Innovation Laboratories we developed a user-centred innovation approach in order to generate, identify and specify options for radical innovation. We describe exemplary methods to be applied in three phases—initiation, proposition and market driving. Focusing on the initiation phase we describe and exemplify the futures workshop approach and its utilization of pre-inventive forms (Finke 1990) to trigger utopian ideation.

22.2 Radical Innovation

Innovations are new products or services which are significantly different to a previous state, through the combination of purpose (the need addressed) and means (the technology used; Hauschildt and Salomo 2010). The novelty of an innovation is not a one-dimensional construct, but rather should be described and operationalized (1) by multiple perspectives ("new for whom?": micro- versus macro-perspective) and (2) by multiple determinants and consequences ("new in what respect?": market, technology, organization and environment). Product innovativeness can be conceptualized with the help of the following four dimensions (Salomo 2003; Garcia and Calantone 2002; Green et al. 1995):

- *Degree of market innovation*: The degree of market innovation provides information on how greatly the innovation differs from existing products in the market. From the perspective of the innovating company (micro-perspective), a high degree of market innovation is connected with addressing a new market

and new customer groups. Such innovations give rise to relatively high levels of uncertainty, but also to the opportunity to fundamentally improve the company's market position. From the view of the industry (macro-perspective), innovations with a high degree of market innovation offer profoundly new benefits, but are normally also connected with extensive changes in learning and behaviour as well as increased adoption risk for potential customers (Rogers 2003).

- *Degree of technological innovation*: The degree of technological innovation is derived from the scope of technical novelty associated with the innovation. The use of new technological principles makes possible great leaps in performance and, as a result, frequently displaces existing technologies. Consequently, innovations with a high degree of technological innovation both at the micro- and macro-levels are associated with comparatively great technological uncertainties.
- *Degree of organizational innovation*: The degree of organizational innovation focuses on the internal micro-perspective. Profound innovations are frequently associated with new, formal, organizational structures and processes. However, they also affect informal characteristics of organizations, for example by changing corporate culture. This is reflected, for example, in intensified and more open collaboration with external business partners which can significantly increase the complexity of the processes (Peters 1999). Strategic realignment is also a feature of innovations with a high degree of organizational innovation.
- *Degree of environmental innovation*: The degree of environmental innovation is an aspect of the industry-wide macro-perspective that has frequently been neglected. Innovations influence not only the direct market players. High product innovativeness frequently demands the set-up of new infrastructure, as well as considerable adjustments to regulatory and social conditions.

Different types of innovations can be defined based on the combination of the four dimensions of product innovativeness. Incremental innovation is limited to discontinuities on the micro-level and as a rule shows changes in only one dimension. By contrast, the opposite extreme of radical innovation shows comparatively high levels of discontinuity and uncertainty in all four dimensions (Salomo 2003; Garcia and Calantone 2002).

Radical approaches refer to the root of things. User-centered radical innovation at Telekom Innovation Laboratories is rooted in user values and requirements including those of an unforeseen future. As Schrage (2012) suggested companies not only need to disclose unsolved problems and new customer benefits but, emphasizing a future perspective, need to understand who customers want to or need to become.

22.3 Open and User-Centered Radical Innovation

In the management literature, it is assumed that radical innovations exhibit a risk-reward ratio that deviates from that of incremental innovations (Zirger 1997). According to this, radical innovations offer the possibility of sustained differentiation

from the competition (e.g. Song and Parry 1999) and the opportunity for exceptional success (e.g. Baker and Sinkula 2005). At the same time, however, the high levels of uncertainties entailed in radical innovations mean that both the probability and degree of success are uncertain (Danneels 2002).

Radical innovation projects pose particular challenges to innovation management: "Is it reasonable to expect that an innovation strategy used on an incremental innovation can be equally effective for a radical innovation? Most likely not. Innovation strategies must be tailored to the nature of the innovation and the degree of uncertainties present." (Lynn and Akgün 1998).

One relevant innovation management aspect refers to the concept of open innovation which has developed at high pace in the recent past. High degrees of uncertainties require less closed but more open innovation models (Chesbrough 2003). Chesbrough's (2003) definition of open innovation focuses on the combination of internal and external ideas to value creating business models and the use of internal and external channels to market. This 'openness' to the multiple sources of origin distinguishes open innovation from the traditional closed innovation approach. The full potential of open innovation calls for two key elements. The first is to combine internal and external knowledge to improve innovations, and the second is to bring monetary value to technical knowledge (van der Meer 2007).

Incorporating knowledge from externals demands real collaboration between internal and external innovation competences. In order to motivate others to contribute their findings companies using open innovation have to provide instrumentality for a structured way of contribution (Braun and Herstatt 2006; Prügl and Schreier 2006). By increasing the number of participants involved, open activities heighten the degree of complexity within the management of innovation and thus create new challenges in management processes that extend beyond the boundaries of the firm (Erner et al. 2008; Chesbrough and Crowther 2006).

One focus of inbound activities of open innovation is that of user innovation. User innovation has been discussed widely in the context of the lead user paradigm (von Hippel 1986). The full potential of open innovation can only be truly exploited if a company has the skills to determine the profoundness of user generated ideas, to differentiate between normal (lead) users and the set of users who are able to foster radical innovation, and has the absorptive capacity to exploit radical inputs (Cohen and Levinthal 1990). Companies not using their ideas with alacrity but remaining inwardly focused, and cultivating a "not-invented here" syndrome, risk missing major and minor trends. In sum, companies should not store its ideas on an inventory shelf because the knowledge will inevitably leak out (Chesbrough and Crowther 2006).

However, capturing and defining ideas for innovative new products and services is not an easy task. Finding "the right job for your product" (Christensen et al. 2007) or finding answers to market-related questions such as "What are latent and future customer needs?" presents a major challenge to organizations. Furthermore, radical innovation project managers often find it difficult to assess the potential and development of the market (Min et al. 2006). Especially in the early phases, it is frequently relatively unclear which market is to be addressed by the innovation at

all (Sandberg 2005). On the other hand, the length and costs of processes in radical innovation projects are frequently above average (e.g. Danneels 2002), which makes an early amortization of the investment in the market more difficult. Finally, many of the methods used in traditional market research (e.g. quantitative surveys) are unsuitable for highly innovative offerings. Traditional methods are often too superficial and have a strong tendency to associate with the past. This makes them unsuitable for identifying latent and future customer requirements (Day 2002). Innovation Management can nevertheless draw on a number of "intelligent" tools which produce reliable market information, even in cases where it is difficult to envisage the future involved (Rosenthal and Capper 2006). These tools are part of the user-centered radical innovation concept of Telekom Innovation Laboratories which is described in the next section.

22.4 The Approach of Telekom Innovation Laboratories

22.4.1 Telekom Innovation Laboratories

Innovative new products and services form an important source of sustainable growth and are future critical in a phase of technological change (Münchner Kreis 2009). For Deutsche Telekom it is Telekom Innovation Laboratories that account for research and innovation (R&I) across the company. In the Laboratories, which are constituted as an affiliated institute of the Technical University Berlin, scientists and industry experts study and develop technologies and solution for tomorrow's communication. Experts from the Telekom Group work together with scientists and external experts to develop novel services and solutions for Telekom customers. Establishing new business units and spin-off companies is another way of utilizing research results. For Deutsche Telekom, innovations are key to opening new fields of growth. Telekom Innovation Laboratories, founded in 2005 as a research and development unit, has since established itself as one primary point of contact for innovation topics in the Telekom Group. The link between Telekom's R&I activities with Technical University Berlin (TU) and a variety of other universities, institutes, and industry partners worldwide creates close ties between the worlds of science and business.

The open innovation model is a guiding principle for the work of Telekom Innovation Laboratories. This encompasses the inclusion of customers, users, and domain experts in the innovation process, enabled by advanced methodology. Telekom Innovation Laboratories has its headquarters in Berlin, and offices in Darmstadt and Bonn in Germany, in Silicon Valley in the United States, and at the Ben-Gurion University in Israel.

The R&I work at Telekom Innovation Laboratories is concentrated primarily on topics and new technologies that can be brought to market within a time horizon of up to 5 years. It pursues two major strategic directions. First, it supports the

development of applications and services, such as in the key areas of interactive high-end media, future communication, and information relevance. Second, its ideas and developments help secure the future infrastructure and complex services in the areas of cross-domain middleware, global cloud, large-scale infrastructure optimization, and broadband access evolution.

The objective of the work of Telekom Innovation Laboratories is to transfer and realize innovations in collaboration with the Telekom Group's business units. The R&I projects are coordinated closely with the existing portfolio, the product roadmap, and the network expansion strategy, and can be realized within a period of up to one-and-a-half years. Other projects are dedicated to longer-term innovation topics, which will result in strategic innovations in a window of up to 5 years. In addition, Telekom Innovation Laboratories works on topics that do not fit into the defined core areas or that demonstrate disruptive potential. This last area includes multidisciplinary topics and candidates for start-ups and investments.

The results of the R&I projects form the foundation of a multitude of current and future Deutsche Telekom products and services. They include solutions for payment with mobile devices, features for Internet protocol television (IPTV), and new approaches to cloud computing and green infrastructures. Telekom experts and scientists from a wide variety of disciplines from all over the world collaborate interdisciplinary on the creation of novel solutions for Telekom customers. The mission of the project field User Driven Innovation is the (further) development and implementation of suitable methods of user orientation along the innovation development process. To guarantee user orientation in radical innovation projects, a specific method toolbox is being applied, which is presented in the next section.

22.4.2 User-Centered Radical Innovation Toolbox

Radical innovation ideas do not fall from the sky draining into a funnel of selection (Breuer et al. 2009). Instead, time, budget and tools for their generation must be allocated upfront. Sources of variation provide new perspectives from positions parallel to established lines of development. Different methods are more or less suitable to come up with ideas and concepts for rather incremental or radical innovation. While resource-oriented approaches tend to result in sustaining or incremental innovations that fit well into existing business processes, divergent methods like futures workshops or blue ocean analysis have a greater potential to generate ideas for potentially radical innovation. Figure 22.1 contains an overview of user-centered radical innovation tools used at Telekom Innovation Laboratories.

Goals of the user-centered radical innovation toolbox are: (1) Identification of new search fields and market opportunities, (2) Generation of qualified value propositions, experience prototypes and business models and (3) Measures for market preparation including definition of suitable markets and market driving strategies.

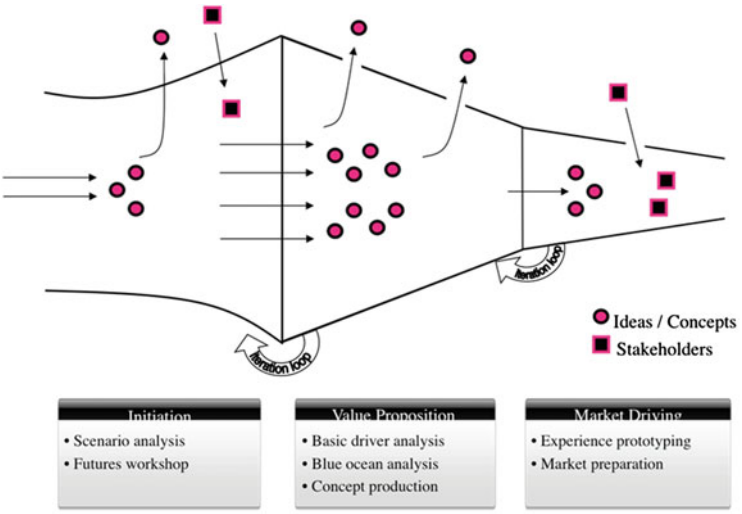

Fig. 22.1 User-centered radical innovation toolbox

One important aspect refers to choosing suitable users for integration based upon specific characteristics (Alam 2006; Gruner 1997). Typical "average" users might have difficulties imagining the future and anticipating and articulating their more or less unconscious future needs. In this context the term "functional fixedness" refers to the users' tendency to concentrate on their existing knowledge about the way products are used at the present. As a consequence, they may not be able to imagine what is technologically possible or to provide new solutions (Leonard 2002). In addition to that users can exhibit the psychological tendency to resist change and thus to show little interest in new features and functions or even disruptive changes (Ulwick 2002; Christensen and Bower 1996).

On the other hand, users who are for instances experts in the market, in the product category or in the core technologies might be very well able to provide sufficient high quality information in the context of radical innovations. Expertise enhances the users' ability to articulate their needs and to evaluate radical innovation concepts precisely (Reidenbach and Grimes 1984). Still, Kristensson and Magnusson (2010) recently provided empirical evidence that ordinary users (idea creators who are unaware of any technological restrictions) tend to produce more radical service ideas than idea creators with information on potential feasibility.

Lead users (von Hippel 1986) are particularly advanced customers who will especially benefit from the solution to a particular customer problem that is relevant for the future. They differ from average customers both in their ability to perceive the needs of the market at an early stage and in their significant interest in a solution to a problem, with the associated high motivation for cooperation. Providing a leading opinion in the sector can be seen as a further, potentially

relevant characteristic, as mouth-to-mouth propaganda can affect the adoption processes of other target customers (Enkel et al. 2005).

In sum, users to be integrated into the innovation process should be selected carefully and with respect to the specific information needs of the referring phase. There are many models for the process of innovation, which vary in the terminology used, by the number of process phases, by the diversity of the structuring and presumptions about activities being sequential or in parallel. In the context of radical innovation generically and thus largely independently of the sector or situation, one can discriminate between the phases initiation, value proposition and market driving (Steinhoff 2006).

(1) Initiation

The initiation phase refers to this initial fuzzy front end of an innovation project. How to proceed from nothing to something? Identification of search fields for new business, but also the generation of new ideas in science, design, and engineering are usually considered ill-defined, or even random. We tend to assume that ideas fall like raindrops from the sky, and we just have to funnel or filter out the good ones to come up with the next big thing (Breuer et al. 2009). Within the concept of open innovation the number of input channels and methods has been increased.

Initiation aims at a deep understanding of (future) users on the one hand and at the identification of (technological) search fields for innovations on the other hand. A search field confines area for exploration of business potentials in terms of generating revenue or reducing costs. It is not a trend, product, or feature, but it may be specified by relating trends and high impact developments in business, technology or society.

Exemplary tools as applied in the initiation phase at Telekom Innovation Laboratories are:

- *Scenario analysis*: Since the mid-twentieth century, futures studies are well familiar with the limits of extrapolation to predict the future and developed an own history of working with multiple perspectives and alternative scenarios. Scenario analysis proceeds from identifying key impact factors to describing alternative future projections, and combines them into scenarios (Fink et al. 2000). "Wild Cards" may be introduced in order to reflect disruptions with low probability but high impact (Steinmüller and Steinmüller 2003), challenging established assumption and fostering thinking beyond the beaten tracks. The method aims at the identification of new search fields and market opportunities and furthermore the sensitization for potentially radical developments.
- *Futures workshop*: Futures workshops are based upon divergent thinking in order to enlarge windows of opportunities, systematically identify search fields, and generate innovative, radical ideas. Divergent thinking is understood as productive and deviating from conventional habits. It is appropriate for problems, which do not have a fixed solution already or to which alternative solutions may apply. A futures workshop typically includes domain experts from

separate fields and consists of phases for critique, utopian imagination and realization (Jungk and Müller 1987; Kuhnt and Müller 2004; see in detail Sect. 4.3).

(2) Value Proposition

The value proposition phase relates to the development of ideas and concepts for radical innovations as well as any pre-selection. Creativity is required, which can be supported by creativity techniques, whereby apart from internal sources especially external sources such as experts and users come into question. Afterwards a first investigation of the feasibility and the return on investment of the innovation in the marketplace take priority. To assess the commercial feasibility, particular care must be taken to see if and when the innovation will be accepted by the target customers (Ram and Sheth 1989).

