Managing the Unmanageable: The Fuzzy Front End of Innovation

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1 The Fuzziness of the Front End of Innovation

An increasing number of doomsayers, such as Peter Thiel, the founder of the internet payment company *PayPal*, criticize a lack of truly innovative ideas. They seem disillusioned because while individuals may have Facebook and smartphones, they still do not travel around in super-sonic flying cars, and because they still have to use refrigerators, microwaves, and ovens that might be more energy-efficient, but basically do not function really differently from what was around 40 years ago. While innovations at the turn of the last century, such as cars, planes, and phones, transformed the lives of billions of people, they critique that innovations today do not generate enough economic growth to improve income and welfare for a substantial number of individuals. Others hold that past and modern innovation is provoking many of the environmental and societal challenges that currently exist.

At the same time, managers consider innovation as vital. According to a recent CEO survey by *IBM* (2012) IBM global CEO study, innovation is one of the highest priorities of top management. But most managers work on the *late innovation process*, which is characterized by defined processes, clear procedures, and documented responsibilities and roles. Management prefers addressing the late phase of innovation despite knowing that the leverages are in the early phase. This is similar to the drunken man who lost his keys in the street and seeks them only under the streetlamp – because there it is bright. The real leverage in bringing

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up new ideas and improving the competitiveness of innovation lies in the front end of innovation, the so called 'fuzzy front end of innovation'.

The term *fuzzy front end* was first attributed to the early stages of an innovation project by Smith and Reinertsen (1991). They described it as the fuzzy zone between the time when the opportunity is known and the time when a serious effort is devoted to the development project. During the 1990s, when time to market became one of the greatest drivers in new product development, most companies started to speed up innovation by reducing the thinking time. As a result, many companies reached the milestone of product specifications faster – but this entailed failures, change requests and additional loops in the later phase. And this became very expensive. In the early 1990s, *Ford* used to have the same amounts of change requests as *Mazda*, but addressed the changes much later than Mazda. As a result, the impact of every change on costs, quality, performance and time was much higher at Ford than at Mazda.

Companies must energize the fuzzy front end of innovation in order to speed up the project as a whole. Moreover, the decision which opportunities and ideas the company selects and wants to pursue has to be taken fast. Instead of having long decision times before a project really starts and a short fuzzy front end, the project decision has to be made faster and the team has to be energized in the early phase. In turbulent environments – and most of our industries are much more turbulent today due to globalization and modern IT - speed is more important than the careful selection of the perfect opportunity. The opportunity costs of delay from starting a project late with subsequent deficiencies in time to market can outweigh opportunity errors in such markets. In some companies – often large companies operating under medium competitive pressure - it still takes months to years from the day when a compelling product idea lands on a manager's desk to the time when the first engineer starts developing technical solutions for the idea.

Today many companies seem to suffer from the same disease: Frontloading of specifications and requirement engineering as a discipline has to be re-learned. The great airplane A380 by *Airbus* is the most fascinating plane in the last decade, full of technology: Besides its huge size – a height of 24 m, a wing span of 80 m, and 560 t of weight with capacity for 520 passengers – it contains a vast amount of electronics: a sophisticated information system in the cockpit, two clicks with an over-dimensional mouse and every information is available to the pilot, and a 3-D-weather radar. But when the first customer Emirates changed its specifications in the infotainment area, the whole project nearly collapsed. Managers sometimes forget that this complex plane with 400 TV channels, 500 km of cables and 40,000 connectors cannot be changed in the last minute without consequences. The project was delayed and caused Airbus serious problems. Unplanned changes in the late project phases are dangerous. The motto is 'fail earlier in order to succeed sooner'.

Boeing was hit even worse with its Dreamliner project in 2012. For the first time in 34 years a plane was stopped from flying due to severe problems in many areas: oil leaks, broken batteries, and bugs in the brake system are only a few examples. Boeing did not integrate its suppliers in the early phase, instead Boeing only checked the specifications of its suppliers. This is not enough for a radically new

system like the Dreamliner. The fuzzy front end of a project is also responsible for system integration functioning smoothly in the late phase of innovation.

