Włodzimierz Sroka · Štefan Hittmár
Editors

Management of Network Organizations

Theoretical Problems and the Dilemmas in Practice

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“In memory of Marek Janus” .

Foreword

There is no doubt that for some decades now it has been extremely difficult for firms to stay competitive when relying only on their own internal resources and capabilities. The increased globalization and liberalization of markets together with the higher complexity and multidisciplinary nature of the innovation process have driven firms to rely on a wide range of formal and informal ties so as to benefit from the complementary or specialized resources of other agents. In other words, we are facing a world of networks.

Reliance upon collaboration agreements in order to increase flexibility and gain competitive advantage is not new. Firms have always needed to establish agreements with different agents—such as suppliers, customers, universities, research institutes, or even competitors—so as to collaborate on different activities along their value chain. However, in the twenty-first century, we have seen that the phenomenon has become even more pervasive and thus relevant. First, it is observed that the possibilities of cooperation may now apply to all activities within the value chain. Collaborative agreements are not only used for less strategic low-value activities but are increasingly being used for high-value and knowledge-based activities such as those related to the research and development function. Second, the increased liberalization of markets and the greater cross-border enforceability of contracts have expanded the markets available to firms and thus the internationalization of these collaborative agreements. The result is that nowadays, in order to stay competitive, many firms have established a global network of interfirm agreements with external agents located not only in developed economies but also in developing ones.

The benefits of network collaboration are substantial. They allow firms not only to be more efficient or flexible but also to access the distinctive capabilities of a specialized partner and thus to concentrate on those parts of the process in which they can exploit their competitive advantage. However, collaboration has been also found to impose numerous challenges; effective management of network organizations becomes key in the maximization of the benefits stemming from collaboration, while at the same time minimizing the risk associated with these practices.

These challenges are mainly related to effective partner selection and control so as to avoid negative spillover effects which may result in the erosion of a firm's competitive advantage. Indeed, it is well known that one of the most difficult dilemmas faced by firms in terms of collaborating in knowledge-based activities is that they are obliged to maintain the necessary knowledge exchange to achieve the alliance objectives, while avoiding the unintended leakage of proprietary knowledge. In addition, given the increased number and dispersed nature of the alliance portfolio which firms need to leverage, achieving effective coordination in order to reach the network objectives also becomes a difficult managerial challenge for these firms. It is for this reason that trust has been identified as a crucial factor which must be taken into consideration by firms when forming their collaboration agreements. Trust between partners allows for smoother communication and coordination and also reduces the risk of opportunistic behavior. As a consequence, firms have tended to show a preference for familiar trusted partners. However, it has been demonstrated that this preference can also lead to the so-called paradox of embeddedness, which may lead to the firm missing potential business opportunities with other agents. These dilemmas, among others, are a frequent concern within network organizations.

It goes without saying that the increased internalization of these agreements and the greater strategic value and variety of the activities being externalized have increased the difficulty of effectively managing these network organizations in terms of both coordination and control. It is for this reason that I believe this monograph sheds more light on this relevant topic by raising numerous issues which are relevant for the effective management of network organizations, from both a theoretical and an empirical perspective. It deals with issues such as the different types of network organizations, the role of trust in networks, and the benefits of clustering and also provides empirical data on the phenomenon. What most impressed me was that this monograph not only addresses the topic from a macrolevel perspective but also from a more microlevel one by taking into consideration managers' and other individual members' perspectives on network decisions.

In conclusion, for me, the key insight the book holds is that firms no longer base their competitive advantage merely on their internal resources but on the distinctive ways in which they manage to combine them with external resources from diverse agents. The reader should note that effective network management can help firms to develop a distinctive and difficult to imitate competitive advantage, which can indeed be critical to survival in the highly competitive global economy in which we are immersed. It is for this reason that the insights provided in this manuscript are a worthwhile read.

Oviedo, Spain
12 February 2015

Andrea Martínez-Noya

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Introduction

Włodzimierz Sroka and Štefan Hittmár

Effective management is crucial to the success of network organizations and may reduce the risk which is inherently associated with cooperative strategy. If such a strategy is to be successful, managers must have a degree of knowledge of the factors which are of key importance in this process. The main goal of this monograph is therefore the complex presentation of the management of network organizations from both theoretical and practical perspectives as well as an international perspective, in the form of the presentation of selected cases from various Central European countries. The authors claim that without some type of network management, irrespective of the type of network, it is not possible to compete effectively with other companies and/or networks. As network organizations are representative of a wide portfolio of possible network types, i.e. alliance networks, clusters, outsourcing, and virtual organizations, this book presents various perspectives of the management of network organizations.

The monograph consists of both theoretical and practical chapters which have been written by the foremost experts on network organizations. The objective of this monograph is presented in four parts. In the first part, the theoretical aspects of network management are presented. The authors, among them Hittmár and Jankal, as well as Lendel, raise different topics which are important for the management of network organizations, such as general management of networks. In turn,

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Oczkowska describes the application of alliances in the network model of international expansion, and Sankowska raises the topic of the relationships between trust and networks. It may, therefore, be said that Part 1 is an introduction to the main topic of the book.

The second part presents the management of different forms of network organizations, concentrating on clusters and alliance networks; however, all texts in this part present differing perspectives. More specifically, the texts of Skokan, Sujová and Hajdúchová concentrate rather on general aspects of clusters, whilst Knop's work is focused on the process of cluster management. The final text in this part, written by Sroka and Gajdzik, is devoted to the managerial aspects of network organizations.

In turn, the third part focuses on the effectiveness of networks, featuring texts by Łącka, Jankalova and Jabłoński. However, the phenomena which may limit effectiveness within networks, such as pathologies, are thoroughly presented in the paper by Cygler.

The last part of the monograph describes network management in practice, including case study analyses from different countries. For example, the texts of Varmus, as well as Štefko and Gallo, present ventures from the Slovakian market, describing the cooperative activities of sporting organizations as well as the application of management tools for the management of network organizations and network models respectively. In turn, Puślecki presents an overview of the management of alliance networks within the biopharmaceutical industry in Poland. Finally, Mazel and Vajčnerová present the example of network alliances in the tourist destination of Oberengadin in Switzerland.

The advantages of the aforementioned monograph are:

- the presentation of the points of view of different scholars who have practical experience in terms of network organizations,
- the presentation of the management of different types of network organizations,
- simple and understandable language,
- a wide application of practical cases.

The authors believe that a combination of theory and practice, together with the nature of the texts presented here, have successfully achieved the goal of this monograph. Therefore, it is designed for a wide group of recipients, including both scholars and managers as well as students of management science.

Part I
Theoretical Aspects of Network Management

Strategic Management of Networks

Štefan Hittmár and Radoslav Jankal

Abstract Strategic management of a network organization is the set of managerial decisions and actions by which network management determines in advance what should be accomplished and how it should be achieved. In the first part of the chapter, different types of strategies at the level of networks and organizations are characterized. Subsequently, the strategic management process which is appropriate for the network is described. Traditional approaches to strategy development place emphasis on enterprise as an object from which the entire process of creation, implementation, evaluation and controlling strategy unfolds. For a network, however, it is somewhat different, as first it is necessary to define the mission and vision of the network, determine its objectives, and consequently—by implementing the necessary steps—to establish its strategies, i.e. overall, business and functional network strategy. It is also necessary to take into account the orientation of the individual network members. Consequently, the individual enterprises of the network have to update their visions and missions to fulfil the strategies of the network.

1 Introduction

As with general management, and the definition of other terms, so in strategic management there are numerous definitions which seek to characterize this concept as comprehensively as possible. We can conclude that strategic management is a concept which is understood differently by different authors. This may be due to the fluidity of contributing factors such as technology, market rules, etc. Similarly, strategy is a dynamic process and as such is never repeated.

The following selected definitions reflect the diversity of views on the content, form, function and other statements of the concept of strategic management. Strategic management theorist William Glueck defines this concept as "*a stream of decisions and actions, which leads to the development of an effective strategy or strategies to help achieve corporate objectives*" (Kazmi 2002). James Higgins of

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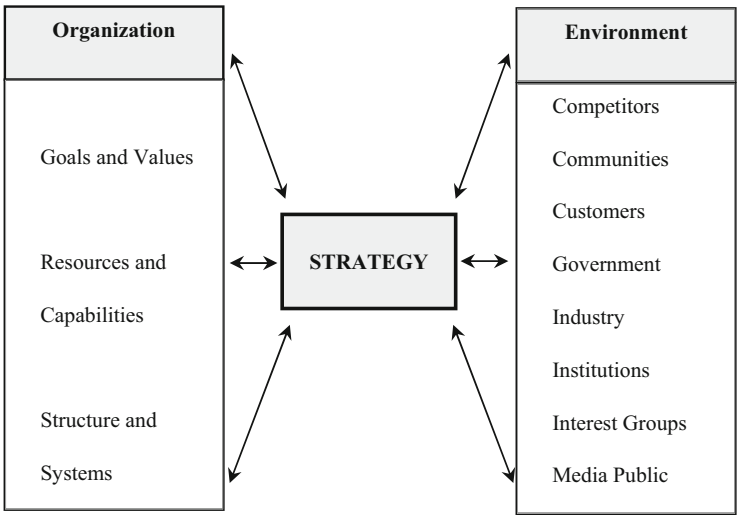

Fig. 1 A generic strategic management framework. *Source*: Fleisher and Bensoussan (2003)

Rollins College states that strategic management "*is the process of managing the pursuit of the organization's mission while managing the relationship of the organization with its environment*" (Štefánik and Laššák 1994). In turn, Lesáková et al. (2001) defines strategic management as a process by which companies analyze their competitive environment to identify opportunities and threats. She also claims that strategic management is (1) a process of evaluation of companies' own resources and skills to understand their strengths and weaknesses, and (2) a process of comparison and finding the intersection of these two analyses to choose the best strategy.

Fleisher and Bensoussan (2003) understand strategic management as a means of running an organization that has as its ultimate objective the development of values, managerial capabilities, organizational responsibilities, and administrative systems which link strategic and operational decision making, at all hierarchical levels, and across all lines of authority. This concept is illustrated in Fig. 1.

According to Dess et al. (2004), "*strategic management consists of the analysis, decisions and actions an organization undertakes in order to create and sustain competitive advantage*". These authors have defined four key attributes of strategic management:

- management of the organization towards overall goals and objectives,
- the inclusion of multiple stakeholders in decision-making,
- the need to incorporate short-term and long-term perspectives,
- the recognition of trade-offs between efficiency (doing things right) and effectiveness (doing the right thing).

2 Strategy

The concept of strategy (from the Greek *Strategos*, a general) comes from military operations—such as the art and science of commanding army forces. Generally, strategy is the active implementation of any long-term plan to achieve specific goals.

Strategies are the means by which long-term objectives may be achieved. Business strategies may include geographic expansion, diversification, acquisition, product development, market penetration, retrenchment, divestiture, liquidation, and joint ventures. Strategies are potential actions which require decision-making from top management as well as a substantial proportion of network or organizational resources. In addition, strategies affect an organization's long-term prosperity—typically for at least 5 years—and thus are future-oriented. Strategies have multifunctional or multidivisional consequences and require consideration of both the external and internal factors facing the network or organization (David 2011).

3 Levels of Strategy

Most academics classify strategies into three levels: corporate, business and functional (operational) (Fig. 2).

If an organization produced a single product or service, managers could develop a single strategic plan which covered everything undertaken by the organization. However, network organizations are in diverse lines of business. Each company within a network must define its own (corporate, business and functional) strategy, where the (overall, business and functional) network strategy is taken into account. Petry (2006) described the meaning of three levels of strategy for networks (Fig. 3).

3.1 Overall Network Strategy

Every network requires an individually tailored, clearly formulated overall network strategy in order to achieve success, and help the companies which are part of the network to prepare their own corporate strategies and to contribute to achieving the goals of the overall network strategy. This strategy contributes not only to the achievement of network goals, but also to the achievement of the individual goals of network members.

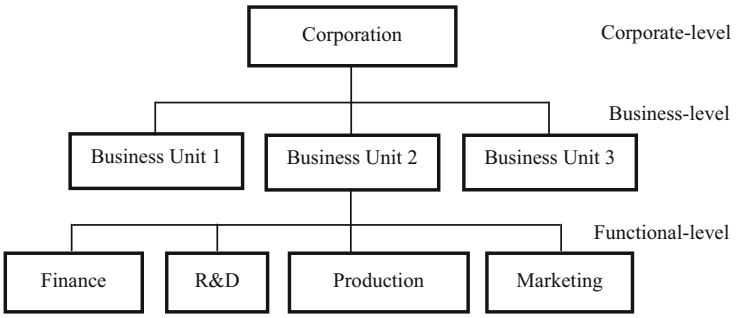

Fig. 2 Levels of strategy

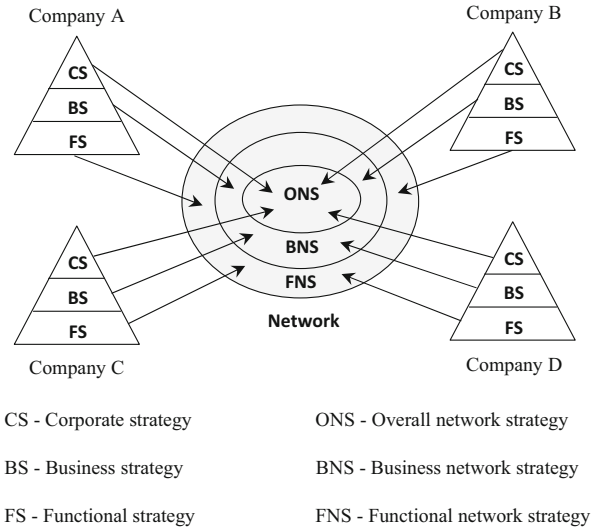

Fig. 3 Network strategy levels. *Source*: Petry (2006)

3.2 Corporate Strategy

If an organization deals in more than one type of business, it follows that a corporate-level strategy will be necessary. This strategy seeks to answer the question: *What business or businesses should we be in*? or *What business are we in*? Corporate-level strategy determines the roles which each business unit in the organization will play. Corporate-level strategy pertains to the organization as a whole and the combination of business units and product lines that make up the corporate entity. Strategic actions at this level usually relate to the acquisition of new businesses; additions or divestments of business units, plants, or product lines; and joint ventures with other corporations in new areas (Daft 2010).

3.3 Business Network Strategy

Network strategy at the business level covers that which is related to the focus of the network as a whole. Every member of the network represents a single business or group of related businesses. Each will have its own unique mission, competitors, and strategy at the business level.

The concept of planning separate business units is based on the following principles:

- The network is managed as a 'portfolio' of businesses, each network member serving a clearly defined product and market segment with a clearly defined strategy at the business level;
- Each network member in the portfolio develops a strategy tailored to its capabilities and competitive needs yet remaining consistent with the overall network's capabilities and needs;
- The total portfolio is managed to serve the interests of the network as a whole, to achieve balanced growth in sales, earnings, and asset mix at an acceptable and controlled level of risk.

3.4 Business Strategy

Business-level strategy seeks to answer the question: *How should we compete in each of our businesses*? or *How do we compete*? For smaller organizations in only one line of business, or large organizations which have not yet diversified into different products or markets, the business-level strategy is typically the same as the organization's corporate strategy. For organizations in multiple businesses, each division will have its own strategy which defines the products or services it will offer, the customers it wants to reach, and so on. Business-level strategy pertains to each business unit or product line. Strategic decisions at this level concern the amount of advertising, the direction and extent of research and development, product changes, new-product development, equipment and facilities, and expansion or contraction of product and service lines. Many companies have opened e-commerce units as part of a business-level strategy (Daft 2010).

3.5 Functional Network Strategy

Strategy at this level deals with various functional areas of the network. Once again, we apply the same rule as with the higher levels, meaning that any strategy of the network members at the functional level must be based on functional network strategy.

3.6 Functional Strategy

Functional-level strategy seeks to answer the question: *How do we support the business-level strategy*? For organizations that have traditional functional departments such as manufacturing, marketing, human resources, research and development, and finance, these strategies need to support the business-level strategy. Functional-level strategy pertains to the major functional departments within the business unit. Functional strategies involve all the major functions, including finance, research and development, marketing, and manufacturing (Daft 2010).

4 Strategic Management Process

The strategic management process, as illustrated in Fig. 4, is a process that encompasses strategic planning, implementation and evaluation. Although the first steps describe the planning which must be undertaken, implementation and evaluation are also significant. Even the best strategies may fail in such cases when management neglects to implement or evaluate them properly. At this stage, the various steps of the strategic management process are described in detail. The process of strategic management within an organization in the network differs in that the process must first take place at the network level before businesses gain access. Subsequently, the participation of a business in the network is taken into account at each step.

4.1 Step 1: Identifying the Current Vision, Mission, Objectives and Strategies of the Network or Organization

A mission statement is a key indicator of how a network or organization views the claims of its stakeholders, and represents the starting point of the strategic planning process. Although corporate mission statements vary, the most comprehensive include four main elements: namely, the mission, vision, values, and goals of a network or organization (Hill and Jones 2012).

A vision statement, in general terms, expresses a view of the future status of the network or organization; and is the starting point from which corporate objectives, strategy and other business activities are directed (Hittmár 1999). A vision statement should answer the basic question, "*What do we want to become*?" A clear vision statement provides the foundation for developing a comprehensive mission statement. Many organizations have both, but the vision statement should be established first and foremost. The vision statement should be short, preferably one sentence, and as many managers as possible should have input into developing the statement (David 2011). The vision of a company lays out some desired future

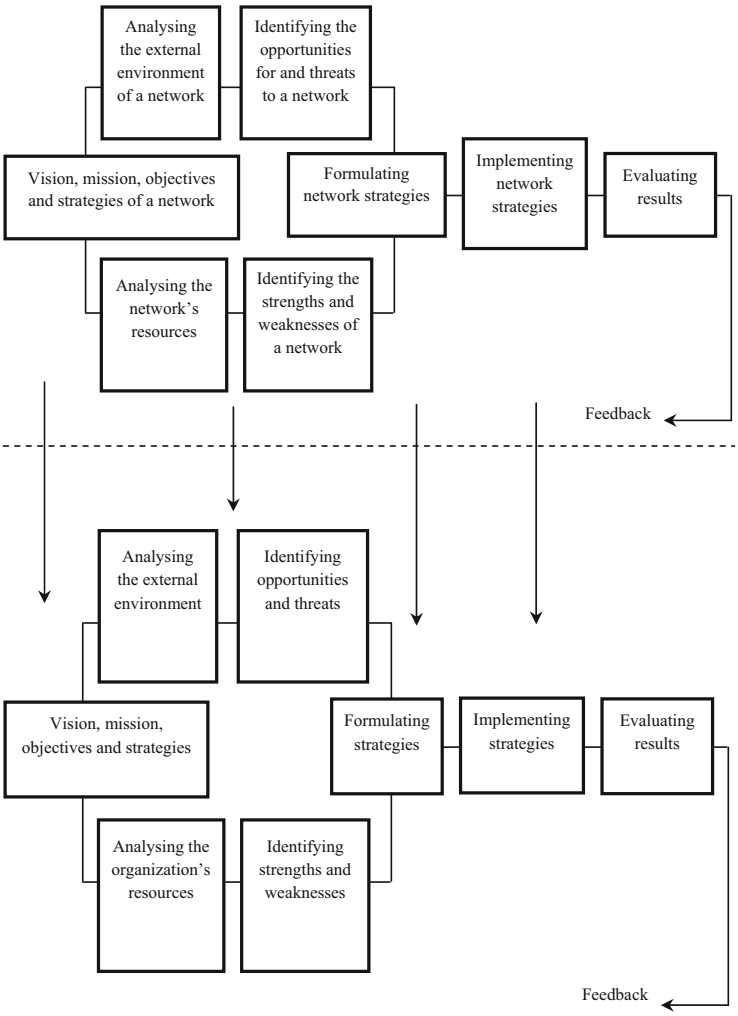

Fig. 4 The strategic management process within a network

state—it articulates, often in bold terms, what the company would like to achieve. Good vision statements are meant to stretch a company by articulating some ambitious, yet attainable, future state that will help to motivate employees at all levels and drive strategies (Hill and Jones 2012).

Each network or organization requires a mission statement which defines its purpose and answers the question: *What is our reason for being in business*? The process of defining the network or organization's mission forces management to carefully identify the scope of its products or services. When defining the mission of the whole network, it is of the utmost importance to take into account the direction of the individual network members. An important first step in the process of

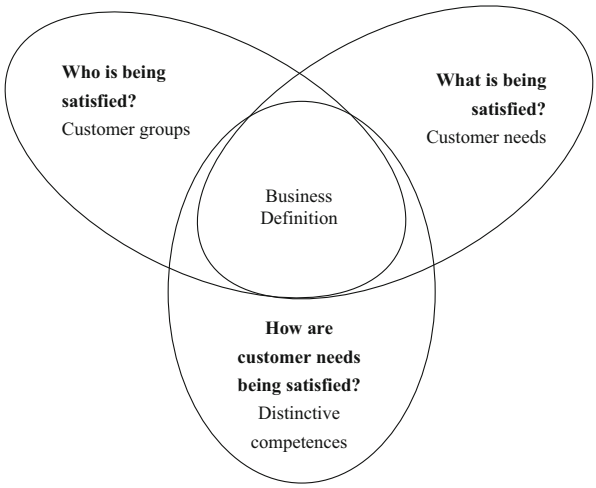

Fig. 5 Defining the business: the starting point of strategic planning. *Source*: Abell (1980)

formulating a mission statement is to come up with a definition of the network's or organization's business. Essentially, the definition should answer these questions: "*What is our business*? *What will it be*? *What should it be*?" The responses guide the formulation of the mission. To answer the question, "What is our business?" a network or company should define its business in terms of three dimensions: *who is being satisfied* (what customer groups), *what is being satisfied* (what customer needs), and *how customers' needs are being satisfied* (by what skills, knowledge, or competencies). Figure 5 illustrates these dimensions (Hill and Jones 2012). It is also important for management to identify the objectives and strategies currently being utilized by the organization and the network alike. Objectives are the foundation of the planning process. A company's objectives provide measurable performance targets which workers strive to achieve. Knowing the company's current objectives gives managers a basis on which to decide whether or not these objectives need altering. For the same reasons, it is important for managers to identify the strategies currently in use.