The user-centered radical innovation toolbox provides a number of methods to facilitate the search for, concretion and pre-selection of ideas, e.g.:

- *Basic driver analysis*: The basic driver method is a structured guide to quickly shape existing (loose) ideas towards user focused and profitable concepts. Goal is the identification of initial users, their drivers in life, and rough market size estimation. Consumers prioritize spending time and/or money in satisfying primary drivers, e.g. Hope (e.g. hope for abundant money), Feel important (e.g. show off to peers) and Get more out of life (e.g. most value for my money, improve myself; see Ross; Merlin Consulting Limited). If a product or service can address some of these drivers, it is more likely to be adopted. Furthermore, by thinking of alternative drivers new potential target groups may be identified and quantified.
- *Blue ocean analysis*: The blue ocean analysis aims at creating ideas in new uncontested market space by varying and adding strategic performance dimensions. Four actions can create a new value curve: (1) Reduce: Which factors should be reduced well below the industry's standard? (2) Create: Which factors should be created that the industry has never offered? (3) Raise: Which factors should be raised well above the industry's standard? (4) Eliminate: Which of factors that the industry takes for granted should be eliminated? (Kim and Mauborgne 2005). These questions provide a rough guideline how to find value innovations from eliminating and reducing, and simultaneously raise and create new value.
- *Concept production*: Iterative ideation, rough assessment, and rapid modification of a variety of tangible concepts help to explore the design space. Low-fidelity (e.g. chapter) prototypes suffice as means of formative evaluation and yield quick answers to upcoming questions, thus addressing the need for confidence in the face of uncertainty. Therefore multiple and fast iterations are more important than individual versions. A variety of materials is being applied to stimulate divergence: Illustration and moderation kits provide new means for

co-construction and communication. Results are qualified lists of prioritized concepts, use cases and business models.

(3) Market driving

Afterwards the emphasis is on development activities, which are generally dominated by the production and test of prototypes and the introduction of the innovation to the market (Gruner and Homburg 2000). In the context of radical innovation there is an increased need for information, not just on the side of the innovating company, but also for the customers targeted by the innovation. Communication has an above average influence on the successful spreading of an innovation in the marketplace (Lee and O'Connor 2003). Using suitable information, when preparing the market, the establishment of new knowledge and attitude structures can be supported as well as lowering barriers to adoption and lowering an increased perceived risk (Binsack 2003).

Exemplary tools in the market driving phase are:

- *Experience prototyping*: Experience prototypes enable users to interact with vivid representations of product and service ideas. Depending on the focus topic and level of detail being required a variety of prototypes from rough chapter and pencil sketches to illustrations and video prototypes may be used to apply methods like heuristic walkthrough and usability testing. Results are concrete user requirements and evaluated experience prototypes.
- *Market preparation*: Market preparation tools support entrepreneurs to create and "drive" new markets. Preparing the market can be understood as "readying the 'market' for the change" (Easingwood and Harrington 2002). This concerns specific actions both in advance and during the introduction to the market, with the goal of lowering user uncertainty and thus positively influencing the spread of the new product in the marketplace. Preparing the market can be conceived of as building market awareness (e.g. via product announcements) and educating prospective customers (e.g. via product demonstrations, active use of opinion leaders in the market; Sandberg 2005).

22.4.3 Example: Futures Workshop

In the previous chapter, a short overview about selected methods of the user-centered radical innovation toolbox was given. This chapter illustrates one method in more detail: the futures workshop.

In principle, a futures workshop can be interpreted as a catalyser for reducing the discontent with the current situation and for showing positive development possibilities for the future (Jungk and Müller 1987). Typically, a futures workshop takes several days and is subdivided into three sequential process phases: the critique phase, the utopian phase and the realization phase.

As an example, insights from a 2011 futures workshop on new services for mobile payment are given. This workshop was the core element of a future wallet ideation. The project aimed to generate new ideas for the Mobile Wallet that go beyond the current roadmap and basic services such as payment, transportation, ticketing and loyalty. It included an initial domain research to identify trends and benchmarks for mobile payment and identity services, the futures workshop and a prioritization, refinement and validation of the ideas that were generated during the workshop. 13 internal and external experts and lead user representatives participated. In order to fit creative exercises and even a touch of utopian reasoning into a one day workshop extensive preparation and briefing of participants was conducted upfront. The workshop itself was then comprised of the three phases:

- Critique Phase: Critically analyzing the status quo.
- Utopian Phase: Developing utopian visions containing future oriented and desirable scenarios.
- Implementation Phase: Generating innovative ideas for new functions, services and Mobile Wallet business opportunities.

In the first phase, participants collect problems as well as resentments and make comments on dissatisfactory situations within a specific subject area. In order to trigger and direct discussions trends in the focus areas mobility, work life and personal information economy were presented. Participants were then asked to think negative, to recall bad experiences in the respective focus area and to share their concerns, fears and resentments about everything that might go wrong. After clustering these points of criticism participants were asked: How should these issues be resolved in an ideal world? To give an example: Regarding mobility and lifestyle someone complained that peer-to-peer payment can only be done with cash and described the complications trying to share a taxi or restaurant bill. Together with other issues the cluster was named "Complicated Informal Payment" asking for simple ways to share and transfer money. This notion was one of the starting points for the utopian phase.

In the utopian phase, it is assumed that any limitations of real life are not valid and that, in principle, everything is possible. The neutralization of any limitations stimulates unusual and unconventional ideas and solution concepts (Kuhnt and Müller 2004). Workshop participants portray an exaggerated picture of the future driven by desire. The characteristic of this method lies in its 3-phase layout. Solutions are not directly derived from problems, but from a utopian conception of an ideal situation with no restrictions (such as money, time, power, technical feasibility). With the intellectual and emotional breaking with boundaries of reality, the preconditions for something radically "new" are created.

For the mobile payment topic participants created postcards from utopia reporting about their joys and impressions. In fact within three groups and with support of a professional illustrator they created whole worlds with ecosystems of activities and transactions. The vision named "Room of Needs" for instance not only puts everyone in full though seamless control of personal information and who to share it with. Moreover, that is a "door to my room of needs. It takes me

anywhere I want and knows what I need before I even do." Basic motives and traits from these utopian visions were analyzed in a learning session after the workshop, e.g. the desire for control over personal information and a free flow of life without barriers of culture, language or currencies.

The third phase, the realization, re-establishes the connection with everyday life. The ideas and solution concepts of the utopian phase are being critically examined, the future vision is systematically broken down into something specific and feasible. The participants analyze how single aspects of the utopian vision can be realized in reality. Especially, the needs on which the utopian visions are based on offer starting points for the realization with today's and upcoming means, e.g. technologies.

Regarding mobile payment analysis of the utopian vision, and several rounds of group ideation, idea selection and refinement yielded ideas such as a shared wallet center and a treasure box. Each was described through a customer view, value, assessment and illustrated drafts. The "Shared Wallet Center" for instance provides for a shared group account for families, housing communities or any other group of people preparing group activities. For instance if a travelling relative asks for emergency money it may be granted though such and account that may be limited by time or amount and remotely controlled by a holder of such rights. The "Personal Treasure Box" on the other hand is a "space" within the Mobile Wallet where personal data (such as passwords or documents) can be hidden and kept secretly. Users can decide which data to hide and which to share for personalization. Confidential data can be safely shared among users from one treasure box to the other.

The short one day workshop provided 26 rough ideas. Their refinement and enrichment with strategic internal knowledge and external trends and microtrends yielded a set of viable solutions that went beyond the given scope of options. On behalf of the workshop participants one external manager revealed at the end of the workshop day that he had considered leaving during the lunch break within the utopian phase because the playful interaction appeared like nonsense and kindergarten to him. At the end of the day he was one major advocate of this workshop format and seriously considered prescribing it to every one of his own employees.

22.5 Conclusion

Rooting innovation in user needs and future orientation are critical factors, both for the success of the company as well as for the success of the new product. Despite this, a lack of user orientation continues to be a frequent phenomenon in the process of innovation—especially in the context of radical innovation (Mason and Harris 2005). Radical innovations exhibit a risk-reward ratio that deviates from that of incremental innovations. Actively dealing with market uncertainties presents a significant challenge to the management. Overcoming the bottleneck factor of user orientation translates into the need for intelligent information generation.

The described methods within the user-centered radical innovation toolbox may all be characterized by detour: They do not go directly to the target, but work around what may appear as the most efficient way to hit the goal. They do not give a direct shot, but pass the ball to another player, even if she or he is not on the playground (like users, non-users, experts from other domains or future visions are outside the realm of an organization). Futures research applies for example wild card irritating well established expectations. This basic approach is supported by psychological research on "pre-inventive forms" (Finke 1990) that may foster creative thinking more than targeting at a specific purpose. Principles of detour apply external points of reference in order to enable multiple shifts in perspective. Detour allows to find "new combinations" (Schumpeter 1910) of potentials inside and opportunities outside the box.

To sum it up: The concept of user-centered radical innovation as applied at Telekom Innovation Laboratories offers a systematic approach for generating insights and ideas for highly innovative new products and services.

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Chapter 23
Co-Innovation and Communication: The Case of SAP's Global Co-Innovation Lab Network

Sabine Patsch and Ansgar Zerfass

Abstract This article describes a company case from the ICT industry and illustrates how collaborative innovation involving several actors is realized and why communication plays a crucial role within this process. Taking a social structural perspective on innovation and communication, it becomes clear that meaning and reality, which are the prerequisites of novelties, are constructed in communicative interactions between companies and their internal and external stakeholders. Consequently, communication cannot be considered as an instrument of innovation management that might be used or dropped in different innovation phases like a tool. The theoretical perspective also underlines that innovation-related actions are influenced by structures: rules and resources enable, modify, and limit innovation actions. The Global Co-Innovation Lab Network (COIL) of SAP, analyzed in the case study, can be seen as a corporate, communicative resource due to its role as an interface between internal and external stakeholders of the company. It enables all parties involved to define framework conditions of a shared co-innovation project and to execute it. Structurally, COIL connects stakeholders across the globe, such as certified or potential SAP partners, users or internals, such as existing and potential business units. Therefore, collectively shared structures, like co-innovation projects, are created. They are considered as a prerequisite for future innovation and communicative actions. Based on previous expertise and experiences, COIL helps to specify shared structures for each project and thus enables successful co-innovations.

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23.1 Introduction

Information and communication technologies (ICT) as cross-sectional technologies drive innovation and growth in many industries (Münchner Kreis et al. 2009, p. 192). It can be argued that they will even "play a more significant role as software becomes a larger part of the company and the product" (Sarrazin and Sikes 2013, sidebar, para. 1). Therefore, companies have started to innovate their core business models based on ICT-driven opportunities (Kagermann et al. 2010). For example, ICT-related research and development (R&D) is of rising importance in industries like automotive, logistics, and health care (Dutta and Mia 2009, p. 102). In order to stimulate and realize ICT-based innovation across industries, different actors have to collaborate. Many companies have created structures and fostered actions to enable such collaboration processes with partners and customers in the past years. Concepts like 'open innovation' (Bogers 2012; Chesbrough 2003; Enkel et al. 2009), or 'networked innovation' (Swan and Scarborough 2005; Valkokari et al. 2009) explain how and why in-house R&D is complemented by innovation collaborations with outsiders. This chapter describes a company case study from the ICT industry and illustrates how collaborative innovation involving several actors is realized and why innovation communication (Zerfaß and Möslein 2009) plays a crucial role within this process. Taking a social structural perspective on innovation and communication, it becomes clear that meaning and reality, which are the prerequisites of novelties, are constructed in communicative interactions between companies and their internal and external stakeholders.

23.2 The Software Industry, SAP and its Ecosystem

In general, the word software is used "to describe the digital instructions and operating information that are contained in *programs* serving to guide machines—especially computers—in implementing desired operations" (Lippoldt and Stryszowski 2009, p. 33). *Software products* are non-physical and digital goods which can be reproduced at low cost, without any quality loss, and in any quantity desired. Another main aspect to describe software is its degree of standardization. Individual software and standard software can be defined as the two extreme cases, where individual software is tailored to the specific requirements of a user, and standard software is developed based on the lowest common denominator concerning the needs of potential users (Buxmann et al. 2013). The development of software can be described as a cumulative process because the transfer, reuse and modification of code is possible (Lippoldt and Stryszowski 2009). *Software markets* are international, as software can be developed globally and distributed worldwide at low cost. Software markets include very few dominant players. In many cases, a standard or technology becomes prevalent, as the consumer's benefit

of using a good—e.g. the same standard format in software systems—rises, when more consumers use the same good. The software market includes several kinds of actors, especially in the area of complex software solutions. Software companies, in a narrow sense, create software, whereas in a broad sense, they implement and operate software. Accordingly, there are several types of vendors competing on the market offering services such as implementation support, training or operating services (Buxmann et al. 2013). Collaborative approaches are used to foster software innovation, for example in partnerships between ICT firms, or between ICT companies and partners outside the sector (Lippoldt and Stryszowski 2009).

SAP AG is one of the main players in the software industry worldwide. In 2012, this global leader in enterprise software and software-related services had about 232,000 customers and more than 65,000 employees based in 130 countries. Table 23.1 summarizes SAP's products and service offerings in five market categories: Applications, Analytics, Cloud, Mobile, as well as Database and Technology. Products across the five market categories are bundled into end-to-end solutions. These solutions are offered for all corporate functions, like finance, procurement or sales, and specifically for 25 industries such as automotive, banking, and healthcare (SAP 2013c). A main part of SAP's portfolio includes services ranging from the customized development of software solutions to support services, consultation on planning, implementing and optimizing business solutions, and educational services including IT training.

This short overview of SAP's portfolio indicates that the corporation collaborates with various partners. Besides partnerships with selling allies, SAP cooperates with service and implementation providers as well as with development partners. Partners support the market adoption of SAP's solution portfolio by co-innovating on SAP platforms and embedding SAP technology, as well as reselling and/or implementing SAP software. SAP offers qualification and training programs for partners, as well as certifications for third-party offerings to underline the technical alignment with SAP solutions. This means that customers can benefit, for example, from pre-tested, certified partner offerings which extend the functionalities of SAP solutions or from accelerated integration projects (SAP 2013a, b).