It is said that in the early 1980s it would have taken *IBM* 3 years to ship an empty box if the correct procedures for the product development process had been followed. Developments in agile computing demonstrate that product development time can be reduced dramatically, and currently many industries are trying to use these principles to speed up their own 'shipment business' in order to prevent 'missing the boat' through delayed product development, a front end process which is too lengthy, and too many and too detailed activities of preparing, planning, analyzing and evaluating. Yet, 'sinking the boat' in the sense of developing inappropriate products through overly hasty actions is no minor challenge in product innovation. Setting the right course early on in the innovation process can save companies from expensive and time-consuming deviations in later stages of the development process. While it is undisputed that taking the right decisions as soon as possible is vital, many companies feel a lack of knowledge on methods and processes which improve front-end decision-making.

Decisions in the early phase are taken under *uncertainty* about technical feasibility can be reduced by virtual or real prototypes. The risk of market failure of the final product certainly remains throughout the innovation process and market acceptance can definitely be assessed only after the product has been launched. Nevertheless, there are methods that facilitate predicting likelihood of acceptance and that therefore ease decision-making regarding which ideas and concepts are worth pursuing. Risks always depend to a certain degree on factors that are beyond the company's control, e.g., competitors' actions or the economic climate. Yet, the right mix of methods and processes can help to identify drivers of risk, reduce uncertainties, and thus take some fuzziness out of the front end of innovation, while at the same time successful management of the fuzzy front end requires an entrepreneurial spirit that accepts risk and welcomes *risk-taking*. For these reasons, effectively managing the fuzzy front end of innovation is one of the most important, and simultaneously challenging, activities for innovation managers.

2 Time for Action at the Front End of Innovation

All actions that are taken between the first consideration of an opportunity and the decision whether to start product development make up the front end of innovation (Kim and Wilemon 2002). The *early front-end activities* include the identification of a problem or opportunity and the accompanying screening and evaluation processes. This phase can be described as strategic arena setting. *General Motors* also called this the 'bubble-up-process', where the strategic decisions for the new product development are made. Like many automotive companies, General Motors involves strategic procurement, advanced development and innovation marketing in this early phase. It is important that this phase is managed in a way which is as inter-functional and interdisciplinary as possible. The more perspectives are considered, the better are the strategic cornerstones for the project. *BMW* emphasizes

the role of the customer and user in this phase: The task of the innovator in the fuzzy front end is to design a system which the customer desires. In the words of a BMW engineer: "Our task is to provide the customer with something that fills the customer with real excitement when he gets it, but that he never knew he was seeking in the first place." This is much more than a fancy marketing sentence. BMW does not ask the customer what he or she wants. In the early fuzzy front end, the usual way of questioning customers about their wants is hardly successful because the customer often only tells the engineers what they know already. BMW innovators have to know the customer better than he or she knows him or herself – this truly represents a very fine line between creating customer excitement and engineering happily in the wrong direction. Identifying latent customer needs is a key challenge in this phase, and approaches such as bodystorming, empathic design, netnography or observation can meet this target better than traditional surveying techniques. The fuzzy front end of innovation is the perfect phase for trying to anticipate customers' and users' future requirements and wishes. The adaptive headlights in the BMW X6, with sensors which constantly monitor the car's speed, yaw rate and steering angle, then calculate curve progressions accordingly to offer optimized illumination of the road ahead, were one of the results BMW developed from *customer insights*.

Later front-end activities comprise all the work that helps to specify the identified opportunities for innovating and to find possible solutions that seize these opportunities or meet specific problems. These activities include idea generation, idea evaluation, concept development, and concept evaluation for product innovations. The most difficult task is finding and specifying the right opportunity. Nobel prize winner Herbert Simon once said "Problem solving involves not only the search for alternatives, but the search for the problem itself." Engineers are very good at weighting and scoring alternatives for a given problem, they love cost-benefit-analysis. But it is much more difficult to find the right problem. The following small example will illustrate this issue.