4.2 Step 2: Analyzing the External Environment

The external environment is a primary constraint on the actions of a manager. Analyzing that environment is a crucial step in the strategic process, as a network's or organization's environment, to a large degree, defines the options available to management. A successful strategy will be one that aligns well with the environment. Managers in every network or organization need to analyze the environment. They need to know, for instance, what the competition is doing, what pending legislation might affect the network or organization, and the specifics pertaining to the labor supply situation in locations where it operates.

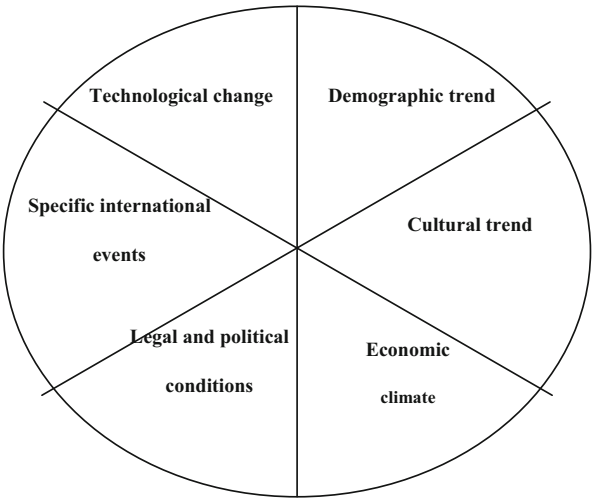

Fig. 6 Defining the business: The starting point of strategic planning. *Source*: Barney and Hesterly (2008)

Step 2 of the strategic management process is complete when management has an accurate grasp of what takes place within its sphere of influence, and is aware of important trends that might affect its operations. The starting point of an external analysis is to identify the industry in which a network or company competes. To do so, managers must begin by looking at the basic customer needs which their network or company serves—that is to say, they must take a customer-oriented view of their business. The basic customer needs which are served by a market define an industry's boundaries. It is important for managers to realize this, for if they define industry boundaries incorrectly, they may be caught flat-footed by the rise of competitors who serve the same basic customer needs with different product offerings. Once the boundaries of an industry have been identified, the task facing managers is to analyze competitive forces in the industry environment (Hill and Jones 2012).

The general environment consists of broad trends in the context within which a network or organization operates which may have an impact on the strategic choices they make. As depicted in Fig. 6, the general environment consists of six interrelated elements (Barney and Hesterly 2008):

Technological change: creates both opportunities, as networks and organizations begin to explore how to use technology to create new products and services, and threats, as technological change forces networks and organizations to rethink their technological strategies;

Demographic trends: demographics refers to the distribution of individuals in a society in terms of age, sex, marital status, income, ethnicity, and other personal attributes which may determine buying patterns; understanding this basic information about a population can help a network or organization to determine

whether its products or services will appeal to customers and how many potential customers for these products or services it might have;

Cultural trends: culture is the values, beliefs, and norms that guide behavior in a society; these values, beliefs, and norms define what is "right and wrong" in a society, what is acceptable and unacceptable, what is fashionable and unfashionable. Failure to understand changes in culture, or differences between cultures, can have a significant impact on the ability of a network or organization to gain a competitive advantage;

Economic climate: is the overall health of the economic systems within which a network or organization operates. The health of the economy varies over time in a distinct pattern: periods of relative prosperity, when demand for goods and services is high and unemployment is low, are followed by periods of relatively low prosperity, when demand for goods and services is low and unemployment is high. When activity in an economy is relatively low, the economy is said to be in recession, and a severe recession that lasts for several years is known as a depression. This alternating pattern of prosperity followed by recession, followed by prosperity, is called the business cycle;

Legal and political conditions: the legal and political dimensions of a network's or organization's general environment are the impact of laws and the legal system on business, together with the general nature of the relationship between government and business. These laws and the relationship between business and government can vary significantly throughout the world;

Specific international events: these include events such as civil wars, political coups, terrorism, wars between countries, famines, and national or regional economic recessions. All of these specific events can have an enormous impact on the ability of network or organizational strategies to generate competitive advantage.

4.3 Step 3: Identifying Opportunities and Threats

After analyzing the environment, management needs to assess what it has learned in terms of opportunities which the network or organization can exploit, together with the threats it faces. Opportunities are positive external environmental factors, while threats are negative. Opportunities arise when a company is able to take advantage of conditions within its specific environment to formulate and implement strategies which enable it to become more profitable. Threats arise when conditions in the external environment endanger the integrity and profitability of the company's business (Hill and Jones 2012).

External opportunities and external threats refer to economic, social, cultural, demographic, environmental, political, legal, governmental, technological, and competitive trends and events that could significantly benefit or harm a network or organization in the future. Opportunities and threats are largely beyond the

control of a single network or organization—thus the use of the term 'external' (David 2011).

Threats are characteristics of the external environment which may prevent the network or organization from achieving its strategic goals. Opportunities are characteristics of the external environment which have the potential to help the network or organization achieve or exceed its strategic goals. Task environment sectors are most relevant to strategic behavior and include the behavior of competitors, customers, suppliers, and the labor supply. The general environment contains those sectors which have an indirect influence on the network or organization but nevertheless must be understood and incorporated into strategic behavior. The general environment includes technological developments, the economy, legal, political and international events, natural resources, and sociocultural changes. Additional areas which might reveal opportunities or threats include pressure groups, interest groups, creditors, and potentially competitive industries (Daft 2010).

Keep in mind that the same environment may present opportunities to one network or organization and pose threats to another in the same industry because of differences in their management of resources.

4.4 Step 4: Analyzing the Resources of Networks or Organizations

At this point we move from an external viewpoint, outside the network or organization, to looking internally. For example, what skills and abilities do the network's or organization's employees have; has it been successful in new product innovation; what is the network's or organization's cash flow; how do consumers perceive the network or organization and the quality of its products or services? This step forces management to recognize that every network or organization, no matter how large or powerful, is constrained in some way by the resources and skills it has available.

Resources in the network or organization are defined as the tangible and intangible assets which are controlled by a network or organization, which it can use to conceive and implement its strategies. Examples of resources include a network's or organization's factories (a tangible asset), its products (a tangible asset), its reputation among customers (an intangible asset), and teamwork among its managers (an intangible asset). Capabilities are a subset of a network's or organization's resources and are defined as the tangible and intangible assets which enable a network or organization to take full advantage of the other resources it controls. That is to say, capabilities alone do not enable a network or organization to conceive and implement its strategies, but rather enable the use of other resources to conceive and implement such strategies. Examples of capabilities might include a network's or organization's marketing skills and teamwork and cooperation among its managers (Barney and Hesterly 2008).

Internal factors can be determined in a number of ways, including computing ratios, measuring performance, and comparison to past periods and industry averages. Various types of surveys may also be developed and administered to examine internal factors such as employee morale, production efficiency, advertising effectiveness, and customer loyalty (David 2011).

4.5 Step 5: Identifying Strengths and Weaknesses

The analysis in Step 4 should lead to a clear assessment of the network's or organization's internal resources (such as capital, technical expertise, skilled workforce, and experienced management). It should also indicate the network's or organization's ability to perform different functional activities (such as marketing, production and operations, research and development, financial and accounting, information systems, and human resources management). Any activities the network or organization does well or any resources that it has available are called strengths. Weaknesses are activities which the network or organization fails to perform do well, or resources which it requires but does not possess at this stage.

Internal strengths and internal weaknesses are a network's or organization's controllable activities which are performed especially well or poorly. Such strengths and weaknesses may arise in the management, marketing, finance/accounting, production/operations, research and development, and management information systems activities of a business. Identifying and evaluating strengths and weaknesses in the functional areas of a business is an essential strategic management activity. Networks and organizations strive to pursue strategies which capitalize on internal strengths and eliminate internal weaknesses. Strengths and weaknesses are determined relative to competitors, and any relative deficiency or superiority is information of vital importance. Furthermore, strengths and weaknesses can be determined by elements of being rather than performance. For example, a strength may constitute ownership of natural resources or a historic reputation for quality. Strengths and weaknesses may be determined relative to a network's or organization's own objectives. For example, high levels of inventory turnover may not be a strength for a network or organization that never seeks to stock-out (David 2011).

The merging of Steps 3 and 5 results in an assessment of the network's or organization's internal resources and abilities and opportunities (Fig. 7) and threats in its external environment. This is frequently called SWOT analysis because it brings together any Strengths, Weaknesses, Opportunities, and Threats in order to identify a strategic niche which may be exploited by the network or organization.

In light of the SWOT analysis, management also re-evaluates its current mission and objectives. Are they realistic? Do they need modification? Are we where we want to be right now? If changes are needed in terms of overall direction, this point is where such changes are most likely to originate. If no changes are necessary, management is ready to begin the actual formulation of strategies.

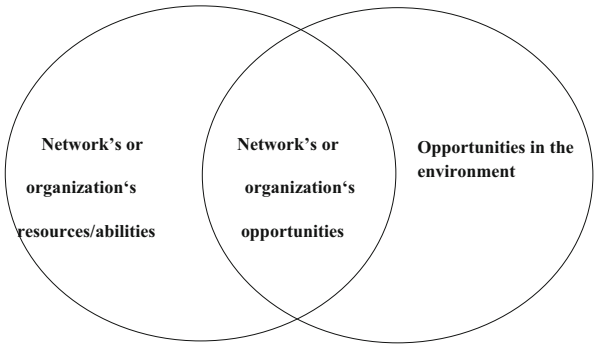

Fig. 7 Identifying the network's or organization's opportunities

4.6 Step 6: Formulating Strategies

It is of the utmost importance that strategies are established for the corporate, business, and functional levels. Management needs to develop and evaluate strategic alternatives and subsequently select strategies that are compatible at each level and allow the network or organization to best capitalize on its strengths and environmental opportunities. Net creation of business strategy is among the most crucial phases of long-term planning, and is based on the defined mission and vision of the network or organization and set strategic objectives. The strategy development phase requires sufficient information from an analysis of the external and internal environment. From an analytical perspective, the formation of business strategy includes the following activities (Hittmár 1999; Hittmár and Jankal 2013):

- formulation of a basic strategy,
- selection of the type of strategy,
- creation of policy options,
- evaluation and selection of the most suitable alternative strategies.

The processes of strategy analysis and choice seek to determine alternative courses of action which could best enable the network or organization to achieve its mission and objectives. The network's or organization's present strategies, objectives, and mission, coupled with both external and internal audit information, provide a basis for generating and evaluating feasible alternative strategies. Unless the network or organization is confronted with a desperate set of circumstances, alternative strategies will likely represent incremental steps which move the network or organization from its present position to a desired future position. Alternative strategies do not come out of the wild blue yonder; they are derived from the network's or organization's vision, mission, objectives, external audit, and internal audit, and are consistent with, or build on, past strategies which have worked well. Strategists never consider all feasible alternatives which could benefit the network or organization due to the fact that there are an infinite number of possible actions and an infinite number of means to implement those actions. Therefore, a manageable set of the most attractive alternative strategies must be developed. The

advantages, disadvantages, trade-offs, costs, and benefits of these strategies should be determined (David 2011).

Step 6 is complete when management has developed a set of strategies which will give the network or organization a competitive advantage. That is, management will seek to position the network or organization to gain a relative advantage over its rivals. This requires a careful evaluation of the competitive forces which dictate the rules of competition within the industry in which the network or organization functions. Successful managers will choose strategies which give their network or organization the most favorable competitive advantage; they will subsequently try to sustain that advantage over time.

4.7 Step 7: Implementing Strategies

Implementation is the penultimate step in the strategic management process. A strategy is only as good as its implementation—no matter how effectively a company has planned its strategies, it cannot succeed if the strategies are not implemented properly. The remaining chapters in this book address a number of issues related to the implementation of strategy.

Successful strategies require a properly matched structure. If a network or organization significantly changes its strategy, it must therefore make the appropriate changes to its overall structural design. In fact, it will be demonstrated later in this publication that many of the new organizational structural designs are means by which networks or organizations cope with environmental and strategic changes.

Implementation is arguably the most critical point of long-term planning. A strategy which is not implemented by its very nature cannot be thought of as strategy. Although the implementation phase reflects a follow-up to strategy formulation, a capable manager even begins to consider implementation during the previous phase. It would be erroneous if implementation was understood formally as the administrative implementation of a ready formulated strategy. Fine-tuning of existing strategies alters the focus of the strategic planning process from conception to implementation of the strategy, which represents a shift from the process of formulating the program to specific—sometimes unpleasant—realities, compromise, conflict, and to confusion and errors. The means by which the implementation of strategy is realized, is considered the key to business success.

Implementation is arguably the most important, yet the most difficult, part of strategic management. Indeed, many struggling companies may have file drawers full of winning strategies, but managers are unable to effectively implement them. No matter how brilliant the formulated strategy, the network or organization will derive no benefit if it is not skillfully implemented. The implementation of strategy requires that all aspects of the network or organization be in congruence with the strategy, and that the efforts of each individual be coordinated toward the accomplishment of strategic goals. Strategy implementation involves using several tools—parts of the network or organization which may be adjusted to put strategy

into action. Once a new strategy is selected, it is implemented through changes in leadership, structure, information and control systems, as well as human resources (Daft 2010).

The strategic-management process does not end when the network or organization decides which strategy or strategies to pursue. A translation of strategic thought into strategic action must take place. This translation is much easier if managers and employees of the network or organization understand the business, feel part of the company, and have become committed to helping the network or organization succeed through involvement in strategy formulation activities. Without understanding and commitment, strategy implementation efforts face major problems. Implementing strategy affects a network or organization from top to bottom; it affects all the functional and divisional areas of a business. It is beyond the purpose and scope of this text to examine all of the business administration concepts and tools which may be considered important in strategy implementation. Many networks or organizations tend to spend an inordinate amount of time, money, and effort on developing a strategic plan, treating the means and circumstances under which it will be implemented as afterthoughts. Change comes through implementation and evaluation, not through the plan itself. A technically imperfect plan which is implemented well will achieve more than a perfect plan which never gets off the paper on which it is typed (David 2011).

4.8 Step 8: Evaluating Results

The final step in the strategic management process is evaluating results. How effective have our strategies been? The best formulated and best implemented strategies become obsolete as a network's or organization's external and internal environments change. It is essential, therefore, that strategists systematically review, evaluate, and control the execution of strategies. The strategic-management process results in decisions that can have significant, long-lasting consequences. Erroneous strategic decisions can inflict severe penalties and can be exceedingly difficult, if not impossible, to reverse. Most strategists agree, therefore, that strategy evaluation is vital to a network's or organization's well-being; timely evaluations can alert management to problems or potential problems before a situation becomes critical. Strategy evaluation includes three basic activities (David 2011):

- examining the underlying bases of a network's or organization's strategy,
- comparing expected results to actual results, and
- taking corrective action to ensure that performance conforms to the plan.

Adequate and timely feedback is the cornerstone of effective strategy evaluation. Strategy evaluation can be no better than the information on which it is based. Too much pressure from top managers may result in lower-level managers contriving numbers which they believe will be satisfactory. Strategy evaluation can be a complex and sensitive undertaking. Too much emphasis on evaluating strategies

may be expensive and counterproductive. No one likes to be evaluated too closely. The more managers attempt to evaluate the behavior of others, the less control they have. Yet too little or no evaluation can create even worse problems. Strategy evaluation is essential to ensure that the stated objectives are being achieved. In many networks or organizations, strategy evaluation is simply an appraisal of how well a network or organization has performed. *Have the assets increased? Has there been an increase in profitability? Have sales increased? Have productivity levels increased? Have profit margin, return on investment, and earnings-per-share ratios increased?* Some networks or organizations argue that their strategy must have been correct if the answers to these types of questions are affirmative. The strategy or strategies may have been correct, yet this type of reasoning may be misleading because strategy evaluation must have both a long-term and short-term focus. Strategies often do not affect short-term operating results until it is too late to make the necessary changes (David 2011).

The final stage of working on a strategy at once completes the process and provides feedback relating to previous phases. This will ensure a continuous reaction to factors influencing the internal and external business environment. This phase is not merely an evaluation of the results achieved, but also provides an opportunity to identify the causes of any differences between achieved and expected results. Thanks to the receipt of feedback, it is possible at this stage to make corrections and changes to the previous stages of the process. The entire process of strategic management is therefore continuous.

5 Conclusions

Strategic management is mainly a reaction to the current, changing conditions and emerging trends in the development of a market economy. This understanding of strategic management emphasizes in particular:

- the openness of organization as a system,
- a change in the view of the role and work of managers,
- the use of methods and techniques to resolve problems and make changes.

The orientation of enterprise in unstable conditions, finding the right direction in which to take the organization, and the selection of pathways to future objectives are the key tasks of a management company. The changing social and economic environment has brought about a number of new values and expressions, which require the preparation of one's own ideas for the longer-lasting and more comprehensive functioning of the business. One of the most important tasks for a manager, entrepreneur or business owner is the need to implement ideas for the future, and then—at the stage of its own functioning—to know how to manage their activities.

Theoretically and practically mastered strategic management enables the network to not only survive, but allows the network and its members to achieve success and a leading position in the relevant industry. It encourages the will to win, the

setting of ambitious goals and the choice of brave and surprising strategies. Strategic management is of vital importance in today's uncompromising times if the network hopes to push through and survive in a changing market environment.

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Alliances Amongst Companies in the Network Model of International Expansion

Renata Oczkowska

Abstract The paper discusses the significant role played by alliances in the network model of enterprise internationalization. It presents definitions and a discussion of alliances, mainly non-equity ones, as a mode of enterprise expansion onto world markets. Against the background of theoretical deliberations, the size and structure of non-equity alliances is discussed as a means of international expansion with reference to information published by UNCTAD. Special attention is paid to contract manufacturing, offshoring services, franchising agreements and managerial contracting. In conclusion, it is proven that in the international expansion of enterprises, simultaneous use of various forms of engagement occurs, among which the significance of non-equity alliances based on partnership agreements is growing in popularity. The use of international contract manufacturing and offshoring services has become a broadly applied practice within numerous firms. International contract manufacturing of cheaper intermediate products and finished goods has spread in traditional sectors, mainly clothing and footwear, but also in modern sectors, such as the electronics, aviation and automotive sectors. The study conducted by UNCTAD concerning the choice made by enterprises as regards the mode of international expansion has proven that dynamic growth of mergers and acquisitions, as well as non-equity investment, took place between 2012 and 2014.

1 The Network Model of International Expansion of Enterprises

The network approach, which emphasizes the significance of a firm's connections in the process of internationalization with various entities within the business environment, namely buyers, suppliers and competitors, is a modern concept of enterprise internationalization. These connections enable the vital process of internationalization of a business and determine its behavior in the internationalization

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process (Fonfara 2009: 15). In this concept, an enterprise is an element of a system in which numerous entities function, mutually influencing each other.

The problem of networks is fast becoming one of the most topical threads of research into the functioning of enterprises and the market, as well as enterprise management from the point of view of the improvement of effectiveness and strategic position. The importance of networks as the third mode of organizing and coordinating business activity, in addition to the market and hierarchy, is increasing, as is the role of networks in reducing operating costs and multiplying knowledge as a strategic resource of enterprises (Zorska 2007: 203).

In the literature it is assumed that networks comprise a set of an organization's vertical and horizontal connections with other participants of the market (suppliers, buyers, competitors or non-profit organizations, among others) of different dimensions: local, sectorial, international, and worldwide (Gulati et al. 2000). If they are of a relatively permanent character and strategic significance, they are known as strategic networks. They provide enterprises with access to information, resources, markets, and technologies, owing to which they may achieve benefits from learning, and economies of scale and scope. The basic structure of the network model includes three types of elements: entities, activities and resources, which are linked by mutual relations. Entities are all market participants whose connections arise from the social division of labor. Activities may be divided into actions performed under the control of one entity (manufacturing of goods, research and development, etc.) and actions which require the involvement of two or more entities based on the exchange of resources or undertaking joint actions. Resources include technical resources (including patents and licenses), raw materials and materials, human capital, marketing, and financial capital (Kutschker and Schmidt 2011: 534).

The three aforementioned groups of the network model are connected by the relations therein, as a result of which networks are formed. A network influences its participants in two ways. The first adopts the form of the flow of information in the network and defines the rules of sharing it. The second refers to differences which result from the position of individual market participants, and which release the power of impact and control the level of imbalance. The position a firm takes in the network is of great strategic value and expresses its power and impact on the network (Surówka-Marszałek 2008: 52).

According to the network approach, the internationalization of a firm means the establishment, maintenance and development of relations with the participants of a network on overseas markets. Therefore, enterprise internationalization is a result of its efforts to strengthen its position by extending the network of connections outside the domestic market.