Close relations with partners and the expansion of its partner ecosystem help SAP to increase its market coverage, improve its solution portfolio, and strengthen its innovation activities (SAP 2013a). As a consequence, *collaborative innovation activities with stakeholder*s are supported by several initiatives at SAP. Examples are *SAP IdeaPlace,* a platform which invites stakeholders to submit, discuss, and rate ideas (SAP 2013d), as well as *SAP InnoJam,* a 30-h event to learn and discuss SAP technologies and finally apply them by creating a prototype (SAP 2013e). Another initiative is the *Global Co-Innovation Lab Network (COIL)* which has been established by SAP since 2007 to support co-innovation processes between SAP and external partners, customers, as well as other stakeholders (SAP 2013f). The COIL concept has been institutionalized for several years and has been adapted continuously. Consequently, a global network of Co-Innovation Labs has emerged, tackling a rising number of co-innovation projects with stakeholders. Therefore, the example of COIL offers an interesting insight in corporate co-

Table 23.1 SAP's product and service portfolio

Market category	Description
Applications	Enterprise applications are the core competence of SAP, and SAP Business Suite as a business process platform. These include core software applications, like SAP ERP, which support critical business processes, such as finance and human capital management
Analytics	Analytics solutions enable users, e.g. to interact with business information and get answers to ad hoc questions without deeper knowledge concerning the underlying data sources
Cloud	Cloud applications and suites are provided as software-as-a-service (SaaS) based on a subscription fee. SAP HANA Cloud is a platform-as-a-service (PaaS) enabling SAP's customers, independent software vendors (ISVs), and partners to create software applications rapidly, e.g. for the needs of social and collaborative business networks
Mobile	Mobile solutions enable SAP's customers to deliver secure, real-time, business-critical information to their employees, partners, and customers on mobile devices. SAP's mobile development platform also supports partners to develop their own applications for their employees and customers
Database and technology	The database and technology portfolio includes e.g. the SAP NetWeaver® technology platform which enables the integration of SAP software with heterogeneous system environments, third-party solutions, and external business partners. In addition, the SAP HANA® platform, based on in-memory computing technology, processes huge amounts of data at a high speed

Source SAP 2013a (adopted)

innovation activities, its structures, and the role of communication, which is considered as a constituting element of innovation (Zerfaß 2009). To investigate the COIL concept in more detail, the theoretical concept of innovation communication in the era of open innovation is outlined first (Mast et al. 2005; Zerfass and Huck 2007; Zerfaß and Möslein 2009). Secondly, the best practice case of COIL is illustrated focusing on major aspects of innovation communication, which is understood as symbolic interactions between organizations and their internal and external stakeholders dealing with new products, services, and technologies (Zerfaß 2009).

23.3 Innovation and Communication: A Social Theoretical View

The term 'co-innovation' implies that at least two partners collaborate to foster innovation. According to Bogers (2012), *collaborative innovation* is a specific type of open innovation and combines knowledge inflows and outflows. The concept of open innovation is based on "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external

use of innovation, respectively" (Chesbrough et al. 2006, p. 1). Bogers refers also to the so called "coupled process" of open innovation understood as "co-creation with (mainly) complementary partners through alliances, cooperation, and joint ventures during which give and take are crucial for success" (Enkel et al. 2009, p. 313). Establishing a coupled process implies that the outside-in process to gain external knowledge is combined with the inside-out process to bring ideas to market, which drives the joint development and commercialization of innovation (Enkel et al. 2009). Coupled innovation processes entail interactions between at least two actors. Therefore, the role of communication in collaborative innovation processes is central and is considered in the following in more detail. At first, the two core terms 'innovation' and 'communication' are conceptualized based on different scientific perspectives. Subsequently, the theory of structuration (Giddens 1984) is outlined to reconstruct the role of communication within the innovation process.[1]

Innovation research uses mainly the conceptualization of communication as transmission and innovation as artifacts. More recent research underlines the social construction of technologies, innovations, and markets, but still uses the conceptualization of communication as *information transmission* and conveying of meaning. The same applies to scientific discussions on innovation communication, as they are mainly based on a traditional term of innovation. The different conceptualizations underline several aspects of corporate practice while complementing each other. The conceptualizations in the lower section of Table 23.2 are focused on the *creation and adaption of communication and innovation,* and the traditional concepts in the upper section of Table 23.2 underline the *management of communication or innovation processes* within the conditions of already prestructured social relations. Social theory (Joas and Knöbl 2004) enables us to understand the duality of acting within given structures and changing those structures at the same time. The *theory of structuration* by sociologist Anthony Giddens (1984) helps to overcome the limitations of both action theory and systems theory, which focus on either side of the process. Giddens' theoretical approach has been applied to various disciplines including corporate communications (Falkheimer 2007; Hahne 1998; Röttger 2005; Zerfaß 2010) and also sporadically in innovation research (Chanal 2004; Coopey et al. 2002; Duschek 2002).

Giddens (1984) points out that social coexistence is determined by both individual *actions* and societal *structures* (rules and resources). These structures enable and influence thinking as well as acting, and are renewed and also partly adapted during each actualization. *Social interactions* can only be successful if those involved can refer to a shared reservoir of rules and resources. This applies both to communication processes as well as to the creation and acceptance of innovations. *Resources* are, on the one hand, material aspects of the environment, a means of production and products (allocative resources), such as a method to

[1] This section is mainly based on an article previously published in German language (Zerfaß 2009).

Table 23.2 Alternative conceptualizations of the core terms innovation and communication

Communication as…	Innovations as…
… *transmission:* Companies transmit objective information via media channels to key stakeholders. This stimulus leads to the transfer of meaning and is intended to evoke desired reactions (e.g., knowledge, attitude change, behavior). *Communication* is a specific form of behavior that is mainly determined by systemic relations and psychological motives	… *artifacts*: *Innovations* are novel products or processes that are marked as new by a company (or its leaders) and that are established on the market or within the organization. The innovative offer meets the demand of actors on the market and is used by them in different ways
… *construction of reality:* Companies and stakeholders constitute social interactions by messaging and comprehension activities referring to each other, which link to shared symbolic structures (communicative schemes and competencies) and target understanding as a prerequisite for influencing each other. *Communication* is a form of interest-led action, where perceptions and orientations are shaped subjectively, but meaning and reality are socially constructed	… *social constructs: Innovations* are technical, economic, or social novelties that imply a change of social practices and that are considered by the involved actors as new because they reach beyond ongoing adoptions of practices. Shared meanings are a prerequisite for novelties; likewise, the meaning of technologies, innovations, markets or added value is only constituted in social interactions

Source Zerfaß 2009, p. 36

create, convey, and understand messages or to build prototypes. On the other hand, resources can be competences (authoritative resources), such as the ability to communicate actively with certain stakeholders, to listen intensively in dialogues with customers and employees, to be able to cooperate, to solve engineering problems, and to create novel combinations of ends and means. *Rules* sanction social acting (legitimization) and constitute meaning (signification) (Giddens 1984).

Collective perceptions and interpretive schemes create cognitive structures that are necessary to enable social activities by various actors and to make them compatible with each other. Rules of communication are modes like articulation or symbolic schemes as well as cultural rooted modes of influence such as manipulations, instructions, or argumentative discourse (Zerfaß 2010, pp. 169–181). Rules of innovation are schematic visions of the novel, possible and valid combinations of materials, process operations, and applications, as well as cognitive associations of certain groups (e.g., farmers, consumers) linked with technologies and societal concepts (e.g., 'nature', 'ecology').

The following illustration shows the process of structuration (Fig. 23.1): Structuration is a dynamic process. Collectively shared structures between involved actors are a prerequisite for innovation as well as for communication activities. At the same time, the actualization of rules and resources makes actions compatible and likely to be successful. Naturally, recurring actions and their

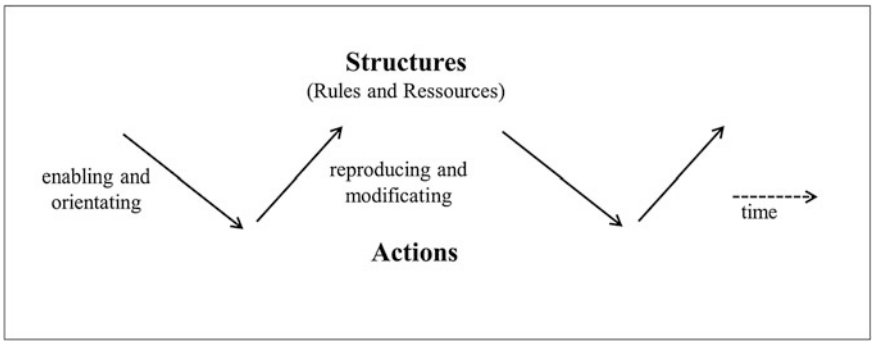

Fig. 23.1 The process of structuration. *Source* By the authors

prerequisites can be reflected. Parameters influencing the success of corporate communications or innovation activities can be identified and used in terms of implicit or explicit knowledge. As a consequence, strategies will be developed that help to change structures for the better.

Taking a social structural perspective, social change can be interpreted as a shift of rules and a change of resources over time. Accordingly, innovation management must focus on drivers that influence rules and resources. At this point, the fundamental role of communication becomes obvious: meaning and reality, which are the prerequisites of novelties, are constructed in communicative interactions between companies and their internal and external stakeholders. Likewise, the meaning of technologies, innovations, and markets are created in social interactions between all actors involved. The role of communication within the innovation process can be reconstructed according to the following.

Communication is a constituting element in innovation management, as technical, economic, or social novelties always evolve in the context of interactions that are enabled and restricted by collective rules and resources. Cognitive schemes determine the meaning of new products, services, processes, and technologies, for whom they are beneficial and how they are evaluated. These cognitive structures can be formed, modified, and reproduced by communication processes.

Open innovation processes create social practices and spheres of communication that enlarge the potential for acceptable novelties and minimize the risks of closed reference systems. Traditional innovation concepts focusing on internal R&D departments decouple thought patterns of innovators from the world of potential users, multipliers, and critical stakeholders. In this case, communication departments are called in the final phase of the development process to translate visions of engineers and product managers into the cognitive frames of yet uninvolved stakeholders. This is often condemned to failure. If, by contrast, interfaces between the focal organization and its internal and external stakeholders are created in all phases of the innovation process, the probability of common

reality constructions and shared values rises. Obviously, the success of such endeavors is never ensured. If the interests of different stakeholders meet, it is not always a win–win situation. However, early communication helps to recognize discrepancies sooner. Adjustments or cancellations of R&D activities are possible, and misallocations of resources are reduced. Accordingly, concepts of 'open innovation' (Chesbrough 2003; Möslein and Neyer 2009) obtain a new justification beyond economical purposive rationality. From a sociological and communicative perspective, there is much to be said for the inherent evidence of such concepts.

Innovation communication has to be situative, and it can be used both adaptively and by structuring in different contexts and phases. Strategic communications should be aware that it acts in the context of established rules and resources. Insofar, knowing the public opinion (Bentele et al. 2003), its structural conditions as well as drivers of change (Zerfaß 2007) is essential. Based on that knowledge, corporate messages can be positioned, stakeholders can be contacted via relevant media channels and with appropriate topics, and campaigns can be run (Fink 2009; Huck-Sandhu 2009). At the same time, it must be repeatedly reflected whether and how current structures and interpretation schemes can be destructed or modified. Accordingly, communication management must accomplish much more than creating compatible messages. To plan, realize, and evaluate innovation communication refers also—and with increasing frequency—to listening, to establishing intelligent routines for monitoring opinions, as well as to identifying relevant publics and stakeholders. Feeding external opinions and interests into the organizational decision process ("inbound") is as important as conveying the corporate point of view to others ("outbound").

Thus, *innovation communication* can be defined (Zerfaß 2009, p. 42) as a strategic stimulation of communication processes with internal and external stakeholders to promote technological, economic or social novelties, (a) by creating, revising, or destructing socially shared patterns of meanings and communicative resources, and (b) by giving impulses for the development of novelties, and by promoting them professionally.

In summary, communication should not be considered as an instrument of innovation management that can be used or dropped in different innovation phases and situations like a tool. Communication has to be understood as symbolic interaction and reality construction. This perspective is also used in elaborated concepts of organizational communication, corporate communications, and public relations (PR) (Botan and Hazleton 2006; Zerfass 2008; Zerfaß 2010).

In the following section, the social theoretical perspective of innovation and communication is used to analyze a company case study. Central aspects of the innovation communication approach described above are outlined to demonstrate how corporations try to deal with the challenges of collaborative innovation by communicative means.

23.4 Innovation and Communication in SAP's Global Co-Innovation Lab Network (COIL)

The social theoretical view on innovation as a social construct underlines that innovation-related actions are influenced by structures: rules and resources enable, modify, and limit innovation actions. One of SAP's key instruments to foster collaborative innovation between the company, customers and partners can be described along this line.

The *Global Co-Innovation Lab Network (COIL)* consists of several teams and lab facilities spread globally. It is intended to be a platform of services enabling co-innovation projects between SAP product and field teams as well as other entities, like current or potential SAP partners and customers (Fig. 23.2).

The main aspects of the *working model* of SAP's Co-Innovation Lab Network are:

- COIL can be described as an *interface between internal and external stakeholders* enabling all involved parties to define framework conditions of a co-innovation project and to execute the project. Accordingly, COIL facilitates the extension of SAP's solution coverage as well as the acceleration of technology adoption and enablement by executing joint technical co-innovation projects and initiatives between SAP, its partners and selected customers. COIL focuses on how different parties can be connected successfully to a co-innovation topic within a dedicated project set-up, whereas the topic ownership is not with COIL, but with SAP's respective product and R&D units.
- Throughout the years of its existence, COIL evolved to create structures and to enable actions in order to tackle the main challenges of collaborative innovation. Consequently, major *co-innovation enablement elements* have been identified to realize project-based co-innovation successfully, like *IP framework, IT infrastructure, subject matter expertise* in the co-innovation team, and *knowledge brokering* to determine experts out of the team, as well as *operations and project management* (Cruickshank 2010).
- As COIL is intended as an interface platform between the SAP- internal and external world, *inbound and outbound communication* and *project-bound communication* need to be managed systematically.
- From SAP's point of view, co-innovation projects in COIL can be attributed to each *phase of the innovation process*. A co-innovation project can be an undertaking of SAP's 'fuzzy front-end phase', including a strong research focus, such as developing a proof of concept paper. A co-innovation project could also be assigned to SAP's development phase or the commercialization phase, such as providing a newly developed SAP technology to early testing and adopting partners and customers to foster a common innovation project. COIL projects are of mid-term length and typically last six months.
- The Co-Innovation Lab Network benefits from its global presence at currently nine locations *close to local and regional markets* in North and South America,

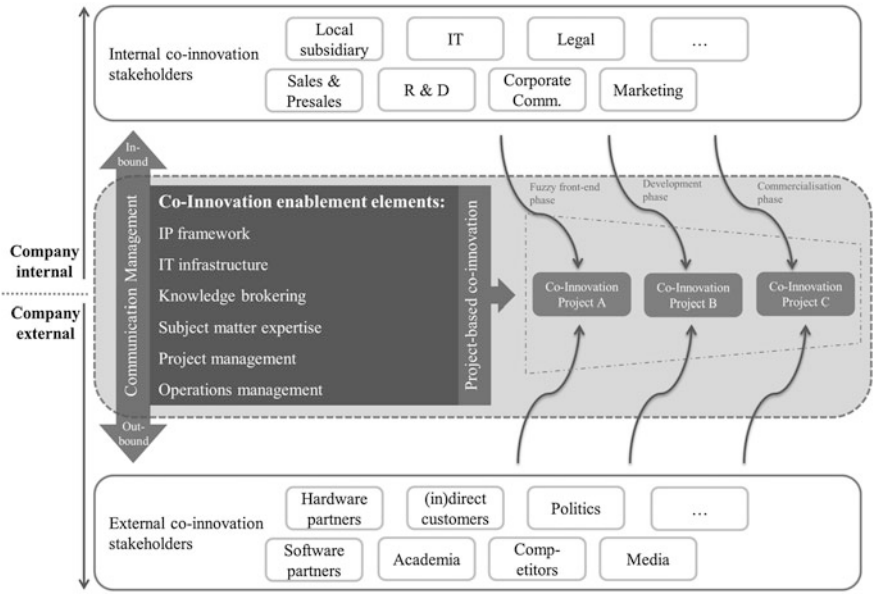

Fig. 23.2 Working model of SAP's Global Co-Innovation Lab Network. *Source* By the authors

Asia, as well as Middle and Eastern Europe. All nine locations include a project facility to work collaboratively, and a showroom to demonstrate ideas or prototypes. In four out of the nine locations, computing centers have been established. This set-up ensures that local COIL employees with certain engineering competences, can act as intermediaries between local, external stakeholders and internal experts, e.g. from other locations of the Co-Innovation Lab Network or from product and sales teams. The onsite colleagues are able to liaise as they master the local language and know national as well as organizational cultures. These aspects help to ensure the necessary dialogue between partners within successful co-innovation projects. Due to the local facilities, the respective managing director of the SAP subsidiary is a major stakeholder, fostering co-innovation projects with local and regional partners.