Designers from the famous Stanford spin-off *IDEO*, meanwhile the most distinguished design company of the world with products like the iPod, the computer mouse and many more, always look for the *sweet spot* if they design a new product. The sweet spot is the point where the leverage between minimal efforts and maximum impact on user value is best. Once, the company worked for a train company which wanted to improve train riding. While typical engineers start collecting ideas on how to improve the train ride, these people started out in a more holistic way. They asked what makes the difference between taking the train and driving by car, the major competitive solution to going by train. And they found that for the customer the train ride is much more than just riding the train: It starts with planning and seeking information (which train leaves at what time), is followed by entering the train station, waiting for the train, boarding the train, the train ride itself, leaving the train at the station, and transferring to the final destination. The customer's perspective on train riding is more than just being on the train. Improving the waiting time for the train turned out to be the sweet spot; the team identified many ideas with a high potential of improving customer value at

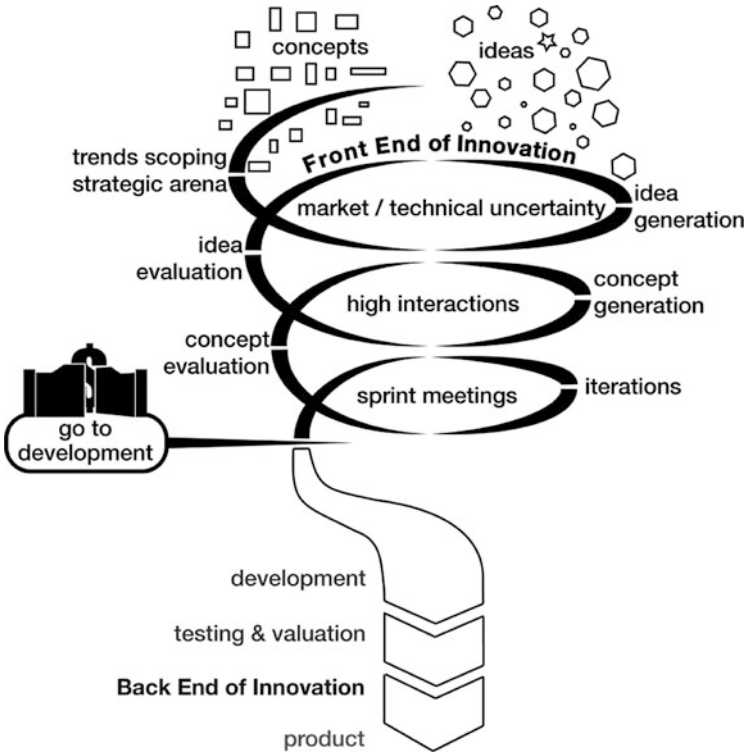

Fig. 1 Activities at the fuzzy front end of product innovation

moderate cost. By directly jumping onto the train and discussing about its interior, the wrong problem would have been addressed.

Figure 1 illustrates the activities at the front end of innovation in a schematic form. The duration of these activities and the degree of detail with which each of the activities is executed for a certain new product idea may vary. Moreover, the number of iterations varies and concurrent fulfillment of activities can take place. Whether the activities can and should be followed in a sequential order will be discussed in later sections of the book. These activities are not limited to mere product innovation, but can be carried out in a more broadly-set technological pre-development phase or in a more product-focused early stage of the product innovation process as well as for process innovations and service innovations. The market and technical uncertainties, and with them the *scope of action*, are high at the very beginning of an innovation project and decrease throughout the innovation process through the diverse activities of strategic arena setting, idea generation/evaluation and concept generation/evaluation. While activities are taken to substantiate the innovation idea, time is consumed and costs are incurred. Therefore, efforts to optimize the whole innovation project are easier to effect at the front end. Front end decisions are considered to have high leverage for the

whole innovation process, and wrong decisions at the front end may lead to costly and time-consuming deviations later on, as conceptual and empirical studies have shown (e.g. Kim and Wilemon 2002; Reid and De Brentani 2004; Verworn et al. 2008). Although in principle the ability to influence the direction of the innovation project is highest at the fuzzy front end, managers typically get more involved in a project after it has passed the so-called 'money gate', which is the time after the project has been transferred into the development phase and the time when innovation projects really start becoming expensive, as Harvard colleagues Wheelwright and Clark (1992) and their Finnish colleagues Poskela and Martinsuo (2009) have shown. However, as the seeds for these development projects are sowed at the fuzzy front end, it is of merit to take a closer look at the art of managing the front end.