In the network model, internationalization means building and strengthening the position of an enterprise by generating and utilising connections with other foreign partners in the network, which can take place in three ways:

– building its position with reference to new foreign entities within the network (international extension),

– strengthening its position and increasing the allocation of resources in relation to those foreign entities with which a given enterprise was connected by a certain bond in the past (penetration),
– increasing the level of coordination between the positions of an enterprise in various networks (international integration) (Gelbrich and Müller 2011: 1051; Limański and Drabik 2010: 46; Sroka 2012: 103–109).

In addition to the internationalization of individual enterprises as participants in the network, the internationalization of the entire network also takes place, which is manifested in an increase in the number and the strength of connections in the global cross-section. A high level of internationalization means that numerous strong connections with entities on foreign markets exist.

In the network concept, the internationalization process is perceived as interactive. Mutual influence may concern the firm's entities (internalization), but also external entities belonging to the network. Interactions among the entities are both the cause and the effect of changes both within the enterprise and the network. Thus, internationalization is an effect of interaction and the development of relationships. In this approach we deal with a set of multilateral connections and dependencies. While in the traditional concept the internationalization process is mainly based on the enterprise's own resources, in the network approach the power of a firm also comes from interactions and connections with other participants on the market.

An increase in the importance of network resources is closely related to the processes of globalization. Clarke-Hill et al. (1998) observe that participation in networks has become a means to the rationalization of operations, overcoming barriers to entry and maintaining the competitive position of an enterprise on the global market. Enterprises competing on the worldwide market broadly participate in various types of strategic alliances (agreements with actual and potential competitors), using them as means of entering foreign markets, and conclude long-term agreements with suppliers to organize so-called global sourcing, that is sourcing on a worldwide scale (Murray 2001).

2 Non-equity Alliances as a Form of Connection to Other Market Participants

2.1 The Notion and the Essence of Strategic Alliance

In the activities of contemporary enterprises on international markets, an important position is occupied by various forms of cooperation. International cooperation consists of establishing long-term joint ventures based on mutual agreements between at least two enterprises from different countries, the content of which is bilateral cooperation in a broadly understood manufacturing process, from research and development through investment and production to marketing (Balling 1998:

12–17). This type of activity develops in the form of strategic alliances. At present, alliances are considered to be one of the most significant trends in the development of the global economy. There is a significant degree of non-homogeneity in defining this notion. Studies of the literature of the subject enable us to distinguish two groups of the definitions of alliances: the broad and the narrow representation respectively.

A broad understanding of alliances indicates that alliances can be concluded by enterprises both with suppliers and recipients, as well as with present or potential competitors; thus, they can be of both horizontal and vertical character. Within the framework of those two fundamental representations of alliances, we can discern definitions differentiating the legal and organizational forms of cooperation; spatial range (domestic, international); the scope of cooperation; and the resources brought therein.

A commonly known definition of the term 'alliance', characterized by broad definitions, was proposed in the mid-1980s by scientists from the Business School in Fontainebleau. According to their suggestion, an alliance is a relationship between enterprises whose intention is the fulfillment of a common goal by the partners (Morris and Hergert 1987). This means that every cooperation agreement is an alliance, regardless of its organizational and legal form, the spatial range, and the scope of cooperation or the resources supplied.

A narrower understanding of alliances is presented by Meffert and Boltz (1994: 124–125), as well as Bronder (1995: 13), who opine that strategic alliances comprise two or more independent enterprises which are current or potential competitors which, by combining their own resources for the fulfillment of intended goals, achieve a better competitive position. On the one hand, an alliance should ensure the growth of the potential of resources, and on the other hand, cost and risk should be spread among the participants. This definition indicates horizontal cooperation between a minimum of two legally and economically independent enterprises due to one or many actions and the mutual exchange of achievements, whereby all the participating enterprises bring in their own resources. This means that strategic relationships between enterprises cooperating in one value chain cannot be categorized as an alliance.

In the light of the above terminological discussion, we can assume that a strategic alliance is an agreement not only between competitors, but also between suppliers and recipients, which consists of the mutual transfer of resources between partners for the fulfillment of the shared goal, which is the improvement of competitive position. In the latest concepts of alliances, it is not only the significance of concluding an alliance agreement and its lasting nature which is emphasized, but also the dynamics thereof (Doz and Hamel 1998: 5). Understood thus, an alliance becomes one of the important options for the strategic development of an enterprise intending to be an active participant on the international and global market, as cooperation in the form of an alliance is the second form of undertaking rivalry, after competition.

2.2 Alliances: Cooperative Non-equity Connections

Relatively long-term relations with foreign partners are ensured by cooperative connections. Among alliances, we can distinguish non-equity alliances and equity alliances. In the case of non-equity alliances, the relations of an enterprise with foreign partners consist of the conclusion of contracts and agreements between partners, but partners do not combine their equities in joint enterprises. Non-equity alliances can take the form of: licenses, franchise agreements, management contracts, "turnkey" investment contracts, and contract manufacturing.

In *license contracts* a foreign licensor, subject to payment, provides a local licensee with the opportunity to use a reserved brand, structure, technology or know-how for a definite period and usually on an established territory (Hollensen 2001: 265–272; Stępień 2011: 148). A type of license agreement can also consist of granting the licensee the rights to the exclusive sale of licensed products on the internal market or on the markets of neighboring countries, alongside promotional or service activity. This entry strategy has numerous inherent advantages. First of all, it creates an opportunity for relatively easy and swift entry onto a specific foreign market which, on the basis of a detailed marketing analysis, is an area ripe for the potential and spatial penetration of the enterprise, without the necessity of incurring the high costs of initial investment. The volume of production and domestic demand remain unchanged on that occasion, since the firm's structure and production programs focused on the domestic market do not change. The sale of the license enables a firm to popularize a product or a producer's brand on markets on which its direct presence is not possible. The conclusion of a license agreement can also serve long-term goals, i.e. constitute an initial position for further expansion onto the licensee's market in the event that the market is protected by economic, political or legal barriers.

In contrast to the benefits related to the sale of licenses, serious drawbacks must also be carefully considered. The biggest threat for the licensor is the potential possibility that in the future the licensee will become a dangerous competitor on third markets, or even on the home market. Therefore, in the license agreement, the licensor tries to prevent the threat of an uncontrollable diffusion of technologies (Berekoven 1985: 42–45). Non-observance of product quality standards by the licensee can result in severe damages to the licensor, if products are manufactured and sold under its brand. Such circumstances threaten to bring about the impairment or even the loss of the positive image of the brand and the firm, and thus a weakening of its reputation. Thus, to reduce the potential negative effects of the agreement, the proper choice of a license agreement partner who should possess adequate experience, considerable market share, sales network, and more besides, as well as the precise formulation of the license contract, is of vital importance.

On the basis of a *franchise agreement*, a franchisee runs its own enterprise under the franchisor's control, paying for the privilege of its reputation and know-how (Welge and Holtbrügge 2006: 109–110). The object of the contract is a package deal including the right to use the trademark, as well as assistance in preparing the

business activity, training the staff or in advertising. The basic condition of a franchise agreement is the franchisee's submission to the standards defined by the franchisor and concerning equipment, décor, the product range, the quality of products and services, and so on. Industries with particularly strong and common franchise connections on an international scale are service sectors such as petrol stations, fast-food restaurants, hotels or car rental companies (Domański 2001: 94–95).

A franchise agreement brings certain benefits but poses certain threats at the same time. The benefits of franchising as an international market entry strategy are determined by relatively low expenditure on system creation; opportunities for rapid expansion with little capital involvement; takeovers on large and distant markets; and the flexibility of the system, namely the ease of reaction to the conditions of the business environment. Among the negative aspects are: strong dependence on qualified staff; and the fact that after gaining some knowledge and experience, the franchisee may detach from the system and become a competitor (Berndt et al. 1999: 134–135).

In the case of franchising on an international scale, a local enterprise is most often used, as such an enterprise is familiar with the local conditions and can adjust the system created by the franchisor to suit the specific set of circumstances. It is also possible to conduct franchising activity via a foreign branch which can conduct franchising on its own behalf and launch its own points of sale or sell the concept to other firms. However, using a branch to conduct franchising is only possible in large corporations which also undertake international expansion in the form of direct investment (Gorczyńska 2008: 100).

Taking into consideration the character of activity being the object of a franchise agreement, we can distinguish: distribution; production franchising in which the object of exchange is the patented technology of production; service franchising; and mixed franchising (Stępień 2011: 148).

Franchising is a form of international expansion similar to licensing. However, we may observe differences between the two, which concern the object of the agreement; the parties to the agreement; the term of the agreement; as well as product development (Gorynia 2007: 45). The subject of a license agreement is usually a selected element of the business (technology, trade mark, know-how), whereas franchising is usually related to the transfer of rights concerning the comprehensive conducting of business activity. In license agreements, the purchasers of the object of the license are usually enterprises with an established market position, and in the case of franchising they are usually start-ups. License contracts facilitate somewhat broad opportunities to negotiate the terms and conditions of agreements, whereas franchise agreements require the franchisee's adaptation to a uniform system. The term of license agreements is usually lengthy and can even last up to several years, while in the case of franchising this term is usually shorter, and agreements are more often renewed. In the case of license agreements, the licensor does not undertake to pass on advances in the development of the product, whereas under franchising, the franchisor passes improvements on to the partner.

Managerial contracts are a specific form of entry onto foreign markets, in the form of an agreement to manage an enterprise located abroad, either in part or in its entirety. The seller brings to the firm its know-how and its professionalism in management, organizational culture, marketing concepts and its own individual style of work, which is to say the factors which helped it achieve a prominent position on the domestic market. In practice, management contracts concern specific processes and projects, related, for example, to restructuring, the modernization of a plant, or modernization of the management process, and have a varied time scale ranging from a few months to a few years. Contracts of this type are usually concluded by firms with considerable international experience, whose competitive advantage arises from their highly qualified staff.

Providing managerial services to a foreign partner may concern individual management functions: production management, finance management, HR management, and marketing management (Limański and Drabik 2010: 46). In managerial contracts, management functions are entrusted to another firm in return for remuneration. Typically, the scope of management operations is limited in the agreement and more important decisions have to be taken with the "hirer's" consent. A managerial contract as a form of international expansion is frequently related to other agreements concerning cooperation between enterprises from different countries, e.g. investment, agreements for the sale of goods, license agreements, franchise agreements or turnkey project contracts.

One can distinguish numerous detailed agreements enabling no-investment entry and the presence of an enterprise on a foreign market, combined with the introduction of its products to that market, with the use of various forms of production. For example, among them we can discern turnkey project agreements, make-to-order production agreements, assembly agreements or contract manufacturing (Rymarczyk 2004: 176–179).

Turnkey project agreements enable a firm with considerable potential and a renowned position on the domestic, as well as international, market to enter a foreign market. Contracts of this type concern significant investment ventures exceeding the capabilities of local contractors, as a result of which the decision is made to purchase a service abroad. The object of the contract may be broad and may comprise services, such as the execution of pre-investment studies, the execution of an investment task, training the staff, organizational and technical commissioning, and also management contracts in certain circumstances. Such contracts are typically accompanied by the sale of licenses and the supply of machines and devices. The investment contractor undertakes to develop a production plant, train staff, as well as to manage the plant periodically, which in practice means signing a managerial contract.

Make-to-order production agreement consists of hiring the production capacity of an enterprise located abroad. The enterprise, on entering a given foreign market, is obliged to undertake or facilitate supplies, coordination, market research and other marketing activities. Tasks are limited by the strict implementation of the order.

An assembly agreement is a form of internationalization enabling the completion of the last link of the production process not in the home country but abroad, often with the use of components from another country. The premise of this entry form is first of all the lower costs of work and production abroad, as well as the chance of the successful fulfilment of the market penetration strategy, and high protectionist barriers protecting the market of a given country against the import of finished goods.

Contract manufacturing is concluded between an enterprise which implements, for example, a managerial contract or a turnkey project agreement on a foreign market, and a firm operating on that market. Subcontractors for the general contractor are usually reputable enterprises specializing in a specific product (complex services) attractive to the general contract executor. The supplier operates under its own brand, namely as the manufacturer of the products or the provider of services offered in a broader set by the ordering party. This form of cooperation may be called the offshoring of production or manufacturing (World Investment Report 2011).

3 Non-equity Forms of International Expansion of Enterprises

3.1 The Size and the Structure of Non-equity Alliances

In the past, transnational corporations created their international production networks mainly based on foreign direct investment, forming international networks comprising branches. With time, corporations began to build networks—within the global value chain—comprising both their own local offices and partner firms. It is believed that the most important of the basic competences of international corporations is the ability to control and coordinate actions within the global value chain. Non-equity alliances include, according to the UNCTAD classification, production contracts and the outsourcing of services (offshoring on foreign markets), license, franchise agreements and managerial contracts.

From a strategic point of view, the integration of economies developing within global value chains requires not only the attraction of foreign direct investment but also winning partners for cooperation, and utilising trade in an appropriate manner.

Non-equity cooperation on an international scale, as UNCTAD estimates indicate, generated sales of about USD 1.2 billion and added value of about USD 0.4 billion in 2010 (Table 1). Within non-equity agreements, between 18.3 and 20.9 million workers were employed, including 14–16 million people in developing countries.

The greatest value of sales was realized within contract manufacturing, with a value estimated at USD 710–765 billion; followed by franchise agreements with a value of USD 330–350 billion; license agreements with a value of USD 340–360

Table 1 Estimated sales, value added, and volume of employment according to non-equity forms of expansion in selected industries in 2010

Specification	Sales (in billions of US dollars)	Value added (in billions of US dollars)	Employment (in millions of people)	Employment in developing countries (in millions of people)
Contract manufacturing selected capital-intensive sectors:				
Electronics	230–240	20–25	1.4–1.7	1.3–1.5
Car parts	200–220	60–70	1.1–1.4	0.3–0.4
Pharmaceutical	20–30	5–10	0.1–0.2	0.05–0.1
Contract manufacturing selected labor-intensive sectors:				
Clothes	200–205	40–45	6.5–7.0	6.0–6.5
Shoes	50–55	60–70	1.7–2.0	1.6–1.8
Toys	10–15	5–10	0.4–0.5	0.4–0.5
Outsourcing services				
IT and business services	90–100	50–60	3.0–3.5	2.0–2.5
Franchising				
Retail trade, hotels, restaurants, business services and others	330–350	130–150	3.8–4.2	2.3–2.5
Managerial contracts				
Hotels	15–20	5–10	0.3–0.4	0.1–0.15

Source: World Investment Report (2011)

billion; outsourcing services with a value of USD 90–100 billion; and managerial contracts with a value of USD 100 billion.

On the basis of the data published, one can claim that contract manufacturing alongside service outsourcing is the prevailing form of non-equity international expansion of enterprises, both with regard to the volume of sales, the generated value added, as well as employment both in total and in developing countries. Alongside the intensification of global competition and the globalization of economic activity, traditional and classic forms of expansions, e.g. exports, licenses or franchising, are losing ground to advanced and modern forms, namely their own subsidiaries outside home countries and contract manufacturing and outsourcing/offshoring services—the activity of which comprises all areas including research and development and the coordination of competitive activity.

4 Contract Manufacturing and Offshoring Services

It is worth mentioning that contract manufacturing includes, according to the UNCTAD approach, agreements on the production or services within the global value chain with a foreign firm. Such an interpretation of contract manufacturing

fits into the outsourcing/offshoring category (Oczkowska 2013: 177–181). Outsourcing services, according to the UNCTAD understanding, are related to the externalization of support processes, including IT, business and the knowledge function. Therefore, we can claim that contract manufacturing and outsourcing services can be regarded as offshoring, that is moving the implementation of production and service processes abroad to an external entity in the case of contract manufacturing, and either an external entity or one's own subsidiary in the case of outshoring services.

The object of outsourcing/offshoring can be support for services, for example, supervision of elements of the IT system, telecommunications, consulting, or promotion, as well as key elements of the conducted activity, or even the entire links comprising the firm's value creation, e.g. project and research activity, logistics, or the supply of intermediate products and components.

The choice of offshoring as a form of internationalization is a strategic decision, and the fundamental motive is the search for the best conditions in which to earn profits owing to the possibility of reducing costs, obtaining access to markets, increasing work efficiency, improving the quality of services, and finally gaining new competences and knowledge. Enterprises may decide to move business activity offshore, thus undertaking the fragmentation and optimization of their own value chain on a global scale. The strategy of international outsourcing, particularly within the scope of contract manufacturing, is above all implemented by transnational corporations from the USA, Western Europe and Japan—both in capital-intensive sectors such as electronics, automotive, and pharmaceuticals, and labor-intensive ones such as the clothes, shoe and toy sectors.

As an example, the largest corporations in the electronics and telecommunication sectors, such as Apple, Dell, HP, IBM, Nokia, Siemens; the automotive sector, such as General Motors, Chrysler, BMW, Toyota, Volkswagen, or Suzuki; and the pharmaceutical industry, such as Bayer, GlaxoSmithKline, Pfizer or Pharmaceuticals, outsource a considerable proportion of their production to foreign partners, especially businesses from Asian and Latin American countries which have access to attractive factors of production and location. Owing to close cooperation and coordination of operations with the ordering party, they are able to manufacture high-quality and low-cost products (World Investment Report 2011).

The use of offshore sourcing becomes an element of the competition strategy of enterprises which are in search of access to new technologies, quality, as well as the promptness and flexibility of supplies. The development of offshore sourcing enables such organizations to improve enterprise competitiveness. The use of numerous sources of outsourcing is a significant element of enterprise strategy at the globalization stage. Among the ten largest IT-BPO service outsourcing enterprises worldwide, as many as five are American firms which possess numerous service centers, both in developed and developing countries (Table 2) (World Investment Report 2011).

On the other hand, among the biggest outsourcing firms located in developing countries, corporations from India are most prevalent. International outsourcing corporations function on the Indian market, servicing global clients on the basis of

Table 2 The largest IT-BPO service outsourcing enterprises worldwide and in developing countries in 2009

Name of enterprise	Country	Sales (billions of US dollars)	Employment (thousands of people)	Major service centers—number, localization
10 largest worldwide				
International Business Machines	USA	38.2	190	IBM has over 50 IT-BPO service centers in more than 40 countries, mainly in developing countries
Hewlett-Packard	USA	34.9	140	The key centers are located in USA, India and Great Britain, HP services are located in over 50 countries. 7 global business centers in India, China, Singapore, Mexico, Costa Rica and Spain
Fujitsu	Japan	27.1	18	Has 91 data and service centers in 16 countries worldwide, among others in Great Britain, Finland, Australia, China, Singapore and the Philippines
Xerox	USA	9.6	46	Global service centers are located in India, Mexico, the Philippines, Jamaica, Ghana, Brazil, Guatemala, Chile, Argentina, Spain and Poland
Accenture	Ireland	9.2	204	Has a global network of over 50 centers located in both Americas, Central and Eastern Europe and Africa
NTT Data Corp.	Japan	8.9	35	NTT is located in the USA, Great Britain, China, India, Singapore and the Philippines
Computer Sciences Corporation	USA	6.5	45	Service centers are located in China, India, South Asia, Eastern Europe, Australia, Singapore and Vietnam
Cap Gemini	France	6.1	109	The firm is present in over 36 countries; service centers are located in India, Romania, Vietnam, Australia, and Poland
Dell	USA	5.6	43	Performs operations in India, Europe, Latin America, Canada and the Philippines

(continued)

Table 2 (continued)

Name of enterprise	Country	Sales (billions of US dollars)	Employment (thousands of people)	Major service centers—number, localization
Logica	Great Britain	5.5	39	Conducts service activity in more than 35 countries, among others in India, the Philippines, Morocco, Malaysia and in Eastern European countries
5 largest in developing countries				
Tata Consultancy Services	India	5.2	160	Conducts service activity in Latin America, Eastern Europe, South-east Africa and in the Pacific region
Wipro	India	4.2	108	Present in USA, France, Germany, Australia, Holland, Japan, Sweden, Great Britain, as well as in Malaysia, Vietnam, Indonesia, the Philippines, Poland, Brazil and China
China Communi-cations Services	China	2.7	127	–
Sonda	Chile	0.9	9	–
HCL Technologies	India	0.8	54	–

Source: World Investment Report (2011)

cooperation agreements lasting several years. The largest of these companies are Tata Consultancy Services (TCS), Wipro and HCL Technologies. The largest Indian firms have subsequently initiated the process of outsourcing to cheaper markets, e.g. China or the Philippines, and have also commenced expansion to Western Europe. Therefore, the biggest Indian service providers, e.g. Tata Consultancy Services or Wipro, in much the same vein as their Western clients, diversify their activity geographically and are present on all continents. Their presence in USA and Western European countries, such as France, Germany or Holland, is worth emphasizing.

Owing to the competitive costs of labor and the vast potential of educated and fluent English-speaking employees, India has become the world center of service offshoring, first of all in the IT and financial industries, but also telephone customer service (call centers). India and China are acknowledged as the most beneficial locations for offshoring activity, which is confirmed by the Global Services Location Index 2011 prepared by a global strategic consulting firm, A.T. Kearney, which considers three major factors determining the attractiveness of offshoring in various countries: the cost of human resources, skills and availability of the workforce, as well as the quality of the business environment (Oczkowska 2011). India is the most attractive location for offshoring, mainly for US enterprises, as it exceeds other countries in terms of costs, the availability of specialists, command of the English

language, IT infrastructure and experience in the IT sector. The factors which attracted investors to the IT services sector were availability and the high level of education of specialists in the IT sector (Liberska 2008: 246–248). Other Southeast Asian countries were characterized by similar advantages; indeed, increasingly frequently chosen alternatives to India and China are Malaysia, Thailand or Indonesia.