As indicated, COIL uses a project-based approach and has defined a co-innovation process containing seven individual steps (see Fig. 23.3). The elaboration of each process step depends on the individual project undertaking. The process view of co-innovation projects at COIL underlines that *communication activities* play an important role:

- The *pre-project phase* and the *project initiation phase* are determined by monitoring internal and external project ideas and topics. Moreover, it is important to stimulate dialogue between stakeholders, to evaluate ideas, and to attain appropriate project partners and promoters for a COIL project ensuring

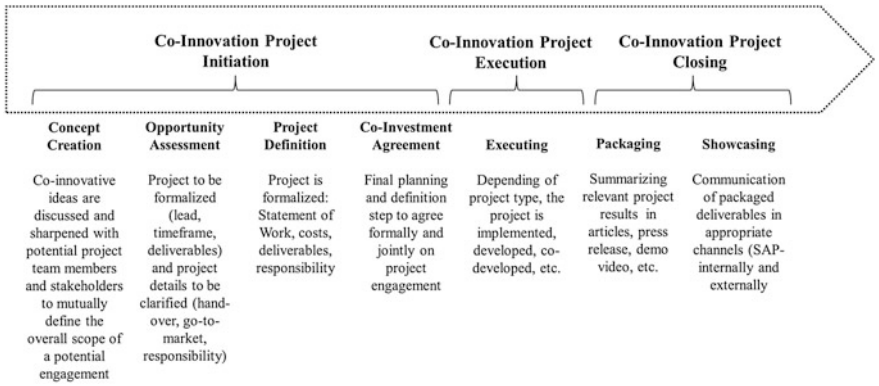

Fig. 23.3 Generic co-innovation process at SAP's Global COIL Network. *Source* SAP 2013f (modified)

resources (e.g., budget, subject matter experts, infrastructure, portfolio integration, campaign integration, etc.). To prepare a COIL project, communication-related activities are discussed and planned with relevant internal and external stakeholders (e. g., the global or local marketing and communications teams).

- In the *project execution phase,* internal project communication between the COIL project partners and sponsors is focused. Interim or final project results are framed and communicated, for example, by writing a whitepaper or preparing a demo video.
- The *project closing phase* is characterized by showcasing results through the appropriate channels, for example, to foster the market launch of a (partner) solution or to prepare follow-up projects by stimulating dialogue for further ideas.

Figure 23.4 summarizes the main communication-related activities associated with each project phase. In addition, the main *communication instruments* addressing company internal or external stakeholders are outlined. Due to its working model and global set-up, COIL uses *two main communicational pillars:*

- *Online Communication,* meaning all web-based communication activities, enables COIL to address its partners and customers independent of time and space on a *global scale*. The SAP Community Network (SCN)[2] is used especially to build a global co-innovation community. Dialogues within the SAP ecosystem

[2] SAP Community Network (http://scn.sap.com) is the social network for both internal and external SAP professionals, such as software users, developers, or consultants, with more than two million members globally.

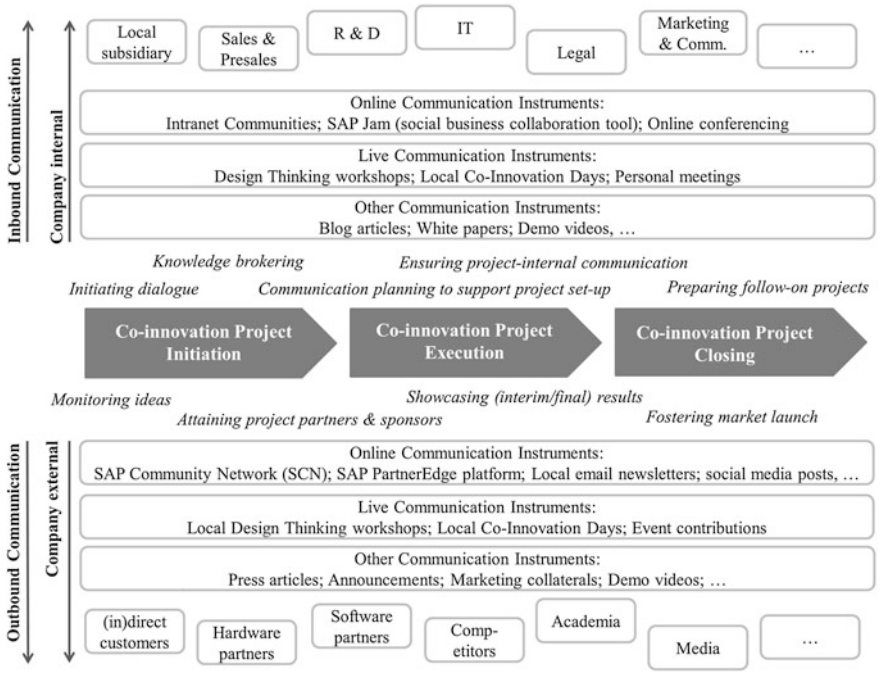

Fig. 23.4 Sample communication activities and instruments during the co-innovation process involving various co-innovation stakeholders. *Source* By the authors

are stimulated by sharing project ideas and project outcomes, for example with articles or podcasts. The partner program SAP PartnerEdge[3] includes a web-based platform and serves as another channel to attain new COIL projects and partners. To ensure internal project communication, online communication channels such as SAP Jam[4] or wikis as well as online conferencing tools are used to exchange knowledge or document project results and challenges. Within the SAP organization, one main communication instrument available on the intranet are the *internal communities* which are especially used to determine subject matter experts for COIL projects or share results, e. g., by posting blog articles, white papers, or demo videos. Online Communication is also used on a *local or regional* level, e. g. by creating local COIL newsletters or using other communication channels offered by subsidiaries or regional representatives.

- *Live Communication,* understood as communication activities in co-presence, is used to strengthen COIL's activities on a *local and regional level.* Strategic

[3] SAP PartnerEdge (www.sappartneredge.com) is SAP's partner program, offering business enablement resources and benefits to support implementing, selling, marketing, developing, and delivering SAP products.

[4] SAP Jam (www.sap.com/jam) is an enterprise social network solution.

decisions to establish a new co-innovation lab as part of the global Co-Innovation Lab Network are always made to benefit from the proximity to respective customers and partners in local or regional markets. Besides project facilities that execute co-innovation projects with externals, each lab location has a showroom to demonstrate interim and final results to stakeholders or to discuss new project ideas. Personal meetings, local events, and workshops are hosted, and design thinking techniques are increasingly applied as an iterative innovation approach to support teams during co-innovation processes (Plattner et al. 2011). On a global scale, live communication is especially used at industry events, e. g. SAP's global annual events SAPPHIRE NOW[5] and SAP TechEd.[6] In most cases, co-innovation prototypes and demos are shown in strong alignment with the respective marketing and communications teams at SAP and other project stakeholders, enabling potential customers and future partners to experience co-innovation first hand.

A manufacturing project (Odlozinski 2013) can be used to illustrate a typical co-innovation project at COIL. After discussing rough project ideas with stakeholders, COIL connected with internal development and product teams at SAP with a manufacturing hardware firm and an industry standards organization to develop a co-innovation project. In addition to knowledge brokering to identify appropriate project members and sponsors, COIL provided the IT infrastructure and project management enabling the co-innovation partners to use existing manufacturing solutions from SAP and its integration capabilities. Besides ensuring shared project structures, COIL fostered a joint, transportable demo board to showcase aspects of a real-world manufacturing process. Futhermore, communication activities with internal marketing and communications teams were executed, such as press activities, collaterals, videos, and SCN posts, as well as contributions to industry fairs and SAP sales events. SAP internal stakeholders from sales and development especially valued the prototype showcasing how potential customers from the manufacturing industry can implement SAP solutions combined with the partners' extensions. The partners contributing to the project valued the co-innovation outcome, as a novel, market-ready solution that was created by bringing together the partners' capabilities.

In the light of the social theoretical view described above, COIL can be considered as an interface with specific expertise to facilitate co-innovation projects. Furthermore, COIL enables access to existing resources, and promotes the creation of new resources, as well as fosters the understanding and change of rules necessary to realize collaborative innovation. Figure 23.5 illustrates the structures and

[5] SAPPHIRE NOW (www.sapphirenow.com) is a customer-facing event where SAP generally has announced major product changes and strategic direction.

[6] SAP TechEd (www.sapteched.com) is an annual conference hosted by SAP, aimed at the company's ecosystem of consultants and software development partners. It is a technical education conference for IT architects, administrators, and developers.

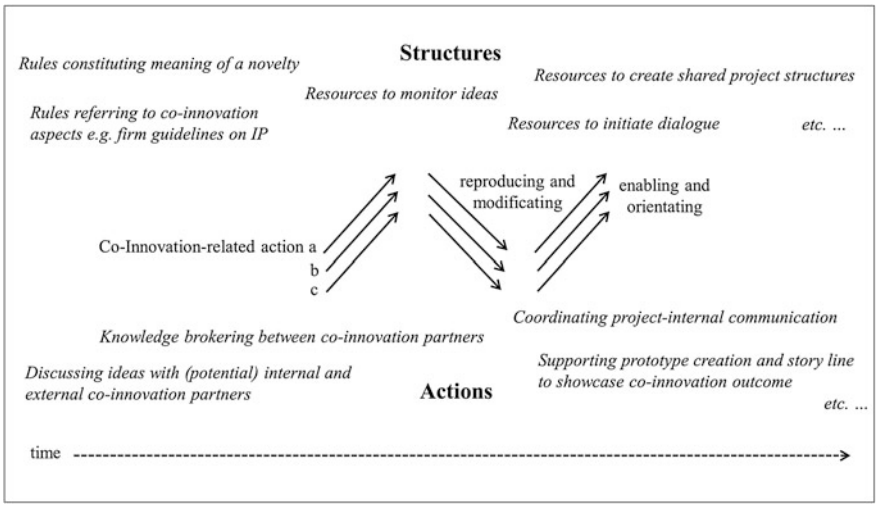

Fig. 23.5 Examples of structures and actions in SAP's Co-Innovation Lab Network enabling co-innovation. *Source* By the authors

actions in SAP's Co-Innovation Lab Network to enable co-innovation between internal and external stakeholders.

COIL is able to give project partners access to resources like *IT infrastructure* based on the latest engineering and system landscapes provided by SAP and key partners, as well as to an *IP framework* adaptable to specific project requirements. COIL enables stakeholders to access existing resources and to create new ones because it identifies and mobilizes internal and external *subject matter experts* as well as *potential project sponsors or promoters*, such as product and field teams or marketing and communications teams driving COIL project topics within their areas of responsibility. Furthermore, COIL's ability to prepare and support projects with *operations and project management* activities can be considered an important resource. Based on COIL's experiences from former undertakings, the establishment of a new co-innovation project is constantly streamlined. Therefore, involved actors can focus on the core process of innovation.

Project-based co-innovation facilitated by COIL supports joint thought patterns that bind involved actors to each other. Common constructions of reality and shared values among internal or external partners, potential users, multipliers, or critics become more probable. Acting as an interface between the internal and external world of the corporation, COIL is a vehicle for inbound and outbound communication. On the one hand, COIL enables SAP to scout the external environment. The network benefits from its local labs functioning as points of contact especially for local stakeholders interested in co-innovating with SAP. Bringing in external project ideas and facilitating project planning and execution involves managing *inbound communication* by addressing suitable internal project sponsors, promoters and potential team members. On the other hand, COIL fosters

outbound communication by stimulating dialogues with (potential) co-innovation partners on topics where SAP searches for allies or by supporting market launch activities. Communication processes help to influence cognitive schemes that determine what novelties mean.

23.5 Conclusion

Collaborative innovation between several actors is a complex undertaking and offers challenges in both theory and practice. Taking a social theoretical view on innovation and communication, the case of SAP's Global Co-Innovation Lab Network (COIL) indicates that structures are created to enable co-innovation actions in organizational practice. A global player like SAP uses several instruments to foster innovation, and opens up organizational boundaries to gain access to internal and external knowledge necessary for innovation (Chesbrough 2003). This case study shows that an appropriate mix of internal and external infrastructure, domain expertise, and processes is needed to capitalize on novelties.

Furthermore, the case underlines the theoretical argument that communication is a constituting element of innovation (Zerfaß 2009): The Co-Innovation Lab Network can be conceptualized as a corporate communicative resource due to its mission to act as an interface between internal and external stakeholders, enabling all involved parties to define structural frameworks for a shared co-innovation project and to execute it. As innovations are created in social interactions, collaborative innovation is based on communication processes. Structurally, COIL as network of currently nine co-innovation labs connects stakeholders across the globe, such as certified or potential SAP partners, users or internals, like existing and potential business units. Therefore, collectively shared structures are created and are considered as a prerequisite for innovation and communicative actions to take place. Co-innovation projects are a form of collectively shared structures, and the expertise and experience of the global Co-Innovation Lab Network helps to specify shared structures per project to enable successful co-innovation actions. Accordingly, actions within co-innovation projects facilitated by COIL refer to existing structures, e.g., meaning of novelties, internal topic responsibilities, or IP guidelines, and influence the modification of existing structures.

In conclusion, different perspectives in theory and practice should be taken into account when investigating collaborative innovation processes. The practice of corporate innovation management and communication may benefit from these considerations by deriving best practices, including other industries, to implement and adjust appropriate structures that successfully enable collaborative innovation actions. From a theoretical point of view, the concept of collaborative innovation and the role of communication in innovations should be researched further, both theoretically and empirically, to enlarge the body of knowledge (Bogers 2012; Ernst and Zerfaß 2009; Lee et al. 2012; Pfeffermann 2011). An interdisciplinary

view combining communication science, social theory, and management theory helps to reflect on the communicative dimension of actions and structures constituting today's organizations and their collaborative efforts to innovate.

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Chapter 24
Empowering Members of a Brand Community to Gain Consumer Insights and Create New Products: The Case of the Vorwerk Thermomix Research Community

Madeleine Kröper, Volker Bilgram and Ramona Wehlig

Abstract Online Research Communities (ORCs) have ushered marketing research into a new era and are one of the fastest-growing segments in the industry. ORCs offer a selected number of consumers a closed online environment in which they interact and co-create with the company not only in "one-off" projects but over an extended period of time. The approach distinguishes itself by the flexibility and diversity of market research methodologies that can be applied. In our case study we describe the set-up, live phase and post-processing of the Vorwerk Thermomix Research Community. Over the duration of 3 weeks, Thermomix invited customers, who are also registered users of the brand's official online recipe community, to participate in a moderated ORC. There were two major goals. First, Thermomix wanted to understand consumers' "cooking journeys", i.e. learn how they decide what to cook, plan their cooking, buy groceries etc. Second, Thermomix aimed to co-create with its customers and develop new features and functionalities for the Thermomix recipe community which serves as a central meeting place for cooking enthusiasts and brand fans. In the study, we show how the ORC was designed to answer our research questions and what methodological benefits the method yields. Furthermore, we investigate the user types that contributed to the platform most and provide insights into how to boost activity levels on the platform. In today's social

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media context, ORCs are a valuable tool for brands to connect with their customers and engage them in value creating activities. This chapter sheds light on this new research approach and unveils the potential of brand community members for insight generation and co-innovation.