3 The Art of Managing the Front End of Innovation

The painter Henri Matisse once said "The sign for which I forge an image has no value if it doesn't harmonize with other signs, which I must determine in the course of my invention and which are completely peculiar to it." Harmony refers to the ways in which elements are arranged. This balance need not necessarily be symmetrical in the sense of allowing each element an equal weight. Rather, the infinite variety of elements that make up the whole entity of an artwork must be composed in a way that allows no element to overpower the other, but to work together to produce fit. The art of painting involves balancing light and shades, vagueness and concreteness, sharp and soft lines, the positive and the negative. The art of cooking lies in mixing the right quantities and types of ingredients to make a dish tasty – not too sour or sweet, not too salty, but then again not stale.

Managing the fuzzy front end of innovation is a similar art: a balancing act between exploiting proven capabilities and dynamically exploring new ones, between stability and flexibility, between certainty and uncertainty, between formal and informal interaction, between market pull and technology push, between creativity and discipline, between free room and limitations. The art of managing the fuzzy front end is not the art of dictating what everyone has to do at what time. Nor is it the art of letting chaos reign. It is the art of identifying and understanding contradictory and complementary forces, supportive and counterproductive influences, and of providing the necessary framework, resources, and conditions to cope with these forces and influences. A late project phase in which hundreds of engineers in dozens of locations need to be coordinated, like the development of an airplane or a new car, often requires process experts and traditional managers. System integration and the convergence of schedules with dozens of cross-company teams necessitate clear gates and strict processes. Process management becomes key with all its instruments, milestones, stage-gate elements, and measures comparable to cockpit controlling.

In the fuzzy front end this is different: Process leadership is not unimportant, but the key capability is being good at managing people, i.e., finding the right people,

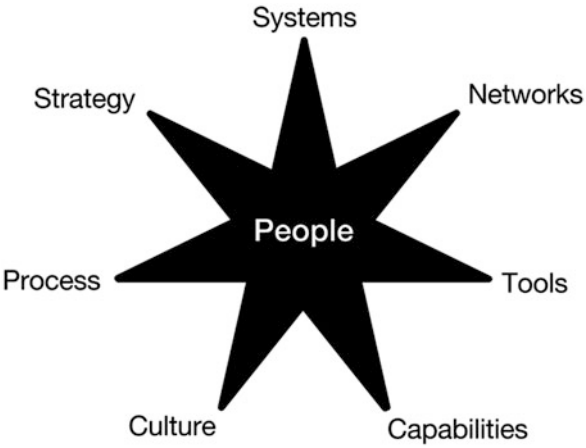

Fig. 2 Drivers of front end success

setting up a good network, coaching the teams, identifying the creative potential of the individuals and providing them with a strong vision and direction. Providing a meaning is extremely important in order to trigger the intrinsic motivation of researchers and innovators. Intrinsically motivated teams that work because of the interesting and challenging task are much more successful than teams that work for more status or more money. *Bombardier* has recently announced the maintenance free train as a vision in the company. This strong vision, its enforcement and genuine belief in it by the top management align all forces within a company and energize the fuzzy front end more than most of the project bonuses often used.

Factors that contribute to these managing capabilities are strategy, processes, methods and tools, interdisciplinary systems and networks, culture and people. At the end it is all about people, especially in the fuzzy front end of innovation. While the stage-gate system has been researched in all aspects and implemented in many companies in every detail and variant, the early innovation phase has been much less explored by academia and much less addressed by companies. One of the reasons is that it is much more difficult and complex. It is much harder to describe a good front end of innovation and consequently implement it compared to the later stage-gate process. Yet, the front end is where most companies have huge potential for improvement and the gap between best practice and average practice is enormous (Fig. 2).