Enterprises are increasingly choosing to move their activity to Central and Eastern European countries. The attractiveness of that region is growing due to the availability of employees possessing specialist skills, the high standard of education, cultural proximity and a friendly climate for foreign investors. The most attractive localizations for offshoring in this part of Europe are the Czech Republic, Hungary, Poland and Slovakia, and to a growing extent Bulgaria, Romania, Lithuania, Latvia and Estonia. In the case of SSCs (shared service centers), firms which decide to isolate and relocate essentially must decide between Asian countries and Central and Eastern Europe. The first direction is particularly attractive for transnational corporations, whereas smaller international firms tend to choose new European Union member countries.

The costs of labor in Central and Eastern Europe are twice as high as in India but are nonetheless significantly cheaper than in Western European countries. Moreover, we can observe that the availability and skills of workers are assessed better in India and in Western European countries than in Central and Eastern European countries, as with the business environment. Geographical closeness, economic connections, and cultural bonds provide an advantage to those countries as a location of services for Western Europe countries. Enterprises choose nearshoring which consists of transferring jobs not merely to the cheapest places but rather to areas geographically but also culturally close to a company's headquarters (Gabryszak and Foremna-Pilarska 2008).

We can assume that in the case of Central and Eastern European countries which have joined the European Union and are adapting their business environment to EU standards, geographical closeness will be an important factor influencing the competitiveness of that region for service offshoring. Offshoring is becoming an attractive form of the internationalization and globalization of enterprises, enabling them to achieve benefits in the form of cost reduction, access to sales markets, and a qualified workforce. However, when making a decision on offshoring as a form of international expansion, enterprises should consider the limitations: namely, difficulties in managing dispersed activity, as well as the costs of coordinating the network of business partners located in different time, geographical and cultural zones. Enterprises must also have an adequate information and communication technology (ICT) infrastructure.

4.1 Franchise Agreements

Franchise agreements are a form of international expansion, typical in the service sector, e.g. the hotel industry, catering industry, retail trade, or petrol stations. Franchising is treated as the most beneficial form of rapid and non-equity market

Table 3 The franchising system worldwide in the year 2010

Region	Number of franchising systems	Number of facilities (in thousands)	% share of foreign facilities	Sales value (in billions of US dollars)	Number of workers (in thousands)
World	30,000	2,640	15	2,480	19,940
Developed countries	12,200	1,310	10	2,210	12,400
Europe	7,700	370	20	340	2,830
Japan	1,200	230	5	250	2,500
USA	2,500	630	5	1,480	6,250
Developing countries and countries transforming their economies	17,400	1,330	30	270	7,540
Africa	1,600	40	70	30	550
Latin America and the Caribbean	3,800	190	20	70	1,810
Asia	11,200	1,070	25	170	4,810
Central and Eastern Europe and the Commonwealth of Independent States	800	30	50	5	370

Source: World Investment Report (2011)

expansion. The franchising system creates opportunities to serve geographically distant markets whose service would otherwise be impossible.

On the basis of information included in the World Investment Report 2011, we can observe that with regard to the number of franchising systems, developing countries and the countries transforming their economies are predominant. These nations have 17,400 such systems, which is 5,200 more than developed countries (Table 3). The share of foreign facilities is much higher in developing countries and is equal to 30 % of the total, whereas in developed countries it is only 10 %. This is a result of the expansion of franchise networks from developed countries to developing countries (Antonowicz 2012).

The highest value of sales is achieved by franchise networks in the USA, constituting almost 60 % of worldwide sales value. Franchise networks located in the USA also employ the greatest number of employees, at an approximate total of 6.25 million, which is over 30 % of the total number of workers within franchising systems worldwide. The number of workers in developing countries and in countries transforming their economies is 7.54 million, which constitutes 38 % of the total.

Among the biggest franchise networks in the world, fast food and hotel sectors prevail. The largest network is McDonald's, present in 117 countries with total sales of USD 70,693 million. Among the 15 largest franchise networks, as many as 12 are American networks, together with 7–11 of Japan, Circle K Stores of Canada and Holiday Inn Hotels & Resorts of Great Britain. The greatest level of

internationalization, at a level of 82 %, was achieved by 7–11 which has 29,225 units abroad. The next positions on the table, albeit with much lower indicators, were taken by KFC at 59 %, McDonald's at 56 %, Circle K Stores at 53 % and Hilton Hotels & Resorts at 52 %.

In Poland, franchise agreements began to develop after 1989, alongside the political and economic changes of the time. The precursors were foreign operators, such as Yves Rocher, Adidas and McDonald's. In 2011, the total number of franchise networks in Poland was 191. Polish enterprises have begun to expand in the form of franchising on foreign markets. Polish firms mostly invest in neighboring countries, such as the Czech Republic, Slovakia, Ukraine and Russia. Enterprises from the fashion industry, such as Reserved, Cropp Town, or House, are the leaders in this segment.

To sum up, it may be said that in the international expansion of enterprises, ever broader, simultaneous uses of various forms of engagement are occurring, among which the significance of non-equity alliances based on partnership agreements is increasing. The use of international contract manufacturing and offshoring services has become a widely applied practice among enterprises. Offshore sourcing of cheaper semi-finished products and finished goods has become widespread in traditional sectors, namely the fashion and footwear industries, as well as in modern sectors, namely electronics, aviation or the automotive industry.

Research conducted by UNCTAD on the subject of enterprises' expansion onto foreign markets revealed that dynamic growth of mergers and acquisitions, as well as non-equity investment, took place in the period from 2012 to 2014.

Globalization stimulates the rapid flow of goods, services and capital, the migration of people, and the rapid expansion of transnational corporations—which introduce the principles of strategic planning and the optimization of production on a global scale, as well as shifting industrial production to countries and regions of the world with lower production costs (low-cost economies). A new stage of globalization means a change in the localization of jobs, production and service provision, which is a consequence of changes in the functioning of enterprises, arising from their adaptation to an ever more competitive environment in which they have to operate in real time, and to the speed of associated technological changes.

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Relations Between Trust and Networks

Anna Sankowska

Abstract Given the increasing importance of networks in the organization of business activities, much attention is given to trust which is inherently linked to non-hierarchical forms of organization. Though trust has been relatively intensively studied, the prior research is rather fragmented. This chapter aims to integrate the theories of trust in networks by combining different streams of research looking separately at the consequences of trust for a network and the effects of networks on trust. A model combining these two perspectives is offered, suggesting that a high level of either trust or density can produce a virtuous cycle of exploitation.

1 Introduction

Networks are an increasingly important form of organizing current economic activities (Sroka and Hitmar 2013), providing a cost-effective means of achieving organizational goals (Williamson 1985) as well as access to complementary resources and opportunities (Pfeffer and Salancik 1978) required for ongoing business activities. They are a means to improve the business position of individual members by providing the advantages enjoyed by large-scale organizations and at the same time those of independent specialized members. They are increasingly organized around certain value creation activities such as R&D, productions, logistics, and marketing. They enable companies to put production factors into new combinations and exploit existing opportunities. It is an alternative to the internalization of activities provided with integration, which offsets the shortcomings of integration and large-scale organizations such as increasing administrative costs, a lack of economic discipline and focus on core competencies (Prahalad and Hamel 1990). However, differently to hierarchy, the network form requires a different method of governance, namely trust (Adler 2001). Trust therefore is a core concept in any scholarly discussion of networks. This importance of trust in networks is magnified when the object of the network cooperation is knowledge sharing or creation. Given the importance of trust in knowledge processes (Sankowska 2013b), in particular R&D networks, links with trust are hardly likely

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to be overstated, as knowledge is the most valuable resource exchanged in this kind of cooperation. Thus, studying trust in networks is important for facilitating R&D networks.

Trust has long been viewed as a useful way of conceptualizing and predicting interactions in organizations and cooperation (Argyris 1973; Arrow 1974; Likert 1967; McGregor 1960). Scientists have long argued that it fosters performance (Dirks and Ferrin 2001; Rus 2005). Prior extensive scholarly research has documented several positive outcomes of trust. The value of trust has been demonstrated in organizational settings (Dirks and Ferrin 2001; Shockley-Zalabak et al. 2000, 2010; Davis et al. 2000; Chow 2008; Sankowska 2013a, b).

Much attention has also been paid to the issue of trust in networks due to the increasing importance of alliances and other networked structures in the contemporary economy. However, the literature has to this point investigated the problems in a somewhat fragmented manner, focusing at one aspect at a time. In particular, literature is divided into two streams: one dominant stream focusing on the effects of trust on networks; the second marginal stream revolving around the impact of the network structure on trust. No single currently available explanation is sufficient to present an accurate overview of trust in networks. Thus, the goal of this chapter is to present a comprehensive model by tackling the two aforementioned perspectives. The current study builds on prior research to show the dynamic interactions between network variables and trust in the form of an integrated model. The main focus of analysis in this chapter is the network perspective as opposed to a corporate level. I advocate that it is better to interpret trust both from rational and structural perspectives and that they are not opposites but rather complementary in the cycle of trust in the network. The logic of this integrated approach is presented in Fig. 1.

There is no logical starting point for the model, as in reality the system can start from an initial level of general trust which evokes collaboration, or alternatively from interaction (structural capital) with the recognition of a common fate that leads to the establishment of trust.

2 The Notion of Trust and Networks

The role of trust is vital when interdependence between actors takes center stage as in the case of network organizations. Trust refers to the willingness to rely on the other partner in a situation involving the risk of opportunistic behavior with a positive expectation that this hazard will not eventuate (Mayer et al. 1995). It exists under conditions of uncertainty and complexity, which is often linked to information asymmetry between partners. It is important in guiding economic exchanges when the contractual arrangements are incomplete by nature or costly and therefore economically unfeasible to detail. It diminishes the perceived risk of opportunism, encouraging actors to act in various ways such as sharing sensitive information.

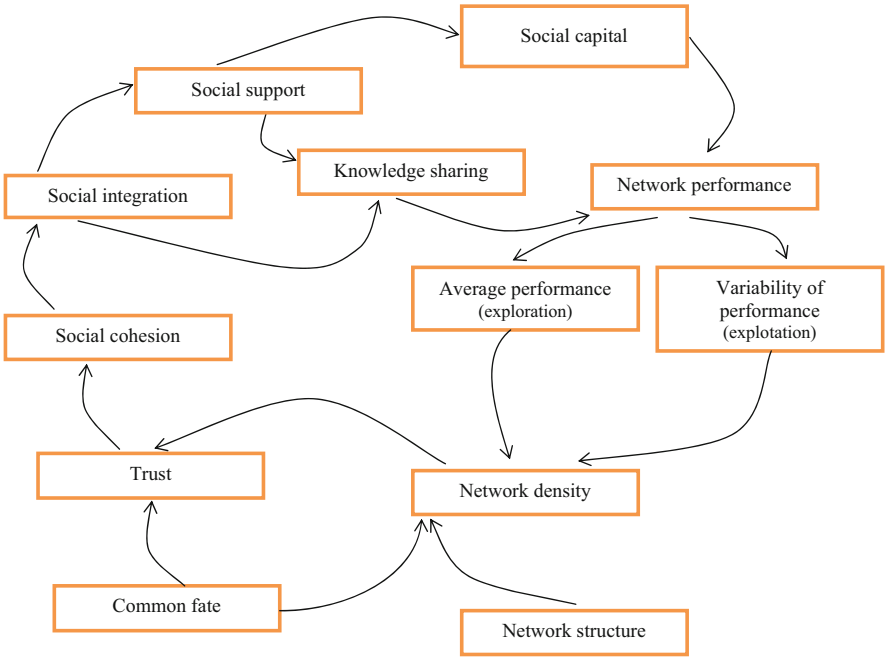

Fig. 1 Linking trust and networks

Social network is a distinct set of ties among a defined set of nodes (persons), with the additional property that the characteristics of these linkages may be used to interpret and predict the behavior of the nodes involved (Mitchell 1969: 2). Within this structure of relations reside different resources which may be utilized by actors. Such resources tied to networks are referred to in the literature as social capital (Lin 2001; Burt 1992). Thus social capital is resources embedded in social networks (Lin 1999; Song et al. 2011). Different and competing approaches to interpretation of the consequences of social capital for competitive advantage are advocated in the literature.

The theory of closure as exemplified by Coleman (1988) states that a cohesive network in which actors are highly connected fosters performance. Burt (1992) posited that access to a large number of nodes that are perhaps not so closely connected is most important, as it provides faster access to information on opportunities and threats in an environment. With such contrasting theories on networks, this usually relates to recognition of different levels of trust and different types of trust outcomes. They provide valuable perspectives for interpretation of the role of trust in networks, of which a further discussion will take place in the later sections of this chapter.

3 The Impact of Trust on Networks

Trust plays an important role in the form of organizing activities and performance within a network (Adler 2001). There are several reasons why trust is believed to be beneficial to network performance. Loose couplings based on trust minimize the shortcomings of hierarchy related to increased costs of monitoring and control and distortion of innovativeness due to reduced autonomy and creativity. Trust in networks creates a favorable environment for cooperation providing a forum for knowledge exchange of various types such as technical, financial or managerial expertise (Gulati 1995). Information exchange, which is particularly sensitive to the quality of a relationship, is an important antecedent for the development of new products and the success of cooperation as a whole. The exchange of information, which is often pivotal to performance, is not as effective when based on simple trading or enforcement rules, which goes to confirm the importance of trust. This holds especially true when we consider circumstances in which value must be created by a set of linked industrial actors rather than individuals. In the literature these effects are mostly discussed in the context of supply chain networks (Ha et al. 2011; Handfield and Bechtel 2002; Doney and Cannon 1997; Wu et al. 2012).

The mechanism through which such exchanges take place is based on the creation of social cohesion and strong ties between members. In the literature, trust and cohesion are often interpreted as equivalent (Buskens 2002). Social cohesion is the degree of social bonds and social equality within social networks, indicated by trust, norms of reciprocity and a lack of conflict (Song et al. 2011). Network partners begin to perceive themselves as having one common identity and common goals. Highly cohesive networks rely on norms and sanctions which are commonly accepted. Members share and diffuse highly similar expectations concerning beliefs, behaviors and norms, which impact their preference for conducting transactions with network members rather than unknown parties. All of these factors compound the feeling of safety, predictability, reliability, concepts which resemble trust in terms of the creation of a positive psychological state. Social cohesion further contributes to social integration, which is the extent of participation in social networks, indicated by active engagement in social roles and social activities, and cognitive identification with network members (Brissette et al. 2000; Song et al. 2011). The effects of social integration trace back to the concept of identification and derive identification-based trust from it (Lewicki and Bunker 1995). This implies that network partners are more willing to participate in common efforts with a degree of goodwill, as well as expectations that all common interests are considered and served. They are more likely to commit to such relationships and invest different kinds of resources therein. What is more, network members share similar information promoting the specialization and application of its content. Over time, the network exhibits greater convergence in cognitive capital. The system embedded in such a network itself is more capable of high performance, especially in the long-term, as it can sacrifice short-term goals in

pursuit of long-term gains. Actors are less inclined to switch to other business partners (Morgan and Hunt 1994; Anderson and Weitz 1989). The normative and continual commitment to the network is established, giving it priority over other options for cooperation. The strong pressure for short-term results inherently linked to arms' length market transactions dismisses long-term cooperation. Each member, relying on a trusted network, can concentrate on building its core competencies, improving technologies and furthering innovativeness, all of which has been demonstrated empirically (Sankowska 2013a). The effects of trust are in this case twofold. The first element relates to the creation of value for an individual actor by providing an opportunity to focus on core competences within a network of complimentary actors. The other has to do with the ability to incorporate this added value of all network members to the entire value of synergy delivered by the network and perceived by the final client.

This magnitude of the trust effect, however, is warranted by the existence of common fate and expectations of common transactions in the future. In this way, social integration builds social capital. The latter is recognized as fostering performance (Burt 1992) such as product innovation (Tsai and Ghoshal 1998).

This perspective of course does not account for the abilities of individual partners and competencies, nor the content of exchange, but signals that—within a network of trust relations—better conditions exist for the coordination of the activities of independent firms with relatively low costs of maintaining such links when compared to traditional models of governance such as hierarchy or market (Adler 2001).

There are, however, some counter-arguments which may suggest limitations to the merit of trust within networks. These go to the rationale that trust in closed networks restricts access to outsiders (Marsden 1983), and thus means that networks are not open to external information. Flexibility with regard to external networks is reduced in favor of the stability and reliability of trusted ties. This alone can reduce members' innovation outcomes due to the enhanced homogeneity of knowledge. Still, dense networks with high levels of inherent trust guarantee high levels of efficiency due to the intensive exchange of information on time, which improves cooperation. The relationship between network density and exploitation might not be linear, however, but rather an inverted-U curve. The reason is that dense, cohesive trust-based networks have higher levels of coordination capacity, albeit at the expense of the heterogeneity of knowledge (Reagans and Zuckerman 2001), which at some point is required to improve performance and efficiency by avoiding sub-optimal choices. An empirical study by Gargiulo and Benassi (2000) revealed that cohesive networks based on trust are less likely to adapt to changes, and thus rigidity increases with density leading to sub-optimal self-enhancing decisions. In extreme cases, this can lead to pathologies within the functioning of networks (Cygler and Sroka 2014).

This point of view has been reinforced by the results of an empirical study by Nakatani (1984) which reported lower levels of probability and sales growth for trust-based networks of *keiretsu* companies together with low levels of variability for these rates. The average levels of the two former indicators are mostly

determined by exploration, while levels of variability are rather determined by exploitation.

The important limitations of trust in a dense network can also be derived from Burt's (1992) theory of structural holes. Burt asserts that there is always a scarcity of resources which one can invest into relations. Maintaining ties requires resources, which are an example of organizational costs. Therefore, firms must to decide which ties to invest in, and what level of strength of ties to build. The more actors engage in overlapping relations that provide similar information, the less they are able to afford to put into non-redundant ties that provide diverse information. The latter situation was described by Burt (1992) as a "structural hole", when a favored focal actor is connected to two unconnected actors, thus enjoying superior access to information. Actors rich in structural holes obtain more diverse information than densely connected actors and also control the flow thereof. Moreover, there is no need to be tied to other contacts because of the presence of knowledge spillover benefits (Ahuja 2000) through the direct contacts (indirect to the focal actor) conveying the information to the focal actor. This saves the focal actor's time and resources which he/she can therefore allocate to other networks. At lower expense, this privileged access to information improves their odds of providing more novel solutions and innovations. As a trade-off of having high capacity to transfer heterogeneous information, these kinds of networks do not have the capacity for resource-sharing as advocated by Ahuja (2000).

Conversely, highly redundant ties based on strength are more prone to an exchange of resources and with that exploitative behavior, and provide more predictable outcomes. The opposite is true, however, for networks with "structural holes", due to the fact that they bring different content and diversity to an actor's own cognitive structures, and are prone to bring novelty and fresh ideas which act to stimulate innovation. Put differently, the advantage of trust-based networks relies on the reliability of information and timely access to resources, while sparse-based networks in which familiarity between actors is lower may reap the benefits of novelty, new opportunities and scanning of threats. This assertion is, however, far removed from the connotation that trust is not important within a sparse network. The difference lies in the magnitude of trust and the types of trust which is present in sparse networks. As in a dense network, trust is strong and particularistic (Uslaner 2002), however in a sparse network trust is more dispositional in nature, while still evoking some level of interactions between actors. Thus the effect of trust on network performance is highly dependent on the structure of the network and the level of trust embedded within; and the final level of performance is the outcome of the allocation of scare resources to redundant and non-redundant ties. This is not to say, however, that an optimal universal combination of resource employment in certain types of network ties exists, as this is dependent on several contingency factors, for instance, sector type, company size, and company organizational strategy. Rowley et al. (2000) contended that such a combination might depend on the uncertainty linked with certain firms. This is contingent on the nature of the industry. Such a hypothesis contradicts the findings of Ahuja (2000) that actors rich in structural holes reported fewer patents, leading him to conclude that

dense networks based on trust are more beneficial than networks of firms rich with structural holes. Similar conclusions come from a study conducted by Podolny and Baron (1997) which showed that structural holes actually have a negative influence on performance. This mixed evidence, though, supports the existence of a phenomenon termed by Uzzi (1997) as the paradox of embeddedness, where actors must individually determine the optimal levels of safety and adaptability provided by dense and sparse networks. The maximization of both at once is not possible (Ahuja 2000), yet nor can maximization of one of them be termed a universally optimal strategy, leaving the configuration of a network open to debate.

Another reason for the limited impact of trust on a network lies in recognition that performance results from a complex set of considerations beyond trust itself and its mediating mechanisms such as social cohesion, social integration or even social capital. Thus, trust consequences in networks should be studied in conjunction with other variables. One such important variable often discussed in this respect is absorptive capacity (Cohen and Levinthal 1990), which suggests that while trust may promote the improvement of performance, network members must have the skills and resources to utilize the benefits of trust. Therefore, even allowing for the fact that the structural characteristics of the network enable it to disseminate information widely or to have timely access to novel information, there are characteristics beyond the structural properties that influence performance after all.