24.1 Introduction

Today, to many consumers it feels natural to actively produce content and publish it online (so called 'user-generated content'). This change in media behavior is even more impressive considering that only a few years back, the majority of people mainly consumed (i.e. read/watched) content online. When Wikipedia was launched—widely unnoticed at that time—users notified the webmasters that there was a security issue on the platform because they could actually change the content of the website themselves. What appears to be alienated and ridiculous in times of daily Facebook updates reflected a very common understanding of roles between consumers and producers—in the media business as well as in the new product development process in any other industry. With the rise of social media, a vast majority of consumers have gradually adopted the role of producers and gained experiences. For instance, they stage themselves on Facebook, write restaurant and hotel reviews, share updates about their lives on Twitter and comment on newspaper articles. This fundamental change in consumer behavior induced a radical shift of the role of consumers from purely consuming towards prosuming (produce + consume) actors on the market.

Confronted with this new breed of consumers, many companies are at a loss. The widespread and often purposeless striving for a large number of Facebook fans as a key performance indicator in social media embodies the current ambivalent attitude towards social media. Alerted by the growing impact of social media, companies precipitately implement social media strategies, but fall short of tapping the full potential. Just as in the old days, they often only see a crowd of willing recipients of communication messages and use social media channels as yet another way of distributing their own content. The game has changed, but they still play with the same old methods and tools from the pre-prosumer era.

24.2 Tools to Empower Consumers

More and more innovative companies, however, manage to overcome the learned definition and separation of consumer and producer roles and reciprocate appropriately (Bernoff and Li 2008; Fuchs et al. 2010). Consumers have proved to be valuable partners in new product development. They help companies to learn about future consumer needs (Bartl et al. 2012) and to innovate more effectively and efficiently, i.e. create desirable products in a shorter time (Bilgram et al. 2013). A number of different interaction modes have evolved which serve different purposes.

Table 24.1 Comparison of empowerment tools. *Source* By the author

Empowerment tool	Research Community	Innovation contest
		
Method	• Asynchronous online research platform • Collaborative sessions and discussions	• Online crowdsourcing of an innovation task in a 'call for ideas' • Selection and rewarding the winners of the competition
Phase in value creation	• Definition of innovation fields • Selection and refinement of ideas	• Ideation of new product ideas
Involved individuals	• Users of a defined target group or existent customers	• Creative and skillful users
Outcome	• Consumer insights and needs • Evaluated and enriched ideas	• Hundreds of (visualized) innovative ideas • Underlying needs
User compensation	• Equal rewards for all active participants	• 'The winner(s) take(s) it all' principle of tournaments

In the ideation process, for example, Innovation Contests are conducted to turn to a large crowd of creative or knowledgeable people with a specific innovation task or problem (Hutter et al. 2011). These contests are based on two core principles: Crowdsourcing and the concept of tournaments. The first principle refers to the outsourcing of creative tasks traditionally performed by the company itself to a large crowd of individuals outside the company by means of an open call. In order to address highly innovative users or even lead users, companies turn to established specialist communities such as Innocentive or Nine Sigma or call for ideas in relevant online communities and other social media sites. The second principle describes the reward system and the temporary nature of Innovation Contests. Only the best ideas submitted within the contest phase are rewarded or in other words 'the winner(s) take(s) it all' (Morgan and Wang 2010). Rewards can range from monetary incentives to brand-related prizes, internships at the company or the invitation to a special event (Füller 2010). This form of crowdsourcing is particularly suited to efficiently collect ideas or solutions to solve complex and novel problems (Boudreau and Lakhani 2013).

In contrast, so called Research Communities (Bernoff and Li 2008) are used to gain consumer insights and feedback on new product concepts (see Table 24.1). For this task, companies usually do not address the most innovative people, but the average customer who buys their products.

Research Communities have a collaborative nature encouraging a free-flowing discussion between participants and the company. An agenda for each day comprising various questions and tasks helps to guide the collaboration. Consumers not only interact with the company in a one-to-one question-and-answer type of research but enter into a many-to-many collaboration mode. Accordingly, participants of this collaborative research platform are also rewarded differently. As opposed to the tournament principle, every participant of a Research Community receives a small incentive as a 'thank you' and a compensation for her efforts.

Online Research Communities have disrupted the market research industry and have become a significant part of many companies' empowerment strategies. The fundamental change that Research Communities bring about is that they establish a co-creation environment enabling a meaningful dialog and interaction mode. They go beyond short encounters between brands and consumers and create a different experience for consumers than 'one-off' research initiatives such as surveys or focus groups. The continuity of the platform-based approach, the versatile research modules and the exchange with the company as well as with other consumers creates an inspiring atmosphere of being part of something meaningful—something that has an impact and adds value for oneself and the company.

24.3 The Vorwerk Thermomix Research Community

The Thermomix is a multi-functional food processor which has up to 12 functions, enabling consumers not only to mix ingredients but also to cook, knead, mix, beat, chop, grind, purée, weigh, and roast them. For years, the company Vorwerk Thermomix has been integrating users in innovation processes in order to better understand problems, needs, and wishes as well as to co-create new products and services. Among other things, the open business model involving thousands of enthusiastic Thermomix users who evangelize and sell the product may account for the company's consumer-centricity. Thus the Thermomix business model is exclusively based on word of mouth referrals. The Thermomix cooking appliance cannot be bought in official stores or via online channels but is exclusively distributed by sales representatives.

The 'fuel' of the Thermomix usage are the special recipes which are specifically tailored to the Thermomix appliance. These recipes enable users to get the most out of the appliance and fulfill the promise of 'success guarantee'. Over the years, an enormous variety of recipes has been generated both by the company as well as by users. In the Vorwerk Thermomix brand community these recipes can be explored, shared, discussed and downloaded. More than 600,000 users worldwide are registered in the brand's community. As part of a global initiative aiming to improve the user experience of the recipe communities especially regarding the search functionality, and understanding user needs. Vorwerk Thermomix leveraged an Online Research Community to involve its customers.

In particular, Vorwerk Thermomix pursued the following objectives: First, understanding and analyzing users' cooking journey was a key goal. The cooking journey comprises several steps: Planning, (online) recipe search, decision making, cooking, evaluating the recipe, and finally managing and organizing the recipes. The main focus of the research was on the search phase within the cooking journey. The goal was to analyze user habits and identify different types of search behavior among users. Second, the goal of the ORC was to collaboratively develop a new search function for the community so that users find recipes they are looking for quickly and easily and collecting feedback on the interface, and attributes.

The case study is structured in five parts dealing with the people who participated in the ORC, the agenda that was conceived for the interaction with the customers and the platform which was designed to serve as a research environment. Subsequently, we describe the outcome of the ORC and share some lessons learned.

People

One of the key challenges at the beginning of a co-creation project is to identify and recruit suitable participants to collaborate with. Here, the Vorwerk Thermomix community 'Rezeptwelt' in Germany served as a base for the recruitment process. Out of a sample of 107,686 registered members (October 2012), 800 people were preselected as potential participants. Among other aspects, having been active in the Rezeptwelt community in the past six months was one of the pre-selection criteria. The goal was to ensure quality of participants' feedback and to identify the most suitable participants for the ORC.

The selected customers received an invitation via direct message to fill in a pre-screening questionnaire. In this message, the project's goals and requirements (active participation in the forum over three-weeks) were briefly described. The pre-screening questionnaire assessed a number of demographic variables (age, gender and Thermomix model), the activity level, cooking behavior, and the motivation to participate.

From a total of 113 Rezeptwelt members who completed the pre-screening questionnaire and expressed their desire to participate in the project, 69 particularly motivated people were selected and invited to the Research Community. The majority of participants were female (94 % vs. 6 % male), with ages ranging from 21 to 70 years, while most of the participants were between 31 and 50 years at age. Two third of the participants visit the Rezeptwelt community and use their Thermomix at least three times a week and have been members of the Rezeptwelt community for more than 24 months.

Participants of the ORC were also analyzed regarding their activity in Vorwerk's continuous brand community Rezeptwelt (i.e. the community they were recruited from). Activities in the Rezeptwelt comprise of the up- and download of recipes, comments and evaluations of recipes, and exchange of messages with other community members or friends. As shown in Fig. 24.1, 12 % of the participating consumers are rather passive users in the Rezeptwelt and therefore called "Marginal activity users". An even smaller number of participants belong

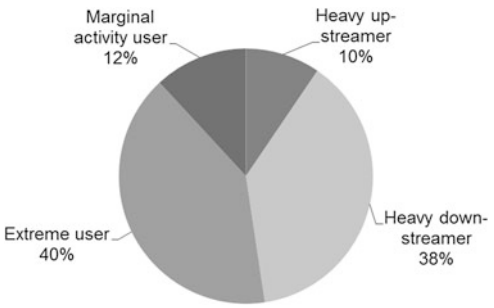

Fig. 24.1 User types participating in the ORC

to the segment of "Heavy up-streamers". The main activity of this group consists of the active creation of content which they contribute to the community. This includes the number of published recipes, given comments, and recipe evaluations. In contrast to these relatively small groups, 38 % of the ORC members belong to the group of "Heavy down-streamer"—a user segment best characterized by its downstream activities in terms of saving recipes. The largest user segment—containing 40 % of the participants—represents the group of "Extreme users". This group shows considerably higher activity levels in all previously mentioned activity dimensions. For instance, the average "Extreme user" uploaded approximately ten times as many recipes as the average user.

In the course of the online research phase of 3 weeks, 47 participants very actively contributed to the discussion with each at least 15 posts in total. Due to the participants' strong identification with and passion for the brand, a non-monetary incentive closely related to the Thermomix world was chosen to compensate them for their efforts. Each participant could choose one of the Thermomix cookbooks which are highly coveted by Thermomix fans.

Agenda

Following a discussion guideline, which captured all relevant research topics, the Research Community moderator posted a daily task to the forum, inviting participants to share their thoughts and ideas. Typically, the task comprised one main question with several sub-questions, to ensure comprehensibility and to encourage people to elaborate on their thoughts in greater detail. Besides posting the daily task each morning, the moderator followed the ongoing discussions and intervened only in cases of misunderstandings or questions. In doing so, the moderator could adapt the structure of the discussion by reacting to directions the conversation took or to aspects which emerged during the discussion. Due to the asynchronous and unobtrusive nature of this interaction, people could individually decide when to work on the tasks. At the same time, the approach fostered deliberate consumer responses on a cognitive level.

Within the first research week, the research focused on the 'status quo'. People were asked to talk about their general cooking behavior, recipe search and management and to evaluate the current Rezeptwelt. In the second week, people were introduced to the future online recipe platform ('Rezeptwelt 2.0'). Besides an

Fig. 24.2 Vorwerk online research community: start page and weekly overview

overall evaluation of the design and structure, participants were invited to test and evaluate new search features and functionalities. In the third and final week, people's creative potential was addressed by showing and discussing different future features and services with the aid of visualizations and mock-ups. In addition to these smaller daily tasks, on Friday participants were given a detailed weekend task on which they could work until Monday morning. One weekend task for example included the visit of other, competing online recipe platforms in order to compare special recipe search features. In a diary, participants were asked to capture their experiences revolving around their daily cooking and search behavior. In contrast to the general open discussions—where participants could see and comment on each other's posts—only the moderator and the individual participant had access to the personal diary.

Platform

A simple and user-friendly interface ensured easy access and guided participation over the three-week research phase. Displaying not only the overall project description but also the task of the day and an overview of all 3 weeks, the start page served as a hub for all activities within the ORC. Participants could directly access the task of the day prominently displayed on this page. By clicking on each research week, five different threads for each weekday appeared (see Fig. 24.2). In order to allow for simple and clear tasks, access was only granted to the present (and past) research tasks, but not to future ones. Each thread was composed of background information, the task description and a comment field where participants could write their answers and reactions to the task. The postings could be enriched by embedding videos, pictures or emoticons. Besides referring to the

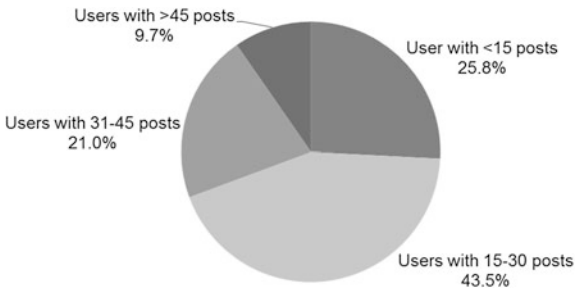

Fig. 24.3 Participants' activity levels in the ORC

daily question, participants were encouraged to comment on others' posts or 'like' other participants' comments.

Outcome

The data produced during the research phase was impressive due to its particularly rich and insightful qualitative content, and also regarding its sheer quantity. Within the set time frame of the three-week online phase, 1,540 posts were written including 350 diary entries. Hence, consumers' contributions amount to a total number of 191,346 words which equal approximately 350 written A4 pages. Each day, at least 52 comments were posted with a peak of 91 comments on two particular days: On one of these days, the beta version of the future Vorwerk Rezeptwelt was introduced for the first time. Of course, this was an exciting day and the customers were eager to explore the new platform and share their first impression and feedback. The second peak could be observed on the final day of the online research phase, where participants were asked to express their general and future wishes for the Rezeptwelt and Thermomix, and to evaluate their overall experience within the Research Community.

Each participant posted 24 comments to the forum per day on average including one outlier with 74 posts (see Fig. 24.3 for the average division of participants' activity levels). In line with the amount of content generated during the live phase, the average participant visited the forum 36 times (total of 2,232 visits for all participants), and spent 1,076 min on the platform. Calculated in man days, this corresponds to 2.2 man days per participant, or 139 man days as a total for all members.

Discussions were summarized daily and qualitatively analyzed. Feedback on the future Vorwerk community was collected to eventually refine features and functions. A special feature of this co-creation project was the collaboration of the HYVE research team with the Vorwerk programmers and creators. They worked together closely during the whole research project and were able to immediatly transfer user feedback into the new community platform. When the new German community website was launched after finalizing the research project, several functionalities had already been adapted based on the research results and users' feedback. As an example, the rank of search fields was modified, showing the most important search features on the top at the list. Even small pieces of advice were

taken seriously. For instance, the search button's color was changed from a green color to a light and signaling orange as people complained about the rather unremarkable search button.

Furthermore, quantitative data from the pre-screening questionnaire was linked to the comments of every participant. Through this, different user "search types" surfaced: One example is the 'confused user', who needs a simple structure or extra guidance and explanations. Identifying and understanding user types differing in terms of their cooking journey and search behavior in particular is a key strategic lever to increase activity on the platform and usage of the Thermomix. By offering unique experiences tailored to the individual user, the relevance of recipes can be increased and inspire consumers to use their Thermomix more often.

Although the ORC required a high level of engagement from participants over a longer period of time, almost all invitees participated actively up to the final day. Hence, they were highly involved and showed motivation to be part of the Research Community, which they also expressed in their final feedback. The research community was perceived as a great opportunity to learn and discuss not only with other people involved, but also with Vorwerk Thermomix employees. People felt honored to be part of a selected and exclusive group of people which could influence the future development of the Vorwerk community. While they were looking forward to receiving their reward—a Vorwerk cookbook—people stated that this was not their main motivating factor for participation. Instead, they were glad to contribute to the improvement of the new community website and expressed their excitement about the launch of it as can be seen in the following original quotes.