4 The Course of the Book

Throughout this book we will take a closer look at the drivers of front end success. Take strategy: Textbook wisdom conveys that a strong strategy is vital for innovation success as it allows aligning all activities of all employees with the set target, and it is only in this way that the strategic goals can be reached (e.g. Cooper

2011). Without question, clear and focused strategies give overall direction and stimulate the target-oriented search for new innovation opportunities within certain search fields, but they intentionally hinder the emergence of initiatives that seem to be completely detached from strategies. Such ideas and activities are constantly filtered out, because they do not pass the value-laden filter of right and wrong as they do not conform to strategy. So strategy is a double-edged sword. Innovative opportunities can arise and a narrow strategy can prevent exploring them, as the Swiss company *Sulzer* showed. The former casting company had a clear strategy that called for exclusively pursuing its core business, which is casting and heavy metals. Once a surgery professor approached the head of prototyping and asked whether the latter could do him a favor and manufacture an implant for an artificial hip. Since the professor paid well and the engineer had become interested, he complied with the wish against all strategic directives. The business became bigger and the division developed into the largest division of the company – for a long time against Sulzer's explicit strategic directive. The user induced the strategic process bottom-up. Luckily the implementation of strategy had not been enforced rigidly at that time, so it was possible for the company to grow in the new area of business.

As the example shows, in dynamic environments, a company may have to change core competences to stay successful. Insisting on once successful competencies and strategies may lead companies into struggle. A capability that was once an asset can become a liability, if it is no longer appropriate and strategic pre-settings may encourage managers to run too fast in the intended direction without reflecting on whether the strategy is still adequate and ignoring ambiguities. In this sense, a rigid strategy can be compared with a creosote bush, whose roots gather every drop of water and do not allow any other plant in its surroundings to grow. The positive link between strategic focus and innovation performance recedes when the focus limits dynamic integration of emerging strategies and diversity (Burgelman 2002; Henderson and Cockburn 1996). The discussion in the next chapter, along with the presentation of *Strategic management of the fuzzy front end at Bayer* by Plischke, Heubach, and Meier, provides fruitful insights into the effective management of this balancing act.

In order to achieve the right strategic alignment, to justify and communicate decisions, and to control project progress, a structured process with clear decision points and control mechanisms for the fuzzy front end is worthwhile. Yet, such a process must not hinder flexibility and creativity. It has to permit iterations, concurrent engineering, improvisational approaches, experimentation slopes, and leaner process runs according to the necessities of the specific projects. These principles and their interplay are described in detail in the chapter "Structuring the Front End of Innovation" by Gaubinger and Rabl. The chapter on "Controlling the Early Innovation Phase at Autoneum" by Freije-Perez discusses how the facilitative role of controlling that focuses on knowledge creation, experimental non-linear operations, and a broad role definition allows to successfully steer through the front end of innovation in the automotive supply industry. The chapter "Voestalpine Anarbeitung: Commercialization Framework for Technology Development Projects " by Gaubinger, Schweitzer and Kirchweger shows an elaborate

framework of a process for commercialization of a technology enriched with an overview of activities and tools that companies should focus on in each phase.

Given the quantity of different tools and methods available to identify trends, new product ideas and customer needs, to assess technologies and markets, and to assess technological feasibility, the appropriate selection and application of these tools becomes paramount. For this reason, in the chapter "Integrating Customers at the Front End of Innovation" by Schweitzer, we provide an overview and critical discussion of different tools to explore current or latent needs of customers and integrate them into activities of idea/concept generation and evaluation in the early stages. Sandmeier, Kahmen and Korba describe in detail how the customer was integrated into an innovative project at ABB for developing battery storage technologies in the energy sector. In "Building a Bridge from Research to the Market: IBM's Industry Solutions Labs", Kaiserswerth explains how these labs function as knowledge hubs, where trend information is exchanged and innovation issues are discussed between internal R&D experts and customers, and how these interactions lead to innovative joint projects.

Yet, not only customers can be integrated into the innovation process under the notion of open innovation, but web-enabled technologies allow the integration of a wide range of different pre-defined or even anonymous external actors. In the last few years, the use of such technologies for the purpose of seeking new product ideas or technical solutions has gained popularity under the term '*crowdsourcing*'. In the chapter "Crowdsourcing as an Innovation Tool", Gassmann, Friesike and Daiber systematize the possible types of crowdsourcing projects and explain step by step how a crowdsourcing project is carried out and which issues have to be addressed at each stage so that crowdsourcing is used in a successful way. An overview on different "Trend Scanning, Scouting and Foresight Techniques" is presented by Rohrbeck. The chapter provides clear assistance in choosing the right foresight method and highlights key issues that have to be borne in mind when integrating and using the results of foresight processes for decision-making at the front end of innovation.