4 The Impact of Networks on Trust

The structural approach to trust takes the view that the characteristics of the network can shape various outcomes (Phelps 2010; Shipilov et al. 2010; Shipilov 2009). This reflects a shift in attention towards the influence of network structure on trust. As suggested earlier, the investigation of the consequences of structural properties on trust are rather scarce in the subject literature, although there is a wide agreement that dense, cohesive networks (Coleman 1988, 1990) and strong ties (Levin and Cross 2004) promote trust. In order to track the effects of networks on trust, attention should be paid to networks of dense transactions which form a stable preferential pattern of interactions and exchange. It is believed that trust arises out of such transactions as suggested by network closure (Coleman 1988, 1990). These are different from arm's-length relationships organized on an *ad hoc* market mechanism basis. A striking example of such a structure is Keiretsu, which is an institutionalized network of long-term business relationships (Gerlach 1992). Methodologically these structures are characterized by high levels of density (Fig. 2). *Density* is the number of linkages in a network in terms of the total possible number of linkages.

The effects of network structure—density—on trust in the subject literature fundamentally boil down to two effects. The first is related to the learning experience that a network provides, while the second is related to the level of control within a network (Buskens 2002). Learning captures the extent to which a network

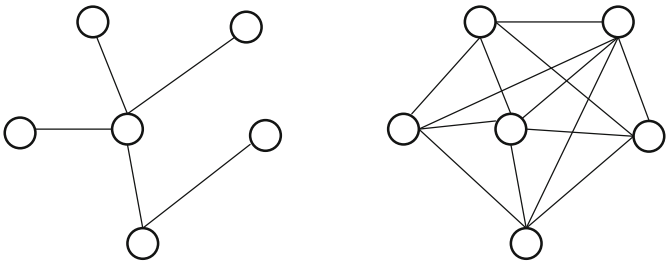

Fig. 2 Types of networks and their effects

member can update his/her expectations of another network member from observing his/her behavior in past transactions. Moreover, information on parties in a network can be provided by a third party. Control refers to the degree to which sanctions imposed on network members for violating rules and norms can be effectively executed in the network. The denser a network, the more opportunities to sanction members who violate trust through third parties. Thus, a potential power of a dense network is the ability to shape the behavior of network members through a control mechanism on account of the fact that members can anticipate sanctions for opportunistic behavior from other actors. Control also entails a reputation mechanism which obligates actors to uphold certain behavioral standards. The higher the density, the faster information is communicated in a network, especially when compared to sparse networks (Buskens 2002), and thus the stronger the effects of control and learning on the building of trust. Still, the speed of transmission also depends on the size of the network. In smaller networks, less time is needed to transfer information to nodes. With larger networks, constituting a larger number of contacts, more time is needed to communicate the information. The likelihood of the sanction of both exclusion and damage to one's reputation increases with the number of ties between network members (density) transmitting information on behavioral patterns. The high likelihood of this happening, together with the higher relative costs of sanctions for a violator, will minimize opportunistic behavior in a network. Thus, increased density and the cost of sanctions result in a greater probability of trust being honored (Buskens 2002).

Beyond the two aforementioned mechanisms which are responsible for the effects of networks on trust identified in the prior research, I suggest an extension of the aforementioned mechanism of learning and control with the "equality" argument derived from a high density network structure. The positive impact of high density on trust in a network is that it is likely that more dense networks are less centralized (see Fig. 2). In decentralized networks, it is unlikely that there will

exist clearly distinguishable prominent or peripheral actors who differ from others in terms of their influence and access to information. This promotes equality between actors, from which trust necessarily arises as a consequence.

5 Conclusions

This chapter recognized the complex picture of trust in relation to networks. The effects of both networks on building trust, and trust on network performance, were presented together with the rationale underlying these interrelations. From the presented model of the trust cycle, it is suggested that trust can arise in a network as a result or as a consequence. In practical terms, it implies that trust may be achieved through common fate and the stimulation of interactions facilitating trust, or prior trust can be used as the basis for network performance.

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Application of Cooperative Management in Enterprises: Management Approach, Problems and Recommendations

Viliam Lendel

Abstract The goal of this paper is to identify the main aspects of cooperative management based on a thorough analysis of the available scientific literature together with the results of empirical research. The focus is on the management approach, i.e. how the enterprise effectively plans cooperation and organizes cooperative activities, leads its own employees, and monitors the implementation of cooperative goals. Accordingly, it is possible to identify problem areas related to the application of cooperative management and propose appropriate recommendations to remove these problems. The considerations presented may assist managers in terms of the effective management of cooperative relations and related activities. The paper offers managers a useful tool in the form of a set of recommendations (instructions) which are intended to support the problem-free use of cooperative management within enterprises.

1 Introduction

The issue of the management of cooperation activities is currently highly topical. In the present day, cooperation as such for a company represents an important tool for increasing its competitiveness. Companies no longer develop their cooperation activities based on "impressions" or "gut feelings", but rather based on knowledge derived from the opinions of their customers, employees and partners. They collect the necessary information, support the creation of knowledge, explore market opportunities and make decisions on the need to cooperate. Companies aim to fully utilize their cooperation potential. In order to be successful, it is necessary to effectively manage these activities and to dynamically react to the ongoing development of the market.

Building cooperation management within a company is a real challenge often faced by managers. The process of building cooperation management involves a

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number of factors, ranging from theoretical concepts all the way to practical applications. At present, companies often strive to manage their cooperation initiatives intuitively. There are several unsuccessful activities in the area of implementation of cooperation management which can be empirically identified among companies. The reason for these failures can be chiefly attributed to the lack of a clear plan of action, division of competencies for implementation and, last but not least, company strategy oriented towards the creation and development of cooperation. Errors are also made by managers, mainly due to a misunderstanding of the term 'cooperation management' and the .underutilization of the cooperation potential of a company.

2 Cooperation Management

Debate is currently ongoing within the professional sector as to the definition of cooperative management and the allocation of areas of its operation. Several definitions of cooperation management can be found in the scientific literature; however, these typically address only a subset of the entire task of cooperation management. The high variability in interpretation of the term can be supported by the following examples. Lafleur (2009) understands cooperation management as a way of managing and developing collaboration in a competitive environment. According to Ray (2002), cooperation management represents a term for the integrated management of company networks. Staatz (1983) sees cooperation management as cooperative decision making within heterogeneous preferences. He highlights the need for a model of cooperation based on a defined group choice.

A similar view is held by Watzlawick, whose idea of cooperation management is that of a complex decision-making process, occurring on three levels of the managerial pyramid, whose goal is to reach a suitable balance between company success within cooperation as a business unit and as a social institution. Mendoza sees cooperation management as the effective use of resources within cooperation as a business organization, focused on satisfying the needs of its members, according to accepted cooperation principles. Zhang (2011) believes that cooperation management represents a basis for solving all managerial problems. According to him, cooperation management provides conditions for creating a system of cooperation based on the effective use of resources and technologies. According to Veerakumaran (2006), cooperation management is a complex decision-making process, and decisions are made on all managerial levels. To build cooperation management in a company is a real challenge that company managers are obliged to deal with, the process of which is influenced by a number of factors.

Sahut and Peris-Ortiz (2014) emphasized the *role of innovation* in the process of building cooperation management in a company. They consider it essential to create a favorable environment for entrepreneurship and innovations. Such an environment is often characterized by determination and the close relationship between the cooperating parties. Ritala and Sainio (2014) support this opinion,

and they point out that cooperation is currently used in a number of industries and sectors in order to achieve various advantages related to innovation. However, they also point out that cooperation is particularly suitable *for the application of a commercial model*. Mustak (2014) expanded the definition of cooperation to include *the area of innovation of services*, which bring profitability, growth and long-term competitive advantage to the cooperating companies within the established network, an opinion shared by Kultti (2011). Other areas which are suitable for cooperation are marketing innovations and marketing activities (Felzensztein et al. 2012).

Another important factor for building cooperation management is *trust between the partner organizations*. Of particular importance is the gradual adaptation of the respective business cultures of the partner companies (Weck and Ivanova 2013). Trust is an essential part of the strategic choice; managers who develop optimal trust in their relationships with the parties involved improve company performance (Wicks et al. 1999). Company managers are obliged to correctly grasp the character of trust and the dynamics of building trust within cooperation (Fawcett et al. 2012).

The requirement for *informational background for cooperation processes* is listed by Monczka et al. (1998). To enable the effective management of cooperation processes, it is necessary to ensure quality information within the company and to enable sharing for the decision-making needs of the managers. The effective transfer of information within cooperation can help to prevent conflicts as well as to enable the management of challenging cooperation activities. Biggiero (2006) highlighted the key role of the process of *creating knowledge* within cooperation. This knowledge is used for managing critical activities which require complex competencies and high added value. When building cooperation management, it is also necessary to take into account *the specifics of the particular region* (Szekely 2008). Kowalski and Marcinkowski (2014) believe that the key motivation for commencing cooperation is the existing market potential within a particular regional economy, as opposed to assistance via the tools of economic policy.

Nemcova (2004) pointed out the fact that each example of cooperation is unique due to the differences between industrial sectors and industries, the number and size of cooperating companies, as well as the level of cooperation and hierarchical networks between these organizations. When using cooperation management, it is also necessary to include *the process of control*. The standard of cooperation will depend on the degree to which mutual goals are satisfied, based on the criteria or company indications which are set in advance (Perry 2007).

The importance of *organizational factors* for the development of cooperation management was emphasized by Jassawalla and Sashittal (1998). These involve changes in the organizational structure to support cooperation; the interest and support of top management of the partner companies; as well as openness to change while at the same time maintaining the mutual goals of the partners. Staber (2010) also mentions the occurrence of copying by individual partners within cooperation. The organizational and strategic complexity related to building cooperation management is also mentioned by Schmoltzi and Wallenburg (2012).

Assuming that the abovementioned factors identified are taken care of within a company, then cooperation management will bring about expected results, such as better product quality, shorter delivery times and higher customer satisfaction (Valenzuela and Villacorta 1999).

3 The State of Slovak Enterprises: Research

Between September 2012 and February 2013, research was undertaken with the primary goal of gathering and interpreting information on the level of cooperation in the environment of Slovak enterprises. The main goal of the research was to identify the key aspects of efficient management and functioning of cooperation, related issues, the degree of satisfaction of companies within cooperation and opportunities for the improvement of currently functioning cooperation. The data gathered provided a complete picture of the readiness of Slovak enterprises to utilize (implement) cooperation management. In total, 273 managers of small, medium and large enterprises participated in the research, drawn from companies active in the Slovak Republic. Data from the respondents was gathered by means of personal interviews (Vodák et al. 2014b).

A lack of literature referring to the use of cooperative management (specification of terms, structure and methods of use) reflects the reality that only a very few managers had the processes documented and understood the issue. Currently, Slovak enterprises have developed cooperation mainly in the form of supplier relationships (68.13 %), purchasing relationships (52.38 %), technical cooperation (44.32 %), education (35.16 %), and advertising and promotion (24.18 %). By contrast, Slovak companies cooperate least in the areas of media (9.52 %), financial consulting (10.99 %), ecology (10.99 %), management (11.36 %) and investments (11.72 %).

It could be considered positive that almost half the respondents (47.62 %) plan to establish more intensive cooperation with a company or an organization in the near future (within one year). Less than 17.22 % of the companies represented in the research do not plan to establish any cooperation in the near future, while 35.16 % of respondents were unable to respond. The main challenges and problems which were listed by respondents in terms of the process of cooperating with companies and organizations were insufficient adherence to the agreed contractual terms (58.39 %), financial demands (35.04 %), distortion of information (34.41 %), low effectiveness of cooperation (29.56 %), and the unwillingness of a cooperating company to provide internal information, i.e. concerns about providing internal information to a company (28.83 %). Respondents indicated that the major benefits of cooperation are strong mutual relations (26.62 %), increased profit (20.78 %), lower costs (20.13 %) and improved competitiveness (15.58 %). In contrast, the areas specified as those where improvement is necessary were better communication (31.78 %), adherence to contractual terms (23.08 %) and improved effectiveness of collaboration (22.14 %).

46 % of the managers surveyed would repeatedly decide to cooperate with their most important partner. This is a measure of their solid relationships, which can be considered as the basic prerequisite for successful cooperation. The research also identified the main advantages of cooperation for the included companies together with their partners (other companies, organizations, etc.). Based on the number of responses, we constructed the following order of the most advantageous impacts of cooperation, as perceived by the companies (1—the most frequently observed and mentioned advantage of cooperation) (Vodák et al. 2014b):

1. ***Supplier-purchaser relationships***—perceived advantage in the form of better, safer and more reliable mutual cooperation, service options, infrastructure and specialized legal services, expansion of the portfolio of clients, time flexibility, regular and timely supplies, responsibility, trust, adherence to contractual terms, speed of dealing with complaints, strong logistical relationships;
2. ***Communication***—perceived advantage in the form of information on new products, consulting services, willingness to deal with problematic situations, willingness to take part in meetings, the supply of information via a company's information system, a high degree of openness in internal communication within the organization;
3. ***Finance***—perceived advantage in the form of lower costs, improved bottom line, higher profits, opportunity to offer products for better prices, increased turnover and sales, increased number of resources and improved payment abilities of the companies;
4. ***Competitive advantage***—perceived advantage in the form of marketing, brand building, name and image, improved position on the market, improved technical capabilities, use of innovations and novel technologies, expansion of product portfolio, improved access to products, sharing of know-how, improved efficiency of manufacturing, improved quality of products and the value for customers;
5. ***Education***—perceived advantage in the form of available information on and knowledge of cooperation, experience, supplying of results, teaching of graduates, securing a qualified workforce, continuous education of employees and students in new areas, higher degree of expertise;
6. ***Internal environment***—perceived advantage in the form of employee motivation, development of the company, location of company branches, office interior, possibility of shortening the hiring process;
7. ***Projects***—perceived advantage in the form of collaboration on preparing, submitting and performing projects, expanded portfolio of projects, securing a higher number of larger contracts and orders.

Empirical research also revealed the intensity of cooperation between a certain enterprise and other enterprises on a point scale from 1 to 10, where 1 means "almost none" and 10 means "highly intensive". Findings of interest were as follows (Vodák et al. 2013):

- Enterprises cooperate most intensively with commercial enterprises; the high intensity of cooperation (level 8, 9, 10) was affirmed by 64.4 % of the managers surveyed,
- Enterprises barely cooperate (level 1) with non-profit organizations; this was indicated by 55.2 % the respondents surveyed,
- Cooperative measures between enterprises and the European Union are extremely weak—49.7 % managers affirmed that they hardly cooperate with the EU,
- A similar set of circumstances can be observed within cooperation between enterprises and local self-government and regional self-government (Senior Territorial Unit).

A Chi-squared independence test of qualitative features proved that there is an element of dependency between the size of enterprises and their level of satisfaction with the extent of their current cooperation (satisfaction index). We also identified dependence between the level of satisfaction with cooperation and the length of time that a company has been active on the market (Vodák et al. 2014a).

4 Planning of Cooperation Activities Within a Company

Planning as part of the management of cooperation activities represents a significant group of activities, through which cooperation goals are set and the resources needed and methods for achieving them are determined. The complexity and demanding character of this process increases with the size of a company, the increasing hierarchical level on which it is performed, the length of time required and the number of involved parties (partners). Planning cooperation activities in a company requires:

- the anticipation of future development of both the external and internal environments, and the subsequent changes that occur (development of customers, change in segments, new communication tools, development of customers' demands, development of factors that influence customers' purchasing decisions. . .),
- taking into consideration the interests of the various involved parties who take part in cooperation activities (employees, top management, suppliers, banks, partners, surroundings); interests of individuals, groups and society,
- consideration of economic as well as social conditions and their criteria,
- the arrangement of goals and tasks of cooperation activities in a hierarchy, which creates conditions for internal harmony of relationships and processes and synergistic effects; also the identification of relationships and processes related to future cooperation and the hierarchical arrangement thereof,
- consideration of the limitations of resources, the suitable allocation and efficient use thereof for supporting cooperation activities,

– the choice of suitable methods and techniques which enable the creation of cooperation ideas and their evaluation and selection, as well as the establishment of cooperation and support for its development.

The planning of cooperation activities in a company can be also defined as a process of setting cooperation goals for the company, their further elaboration, as well as specifying resources and ways to reach them.

4.1 Setting Cooperation Goals

This step represents a key element of planning cooperation activities in a company. This process is highly significant in that it may be used to establish the basis for effective cooperation management and for achieving successful results in the form of successfully completed cooperation activities. It also provides direction to all efforts placed into managing cooperation activities in a company. Cooperation goals define the course of a cooperation process and are one of the prerequisites for its development. Cooperation goals in general represent future situations which are to be achieved by a certain time-specific moment. All future company cooperation activities should be directed towards achieving these goals. Achieving goals in cooperation is realized through achieving individual tasks, into which goals are structured. A company which decides to manage its cooperation activities needs to understand that its goals indicate where the company is heading in the process of creating cooperation, and what it seeks to achieve or how it wishes to develop cooperation. Cooperation goals are also the basis for the entire planning process and are the source of motivation for employees engaged in cooperation activities. Finally, cooperation goals represent the basis for control and evaluation of the realized cooperation activities.

4.2 Resources for Achieving Goals

The other key step in planning cooperation activities is the organization of resources. Resources are the limiting factor for taking advantage of opportunities in the external environment that are identified while seeking means to achieve the set goals. The defined cooperation goals can be achieved using the following resources: labor (employees, managers, owners...), material (material, energy...), capacity (technology, machinery, IT equipment...), financial (loans, profit, share capital...), and others (information, time, licenses...). In addition to the listed resources we could also add the *cooperation capacity of the company*, which is based on and interconnected with total knowledge, resources, experience, managerial capabilities and skills which a company has at its disposal for the purpose of managing cooperation activities.

4.3 Means of Achieving the Set Goals

It is also highly important to specify the means by which the previously set goals should be achieved. Typically there are several options—possible solutions, which may be described as so-called variants which may be formed by a combination of various resources in such a way that all the goals are optimally achieved in their logical interconnectedness (Hittmár 2011). When establishing cooperation, it is not sufficient merely to define the vision and goals as represented by a concrete future cooperation opportunity, but also the ability of its practical achievement. In order for the company to be able to create and achieve successful cooperation, it is obliged to use *project management*. Above all, it is necessary to realize that the process of establishing cooperation is an extensive project which involves multiple processes.

5 Organization of Cooperative Activities in a Company

During the process of managing cooperation processes in a company, company strategy is revised and modified so that it reflects the plans of top management regarding the management of cooperation activities. However, such a change can end up influencing the roles of multiple employees. Depending on the character and number of the completed cooperation projects, it is necessary to revise the currently used organizational structure to adapt it to the current set of circumstances. Given the variability of cooperation projects, it is possible to use multiple types of organizational structures. The general rule is that the organizational structure adapts to the cooperation project (content, complexity, extent, time needs) and not vice versa. Organization remains of key importance in the process of managing cooperation activities, especially in today's turbulent environment. Cooperation management aims to ensure the competitiveness of the company in such an environment. However, for this to happen it is necessary that the company be capable of reacting dynamically to the changes which arise as a result. There is scope here to use *dynamic cooperation organization structures* which offer immediate reaction and a consequent change in configuration of employees and processes, as necessary. Therefore, such organization structures facilitate cooperation with partners in the area of research and development, marketing etc., as well as the ability to work on multiple projects at the same time. Dynamic cooperation organization structures (champions, purpose teams, project teams, project centers…) are characterized by the following properties:

- the ability to rapidly react to changes, high added value, informal team work,
- the use of the creative approach, direct evaluation and testing of new ideas,
- flexibility in the content and activities of the groups and individuals,
- the acceptance of a higher degree of uncertainty and risk in management,
- focus on results, adequate number of management levels,

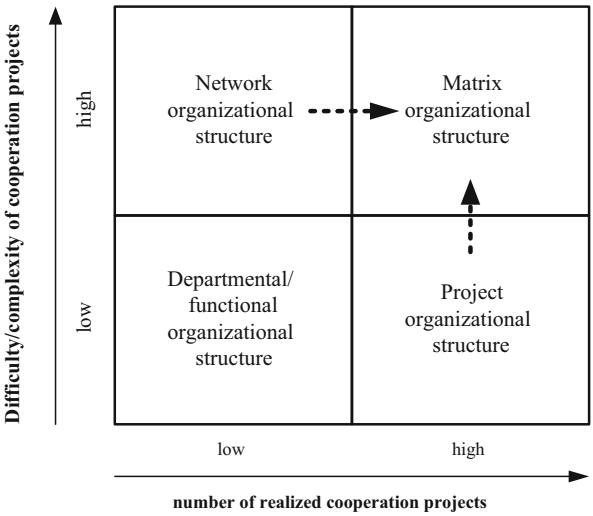

Fig. 1 Matrix of cooperation organizational structures

- administratively undemanding methods of management,
- lower number of organizational elements and connections,
- lower requirements on the management system, de-centralized management.

For the purpose of fulfilling the organizational needs related to managing cooperation activities, a *matrix of cooperation organizational structures* was created (Fig. 1). Cooperation organizational structures are located in the matrix based on two main parameters—the number of cooperation projects undertaken and how demanding/complex the cooperation projects are.

In the first quadrant we may observe the *functional organizational structure*. This is a classic organizational structure, suitable for situations with a relatively low number of realized cooperation projects of relatively low complexity. Company employees are managed by their superior within a department to which they are assigned. Their job does not change, i.e. they remain in their linear positions. Communication in this organizational structure takes the form of coordination work meetings of cooperation teams. The role of line managers is to ensure the process of planning, realization and control of cooperation activities.