> Thank you for choosing me and providing the opportunity to discuss and share ideas. Time flies—I really enjoyed every second of the three weeks. Discussing and exchanging—or just reading—others' members' opinions was really nice (love). Consider me ever interested in future research projects. Best wishes for success to the team and good luck with the implementation of our propositions and wishes.[1]
>
> So this is the final day – what a pity! I really enjoyed being part of this forum (any time again). I am looking forward to the new Rezeptwelt. Besides my cookbooks and recipe folders, it will remain the place where I can relax in the evening.[2]

[1] Original quote in German: „Zum Abschluss möchte ich mich dafür bedanken, dass auch ich ausgewählt wurde und hier mitschreiben und mittüfteln durfte! Es waren recht schnelle drei Wochen, die mir wirklich sehr gut gefallen haben. Auch der Austausch mit anderen Mitgliedern bzw. das Lesen anderer Meinungen gefiel mir gut! (Love) Ich würde jederzeit gerne wieder an einer solchen Befragung teilnehmen! Nun wünsche ich dem Team viel Erfolg und Spaß bei der Umsetzung unserer nicht wenigen Vorschläge und Wünsche…".

[2] Original quote in German: „der letzte Tag -schade-, denn es hat mir viel Freude bereitet an diesem Forum teilnehmen zu dürfen.(Immer wieder gerne). Ich freue mich schon auf die neue RW. Sie wird neben meinen Kochbüchern und meinen Rezepteordnern, der Ort bleiben, in dem ich mich abends entspannen kann."

> Joining this discussion forum and keeping the diary, I was intensively dealing with the recipe search. Thus, I've learned to use various unknown or not frequently used functions and tricks. It has been fun to test these things out![3]

The example quotations also indicate how customers' passion for the Vorwerk Thermomix brand and their brand knowledge was positively influenced. Empowering consumers therefore not only helped to gain insights and create new community features but also gave a boost to the consumer-brand relationship.

24.4 Conclusion and Outlook

The Vorwerk Research Community illustrates the enormous benefits of involving customers both in innovation research and new product development processes. Online Research Communities enable the collaboration with customers over a specific time—several days, weeks or even years. Correspondingly, this intense collaboration requires the engagement of a highly affected community such as brand enthusiasts. Bringing together this strongly committed group of people helps to establish in-depth dialog, in which people not only perform a particular task assigned to them, but also exchange, share and develop ideas.

Whereas the key factors of successful ORCs are its members, some additional factors should be considered to tap the methods' full potential. First, the moderation of the forum should be unobtrusive and avoid influencing, but rather provide consumers with all relevant information to conduct the tasks. Second, the website's interface and structure should be clear and uncluttered, intuitive and suitable for people with little social media knowledge. Additionally, an appealing layout encourages people to visit the forum frequently—daily, or even more often. If desired, the design of the ORC can be customized to the specific corporate design of an already existing brand community to create a consistent brand experience. This may give people the feeling of familiarity and comfort. Finally, the tasks should be diverse and fun. This can be achieved, for example, through visually rich input and pictures.

In times of online social networks and organized brand communities, companies can and should tap this potential and collaborate with consumers in order to gain consumer insights and translate them into solutions for new product development. Establishing Online Research Communities as virtual places for a deep and possibly ongoing exchange and discussion between a company and consumers will help to develop user-centered products and services, establish strong relationships and retain them long-term.

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[3] Original quote in German: „Durch die Teilnahme am Diskussionsforum und dem Tagebuch habe ich mich doch intensiver mit den Inhalten der Rezeptsuche beschäftigt. Ich habe Funktionen und Tricks kennengelernt, die ich vorher noch gar nicht kannte oder nicht aktiv genutzt habe. Das Probieren hat Spass gemacht."

Outlook

In the past two decades, the Internet has significantly transformed the market research industry in terms of efficiency. New methods have been conceived to harness the easy access to consumers and electronic communication channels via the Internet. Online panels with millions of users willing and ready to fill out questionnaires have reduced the duration of field phases and considerably accelerated feedback loops within innovation processes. Although the Internet is known to be an enabler of consumer empowerment, it has not changed the role of consumers in market research to a larger extent. Rather, the introduction of online panels has commoditized the participation of consumers. Answers can be bought in hundreds and thousands and participating consumers are considered mere providers of data.

Online Research Communities offer a new opportunity to continuously engage with consumers for market research purposes and build meaningful relationships. Given the chance to play a more intensive role within the innovation process, consumers feel they work on an important task, are taken seriously and have an impact on the future of a company. Instead of outsourcing the access to consumers to specialists only, companies started to build and maintain relationships to consumers not only for sales reasons but also for research purposes. Here, the Internet and social media platforms, in particular, are a promising source of interested consumers. Also branded communities, such as Vorwerk Thermomix's recipe and cooking community, can be used to invite consumers to participate in innovation endeavors. These consumers are usually more involved than panel users, they know the products and services very well and often feel honored to work together with the brand. They have decided to follow the brand in social media and indicated that they would like to enter a relationship.

In many cases, companies are overwhelmed with the crowd of consumers willing to interact with them on various social media websites. Instead of looking for the really urgent questions and tasks they could tackle together with these users, they start involving them in shallow 'small talk' conversations. Although consumers often appreciate any type of interaction with a brand, a meaningful dialog has several positive effects. For one, motivated consumers or brand fans may provide valuable information and ideas which can help the company propel their innovation efforts. Secondly, maintaining the relationship with these consumers is a core task of marketing anyway, thus, including some innovation tasks can provide relevant discussion topics and spur the conversation. In order to capitalize on this effect, companies need to intertwine innovation and marketing capabilities and disciplines to holistically utilize consumer empowerment. Thirdly, empowering consumers has also been found to have an impact on consumers' product demand (Fuchs et al. 2010). Therefore, involving consumers in meaningful tasks and inviting them to co-create value can increase sales, deepen the consumer-brand relationship and strengthen the brand's image. Fourthly, building one's own community of users may also yield cost cutting effects, especially when research communities are centrally orchestrated to serve multiple departments within a company.

Consumer empowerment strategies are an imperative for companies nowadays. By staging authentic co-creation experiences centering on meaningful task rather than superficial encounters between brands and consumers, empowerment may yield multiple positive effects for insight generation, innovation management and customer relationship management.

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Chapter 25
The Role of Social Media for Innovation

Tim Kastelle and Ralph Ohr

Abstract It is now well-documented that social media can play an important role in supporting the innovation process. Social approaches are most commonly thought to be useful in either idea generation, as in open innovation approaches, or in idea diffusion. However, while the connection between social media and innovation success has been established, the mechanics of how social media supports innovation are less well understood. This is the issue that we investigate in this chapter. We use data from two case studies. One firm has been very successful in using social media to support organizational innovation, the other less so. After describing the cases in some detail, we discuss how social media use affects all phases of the innovation process. We then also look at how social media use addresses innovation capability at an individual level. We draw several conclusions and key learnings from the data presented. It appears as though social media best supports innovation when social approaches are effectively integrated into the day-to-day activities of an organisation. Instead of simply "adding some social" and hoping to see improvements, the use of social media must be integrated with the strategy and objectives of the firm. The selection of the best social media channels to use then follows from this integration with strategy. There is no absolute must-use channel—the correct tools will depend on the value proposition and target market of the organisation. At a personal level, social media can be leveraged to strengthen important innovation capabilities, such as exploration, connection and network building. Using social media to support innovation is only worth the effort for both organisations and individuals when there is a clear outcome desired, accompanied by a suitable strategy for reaching these objectives.

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25.1 Introduction

Social media is playing an ever more important role in innovation. As firms find it increasingly impossible to innovate on their own, adoption of open innovation strategies to tap into widely distributed knowledge is on their agenda. Chesbrough (2011) has pointed out that *opening up the innovation process will not stop with accessing external ideas and sharing internal ideas. Rather, it will evolve into a more iterative, interactive process across the boundaries of companies, as communities of interested participants work together to create new innovations*. This interaction and integration in the open innovation process is increasingly accomplished through employment of appropriate technologies.

Dodgson et al. (2008) discuss the role that innovation technologies play in modern innovation. They identify these as technologies that support innovation (rather than technologies that are in and of themselves innovative). The various social media technologies currently available, such as social networks, microblogs, virtual communities, crowdsourcing or content sharing platforms, fall into this category of innovation technologies.

Lindegaard (2012) highlights five key aspects how social media may support open innovation activities:

- Better interaction with external participants in the innovation process, such as customers, consumers and partners
- External support of the ideation process
- Business intelligence to better understand the innovation ecosystem
- Identification of appropriate people, being capable of assisting dedicated innovation efforts
- Branding, promotion and marketing of innovation outcomes and capabilities

Joint research from Capgemini Consulting and MIT Center for Digital Business (2012) has confirmed digitally mature firms to be significantly more profitable than their industry competitors. Moreover, a recent European survey from Google EMEA and MillwardBrown (2012) has shown that high-growth companies are more likely to be leveraging social tools for business success. 81 % of these high-growth businesses report a significant impact of social tool employment on growth and expansion. These results suggest that social media can also affect innovation activities positively if introduced and applied appropriately.

However, using social technologies can raise some issues. There are new social media tools arriving weekly, it seems. Which ones should we select? How should we integrate social media with regular, ongoing innovation efforts? Are these tools worth the time and effort required?

All of these questions are currently under-researched and under-theorised. In this chapter, we will outline two case studies with which one of the authors has been involved. From these, we make some suggestions about how to use social media to support organisational innovation. Further, we also suggest how social media can be used to strengthen personal innovation capabilities.

25.2 Background

In this chapter we define innovation as executing new ideas to create value (Kastelle and Steen 2011). Defined in this way, innovation is process more than an event. In other words, it is not simply about idea generation. There are a couple of models that conceptualise innovation processually as an innovation value chain. The first is by Hansen and Birkinshaw (2007). They describe innovation as a three step process, consisting of idea generation, idea selection and execution, and diffusion. This model was expanded by Deloitte and the APS Management Advisory Council (2010) into a five-step model which each of the final two steps in the previous model into two. The process in this version consists of idea generation, selection, execution, sustaining and diffusion. All of these are straightforward in their definition except for sustaining. This is essentially internal idea diffusion-keeping people within an organisation engaged all the way through the innovation process. Roper et al. (2008) show that organisations need to be competent at all phases of these innovation value chains in order to successfully innovate.

The words "social" and "social network" are often used synonymously with "social media". This implies a primary value in social approaches as broadcasting, which leads to a role in the innovation process that generally supports innovation diffusion. However, in practice social tools can be used much more broadly than simply as media. There is increasing attention being paid to the concept of "social business" (Gray and Vander Wal 2012; Merchant 2012). If one views social in this way, then it is apparent that social approaches can support the innovation process more broadly.

In this chapter, we use data from two case studies to illustrate how social media can be used to support all phases of the innovation process. One organisation has done this successfully, while the second has not had such favourable results. The contrast between the two cases and the reflections on personal innovation allow us to draw some general conclusions about how to use social media to effectively support innovation.

25.3 The Cases

The case studies come from one of the author's experience in a collaborative program between his institution, The University of Queensland Business School, and the Wharton Business School called the Wharton Global Consulting Practicum (GCP). Wharton initiated the GCP in 1978. The program is based on collaboration of teams of MBA students, faculty and advisors from Wharton and their partner universities to undertake a live consulting project. These projects take place around the world for clients identified by the partner universities. The clients are generally trying to enter or expand their business in North America and the student

teams develop strategies to enable this expansion. The author Kastelle has supervised five of the projects to date, and two of them have included a significant social component in the final set of recommendations.

Schumpeter (1912) identified entering a new market as one of five forms of innovation. In several of the GCP projects this has certainly been true as the client organisations have had to innovate significantly simply to enable their entry into the new market. As the projects run over a six-month period, we are able to gain substantial insight into how the organisations operate, including their approach to innovation, and our work on two of these projects provide data for our subject. Descriptions of these two cases follow.

Case one—Lorna Jane:

Lorna Jane is a womens' active wear manufacturer based in Brisbane, Australia. The company was founded in 1993 by Lorna Jane and Bill Clarkson. Lorna Jane currently has 135 retail stores in Australia, and two years ago engaged in a GCP project to plan an expansion into North America. Since then, they have opened thirteen stores in Southern California supported by the strategy developed in the GCP project, and they plan to open another ten within the next twelve months in Northern California and one other western US region.

They have used social media extensively both in Australia and in the US. Their primary tool is Facebook, and they also actively engage with people through Twitter, YouTube and Pinterest. Of the four channels, Facebook is by far the largest currently with more than 691,000 people liking their page. 15,000 people follow the brand on Twitter, they have 9,000 followers on Pinterest, and 1,000 people subscribe to the YouTube channel.

In addition to these channels, they also have a community website called Move Nourish Believe (MNB). While the firm sells workout clothes and other casual wear for women, their purpose is to enable a healthy lifestyle for women. The MNB site includes blog posts, videos, and pictures that provide health tips, exercise regimes, diet ideas and recipes, and forums for discussion around all of these topics. The YouTube channel is primarily used to provide the videos for the MNB site, rather than as a stand-alone communication channel. Similarly, Pinterest is mainly used to provide the pictures for the Inspiration Board that is a prominent feature of the website.

Case Two—TravelOrg:

The details of TravelOrg are still confidential. It is an industry body that has 120 member organisations that provide tourism services based upon a cultural theme in a region of Australia. Their objective in the GCP was to increase the number of tourists from North America that engage the services of their members. As a non-profit group, their resources are more limited than those of Lorna Jane. Consequently, social networks played a key role in the recommendations that arose from the GCP project.

Since then, TravelOrg has started to use two social networks in support of their main website. As with Lorna Jane, Facebook is their primary tool, with 300 people

liking the page. They also use Twitter and 170 followers there. The Facebook page is updated regularly, and Twitter is generally used to direct people to the content created on Facebook, which is primarily photos. The sites are usually updated by either marketing manager or by board members that also use social media to support their own operations.

25.4 Using Social Media to Support Organizational Innovation

The two organisations have had quite different outcomes from using social networks to support innovation. Lorna Jane has been successful in this regard, while TravelOrg has not. In part this reflects differing approaches to innovation. Lorna Jane's primary form of innovation is business model innovation. They have developed a unique supply chain that supports new product development and new product stocking cycles that are much faster than those of their competitors. They have used their strong sense of purpose to build communities that support this business model as well. Their social networks built through social media are a key component of this business model. TravelOrg also primarily innovates their business model, but their approach is quite different. They have built a unique set of collaborations, which are indeed based on social networks. But they are not digital networks, but rather interpersonal networks.

The differences in the approaches of the two organisations can be seen across all five phases of the innovation process.

Idea generation:

Lorna Jane actively uses social media to help generate ideas for innovative new products. They solicit ideas through Facebook, and especially through the MNB community. MNB itself is an important innovation, and it has been co-created with Lorna Jane's customers and stakeholders (Vargo et al. 2008).

In contrast, idea generation within TravelOrg still happens almost exclusively internally. Their key innovation recently was the development of an international network of similar cultural tourism organisations–the first of its kind. The network includes groups from Canada, the United States, Chile, Japan, and Australia. The idea for this network originated with the TravelOrg's CEO, who also organised and carried out the negotiations involved.

Idea Selection:

Lorna Jane uses social media in several ways. Ideas for new products, and even new platforms like MNB are regularly tested on their Facebook page. They recently added a photo studio in their headquarters so that they can take pictures of prototypes as soon as they are made, which are then shared through the firm's social media platforms. Lorna Jane then uses the feedback on these posts to gauge

the likelihood of success of the prototype. Many judgments are still made internally, but social networks are playing an increasingly important role in idea selection.

Idea selection happens more traditionally within TravelOrg. Smaller ideas are evaluated by the management team, or in many cases the people that generate them in the first place. Larger ideas, such as the international cultural network (and even participating in the GCP) must be approved by the board, which mainly consists of heads of TravelOrg's member organisations.