In the chapter "Leveraging Creativity", Gassmann and Friesike stress that the ability to find creative solutions to challenges of new product development is not merely a personal gift only a few of us possess, but rather a capability that can be systematically built and used with the help of specific problem-solving techniques. A specific method of creative idea generation is cross-industry innovation, which is scrutinized in the chapter "Out of Bounds: Cross-Industry Innovation Based on Analogies" (Zeschky/Gassmann). In the chapter "Accelerating Learning by Experimentation", Thomke sets out in detail a four-step experimentation cycle that products evolve along, and he describes which chances and challenges teams usually encounter in technical experimentation and how factors such as the fidelity, cost, or iteration time of experiments affect front end success. The chapter includes several hints and tips that help to make the best use of experimentation at the front end of innovation.

A variety of tools for opening up the fuzzy front end of innovation to embrace input from customers and other external sources is discussed in the case studies: In

"BGW: Partnering the Outside-in Process", Wecht explains how an innovative tool called Expert Innovation Journeys works and how it can be used to generate ideas through active collaboration of corporate employees and external experts in a sophisticated workshop process. Another innovative open innovation tool that builds on the knowledge of external and internal experts is the "SPRINT Radar" which is presented by Eser, Gaubinger and Rabl. The case demonstrates how this multi-stage tool can be effectively used to explore trends and tendencies in the field of mechatronics. Further, Rudzinski and Uerz present an "Open Innovation approach to Strategic Foresight at Volkswagen" in their chapter, in which they highlight the importance of integrating different players from within the company to find broad acceptance in the company and to detect weaknesses in the current innovation strategy.

The chapter "Emporia: The Merits of Online Idea Competitions" compares focus groups to online idea competitions and provides insights into the strengths and weaknesses of the two approaches for the specific case of generating ideas for mobile phone solutions for senior citizens. Oenbrik provides an overview of the different open innovation approaches that Evonik Industries uses, from R&D co-operations, over technology scouts as agents for operative business units and for strategic topics to internet-based open idea competitions, and reflects on the strengths of these techniques for Evonik. Füller, Lemmer, and Hutter elaborate on such internet-based competitions in the chapter "Crowdsourcing: How Social Media and the Wisdom of the Crowd Change Future Companies" and present numerous examples of utilizing crowdsourcing for business innovation. They explain the principles of crowdsourcing which have to be considered in order to run successful crowdsourcing initiatives.

The increasing number of players who contribute to an innovation project, not only from inside the company, but also from the outside, turn *intellectual property* (IP) *management* into a core strategic issue. The quarrel about intellectual property infringement between *Apple* and *Samsung* that has lately received intense media coverage illustrates the difficulties that may arise for IP management when innovations are increasingly developed and produced in a collaborative way. While Samsung is a supplier of Apple and delivers for instance ASIC processors for iPhones, the two companies are fierce competitors, too. Sharing information with suppliers may contribute to innovation success, but if the supplier evolves into a competitor, this subject is sensitive. Crowdsourcing approaches may even intensify the challenges of properly managing intellectual property rights. For example, designers, technicians and inventors gathered on a virtual platform to spin ideas about cars. The ideas soon became so extensive and elaborated that *Local Motors*, a newly founded American open-source car developer, used them to develop the car model Rally Fighter. The US military has already ordered the development of a desert vehicle prototype by Local Motors and their co-creators. Further orders are in the pipeline. Ideas, designs and concepts were on the web for some time and everybody was allowed to contribute and to refine the ideas. The spirit behind this movement had been one of free access, sharing, and the openness of research and development. This idealistic demeanor is challenged when ideas actually

materialize into products that make money. With thousands of co-developers that contributed to ideas, it is difficult to calculate fair shares in profit, and contributors might claim intellectual property rights, if not enough attention is paid to a good intellectual property management. In the chapter "Managing the Intellectual Property Portfolio", Bader and Gassmann address this intellectual property challenge and lay down a systematic model for managing patents along the lifecycle of technologies. This holistic life-cycle model allows companies to recognize the importance of aligned activities that are rooted in the corporate technology and product strategy, and it scrutinizes the decisions that have to be taken in each phase of a technology's life cycle.