In the second quadrant we may observe the *project organization structure*, used mainly in situations in which a company undertakes multiple projects of relatively low complexity. If necessary and if existentially important for the company, it is possible to use this organizational structure to deal with demanding and complex cooperation projects (represented by the arrow in Fig. 1). In this organizational structure, members of project teams are freed from their permanent work position.

In the third quadrant we may observe the *network organizational structur*e, making it possible to deal with complex and demanding cooperation projects and—if necessary—multiple projects at the same time (represented by the arrow in Fig. 1). This organizational structure is characterized by a high degree of flexibility and dynamics. Cooperation projects are managed in the required time

and to the required level of quality, while a relationship is established with the main organization.

In the last quadrant we may observe the *matrix organizational structure*. Due to its inherent structure, it enables companies to deal with multiple cooperation projects with a high degree of complexity. It also enables the efficient use of company resources. Employees are managed by a project leader, while they also remain in their functional positions.

6 Identification of the Main Problems and Formulating Recommendations

The use of cooperation management in a company is a complex process which requires a thorough understanding of the company environment. Company managers should be aware that implementation of cooperation management also brings certain risks. A failure to appropriately recognize these risks would doom the initiative to failure. In order to succeed in this area, the early identification of risk areas is key, as are corresponding measures which must be taken in order to increase the probability of successfully implementing cooperation management in a company. In the next section, we identify possible risks together with recommendations that are meant to assist in reducing these risks. It should be noted that prevention is also a necessary requirement for the successful functioning of cooperation management in a company (Vodák et al. 2013).

The most frequent issue is *underutilization of the cooperation potential of a company*. This means that the company either is not aware of its potential for cooperation, or that conditions suitable for its development and utilization are not present. Manifestations of this issue differ. Chiefly they are represented by the arising of misunderstandings, costs, or the undertaking of inefficient cooperation processes (often repeated multiple times). Managers of a company should dedicate their time to a thorough analysis of the cooperation capacity of the company. In turn, the company should possess a suitable overview of its knowledge, experience, resources, assets and managerial skills and capabilities which are available for full utilization in order to create and manage cooperation. However, this requires that the top management of a company have a clear idea of how to build and manage cooperation. This needs to be reflected in company strategy, supported by the corresponding human and financial resources. Managers must actively communicate with potential partners as well as their own employees and engage them in the establishment of cooperation. A recommendation could also be made to the top management team regarding the creation of a motivation program, with the aim of stimulating employees to engage in cooperation processes. Employees represent a key component of the success of cooperation management.

Another risk area is the *absence of an information system* which would support the efficient exchange of information between cooperating partners. Information

from the partners is often not registered in a form in which it could later be used, or is not accessible to all relevant persons. This leads to situations in which managers and employees do not react sufficiently to information. Managers of a company should also consider creating corresponding databases which are interconnected with company information systems. Each person in a company should know how to react in case of a relevant impulse. This can only be enabled by the effective use of information as part of cooperation. An information system should reflect the requirements and the current set of circumstances as regards the information technologies of the cooperating partners.

Another serious issue is *the lack of a necessary environment which would support the establishment of cooperation—a suitable culture*. Managers of a company should consider focusing on the establishment of a company culture based on communication and collaboration. In addition to the abovementioned recommendations, implementation of which could improve the quality of the cooperation environment, it is necessary to focus even further on employees of the company. Top management of the company should strive to stimulate employee activities by creating a suitable environment which would ensure open communication, discussion of cooperation opportunities, and teamwork. Managers should transfer their engagement to team members, consequently bringing a higher level of engagement into the development of new forms of cooperation.

A poorly prepared cooperation program represents a frequent issue in terms of implementing cooperation management in a company. Company managers tend to focus purely on the technology side of cooperation and forget the other dimensions. A company needs to have at its disposal sufficient information on cooperation processes, abilities and resources. In cases in which the company does not dedicate the necessary amount of attention to this area and commences the implementation of cooperation management based on insufficient documentation, it is highly probable that such an implementation effort shall be doomed to failure. Company managers should consider the following measures:

- carrying out a detailed analysis of the current set of circumstances specific to a company; correctly understanding the role played by technology in the implementation of cooperation management,
- performing complex mapping of the potential for cooperation and specifying the requirements for cooperation,
- correctly introducing a system for evaluating a company's cooperation performance, including the rules thereof.

Problems may also arise in the process of *defining cooperation goals* which a company aims to achieve in relation to the planned cooperation. Frequently it is unclear how the actual cooperation will be implemented and which activities will be necessary to undertake. Under such circumstances it is necessary that the company understands the goals of its cooperation options and that these are reflected in its strategic goals. Company managers should consider the following measures:

– correctly understanding the principles of cooperation (solid knowledge of the topic, achieved by studying the literature, as well as other types of processional education),
– clarifying what precisely is the goal of the company through the use of cooperation management,
– understanding the expected outcomes of cooperation and the paths to its successful fulfilment, which may include preparing a common vision together with partners.

An important problem which may arise at this point is *the exclusion of the human factor* in the process of utilizing cooperation management. Employees are not involved in creating the necessary documentation for future cooperation, the process of identification of cooperation potential or setting the requirements of cooperation, and would not have sufficient information on the goals of cooperation management. This can result in a set of circumstances in which they perform certain activities without interest and in a passive manner, since they are not involved in and informed of the company's goals in this area. Managers could therefore consider the following steps in order to minimize this issue:

– ensuring regular communication with employees with the goal of creating an environment suitable for the development of future cooperation,
– enabling employees to take part in the development of cooperation programs and consequently in using cooperation management within the company,
– clarifying the meaning of cooperation to employees with reference to the future direction of the company.

With these steps there is a risk of automatization of the previously poorly set (incorrect) processes. In order to minimize the risk of such situations arising, managers could consider the following:

– identifying and regularly updating cooperation processes, and placing emphasis on the processes which are directly related to work in the area of cooperation,
– dedicating attention to an analysis of the current state of cooperation processes,
– creating a separate process model of successfully implemented cooperation.

The use of cooperation management in a company can be successful only in cases in which the company accepts the initial conditions, which may of course include certain limitations. In cases in which *the initial conditions are ignored*, a number of serious issues may arise as a result. Managers could consider the following as preventative measures:

– define key indicators for the use of cooperation management in a company,
– define control points within the use of cooperation management in a company,
– take limitations into account (degree of use of cooperation management, risk of failure, level of cooperation capacity etc.).

Only if measurable goals are defined can the company management consider and evaluate cooperation outcomes. A frequent issue which arises in the utilization of

cooperation management is the *absence of feedback* which is meant for those managing such a process. The entire process of cooperation management (from analysis to realization) should necessarily be monitored and evaluated. Company management could therefore consider an intermediate evaluation of the use of cooperation management within a company. Such a measure requires that the goals of using cooperation management are clearly defined, based on measurable indicators. Company managers should clearly outline and set the metrics in order to quickly and effectively manage company areas related to cooperation, using well-defined and measurable goals. However, it is necessary that the group of metrics be defined according to the main priorities for managing the cooperation activities of the company (Soviar et al. 2013).

7 Conclusions

Statements of the complexity of managing cooperation activities within a company are justified. The topic of managing cooperation activities is currently highly relevant among Slovak enterprises, managers of which strive to build cooperation management in their companies, aiming to facilitate the creation of successful cooperation and the fulfillment of set cooperation tasks. In order for this initiative to be successful, it is necessary to use elements of project management and to establish an environment which will support new cooperation, enabling communication and the effective use of information within created partner relationships. For this purpose, the presented methodology of planning cooperation activities within a company could be of assistance to managers. To this end, it is necessary to apply principles of strategic management. Success in this area will depend on company management and the correct understanding of the actual importance of cooperation management for the company. In cases in which cooperation management is understood only in terms of technology and not as the behavior of the company towards its cooperating partners, then the whole project is doomed to failure. In summary, cooperation management helps company management to set the business on the correct course and to prepare for unavoidable changes and risks of various character (Varmus 2009).

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Part II
Management of Selected Forms of Network Organizations

Industry Clusters as Network Organizations

Karel Skokan

Abstract Industry clusters as a specific form of networked organizations in a given industry and territory have become highly popular tools of economic policies in recent decades and are recognized as an important instrument for promoting industrial development, innovation, competitiveness and growth. The goal of the paper is to outline the development of clusters, cluster initiatives and cluster policies in the Czech Republic, which originated between 2003 and 2013 and were financially supported by EU structural funds. After a brief theoretical background, the overall view of cluster development at the national level is explained. The leader in cluster development was the old industrial region of Moravia-Silesia with its mining, metallurgy and heavy machinery industries. The case of the Czech machinery cluster demonstrated that the creation of cluster initiatives does not guarantee future cluster success without the involvement of key business players.

1 Industry Clusters

Industry clusters, as a specific form of networked organizations in a given industry and territory, have become highly popular tools of economic policy, especially over the last two decades. The first ideas on clustering were represented in the concept of industrial districts already visible at the end of the nineteenth century according to Marshall (1920). However, only since the 1990s have clusters begun to be incorporated into public economic policy in numerous countries throughout the world. The prevalence of clusters in various industries was accompanied by detailed cluster analyses and theoretical approaches which resulted in national cluster policies. The modern age of clusters is closely connected with Michael Porter (1990) whose publication "The Competitive Advantage of Nations" described the tight relationship between cluster participation and the competitiveness of firms and industries and proposed the first definition of the term 'cluster', frequently criticized and improved upon in subsequent literature.

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Industry or regional clusters are today recognized as an important instrument for promoting industrial development, innovation, competitiveness and growth. Although primarily driven by the efforts made by private companies and individuals, clusters are influenced by various actors, including governments and other public institutions at national and regional levels. The cluster concept covers a variety of different business structures, national-regional-cross-border clusters, clusters of competence, industrial or production systems and innovation systems and is used for different purposes to increase the competitiveness of SMEs, support collective research, rationalize a whole industry, and implement an environment management system. Numerous definitions of the term exist as a result, but almost all share the idea of proximity, networking and specialization.

The most widely used definition is that of Porter (1990): "Clusters are geographically close groups of interconnected companies and associated institutions in a particular field, linked by common technologies and skills. They normally exist within a geographic area where ease of communication, logistics and personal interaction is possible. Clusters are normally concentrated in regions and sometimes in a single town".

To the former definition, Porter (1998) later added that clusters include, for example, "suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure and, finally, many clusters include governmental and other institutions—such as universities, standards-setting agencies, think tanks, vocational training providers, and trade associations—that provide specialized training, education, information, research, and technical support". Porter's theory of clusters has become the standard concept and was further elaborated upon by numerous followers such as Rosenfeld (1997), Asheim et al. (2006), Karlsson (2008) and others, who further developed the cluster concept or discussed it from different perspectives, both positive and negative. A critical view of this theory was presented by Martin and Sunley (2003) who argue for a cautious use of the notion, and label this definition as somewhat chaotic.

However, a report prepared by an expert group from the European Commission (2005) describes clusters in accordance with Porter as "groups of independent companies and associated institutions that are collaborating and competing; geographically concentrated in one or several regions, even though the cluster may have global extensions; specialized in a particular field, linked by common technologies and skills; either science-based or traditional; a cluster can be either institutionalized or non-institutionalized".

Clusters develop over time; they are not a phenomenon that appears or disappears overnight. For many clusters, the roots of their development go back many years. Natural factors such as resources, or location on a major trading route or river, can have effects on the presence of specific clusters which may be felt many years after they have lost any direct influence. Another root of cluster development may be the existence of initial institutions, such as companies or universities, which over time may act as an anchor for the cluster, spinning off new businesses and attracting investment from companies outside the region. In order to focus the debate on innovation and competitiveness which clusters are expected to initiate

and increase, the following definition was proposed by the European Commission (2005): "The cluster is a mode of organization of the productive system, characterized by a geographical concentration of a critical mass of economic actors and other organizations, specialized in a common field of activity, developing interrelations of a market and non-market nature, and contributing to innovation and competitiveness of its members and the territory".

Nowadays national and regional authorities often tend to actively develop clusters. Many countries have now moved beyond an initial analytical phase reviewing clusters and their historical development, to seeking engagement in upgrading or creating clusters and launching coordinated cluster activities in the form of cluster initiatives.

Clusters bring economic and social benefits, and have a positive influence on innovation and competitiveness, skills formation, information, growth and long-term business dynamics (Porter 1998, 2003). Kettels and Memedovic (2008) claim that clusters bring about higher productivity of firms, a higher level of connectivity and innovation, and that the formation of new business enterprises tends to be higher within clusters. Clusters are expected to bring benefits not only to their members but to the regions they operate in and to higher education institutions as well. Firms in clusters can be more specialized and can cooperate better than those in isolation, and may also reach a higher level of innovation due to the knowledge spill-over in proximity. It is also worth mentioning that clusters help to stimulate new start-ups. Cluster activities cover numerous joint actions in the areas of networking, human resources and training, research and development, marketing, internationalization, standardization, financing, etc.

2 Cluster Initiatives

It is important to distinguish between clusters—groups of companies in a geographical region or industrial sector, sharing resources and experience for mutual benefit—and cluster initiatives (CIs)—efforts organized by government or enterprise to increase the growth and competitiveness of clusters within a region. Cluster initiatives typically include three strands: cluster companies, government, and the research community. Whilst clusters are a long-standing phenomenon, many of the most successful in recent years have been linked to concerted initiatives. CIs are now appearing in less-developed regions of advanced economies, as well as in developing economies.

"Cluster initiatives" are viewed as conscious actions taken by various actors to create or strengthen clusters. There are multiple relevant actors who may relate to one another in different ways. Governments and other public authorities are known to be responsible for most cluster initiatives and usually act as the initial sponsor of cluster initiatives, although there is marked geographical variation. Cluster initiatives can be developed at different levels, however most are at a local/regional level

rather than national. The cluster development process balances analysis and action, seeking to deliver some early benefits to cluster participants.

The first cluster initiatives were launched in the 1970s and 1980s in Italy, and have become renowned in the literature relating to industrial districts. Denmark was also among the pacesetters in developing cluster policies. Its Industrial Network Co-operation Program, which helped to foster growth clusters amongst companies, was launched in 1989 and terminated in 1992, during which time it provided financial support to over 300 inter-firm networks. This program has subsequently been 'copied' in countries such as Australia and the USA, and since then many cluster initiatives have developed in different parts of the world.

Cluster initiatives (CIs) have become a central feature of improving growth and competitiveness. The Green Book on cluster initiatives (Sölvell et al. 2003) identified more than 500 cluster initiatives around the world, primarily in Europe, North America, New Zealand and Australia. Some of the findings were that every CI is unique; most CIs are found in national environments where the promotion of science and innovation is an important part of government policy; the objectives of CIs can vary greatly; CIs are initiated by government (32 %), by industry (27 %), or equally by both (35 %). Financing comes primarily from government (54 %), from industry (18 %) or equally from both (25 %). Almost all CIs (89 %) have a dedicated facilitator and many (68 %) have some sort of office, 95 % of CIs have ten active members or more, and 40 % depend on one key individual for their future success.

Cluster initiatives have made key contributions in three clear areas. They stimulate weak regions and declining industrial sectors; attract investment into clusters and networks, rather than individual firms; and the majority of CIs on a worldwide scale support research-intensive clusters.

At the end of the 1990s, industrial and regional policy increasingly concentrated on stimulating clusters and clustering processes. Recent initiatives of cluster mapping and policy formulation have been launched in countries such as Denmark (essentially a re-start), Portugal and the United Kingdom, but also in new EU member countries such as Slovenia, Latvia and the Czech Republic.

3 Cluster Based Policies

Cluster initiatives have developed as a new policy agenda, most often as an outgrowth from traditional policy areas such as regional policy, innovation policy and industrial policy. CIs are emerging within three distinct policy fields: (1) regional industry and SMEs policies, (2) FDI attraction policy, (3) science, research and innovation policies, which are often summarized under the concept of cluster policies (Sölvell et al. 2003).

The definition of "cluster policies" is not homogeneous and varies in a number of ways. They bear the mark of different policy areas such as industrial policy, regional development policy, innovation policy or technology policy; their targets

differ from mega-clusters to local networks, with a growing amount of attention paid to knowledge-based agglomerations; they can deal with national, regional or local (municipal) clusters; they address cluster creation or the later stages of their life; they act on the cluster environment or more directly on the dynamics of the cluster itself; they can be characterized by a more "top-down" or "bottom-up" character; finally, they are developed at various levels, whether local, regional, national or international, sometimes in combination.

Principally, 'cluster policy' can be of two main types: (1) to support the growth of existing or embryonic regional clusters, and (2) to allow knowledge of how industrial development in (successful or unsuccessful) regional clusters informs policy-making in general. Both approaches feature certain specific characteristics:

- cluster policy entails a shift of focus from individual firms to local/regional systems of firms and firms' value-adding environment,
- cluster policy also means less reliance on large firms and more interest in local agglomerations of SMEs,
- this kind of policy also concentrates on indigenous growth processes in contrast to efforts to attract inward investments,
- the notion of clusters also leads to stimulating social processes, e.g. encouraging trust-based interaction to increase the flow of knowledge between local players, rather than intervening, for instance, through financial incentives,
- finally, the idea of clustering points to the role of public authorities as facilitator or broker between companies, and between companies and the knowledge infrastructure.

Within the area of cluster policy may be found a wide variety of approaches. Countries such as Denmark, France, the Netherlands, Portugal and the United Kingdom (Scotland) have a more or less distinct national cluster policy that aims to support national and regional clusters in different ways. A national cluster program has also recently been launched in Sweden. In Belgium and Spain the cluster policy is regionally defined. Examples of a distinct cluster policy can be seen in the Flanders, and in the Basque region, although there are also examples in other regions of the two countries. Generally, in the federal states cluster policy is developed and implemented at the regional level, and therefore objectives, goals and instruments are often very different from one region to another. This may also be the case in countries with newly created decentralized regional development institutions (such as the United Kingdom).

In other countries one can find specific regional cluster instruments, but not a fully developed cluster policy. Thus, the cluster approach does not pervade enterprise or regional policy, but some specific measures that aim to support some regional clusters exist. In these cases the promotion of clustering is used as an element of, in particular, innovation and technology policy and regional policy. Austria, Finland, Germany, Italy and Norway are seen to have somewhat interesting cluster instruments. In the federal states of Austria and Germany the selected policy instruments are designed and implemented at the regional level, rather than at national level.

Clusters are dependent upon industry concentration in regions and are found throughout Europe and the world. Some have developed over decades if not centuries, while some are very young and were established only as a reaction to rapid changes in industry or technology. However, in theory or in policy they are often perceived as drivers of industry and regional competitiveness bringing increased innovation, knowledge spill-overs as well as a higher level of performance from their members, industries and regions. For this reason, they appear in many European, national or regional policies, as a series of different activities, initiatives, programs and procedures which are aimed at increasing the economic performance and socio-economic benefits based on the existence and development of clusters.

In 2006 the EU adopted a broad-based innovation strategy which identified the goal of strengthening clusters in Europe as one of the nine strategic priorities for successfully promoting innovation. In terms of the EU Industrial Innovation Policy, clusters are seen as "powerful engines of economic development and drivers of innovation in the European Union." Since 2008 the EU has developed a set of actions aiming to raise the level of excellence and openness of clusters, including the following tools, instruments and information sources: the European Cluster Excellence Initiative, the European Cluster Policy Group, the European Cluster Observatory, the European Cluster Collaboration Platform and the European Cluster Alliance (Pavelková et al. 2013). Clusters and cluster policies were also incorporated in so-called Smart Specialization Strategies regarded as one of the key concepts of the EU 2020 Strategy.

4 Cluster Development in the Czech Republic

The idea of regional industry clusters only arose in the Czech professional community approximately 10 years ago, yet was to quickly gain general acceptance, not only by academics mostly at regional universities but also by politicians at the government and regional level as in the case of the Moravian-Silesian region. Nowadays the Czech Republic is one of the most advanced countries among new EU members in this field. The development of clusters in the Czech Republic is associated with the EU operational programs entitled Industry and Enterprises (2004–2006) and Enterprise and Innovation (2007–2013) and can be divided into two stages (Skokan 2011). The first stage covers the years from 2002 to 2006, in which the cluster concept was presented in the Czech professional literature, to public authorities at both the national and regional levels and to company managers in industries with clustering potential. It also includes the announcement of the first cluster program entitled CLUSTERS which was supported by EU Structural funds in the search for prospective clusters and their establishment, during the initial timeframe of the program which lasted from 2004 to 2007. The second stage covers the years from 2007 until the present day, during which established clusters developed or new clusters came into being and gained access to public funds

offered by the COOPERATION program funded by EU structural funds from 2007 to 2013.

The aim of the first cluster program, entitled CLUSTERS (2004–2008) was to implement infrastructure for entities which group together under certain conditions in order to generate the competitiveness they need in the form of a cluster, i.e. with the integral participation of the region, the tertiary or research sphere, and business entities. The specific objective was to support groups of companies and associated institutions in two types of projects: (1) The search for companies suitable for association in clusters, as well as the assessment of the viability and benefits of clusters. The result should necessarily be a feasibility study which proves the viability of establishing clusters in both the specific industry and the region. (2) The establishment and development of clusters and fulfilment of their mission followed naturally from the first phase. For the first type of project, 42 applications were approved, while for the second type of project 12 established clusters were supported by public funds. The subsidy conditions for the cluster establishment project were to group at least 15 organizations including one higher education or research institute and 60 % of SMEs. By the end of 2008 there were more than 30 existing clusters in the Czech Republic, nine of which were established in the Moravia-Silesia Region (MIT 2003).