Idea Execution:

On the product side, Lorna Jane does not use social media much in the execution of new ideas. This is still the responsibility of internal staff. However, the social community has played a substantial role in the development and execution of the MNB site. This has been genuinely co-created with customers and stakeholders.

As with idea selection, idea execution is a fully internal process at TravelOrg.

Sustaining Ideas:

Lorna Jane uses social media to maintain internal enthusiasm for innovation in two ways. One is in the social media board that they have in their headquarters. This is modeled after Lean Boards (Parry and Turner 2006). The social media board includes several screens that have live updates from all of Lorna Jane's social media channels, statistics on visits to the firm's main website and MNB from Google analytics, and analyses of social media mentions of various women's active wear brands in various geographic regions. The social media board is prominently displayed at the entrance to the headquarters, so everyone there sees it as they enter their workplace.

The second use of social media to support sustaining ideas comes through the MNB site. Employees are encouraged to regularly participate in this community site. They also contribute to content generation by writing blog posts and participating in photo shoots. This keeps them in closer contact with customers and other stakeholders, and it also helps to maintain enthusiasm and morale with the firm.

Sustaining ideas is more challenging for TravelOrg. As a membership organisation, they not only must maintain enthusiasm for new ideas within the management team, but also within the members. Much of their effort in this phase is spent on member communications as the members often form the biggest obstacle to applying new ideas within the organisation.

Idea diffusion:

Lorna Jane uses social media both as a form of business model innovation, and also as a tool to diffuse their innovations. The use of the MNB site to co-create value is unique within their segment of the market. The core purpose of the firm has been developed internally, but the expression of this purpose is generated collaboratively with customers and others within the community. As we have discussed, this contributes to nearly all of the phases of innovation. But it

particularly helps with idea diffusion. Since the community has participated in earlier parts of the innovation process, they are primed for new products and services that are the outcome of this process.

The firm's strong social community has also been helpful in the successful expansion into the US. Despite having only thirteen stores there, and with less than 1 % of the market, Lorna Jane nevertheless regularly receives more than 10 % of the social media mentions in the women's active wear category. They have used this high level of recognition and participation to support the expansion.

Social media has played a smaller role in TravelOrg's successful innovation. As discussed, their primary innovations have been in building collaborations to innovate their business model. In addition to the international cultural tourism network, TravelOrg management has also used their personal networks to develop an alliance with local universities to provide tourism experiences for their international students. This was one of the GCP recommendations, but we expected this to play less of a role than social media in expanding the market for TravelOrg's members. In their case, it has been the more traditional interpersonal social networks that have driven growth.

25.5 Using Social Media to Support Personal Innovation

The previous section outlines how social media supports innovation within organisations. However, at the micro level, innovation takes place within and among individuals. Social tools also support the innovation efforts of individual people. In this section, we will evaluate how social media contributes to the development of personal innovation capabilities.

Dyer et al. (2011) have identified five key skills that distinguish successful innovators. The central skill has turned out to be "associational thinking", which can be described as ability to synthesize and make sense of novel inputs. The additional skills "questioning", "observing", "networking" and "experimenting" trigger associational thinking by increasing the stock of building-block ideas. Breakthrough ideas often occur at intersections by connecting seemingly unrelated ideas, fields or problems. Associational thinking, however, implies having access to diverse sources of information and ideas. People who bridge different knowledge or disciplinary network domains are referred to as brokers or domain spanners. Björk (2012) has confirmed that those domain spanners have higher ideation performance than individuals engaged in only one knowledge domain. Social media can be very effective and efficient in supporting to build up diverse networks. Virtual networks can be complementary to interpersonal networks as they are not subject to spatial or temporal limitations.

The authors Kastelle and Ohr themselves started working together through participation in virtual networks and communities on the subject of innovation management. They have experienced the benefits of associating ideas by networking across individuals with different backgrounds and perspectives. Moreover,

experimenting and testing own ideas through publishing them on personal blogs has proven to be useful in order to advance innovation management knowledge more iteratively and interactively.

Another aspect how social media can support individual innovation work is based on the fact that modern workers have to balance goal-oriented work in structured organizations and emergent learning in informal networks (Jarche 2012). Ever increasing problem complexity and amount of knowledge requires workers tapping into open, diverse knowledge sources while simultaneously getting their specific, internal tasks done. Participation in communities is a promising opportunity to integrate work and learning. Here, knowledge in the field of practice or interest is exchanged and advanced. As a case in point, both authors are engaged at *Innovation Excellence*, the largest innovation management community worldwide.

25.6 Conclusion and Key Learnings

These cases illustrate several points about using social media to support the innovation process. We can now revisit the questions that we posed at the beginning of the chapter:

How should we integrate social media with regular, ongoing innovation efforts?

There are several issues to consider here. The first is how social approaches fit with the overall strategy and capabilities of an organisation or person (Fig. 25.1). For Lorna Jane, social approaches are central to their expansion strategy, and also to their normal operations. Consequently, social media is well-integrated throughout both their day-to-day activities and their innovation efforts. One of the reasons that they are successful in this approach is that they have participation in social networks from all levels of the organisation, starting with Lorna herself. This is also demonstrated by the use of the MNB site to communicate the core purpose of the firm to employees, customers and other stakeholders. Because of this high level of integration, Lorna Jane allocates the time and resources to use these tools effectively. The success that they have achieved in their expansion into California is due in large part to the social networks that they built in advance of the move (Clarkson 2012).

In contrast, social media is not nearly as well-integrated into the daily operations of TravelOrg. This is largely due to their constrained resources. But also, they have relied on personal social networks to fuel growth throughout the entire existence of the organisation. This is something that we probably underestimated during the GCP project. The critical point is that both organisations have met their strategic goals, but they have done so with very different approaches to social media. They have both been effective at matching their social approach to their overall strategy and also the capabilities held within each organization.

The second issue to consider is which parts of the innovation process should be supported through social media. In open innovation strategies, social networks

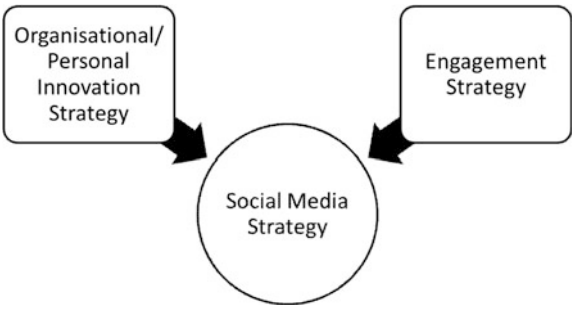

Fig. 25.1 Social media strategy as a consequence of innovation and engagement strategies; *Source* By the authors

primarily support idea generation and selection. In many other cases, as with TravelOrg, social networks are used almost exclusively for innovation diffusion and communication. The Lorna Jane example, where social media is used to support the entire innovation process, appears to be more rare. Again, the best choice will depend in large part on the overall objectives of the organisation.

Which social media tools should we select?

This question is harder to answer in absolute terms. By the time of publication, there will almost certainly be new social media tools available that did not exist as we write this chapter. In general, the best answer will again be that the tools must match the objectives of the organisation. Facebook makes good sense for Lorna Jane, because it fits their target demographic very well. This is not the same demographic group that TravelOrg is trying to reach, and this may help explain why their efforts on Facebook have not been as successful. In many respects, the different social networks represent different channels. Just as advertising in newspapers meets different goals than advertising on television, so too will different social networks be more or less appropriate for meeting particular objectives. The best lesson in these cases is to pick the tools that best fit with what an organisation is trying to achieve, rather than simply following trends, or going into one particular social network just because others are. Attaining the right mix of social media tools to support open innovation activities also requires some experimentation.

Are these tools worth the time and effort required?

The simple answer that social media tools are only worth the effort if they are clearly tied to strategic goals. The approach at Lorna Jane has been successful because they are able to create enough new and novel content to keep all of the social media channels that they use updated frequently. TravelOrg's efforts are much more intermittent, and it may be the case that they would be better off reallocating resources elsewhere. At the personal level, it also only makes sense to participate in social media to meet clear objectives. These can be tapping into peripheral knowledge domains, generating and testing new ideas or integrating learning and daily innovation work.

Social media holds great promise for supporting the innovation efforts of both organisations and individuals. It is often used simply as a broadcast tool, which supports innovation diffusion. However, as can be seen, the potential to integrate social media through entire organisations as well as individual innovation workers is high, as is the potential return to such efforts.

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Chapter 26
Innovation and Value in Networks for Emerging Musicians

Phillip A. Cartwright and Gareth Dylan Smith

Abstract This chapter considers innovating on networks as they pertain to marketing, promoting and selling independent music. The focus is on emerging musicians, although without loss of generality. That is, it is believed that the proposed framework and application is applicable across the entertainment sector and beyond. Following the Introduction, Section II of the chapter sets forth key concepts including a seven-point business process. The authors' understanding of network is described and the concept of value is introduced. Section III places the primary focus on "orchestration" defined in terms of efforts to achieve success by finding and managing creative combinations for value. Section IV of the chapter elaborates on the artist's touch points and value in the context of orchestration. Section V offers a summary and conclusions.

26.1 Introduction

This chapter considers innovating on networks as they pertain to marketing, promoting and selling independent music. The focus is on emerging musicians, although without loss of generality. That is, it is believed that the proposed framework and application is applicable across the entertainment sector and beyond. The entertainment market, particularly that market most relevant for emerging artists, is uncertain and volatile. Whether considered as a managerial or computational

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exercise, the framework taken intuitively or with quantitative rigor suits the purpose of the chapter. Indeed, the exercise is comprised of science and judgment.

Following the Introduction, Sect. 26.2 of the chapter sets forth key concepts including a seven-point business process. The authors' understanding of networks is described and the concept of value is introduced. Section 26.2.1 places the primary focus on "orchestration" defined in terms of efforts to achieve success by finding and managing creative combinations for value. The next Section of the chapter elaborates on the artist's touch points and value in the context of orchestration. Section 26.3 offers a summary and conclusions.

26.2 Process and Concepts

In order to organize and direct effort, businesses need a framework for guiding the mobilization of an organization in alignment with its strategic plan. The roadmap enables everyone in the business to clearly understand each action and what decisions need to be made, who needs to make them and when. Borrowing from the information technology and management literatures the general road map adopted for this article is as follows.[1]

26.2.1 The Business Process Roadmap

1. Create—create the "art object" as a consequence of a creative initiative and perceived demand. Create refers to the process of creativity. It is important for purposes of this article to distinguish between the artistic and creative processes. Following Hagoort (2003), the artistic process is thought of in terms of accident, chaos, or unpredictability. The creative process, on the other hand, is systematic and intentional.[2]
2. Distribute—release the information from the back-end and move it to an accessible environment. Distribute refers to the act of making the object available or accessible to the end user. Traditional marketing processes associate distribution with "middlemen". In the context of this chapter, "middlemen" have been removed and the gap between the artist and end-user considerably narrowed by technology.
3. Store—placing the object in a place where it can be accessed easily. Store refers to the storage of an art object on a server for easy accessibility.
4. Promote—letting users and potential users know where they can find the object (and why they should take the time to access it). Broadly speaking, promotion

[1] Hagel et al. (2002).

[2] Hagoort (2003).

refers to the leveraging of all of the communication tools available to the artist for delivering the message to the end user. Arguably, for most emerging artists, owned media is most relevant. It is a channel the brand has created and that it controls. Owned media is dedicated to inform its customers (potential or actual) and interact with them. Examples of online owned media are business (corporate) websites, mobile sites or applications, corporate blogs and social networks pages.

5. Orchestrate—using multiple platforms and channels to focus attention toward the object being consistent and persistent in the message. Orchestration refers to efforts to achieve success by finding and managing creative combinations for value; it is key to exercise relationship management over both old and new ways of getting things done. Here live performance meets YouTube and VirginMega meets iTunes. Creative combinations have to be both creative (original and expressive) and they must have compatibility and consistency.
   Orchestration might not be foremost on the mind of all artists, but it must be as the messages one sends should be supportive of each other. Not surprisingly, in the search for originality and expressiveness, artists may attempt to achieve success by what economists refer to as "creative destruction" the terminology introduced by Joseph Schumpeter (2004).[3] The road to success is achieved through redefining the playing field by being radically different. The problem with this approach is that many independent artists do not have means to produce something radically different, and so their best bet is to differentiate themselves by using what they have in clever and supportive ways.
   Arguably, radical changes are difficult to bring about when networks (especially technology networks) are involved because in order to achieve radical changes it is necessary that the artist or artists master or gain command of ever-broader arrays of possibilities.[4] In technology companies, firms may overcome such problems by forming alliances, but in the case of artists, such alliances may be out of the question.
   The power of creative combination, the compatible and consistent combining of different channels to market creative objects is that the outputs can satisfy current end users, and possibly open up new markets while leveraging existing skill sets utilizing already available technology. Such combinations also tend to be more cost effective as large investments can be avoided.
6. Adapt—paying attention to user response and adapting to improve the response. Adapt or adaptation is associated with change in response to the ways in which the environment moves. When artists engage in the artistic and creative processes presumably there is some adaptation taking place. In the world of the arts and considering the ubiquitous nature of technology, learning-by-experience is always "in play". Learning-by-experience can lead to successes and failures, the latter owing to false impressions or conclusions, for example.

[3] Schumpeter (2004).

[4] Yoffie (1997).

Following Axelrod and Cohen (1999), adaptation refers to a process of adjustment and selection that is successful.[5] Smith (2013a) describes a similar, on-going process of adaptation through the metaphor of the Snowball Self, in which the processes of identity realization and learning realization combine as we construct and construe meaning for ourselves in life; in a continuous, reciprocal, symbiotic relationship with our socio-cultural environment, humans learn from what we do, and our meaning-orientated actions lead and inspire us (consciously or subconsciously) to new (intentional or unintentional) learning, which in turn transforms who we are—individually and collectively.[6]

7. Monitor—staying up with the environment and acting rapidly when signals indicate change. Monitoring refers to taking an active role in maintaining awareness of end-user response. Given uncertainly about end-users, this "last mile" is a distance that must be traveled interactively, never fearing learning, adaptation and testing. Building on that which is known, or growing through adjacencies, is a sensible path to follow.[7]

26.2.2 Networks

As concerns networks, for purposes of this article, networks are topological structures that interconnect nodes. Nodes may be individuals, organizations or physical structures. It is inherent in the structure of a network that many components of a network are required for the provision of a typical service.[8] Rauch and Hamilton (2001) define a network as "…a group of agents who pursue repeated, enduring exchange relations with one another and, at the same time, lack a legitimate organizational authority to arbitrate and resolve disputes that may arise during the exchange."[9] The reference to lack of organizational authority is included in this definition to avoid issues arising as a consequence of hierarchy. This seems reasonable in our context.

Not all networks are the same. For example to use Negroponte's (1995) examples, television networks and computer networks are very different.[10] A television network is hierarchical in the sense that there is a source and many receptors. On the other hand, computer networks are a lattice of heterogeneous processors capable of acting as both source and receptor. What is required is an understanding that networks are characterized by patterns and that patterns change over time. Following Sawhney and Parikh (2001) if one can understand the

[5] Axelrod and Cohen (1999).

[6] Smith (2013a).

[7] Buisson et al. (2006).

[8] Economides (1996).

[9] Rauch and Hamilton (2001).