As indicated in several of the above chapters, the tools and methods presented can only live up to companies' expectations when the right type of people are involved in their application. For example, Schweitzer highlights that different types of customers are important for the various tasks at the front end of innovation; while technically savvy users may prove vital for concept development, for early evaluation of the market potential of different concepts emergent users or early adopters may provide important information. As for trend forecasting, Rohrbeck explains the contribution that proponents and opponents of innovation projects make in the foresight process and suggests different methods of institutionalizing such roles at the front end of innovation. In the chapter "A Design Perspective on Sustainable Innovation" – *strategic design for sustainable innovation*, Markus Kretschmer focuses on the specific skills designers contribute at the front end of innovation with their particular problem-solving approach, their understanding of product culture, and their ability to think and communicate visually. In the same vein, the chapter "Dancing with Ambiguity: Causality Behavior, Design Thinking, and Triple-Loop-Learning" by Leifer and Steiner demonstrates how design thinking drives front end performance. In addition, Sandmeier and Korba describe the challenges of finding and motivating the right experts to contribute in the early phases of an innovation project. In "Google Ventures", Friesike presents an intriguing way in which Google looks for innovative ideas and the right people to realize these ideas. This is achieved by supporting start-ups, especially such start-ups whose aim it is to directly compete with Google's products. Google invests in these companies, provides them with marketing, managerial, and technical know-how, and ties them to the company so that finally these start-ups turn into co-operative partners rather than competitors.

In the chapter "Applying Cross-Industry Networks in the Early Innovation Phase", Enkel and Heil explain how innovation networks including companies and individuals from other industries fuel innovation and discuss the importance of selecting the right partners for such networks. If the cognitive distance between people from the company and outside sources is too extensive, the company may not be able to absorb external knowledge. Conversely, if the cognitive knowledge is too similar, the firm might not absorb vital new knowledge, because the knowledge the employees may obtain from the external sources equals their existing knowledge and thus is redundant. So again it is the right selection of people that determines the success of front end activities. Furthermore, the authors describe

how the internal capacity of absorbing external knowledge can be enhanced and discuss the importance of cultural elements, such as trust and openness, shared norms, and common objectives, in creating multilateral innovation networks. The power of culture as an enabler of fuzzy front end performance is also demonstrated in the chapter "3M: Beyond the 15 % Rule", in which Rahn lays down the cultural cornerstones that make 3M such an innovation machine. Besides awareness of cultural aspects, the management of front end networks demands good coordination capabilities. If project participants and their roles do not remain the same throughout the project, as in the case of the *ABB* project, such coordination can become a critical challenge. For example, in chapter "The MINI Countryman: Successful Management of the Early Stage in a Cooperative Product Development Environment", Seidel, Oberdellmann and Clayton describe the difficulties arising from the shift in responsibilities from *BMW* in the concept phase to *Magna Steyr Fahrzeugtechnik* after target agreement.

While so far innovation research has mainly focused on product innovation, currently service innovation and system innovations are gaining increasing attention. Ingrained in this enhanced understanding of innovation is the concept of business model innovation. In "Revolutionizing the Business Model", Gassmann, Frankenberger, and Csik are set out to explain how the value proposition towards the customer, the value chain and the revenue model are created to profit from innovative business models, and they present the BMI Navigator, which enables the creation of business models in a three-step process, from initiation to ideation and integration. In the "Landis+Gyr Case Study", Bonakdar, Bjelajac and Strunz demonstrate how an analytical process can be followed in practice so that business models can be designed and analyzed systematically and how the main results of this process can be integrated into a management cockpit to allow easy monitoring of the basic indicators and easy comparison of key data between different business models.

The first part of this book is a profound source of conceptual contributions to the five key dimensions of managing the front end of innovation: strategy, processes, methods and tools, interdisciplinary systems and networks, culture and people. The second part of the book offers a rich selection of successful practice cases that demonstrate how these key success factors have been prosperously applied in different industries and organizational structures.

While reading through the chapters, the words of Paul Cezanne shall serve as a guiding rule: "To paint is not to copy the object slavishly, it is to grasp a harmony among many relationships." In this sense, the chapters of this book aim to inspire the reader to reflect on the ingredients needed to efficiently and effectively navigate the fuzzy front end of innovation.