The second cluster program (2007–2013) was announced within the Operational Enterprise and Innovation Program and is currently running as part of the so-called COOPERATION Program focused on support for the establishment and development of cooperative industry groups. The overall objective of the Program is to provide support for the establishment and development of cooperative industry associations such as clusters, centers of excellence, technology platforms and cooperative projects at regional, supra-regional and international levels as a tool for boosting the competitiveness of the economy and economic growth. The objective is "to create infrastructure for cooperation of enterprises, scientific, research and educational institutes and the communal sphere at the regional and supra-regional level and international cooperation of new and existing groupings and the type of projects include identification, establishment and development of clusters (e.g. joint purchase and use of facilities, joint workshops, seminars or marketing presentations)" (MIT 2010: 66). The summary of financial aid for clusters and the number of clusters supported is given in Table 1.

Table 1 Financial aid for clusters in the Czech Republic

Operational program	Cluster supporting program	Allocation in 1,000 euros	Supported projects
Industry and Enterprise 2004–2006	CLUSTERS Mapping	10,000	41
	CLUSTERS Establishment and Development		12
Enterprise and Innovation 2007–2013	COOPERATION	90,000	41

Source: MPO (2013)

The development of clusters in the Czech Republic in the last 10 years is presented in Fig. 1. It describes subsidies granted within the auspices of the Operational Programs of 2004–2006 and 2007–2013.

Financial aid for cluster development constituted a highly attractive subsidy, and by the end of 2012, 79 initiatives were announced and established for the development of clusters. However certain such initiatives collapsed after barely a few months in operation, meaning that only about 60 clusters are still operating at this point in time. The distribution of clusters in the regions of the Czech Republic is highly uneven as is shown in Fig. 2.

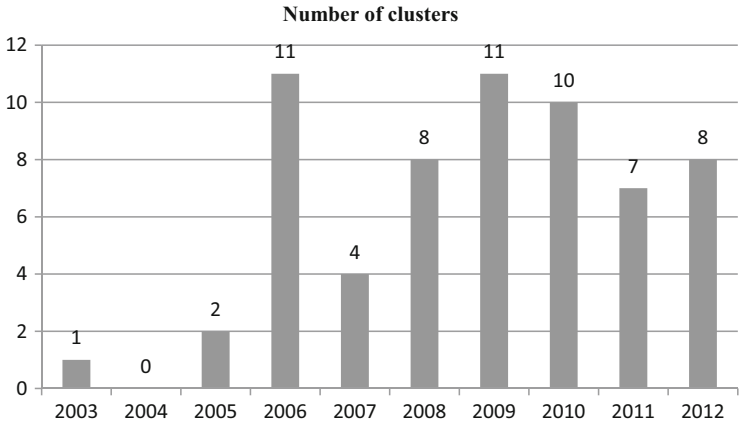

Fig. 1 Development of clusters in the Czech Republic. *Source*: MPO (2013)

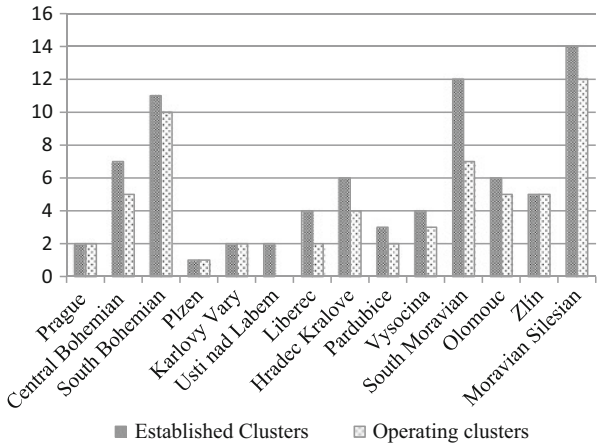

Fig. 2 Clusters by region in the Czech Republic. S*ource*: MPO (2013)

Nevertheless the initial impetus for cluster development based on EU financial aid proved an extremely effective instrument.

5 Regional Clusters in the Transformation of the Moravian–Silesian Region

The abovementioned results clearly demonstrate that the leader in cluster development in the Czech Republic was the Moravian-Silesian Region, the former heartland of Czechoslovakia's coal, steel and heavy engineering industries, with a population of 1.3 million and employment of 530,000 as of 2012. Over the past decade, its main industries have had to adjust to three major changes. Firstly, they have had to cope with the transition from a planned to a market economy. Secondly, they have experienced the collapse of their main former markets in Eastern Europe and especially in Russia. And, finally, as in all western market economies, the region has had to deal with the massive restructuring of the coal and steel industries (Skokan et al. 2012).

Moravia-Silesia has not found the adjustment process easy. Employment in the coal industry has declined from over 100,000 in the early 1990s to around 19,000 today. Over the same period, employment in the steel industry has fallen from 90,000 to 22,000. Further job losses in steel and heavy engineering are inevitable. Nevertheless, over the past decade much progress has been made, including major improvements in the physical environment and a reduction in pollution. New employment has been created in the expanding service sector. While inward investment has made a major contribution to restructuring the Czech economy, Moravia-Silesia has attracted relatively little green-field foreign direct investment. The region's ongoing problems were reflected in the level of unemployment which reached a peak of above 16 % in 2003. Recognizing these problems, the region has been identified by the Czech Government as a priority for regional economic development. A number of regeneration projects contributed to the region's redevelopment in the 1990s, such as the establishment of the Regional Development Agency, Science Technology Park, Industrial Zones Programs, etc. In 2002 special attention was paid to the "cluster approach" in the regional economic development policies of Moravia-Silesia.

The most significant industrial sectors in the City of Ostrava and the Moravian-Silesian Region are nowadays organized into clusters, providing the region with a new profile and simplifying the relationship between potential investors and suppliers. In terms of clusters, the Moravian-Silesian Region has the longest tradition of all regions in the Czech Republic.

The time-honored tradition of steel production and the concentration of metallurgical companies in the region gave rise to natural groupings for the production of steel and metal processing in the 1970s within the planned economy and direct

management of the metal industry. However, the management profile of this industry underwent changes as a result of the privatization schemes of the 1990s.

The metallurgy cluster has been in existence in the region for more than 50 years. In the new period of transformation post-1990, the representatives of 20 Czech and Slovak companies engaged in the production, trade and research of products of iron and steel metallurgy met as early as November 1992 in Prague in order to transfer control of existing joint ventures to the joint-stock company Hutnictví zeleza, a.s. (The Steel Federation, Inc.). The first cluster initiative in the region launched its activities on 1 January 1993. The Steel Federation is an exclusive steel association operating in the region. Its members are major Czech and Slovak steel producers and companies directly involved in the steel industry. Membership expresses a need for co-operation in many areas on global markets.

The new era of cluster development in the region after 1990 began as a joint initiative of the VSB-Technical University of Ostrava, the Union for the Development of the Moravian-Silesian Region and the Regional Development Agency of Ostrava supported by the Czech government agency CzechInvest. The Moravian-Silesian Region was the first Czech region to carry out a study identifying clusters (2002), and subsequently established the first cluster in the country—the Moravian-Silesian Engineering Cluster (2003). This cluster was converted into the National Engineering cluster in 2008.

As a result of its highly developed industrial base, extensive education system and a range of initiatives supporting research and development, the region has become the Czech leader in utilizing the concept of clusters to support the local development of key economic sectors. Today, clusters form an integral pillar of the region's future industrial development, and provide key support for the growing competitiveness of the region as a whole. Currently there are a total of 13 cluster organizations in the region, 12 of which were established within the last 10 years as can be seen in Table 2.

Table 2 Regional clusters in Moravia–Silesia in 2012

Cluster	Established in	Members
Czech machinery cluster	2003	61
MS wood processing cluster	2005	30
Envicrack alternative energy cluster	2006	28
Hydrogen cluster	2006	11
IT cluster	2006	32
MS automotive cluster	2006	62
MS energy cluster	2008	20
MS tourism cluster	2008	35
Knowledge management cluster	2009	32
Safety technology cluster	2010	18
Green horizon cluster	2011	9
Czech telecommunication cluster	2011	51

The most prosperous of these clusters, and the most important in terms of the regional economy, is the Czech machinery cluster which has developed over a period of decades. The last part of this chapter is devoted to its development.

6 Evolution of Clusters: The Case of the Czech Machinery Cluster

Clusters are not created from scratch, but rather develop gradually and have a defined lifecycle. Cluster evolution theory mainly deals with the emergence and the development of clusters. Evolutionary approaches emphasize the unpredictability of future cluster trajectories but stress that they are constrained by the past. Menzel and Fornahl (2010) propose the concept of cluster life cycles, a concept which is derived from product and industry lifecycle approaches. The authors expect clusters to move through a set of stages (emergence, growth, sustainment and maturity, decline or transformation) all of which feature different factors relevant to cluster development.

Emerging clusters are usually difficult to identify as potential firms which may constitute part of a cluster are scattered and the spatial and thematic boundaries are not yet defined. The distinguished feature for cluster formation is the role of pre-existing economic, political and institutional structures and the role of pioneering firms in particular regions. Firms are considered to be attracted by the proximity to higher educational institutes and a pool of well-educated labor. Growing clusters, on the other hand, are increasingly affected by demand and competition. With regard to sustaining clusters, the predominance of incremental innovations point to the increasing maturity of the cluster. Also, the number of market entrants and the number of collaborations with higher education institutes decline and clusters 'lock in' (Rehak et al. 2013). Declining clusters exhibit rigid and homogeneous networks, which slows down the innovation process. Cluster transformation and renewal requires radical innovation, a change of the institutional setup and networks, financial resources, proximity to research institutions and a pool of skilled labor. These factors obviously resemble those which can be viewed as decisive in the initial emergence of clusters. The following sections analyze the main factors relevant to cluster change.

The lifecycle of the Czech Machinery cluster can be traced back almost a hundred years; numerous drivers were identified in the development of the machinery and engineering industry in Moravia-Silesia (Skokan 2014). The current level and state of technological development within the regional machinery and engineering industry is the outcome of previous development of metallurgy and engineering (Table 3).

The emergence phase relates to the beginnings of coal mining in the region, namely the foundation of the first ironworks in Ostrava (the Vítkovice Company in 1828), together with the rapid growth of metallurgy, heavy machinery and engineering. After the establishment of Czechoslovakia in 1918, the region became a

Table 3 Main phases of the lifecycle of the machinery industry in Moravia-Silesia

Emergence phase	Growth phase	Sustainment phase	Transformation phase
Prior industry structure Entrepreneurial environment Pool of labor	Demand increases Supportive institutions and organizations Suppliers and customers	Growing inflexibility of institutional structures Isolation and lock in Loss of markets	Change of political and entrepreneurial environment Change of cognitive framework and firm routines
Phase 1:	Phase 2:	Phase 3:	Phase 4:
Emergence of coal mining, metal, heavy machinery in the nineteenth century (until 1918)	Gradual growth and maturity Breakdown due to crisis and war (1918–1945)	Maturity and decline of large state-owned companies in planned economy (1945–1989)	Restructuring and dynamic re-growth by privatization and FDIs Establishment of cluster initiative (1989–2013)

Source: Skokan (2014)

national industrial center, and a clear growth phase was discernible. The favorable conditions of the market economy developed until 1939, when it was interrupted by the global crisis and Nazi occupation from 1939 to 1945; however fast-growing demand for the support of Germany during the Second World War contributed to the modernization and improved performance of the machinery industry.

Post-war development was characterized by nationalization (1945), followed by the concentration (1955–1970) of smaller firms into so-called production-economic complexes similar to today's clusters. The main complexes in the region were, to give but a few examples, Vítkovice Metal-Machinery complex, the Steel and Iron complex, Ostrava-Karviná Mining Group—which also included machinery companies—and more enterprises besides. Growth was supported on one hand by state investment and COMECON division of labor for communist countries; while on the other hand, circumstances such as the centrally planned economy, isolation from the wider world and contemporary know-how behind the Iron Curtain led to the loss of industrial dynamics in the 1980s, which resulted in something of a sustainment phase for the machinery and engineering industry.

The transformation phase began after 1989 and at first included privatization of companies with various outcomes depending on the method used, whether voucher privatization and direct management buy-out or foreign buy-out. It resulted in the vertical disintegration of former complexes and large companies, as well as the establishment of new companies spun off from parts of the former complexes. The attraction of FDIs and acquisitions again led to the establishment of new firms; while the growth of productivity and employment due to the modernization of production equipment, ICT, methods of management and focusing on new markets in the EU and a more global scale of operations in response to these changes

Table 4 Timeline of important events in cluster development in Moravia-Silesia

Year	Action
2002	Pilot project "Identification of industry grouping for state aid support in North Moravia-Silesia"
2003	Establishment of the first Czech cluster "Moravian-Silesian Engineering cluster"
2004–2005	Search for clusters in Moravia-Silesia (identification phase)
2006	Regional initiative ClusterNet in Moravia-Silesia
2005–2008	Establishment of eight regional clusters in Moravia-Silesia (CLUSTERS Program)
2008	Czech National Cluster Association
2009–2014	Development of established regional clusters (COOPERATION Program)

Source: Skokan et al. (2012)

resulted in the establishment of the Moravian-Silesian engineering cluster initiative. After the first years of its somewhat 'fuzzy' existence, this first Czech cluster expanded outside the region and nowadays covers nationally located companies in the main value chains operating within the Czech machinery cluster.

The new era of cluster development began in the region as a joint initiative of the Czech Investment agency CzechInvest and the VSB-Technical University of Ostrava supported by the Moravian-Silesian Regional Authority. The region was the first in the Czech Republic to carry out a study identifying clusters (2002), and subsequently established the first cluster in the country—the Moravian-Silesian Engineering Cluster (2003) which was later transformed into a nationwide Czech machinery cluster. A timeline of important events in this development, which was strongly influenced and supported by regional authorities and by financial aid from EU Structural funds, is given in Table 4.

The pilot project helped to identify the metal-engineering cluster as having the greatest potential in the region. The establishment of this cluster was initiated at the regional level by the Union for the Development of the Moravian-Silesian Region with the additional support of the Moravian-Silesian Regional Administration, and the VŠB-Technical University of Ostrava (VŠB-TU) which is also a member of the majority of MS clusters.

The cluster was originally designed as a horizontal platform for the entire engineering sector in the region comprising firms from heavy machinery and metallurgy industries as well. After establishment it focused exclusively on firms from machinery and engineering.. These broad objectives, together with weak management under the head of the Union for the Development of the Moravian Silesian region and the unclear financing of its activities, led to crises in financing, concept, specialization and membership, during which its member base declined from 35 to 18 members within 2 years (Fig. 3).

Strong impetus for cluster development came in 2005 when new leadership took over the Vítkovice machinery group, the leading machinery company in the region. The development of the pilot cluster was not straightforward, but nonetheless was successful in the end. The industry structure of CMC is shown in Fig. 4.

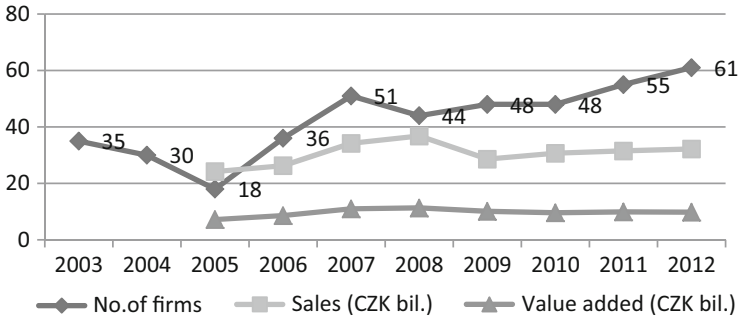

Fig. 3 Development of the Czech Machinery cluster. *Source*: Skokan and Zotyková (2014)

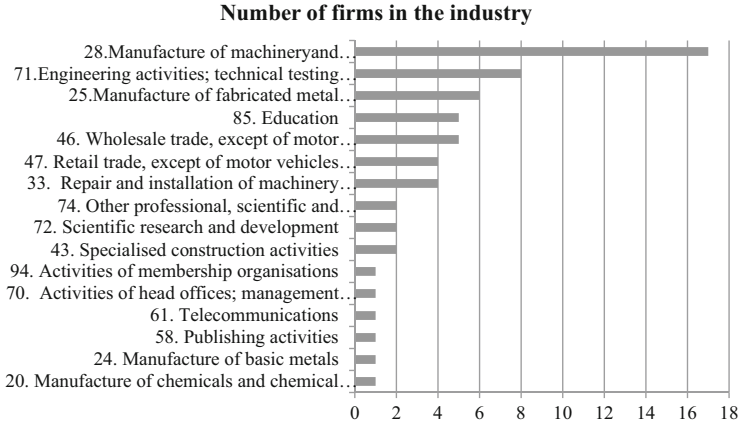

Fig. 4 The structure of the Czech Machinery cluster by industry. *Source*: Skokan et al. (2012)

The vast majority of firms (17) belong to NACE group 28—Manufacturing of machinery and equipment, followed by eight firms from NACE group 71—Engineering activities, six firms from NACE 25—Manufacture of metal products, and five education providers. The gradual growth of the number of member firms is based on value-chain related companies and was interrupted during the global financial crisis. Surprisingly, the volume of sales and total value added to cluster companies did not follow the growing trend of cluster members, as not all new members are manufacturing firms.

The Czech Machinery Cluster supplies the following sectors: conventional energy; nuclear energy; chemical and petrochemical industry; transport; metallurgical industry; and green technology. The main activities of the cluster are focused on (a) supply chains—enabling smaller cluster members to participate in large contracts for power industry, nuclear power and ecological engineering; (b) purchase alliances—cost reduction of joint purchasing based on quantity discounts; (c) internalization through export and investment: India, Argentina, Turkey, China; (d) cooperative projects—innovation in training engineers for nuclear

power; innovation in professional training at secondary schools (energy resources of the twenty-first century); (e) HRD for R&D teams, new talents for science and research.

The main activities of the cluster are focused on supply chains—enabling smaller cluster members to participate in large contracts for power industry, nuclear power and ecological engineering; purchase alliances—cost reduction in joint purchasing based on quantity discounts; internalization through export and investment; cooperative projects in innovation and training engineers for nuclear power; energy resources of the twenty-first century; innovation in professional training at secondary schools; HRD for R&D teams, new talents for science and research. Importantly, all such outcomes stem from business and requests from companies, and are business-driven rather than arising from the public sphere.

7 Conclusions

The establishment of clusters in the Czech Republic has become fashionable in recent decades, driven mainly by the availability of EU structural funds which have financed feasibility studies for their identification, and supported projects after the so-called cluster establishment phase. The emergence of clusters takes many forms. One example is based on companies which have already been active in the industry and the region for many years, as in the case of the machinery cluster in the Moravia-Silesia region. Another example is the establishment of new firms in industry and regions, as in the case of ICT or new energy source clusters where the firms are relatively new. However in both cases it must first be the firms which are established and operate in a given industry and region, subsequently gradually developing linkages and networks during various phases of their lifecycle. The existence of these firms is a fundamental condition for cluster development. The issue at hand is whether we may label them industry groupings or clusters, depending on the existence of cluster initiatives and cluster organization.

In the majority of clusters, their member firms existed and cooperated within the industry and region before any cluster initiative was organized and declared. There are numerous drivers, events or policy measures of endogenous and exogenous nature at regional, national and global levels which have a strong influence upon industry and cluster lifecycle, affecting the level of performance and competitiveness of companies both within the industry and clusters. This was also the case in the machinery and engineering industry in the Moravia-Silesia region where these factors played a decisive role in cluster development during the lifecycle of the old industrial region. The case of the Czech machinery cluster demonstrated that the creation of a cluster initiative does not guarantee future cluster success without the involvement of key business players. Clusters were originally defined in theory as industry-driven, a fact which still holds true even under specific Czech conditions regardless of cluster funding.

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Cluster Mapping: A Basis for the Creation of Network Cooperation

Andrea Sujová and Iveta Hajdúchová

Abstract Enterprises in today's globalized world are trying to find ways to deal with increased competitive pressure. The competitiveness of small and medium enterprises in many cases depends on their ability to cooperate—thus to create alliances, networks and consequently business clusters, which constitute a form of interorganizational network. The concept of business clusters goes further than the network cooperation of enterprises, because clusters are not only networks of interdependent enterprises, but also include institutions producing knowledge, bridging institutions and customers linked to the production chain and thereby creating added value. This chapter deals with mapping such clusters, the purpose of which is to identify the potential existence of a cluster and to draft a cluster map showing the supply and value chains in the cluster. Attention is paid in the paper to techniques for identifying clusters, which is the basic prerequisite for its geographical location with sufficient sources giving it a key position in the economic sector and a decisive competitive advantage over competitors.

1 Introduction

All enterprises attempt to find the optimal market focus and operation in an environment characterized by strong competition. It is possible to decrease the intensity of competitiveness by joining forces with other companies in clusters. From the point of view of modern management, it is the art of substituting negative cooperation, represented by competing against each other, with its opposite, i.e. positive cooperation. Pragmatically it is presumed that partial competition is retained. The concept of a business cluster was first mentioned by Porter (1990) in his book "The Competitive Advantage of Nations".