[10] Negroponte (1995).

network patterns and changes in the pattern, it is possible to identify value opportunities and how those value opportunities change.[11]

Traditionally in models of music distribution, retailers and marketers have concentrated on selling as many units as possible of a very small number of products. As eloquently captured by Chris Anderson (2006) in his concept of the "long tail", this is decreasingly the case, as new distributors (often and increasingly the artists themselves) are selling far fewer numbers of units of an almost infinitely larger number of products.[12] Companies benefiting from this new market environment include obvious winners in the advent of the information age, where so very much is available at so little cost to so many, around the clock and around the globe—companies such as Google, Amazon and Netflicks. Thus, as Netto (2012) points out, 'there are many more potential consumers of music now than at the time when people were dependent on a physical record store'.[13] Musicians operating in the "long tail" do not generally achieve "success" as it has long been construed by the mainstream media and consuming public; for these musicians success is not about stardom and stadiums, but instead about sustainability and (artistic) satisfaction.[14]

New kinds of networks are emerging, dealing in innovative ways with the value carried by music. One such network is SUSMusic (2013)—"an altruistic, collaborative peer community that champions and promotes craftsmanship in contemporary music",[15] organizing itself around core values (altruism, collaboration, championing new music) to create a new value community in which emerging and established artists work together for the common good of the group and world beyond its membership. SUSMusic's emergence and presentation of a fresh paradigm typifies the entrepreneurship and networking that has been made possible—perhaps inevitable—by the ubiquity of the Internet, and new modes of engagement that it both facilitates and demands. Gloor (2006) defines such networks as "COINs—collaborative innovation networks".[16]

It has been argued (and is discussed further, below) that in today's world musicians "do not compete for listeners' money but for their attention"; SUSMusic and similar COINs epitomize "the unprecedented rise of what might be termed a nonprofit music sector",[17] wherein value lies not (or at least not primarily or intrinsically) in financial ambition or gain. A growing literature on netlabels explains how these non-commercial platforms serve to distribute and to raise awareness of music to audiences, with no money exchanging hands.[18] The 'free'

[11] Sawhney and Parikh (2001).

[12] Anderson (2006).

[13] Netto (2012).

[14] Smith (2013b).

[15] SUSMusic (2013).

[16] Gloor (2006).

[17] Galuszka (2012).

[18] Galuszka (2012) *ibid.*

music distribution networks, however, form only a part of a larger monetizing model for many contemporary artists.

While the commercial and nonprofit music markets sit side-by-side, they can often form an awkward communion, as exemplified by the release via YouTube of David Bowie's single on 8 January 2013. It was an instant 'hit' on social networks such as Twitter and Facebook, chalking up almost 1 million hits in under a week and receiving widespread acclaim from audiences. However, because the single was made available at no cost to people who had pre-ordered (paid for) the album from which the single was taken, and only paid-for singles sales count towards Chart ratings, the mainstream media were unable to portray the song as a 'hit' in the former (yet concurrent) model where success is a direct reflection of unit sales. Musical groups and artists today frequently achieve and maintain success (in terms of value to consumers and the band members) without achieving high-profile, high-stakes, highly profitable commercial success; Smith calls for a 'substantially changed cultural understanding of what it means to be a musician', in order for the rhetoric of mainstream contemporary media, as well as publications in academic fields, from business and marketing to popular music studies and education, more accurately and honestly to portray the realities of life for the majority of musicians in developed countries today.[19] In an increasing number of cases the musician whom you see teaching drum kit classes on online or in a glossy magazine will be the same person who you caught on stage at a major punk festival, who drove the van home through the night in order to make it to the university to teach his undergraduate dissertation class in the morning. Whereas once upon time such an existence would have been construed as a paying one's dues en route to success, for a considerable majority of excellent, professional musicians in the contemporary socio-musical business environment, this is success. It is just not widely recognized and valued as such. It is as a result of this paradigm shift that Netto (2012) calls for a realignment or re-conceptualization, by all stakeholders, of what have traditionally been identified as the 'core industries' of the music business and 'related industries'. All stakeholders (producers, consumers, users, tastemakers and combinations of these roles) must grasp the manifestation of what we all have felt shifting beneath our feet for a decade-and-a-half.[20]

26.2.3 Value

Third, this article considers value. It is necessary to go beyond what is learned in accounting and financial textbooks offering methods for calculating fair market value in terms of debt and equity capitalization. This article considers value as goods, services, or money, considered being a fair and suitable equivalent for

[19] Smith (2013b) *ibid.*

[20] Netto (2012) *ibid.*

something else. The "something else" in this context can be tangible or intangible. The point is to recognize value in the context of exchange whether it is a market price or a sense of recognition for an exceptional performance.[21]

The value of any activity, product or service resides in its ability to make or to contribute meaning.[22] This may be meaning for the musical artifact in-and-of-itself, but increasingly musicians must understand 'the new character of value in music', whereby 'music no longer generates its revenue from the sale of CDs or other carriers, but from its capacity to sell something else, linking customers to other products and services'.[23] An example where this principle is at work is the cellular telephone market, in which customers willingly pay up to several hundreds of dollars for smartphones, one of the main emphasized benefits of which is that they provide endless access to music that is basically free through applications such as Spotify. Similarly, internet companies gather huge quantities of data on individuals from each and every time we visit a web page. While access to sites is ostensibly free, companies use information from browsing habits to target products and services at niche markets. The savvy, monetizing musicians of the future will be tapped into this process, collaborating with those selling services for which customers are happy to pay—which is not a million miles from the time-honored tradition of having a band play in a bar or restaurant, and, because of the increase in value thus brought to the venue, paying the band a percentage of takings or an appearance fee.

Musicians and artists have long taken performance events as opportunities to sell merchandise; in scenes such as jazz, punk and folk, artists historically sold the majority of (still relatively small quantities of) their albums to people after gigs. However, CDs, vinyl, tapes—physical objects carrying music—are anathema to the majority of consumers of music today. Such items are cumbersome, non-portable and limiting, so bands need to sell other things that people do still want to own, and that carry an emotional connection to the music that brought them to the point of purchase. Such things might be items of clothing, or posters, but increasingly musicians are selling fans a participatory experience, such as Björk's 2011 interactive album Biophilia that incorporated a range of iPad apps. Other artists offer rewards to customers for their support through websites such as Kickstarter and PledgeMusic. Singer and song-writer Saint Saviour (2013) invited people to pledge sums of money to fund the recording of her debut album in 2012, offering a range of items and services, ranging from a download of her album and updates on the recording process (£8) via appearing in a Saint Saviour video (£35) or owning her costume from a recent concert (£150) to recording a song 'demo' at her home (£250).

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[21] Low and Kalafut (2002).

[22] Kawasaki (2004).

[23] Netto (2012) *ibid.*

26.2.4 Orchestration

This article is concerned primarily with the fifth step of the process, "orchestration". As stated previously, orchestration involves efforts to achieve success by finding and managing creative combinations for value; it is key to exercise relationship management over both old and new ways of getting things done.

Taking a general definition of orchestration in mind, the term is used to connote organization and harmonization of elements for the purpose of fulfilling a desired outcome. Computer scientists refer to orchestration in the context of computing; orchestration describes the automated arrangement, coordination, and management of complex computer systems, middleware, and services. Following Dhanahaj and Parke (2006) orchestration is defined as "the set of deliberate, purposeful actions undertaken by the hub firm as it seeks to create value and extract value from the network."[24]

It is recognized that conventional metrics of Social Network Analysis (SNA) such as degree, closeness, betweenness and bridging are extremely useful.[25] Centrality is associated with power and influence. However, it is often the case that for networks associated with musicians, and those of unsigned emerging musicians in particular, the artist site (hub) lacks authority to issue demands upon a network including not only social networks and blog aggregators, but online promotion and sales platforms as well. These networks are "loosely coupled" in the sense that they are connected, but the degree of responsiveness is indeterminate for any given message.[26]

Sawhney and Parikh (2001) focus on network technologies, and their model has relevance for the purposes of this article for cases in which information, inputs and outputs, are disconnected.[27] Where once inputs and outputs were highly centralized, today inputs (videos, for example) become embedded in a shared infrastructure (a network server). It is not necessarily the case that each song or video resides on every computing device, owing to connectivity. It is in this spirit that hand-held devices are personalized-much less needed for processing functions and far more used for performing tasks in a customized way for individuals. At the front-end the information fragments or splits off in many different directions reaching users at different end-user locations.

Interestingly enough, once one understands the network concepts of the front-end and inputs, the back end or outputs, and the idea that value resides in the exchange associated with relationships, the importance of what happens between the front-end and the back-end is essentially irrelevant and the value is to be realized by managing relationships. The highest value is to be found by focusing on and managing the most important relationships. The music world has become

[24] Dhanaraj and Parke (2006).

[25] Wassermann and Faust (1994).

[26] Provan (1983).

[27] Sawhney and Parikh (2001), *Ibid.*

much more complicated and this means finding ways to adapt and respond in a changing environment. Amongst the implications of complexity is the need to confront and manage in a highly non-linear world where outcomes are less predictable than ever and plotting a meaningful course for success means learning to "predict the unpredictable".[28] Networks in business and personal relationships have long been studied in both offline and online worlds.[29] Networks play important roles in success and the information or knowledge that is both inputs into a network and that which is gained as a consequence of reading network output has a lot to do with the extent to which value is created and captured. In this article, network knowledge or intelligence has a lot to do with how pop-rock musicians shape their careers. In simplest terms, knowledge of networks including the players, the relationships and the value generated by each, lies at the heart of the argument.

As suggested by Besson and Cartwright (2013), perhaps the key barrier to success in the network context is content mobility or the ease with which knowledge spreads within the network.[30] Content mobility can be increased through the creation of "common identity" among network partners and formal and informal socializing. To understand mobility, network centrality measures such as degree and betweenness associated with bonding, power and influence are useful. It is reasonable to hypothesize that higher scores on centrality raise content mobility and appropriability. Similarly, the extent of reach and variance in network reach is important as highly volatile networks will imply lower stability and lower mobility and appropriability. Bridging is associated with the extent to which links are formed connecting distinct groups. The importance of bridging is evident when there are structural holes in the sense of Burt (2004).[31]

Musicians' networks are likely to be "loosely coupled", in the sense that the linkage may not be particularly strong as in a binding contractual relationship. Typically, the artist does not command authority to demand consumption and sharing of content. Such fragmentation and "loose coupling" of artist networks has at least two consequences. First, uncertainty as to responsiveness is coincident with the fact that musicians have little or no power to demand attention or require purchases of their music. Second, transactions costs in the network are likely to be significant. Determined artists are likely to experience transactions costs as a consequence of efforts associated with bonding and bridging. These costs are potentially a significant barrier to success. From the artist's perspective, such transactions costs are a consequence of locating a value-generating node, connecting with it, and directing content toward that node. Logically, unless valuable relationships reside in the core, bridging to value adding nodes or bridging to other groups having value added nodes and moving content through the network

[28] Bonabeau (2002).

[29] See for example Watts (2003).

[30] Besson and Cartwright (2013).

[31] Burt (2004).

(sharing) is of utmost importance. Otherwise, the emerging artist manages clusters of low value relationships.

'Relationship Marketing' presents an interesting framework for understanding the networks and relationships that artists and other stakeholders nurture to mutual and individual benefit. Gillett (2012) explains how in this framework roles shift and categories overlap,[32] in ways described by Gordon (2012) as typical of the functioning of the 'DIY' punk movement since the 1970s.[33] When bands record, produce and sell their own music, and buy from and promote one another, notions of value and success become inextricably interwoven with the values and destinies of other stakeholders and their products. It is thus not too much of a stretch—if indeed any at all—to view the contemporary, internet-savvy musical artist and his or her network of relationships as exemplifying an updated, technologized and more sophisticated DIY scene.

Generally, artists, especially emerging artists, have difficulties linking their activities with value creation. In part this is due to a lack of training and experience in the "business of doing business". It is also in part due to the lack of a framework by which these artists can link business processes with value. The lack of a known practical framework in a business where competition is fierce and funding sparse, is certainly problematic and a topic for future research.

Appropriability and retention of value is facilitated by way of a value "engine". The value engine takes as its inputs both tangible and intangible assets. These assets are sourced externally and from within. Assets are financial and non-financial. The engine drives value creation and captures the artist's competitive advantage, the decision making process and the asset base in the market. In order to create competitive advantage, the musician relies upon the execution of strategic initiatives, which are determined after consideration of the possibilities. The process is dynamic, requiring both adoption and adaptation from existing examples and response to changing circumstances. The musician responds to immediate circumstances and needs as well as the larger, external environment. Grasping the possibilities is the source of future competitive advantage. These are the decisions that the artist takes to enhance flexibility and strength.

The set of possibilities under consideration should be as extensive as possible and requires understanding of the overall business platform. The notion is that the more extensive and inclusive is the set, the better are the chances of success. Building the list of possibilities requires serious brainstorming. As part of the artist's overall business platform, there are essential assets that are critical to the execution of the strategies. These assets are tangible and intangible. Tangible assets are associated with transportation equipment, instruments and accessories, for example. Tangible assets also include financial capital. Thomas Stewart

[32] Gillett (2012.

[33] Gordon (2012).

considers intangible assets in the context of "intellectual capital". Stewart (1998) considers human, structural and customer capital.[34] Adapting Stewart's framework for the purpose of this article, human capital should be considered as capabilities that the artists or musicians themselves bring to their project. These are the skills necessary to deliver entertainment to a customer or fan base. Structural capital is knowledge-based. It pertains to knowledge self-developed as well as when multiple persons are involved. It is a consequence of joint experience. Finally, customer capital refers to the consumers or the fans.

To understand value it is key to connect with the idea of value recognized or the value that the market as judge considers in its valuation. How and when an artist's project and the relevant assets are revealed or communicated will impact realized value. Like any business there are two levels of issues that must be addressed. First, the traditional issues involving how the artist grows relative to the market are concerned. Second, are the issues of gaining sufficient financial support for viability and sustainability of the project. This set of issues is related to how and to whom the artist connects. These two facets of getting to the market, traditional and financial, require an excellent understanding of what the artist can deliver and setting fan expectations accordingly.

26.3 Summary and Conclusions

The primary focus of this article has been innovating on networks as they pertain to marketing, promoting and selling independent music. The article is particularly concerned with the keys to success and barriers to recognition for emerging musicians, although the implications of the research are thought to have far reaching applications.

In the context of "orchestration", this chapter has considered concepts of content mobility, appropriability and stability. Successful orchestration is related to content and its mobility, which in turn, relates to the extent to which the network is successfully bridged to networks outside its immediate localized connections. In cases where key network nodes or gateways are within the local network, the possibility of achieving content mobility may be improved. In any case, the absence of contractual commitments to insure that information received will be shared is clearly a serious barrier to successful orchestration. To the extent that key network connections are to be found outside the local network, successful bridging and content sharing may be more difficult. In fact, even in cases where the artist might have some reasonable following, notable success with respect to engagement and influence is likely to be difficult to attain. These factors are certainly barriers to achieving significant mobility, and therefore, appropriability or value capture.

[34] Stewart (1998).

Innovation is required of today's musicians if they are to achieve any sort success in their careers as artists. The necessary innovation is of both the 'sustained' and 'disruptive' kinds,[35] for an artist must continue not only the gradual work of evolution, but also embrace the new—in terms of means of sales and distribution, and also in the ways in which musical products, processes and people are valued in a fast-changing, increasingly technologized world. It has perhaps long been the case that artists who innovate too much or too quickly, in ways that are not sufficiently well managed in their orchestration miss out on 'their chance' for success. Other innovators become game-changers, showing other players a new way to get things done. It is through the establishment, maintenance and careful nurturing of good relationships—of effective networking—that artists stand the best chance of recognition and commercial success, that is, of getting others to see and to believe in the value of their work.

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[35] Gloor (2006).

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