Porter (1998) defines a cluster as a geographically proximate group of interconnected companies, suppliers, service providers, and associated institutions in a particular field, linked by externalities of various types. According to Delgado

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et al. (2014), clusters are geographic concentrations of industries related by knowledge, skills, inputs, demand and other linkages. Members of clusters are competitors and at the same time business partners. Sub-contracting relationships, or common technologies, common purchasers or distribution channels, or a common labor market, may all function as a means of connecting the cluster. According to the UNIDO, regional clusters are a territorial concentration of companies which produce and sell similar or complementary products, and which are thus forced to overcome similar problems and challenges. As a result, this can bring about the formation of specialized suppliers of machinery and raw materials and the development of specialist competencies and skills, as well as the faster development of specialized and personalized services.

The business cluster as a cooperative (network) chain is an organizational form of linked companies, which are independent entities with a cooperative and relatively stable relationship, which carry out certain activities in tandem with the aim of achieving increased efficiency and profitability. This increases the opportunities for problem solving and the further development of cluster companies. Within the network, new products and services, as well as production and sales, are jointly developed. Besides production companies, research and development centers, consultants, universities, associations, and monetary institutions are also part of clusters (Leeder et al. 2004).

Success in the management of a cluster depends on the managerial activities in the first phase, i.e. the decision to create a cluster, and the process of cluster creation itself. The goal of this section of the book is to clarify the methodology of cluster mapping and its application to mapping clusters in the wood processing industry in the Slovak Republic.

2 Methodology of Cluster Mapping

The goal of cluster mapping is to determine the sources of existing or potential competitive advantages and plan their incorporation into the defined scope of activities. The process of mapping is focused on:

- the identification of present or potential clusters on the domestic or regional markets,
- the identification of key threats and opportunities for groups of companies and other agents, including universities and research and development centers,
- the processing of detailed maps and action plans for groups of agents with the goal of resolving common problems.

A methodology for cluster mapping was presented by Porter (2003) in his paper "The economic performance of regions". According to Porter's methodology, industries are initially classified as "traded" or "local." Traded industries are concentrated in a subset of geographic areas and sell to other regions and nations, while local industries are present in most geographic areas, and primarily sell on a

local basis. The geographic scope of a cluster is defined by the distances over which linkages and externalities have a meaningful impact. These distances differ by cluster categories and their underlying types of economic activities. For practical purposes, the geographic scope used in cluster mapping is an administratively defined region. A regional cluster exists when the level of this activity is overrepresented relative to the national average, measured as locational specialization above a certain set of cut-off points. This overrepresentation signals the presence of a critical mass at which cluster dynamics kick in.

Based on Porter's methodology, the U.S. Cluster Mapping research team (Delgado et al. 2014) developed a novel clustering algorithm which assesses the quality of alternative sets of cluster definitions and captures multiple types of inter-industry linkages. The algorithm relies upon clustering analysis, numerical methods used to classify similar objects into groups, and a set of well-specified parameters including the choice of underlying data and the number of initial groups from which to start the analysis. The process generates many different cluster configurations by applying clustering functions to data which provides different measures of the relatedness between any two industries, and modifying the parameter choices. Each configuration is composed of mutually exclusive groups of related industries (i.e. clusters). The algorithm then provides scores which may be used to assess the quality of each configuration. Quality here refers to the configurations' ability to capture meaningful inter-industry linkages within clusters. This allows for the identification of the configuration which best captures certain types of inter-industry links.

After the analysis of knowledge of cluster mapping methodology, we devised a basic process for mapping a potential business cluster:

- analysis of the dimension of the cluster which enables determination of the reasons for or suitability of forming a cluster,
- cluster defining (localization of the cluster) enables identification of the potential geographical localization of the cluster,
- analysis of the relationships of the sector with other sectors of the economy and detection of horizontal and vertical links of the cluster,
- creation of the cluster map as a graphical representation of the supply chain or value chain inside the cluster.

2.1 Analysis of Cluster Dimensions

The performance and development potential of a cluster depends on three dimensions which must be addressed by policymakers through corresponding policy or program interventions (Lämmer-Gamp et al. 2012):

The dimension of framework conditions, which structure the business environment in which the cluster operates: in a competitive environment clusters need to

develop within favorable framework conditions which support the activities of cluster participants. There are two types of framework conditions:

- *Macroeconomic framework conditions*: **s**tability-oriented macroeconomic policies and fiscal consolidations are necessary macroeconomic framework conditions in order to create jobs, export growth, and for economic development in clusters.
- *Structural framework conditions*, *including infrastructure*, *well-functioning goods*, *services and labor markets and regulations*: well-functioning markets and the free movement of capital, labor, goods, services and knowledge create dynamic markets which promote favorable growth conditions for clusters. While the macroeconomic framework conditions are common to all clusters in a particular country, structural framework conditions are rather cluster-specific.

The dimension of cluster participants: a critical mass of companies and other stakeholders relevant to cluster activities, such as research institutions and universities, is mandatory for the success of a cluster. The actual size of a critical mass depends on the potential which is represented by the cluster participants, who must be willing to collaborate with others on joint R&D and business development projects.

The dimension of cluster management organization: in order to facilitate collaboration between the cluster participants, there must be a strong coordination body—a cluster management organization. The quality of cluster management is critical in order to initiate and support collaboration among companies and other relevant stakeholders.

Suitable analytic methods are the strategic analysis of the sector and SWOT analysis. The results of such analyses enable the determination of basic conditions for cluster creation and an evaluation of the suitability of creating a cluster.

2.2 Cluster Definition

Porter (2000) recognized the need to clearly identify the industry boundaries of each cluster, and to that end pioneered a set of cluster definitions which became the foundation for cluster analysis. In order to compete more effectively, regions need to understand their cluster strengths in comparison to other areas. To accurately make this comparison, a consistent, national set of cluster definitions which mark the industry boundaries of each cluster is required. An effective set of cluster definitions should group closely related and supporting industries which capture the greatest possible number of linkages.

Clustering includes networking and trust, which means that even though all other criteria are met (including geographical vicinity and certain business relations) no cluster may be formed without social networks and trust. For this reason, the tools of cluster identification only allow for the designing of a potential cluster.

Two main approaches to cluster definition have developed over the past 20 years:

- clusters based on inter-industry linkages inferred from multi-region analysis (*comparable cluster definitions*);
- cluster definitions based on observed linkages among industries or firms in a single region (*region-specific cluster definitions*);

Many derived cluster definitions generated by researchers are based on both approaches (see Cortright 2006; Feser et al. 2009).

Several techniques for the identification of a potential cluster at a national or regional level exist:

Input–output analysis (Feser 2005): the identification of business relationships between various industrial sectors, used for depicting supplier-consumer relations inside the cluster and between clusters. Input–output tables are available only at macroeconomic level, and therefore cannot be used at a regional level.

Coefficient of localization as a ratio of employment rate in the sector in the region and employment in the sector throughout the country. The value of the coefficient of localization (LQ) is determined by to what factor the employment rate in the sector is higher in the region than throughout the country. The formula for the calculation of LQ, as defined by Porter (1998) is:

$$LQ = \frac{x_i/X}{y_i/Y} \tag{1}$$

where:

LQ	the coefficient of localization of employment rate in the region
x_i	the number of employees working in the given sector and region
X	the total number of employees in the region
y_i	the number of employees working in the given sector in SR
Y	the total number of employees in SR.

The coefficient serves for the geographical localization of the cluster. Regional clusters potentially exist where there are groups of connected industries with an LQ higher than 1.

For enhancement and specification of these localities, the Boston Consulting Group (BCG) method is used. This method considers another element, namely the dynamics of specialization, which is measured through a comparison of changes of the coefficient of localization over a time span of several years. Localizations of the cluster are then divided into four quadrants using the BCG method (Nolan 2004):

- Stars: specialized, with increasing specialization; a need for extensive investment to finance rapid growth.

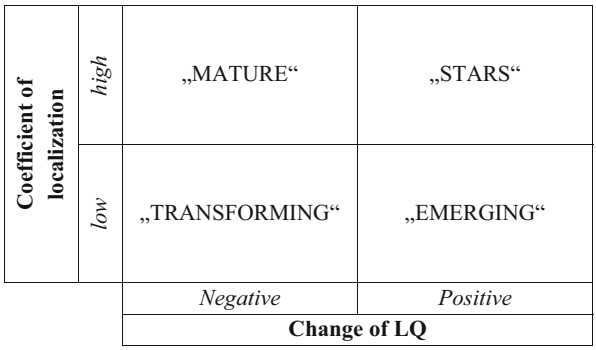

Fig. 1 Depiction of the BCG matrix. *Source*: Nolan (2004)

- Mature: specialized, with decreasing specialization; these are successful units with minimal need for investment as a means of retaining their share.
- Emerging: unspecialized, with increasing specialization; these are groups of companies which require extensive investment to retain their position.
- Transforming: unspecialized, with decreasing specialization; do not show any signs of expansion (Fig. 1).

Detection of a comparative advantage: National or regional share of export of the sector in terms of the total export of the region or country. RCA indicators serve this purpose as follows:

- The RCA indicator as a logarithm of the quotient of export and import commodity groups in that country to total exports and imports of the same country, which expresses competitiveness at a national level (Aiginger and Landesmann, 2002). This variable can be modified to detect the competitiveness of commodity groups within the region, i.e. to determine regional competitiveness.
- Competitiveness growth index (RCA1): the comparison of export rate in the sector of a country with total export share of a country or integration group. A variable RCA1 facilitates an assessment of the competitiveness of an industry on the international and worldwide market.

2.3 Analysis of the Relationship Between the Sector and Other Sectors

Several approaches exist for the identification of the relationship between the sector and other sectors of the economy. One group is based on mathematical-statistical methods (similarity matrices). A similarity matrix *Mij* provides the correlation between any pair of industries *i* and *j*. The matrix is based on the choice of indicator and the measure of similarity. Indicators used in the literature include employment,

number of establishments, measures of buyer-supplier linkages, and measures of shared labor requirements. The following are worth mentioning:

Locational Correlation (***LC***). Porter (2003) examines the employment co-location patterns of pairs of industries to capture inter-industry linkages of various types (e.g., technology, skills, supply, or demand links). He defines the locational correlation of employment (*LC-Employment*) of a pair of industries as the correlation coefficient between employment in industry i and employment in industry j in a region r:

$$\text{LC-Employment}_{ij} = \text{Correlation}\left(\text{Employment}_{ir},\ \text{Employment}_{jr}\right) \tag{2}$$

Similarly, we may also define an alternative locational correlation based on the number of establishments in a region-industry:

$$\text{LC-Establishments}_{ij} = \text{Correlation}\left(\text{Establishments}_{ir}, \text{Establishments}_{jr}\right) \tag{3}$$

The LC measures can be implemented for highly granular industry definitions, and its scale is easy to interpret, with values between −1 and 1.

The Coagglomeration Index (***COI***) developed by Ellison and Glaeser (1997) captures whether two industries are more co-located than expected if their employment is distributed randomly. The revised version of the *COI* in Ellison et al. 2010 is:

$$\text{COI}_{ij} = \sum\nolimits_r (s_{ri} - x_r)^* \left(s_{rj} - x_r / \left(1 - \sum\nolimits_r x_r^2\right)\right. \tag{4}$$

where s_{ri} is the share of industry i's employment in region r; and x_r measures the aggregate size of region r, as the mean employment share in the region across industries. A value of zero or negative for *COI* would suggest no externalities-driven co-agglomeration. The higher the positive value of the *COI*, the greater the potential for externalities between two industries, but it is not easy to assess whether particular positive values are large or small.

Multidimensional Similarity Matrices: Combinations of the unidimensional similarity matrices described above which can better capture more types of inter-industry links (e.g., demand, supply, skills, knowledge, and others). For example, we compute an *Mij* that we call *LC-IO-COIij*, which is the average of four (standardized) individual matrices: *LC-Employmentij*, *LC-Establishmentsij*, *IOij*, and COI*ij*. The multidimensional *matrix* has a strong and statistically significant correlation with each of the individual matrices.

The second possible means by which to do so is the method of questioning. Through this method, one may gather a wide array of information, which can cover the extent and depth of knowledge of the expert, his opinions and preferences. This method is characterized by the fact that it is conducted through

questionnaires prepared in advance. The outcomes enable the identification of horizontal and vertical connections within the cluster (Lodl 2006), such as:

- *Identification of key processes*: familiarization with the established system of company processes in the sector with different areas from the perspective of suppliers and consumers respectively.
- *Identification and interview of knowledge*: the main purpose is to gain insight on the observed cluster, the key knowledge of experts on processes, their share in the sector and their significance based on questioning the owners on key processes. The outcome is the specification of significant (critical) links, and the priorities of the given sector.

2.4 Creation of the Cluster Map

By summing the vertical and horizontal level of links, it is possible to design a knowledge map of the cluster, which enables identification of the efficiency of the potential cluster. The cluster map depicts the relationships on vertical and horizontal levels inside the cluster and on inputs and outputs of the cluster. It is a depiction of the supply and value network amongst cluster members. The cluster management organization is most important in terms of stature. This organization devises the strategy of the cluster and functions as a facilitator of the cluster, which assists the growth of existing companies and attempts to invite new companies into the cluster. This creates conformity amongst companies and their support infrastructure, including government, educational sources, and research and development institutions. The facilitator contributes to effective communication and links inside the cluster, and to communication and negotiations with external clients, government agencies, and company representatives.

In the next step, it is necessary to determine the potential efficiency of the cluster. A suitable tool appears to be the nine-box matrix (GEC matrix). Individual criteria, mapping the contributions of the cluster for companies, are evaluated by experts on a scale of 1 to 5. Based on the statistical processing of the information collected, the resulting values for contemporary and future strength and the market attractiveness of the sector are determined.

3 Cluster Mapping of the Wood Processing Industry in Slovakia

The wood processing industry (WPI) is one of the most important and dynamically developing industrial sectors in the EU, with a 10 % share of the production industry in the EU in its entirety, creating approximately 8 % of the industrial benefit and approximately four million jobs. It functions as an indicator of the stable

and strong socio-economic position of the EU member states. The wood processing industry is a sector based on renewable natural resources in the form of wooden raw materials. It is therefore able to achieve sustainable growth and be competitive on international markets. The goal of the European Union is to build an economy based on renewable natural resources, resulting in the need to pay increased attention to the development and support of the WPI.

3.1 Analysis of Cluster Dimensions

An analysis of the wood processing cluster necessarily includes definition of the framework conditions and cluster participants:

3.1.1 Framework Conditions

Slovakia, based on its forest area, has a reason to orientate itself towards the sustainable utilization of wood. With a total forest area of 2 million hectares, Slovakia is among the most sylvan countries in Europe. Managed forests cover 67 % of the total forest area. Given the fact that the production of wood-based materials is not dependent on the importing of raw material, it serves as a stabilization factor in the economy. Sufficient stocks of timber create a comparative advantage for the Slovak WPI.

Through a strategic analysis of WPI, the structure and number of companies in the sector, economic action of the sector and price development (by observing the price indexes of industrial producers and consumer prices) were determined. The macroeconomic conditions created for the WPI by the Slovak government were analyzed. Consequently, based on all results, analyses of strengths and weaknesses, opportunities and threats for the WPI sector were carried out, and through the SWOT matrix the strategy for the sector was determined. In the WPI sector, weaknesses within existing opportunities are present, meaning that a strategy of alliance is suitable here.

The results of the aforementioned analyses revealed that the formation of a cluster may be an opportunity to increase the competitiveness of the sector, due to the following reasons:

- a large number of small and medium sized companies exist—an average of 245 entities over the past 10 years;
- important foreign investors with quality background in research and development at their parent companies are present in the sector;
- Slovakia has sufficient numbers of qualified workers and educational institutions in secondary and tertiary levels for the WPI sector;
- the strategy of alliance is suitable for the development of the WPI sector;

- WPI in Slovakia has comparative advantages, which lie in the sufficient stock of raw material, but has low and decreasing values according to the RCA indicator (revealed comparative advantage), which goes to the decreasing competitiveness of the sector.

3.1.2 Cluster Participants

A characteristic feature of the WPI is the processing of raw wood and production of wood products at various stages of finalization. The WPI, within the classification of business activities of the EU (NACE), consists of the following sections:

- NACE 16: primary mechanical wood processing (timber industry)—109 units,
- NACE 17: primary chemical wood processing (pulp and paper industry)—45 units
- NACE 31: secondary wood processing (production of furniture)—100 units

Enterprises aggregated into these sections represent the members of a cluster, a critical mass of companies. Data for WPI cluster mapping was obtained from the database of the Statistical Office of the Slovak Republic. Other stakeholders relevant for WPI cluster activities are as follows:

- Slovak Forest Products Research Institute in Bratislava: the main purpose of this institution is to promote the development of Slovak WPI through research and development;
- Pulp and Paper Research Institute: the main purpose of this institution is to promote the pulp and paper industry in Slovakia. The main activities of the PPRI have always been concentrated on technological research and development, as well as the industrial application thereof, for pulp-mills, paper-mills and processing plants;
- Scientific and technological parks: university scientific park and research center at the University of Žilina;
- The Slovak Association of Wood Processors (ZSD SR) is a voluntary organization of employers at the ownership level. One of the priorities of the association is to promote the WPI and increase the finalization of wood processing under Slovakian conditions;
- The Pulp and Paper Federation of the Slovak Republic in Banská Bystrica is an interest organization, which associates corporate entities and personal businesses from the pulp and paper industry and related industries. Eleven companies associated in the PPFSR cover 100 % of paper produced in Slovakia and the majority of goods produced in the entire sector;
- Educational institutions: secondary woodworking schools in Banská Bystrica, Žilina, Topol'čany, Liptovsky Hrádok, Krásno nad Kysucou, Vranov nad Topl'ou, Spišská Nová Ves; and universities: Technical University in Zvolen, University of Žilina. The Technical University in Zvolen offers Bachelor's and Master's degrees in forestry, wood science, ecology and environmentalistics,

and production technology. The University of Žilina offers Bachelor's and Master's degrees in transportation. It may be said that ensuring faultless transportation is necessary for the effective functioning of the cluster;
- Regional consulting and information centers in Slovak cities, the business innovation center (BIC) in Banská Bystrica, the Slovak forestry and wood science library in Zvolen, and the regional development agency in Banská Bystrica;
- Transport and logistics centers: 23 logistic centers in Banská Bystrica region, 25 in Žilina region, and 31 in Nitra region. An important example in terms of logistic services is GEIS, located in Zvolen.

3.2 Localization of the Cluster

The source of data for the identification of key regions suitable for the WPI cluster was a database of employees (according to NACE) for individual regions of Slovakia as well as the country as a whole, drawn from Statistical Office data for companies with more than 20 employees: (http://slovak.statistics.sk)

- the number of employees in individual sections of the WPI sector in individual regions of Slovakia;
- the number of employees in individual sections of the sector for the whole of Slovakia;
- the total number of employees in Slovakia.

Using this data, we calculated the coefficient of localization (LQ), which determines whether groups of linked sectors, or potential clusters in Slovakia, exist in individual regions. From the analysis of regional representation focused on the production of wood-based products, we observed that the highest representation is in the Banská Bystrica, Žilina, Nitra, Košice, and Prešov regions. These regions were identified through the coefficient of localization (LQ) in 2005, 2008 and 2012. The results are shown in Tables 1, 2 and 3.

From the results, it is clear that Banská Bystrica and Žilina regions, with LQ values higher than 1, are suitable for the formation of a cluster. Banská Bystrica region is the most forested area in Slovakia, and forest harvesting in this region (mainly in the northern part), is several times greater than in other regions. Major firms which deal in wood processing and saw-mills are represented in this region,

Table 1 Coefficients of localization in SK NACE 16 Wood processing (LQ_{WP})

Region/Year	2005	2008	2012
Banská Bystrica	2.862	1.965	1.799
Nitra	0.641	0.211	0.221
Žilina	2.19	1.660	1.533
Prešov	0.057	0.100	0.328
Košice	0.248	0.605	0.091

Table 2 Coefficients of localization in SK NACE 17 Pulp and paper industry (LQ_{PPI})

Region/Year	2005	2008	2012
Banská Bystrica	0.117	0.242	0.266
Nitra	0.833	0.257	0.222
Žilina	0.617	0.701	0.812
Prešov	0.562	0.318	0.348
Košice	0.603	0.386	0.413

Table 3 Coefficients of localization in SK NACE 31 Furniture production (LQ_{FP})

Region/Year	2005	2008	2012
Banská Bystrica	1.089	0.884	0.546
Nitra	1.012	0.832	1.130
Žilina	1.189	0.767	0.400
Prešov	0.138	0.055	0.343
Košice	0.417	0.311	0.052

Table 4 Change in the coefficients of localization

	NACE 16 (WP)		NACE 17 (PPI)		NACE 31 (FP)	
Region	$\Delta LQ_{08\text{-}05}$	$\Delta LQ_{12\text{-}08}$	$\Delta LQ_{08\text{-}05}$	$\Delta LQ_{12\text{-}08}$	$\Delta LQ_{08\text{-}05}$	$\Delta LQ_{12\text{-}08}$
Banská Bystrica	−0.897	−0.166	0.125	0.024	−0.205	−0.338
Nitra	−0.43	0.010	−0.576	−0.035	−0.18	0.298
Žilina	−0.53	−0.127	0.084	0.111	−0.422	−0.367
Prešov	−0.043	−0.009	−0.244	0.095	−0.083	−0.003
Košice	0.357	−0.277	−0.217	−0.038	−0.106	0.032

such as Kronospan Zvolen, Smrečina Hofatex, Doka Drevo, and PRP Vel'ký Krtíš, all of whom distinguish this region as a leader in wood processing.

The best results for the pulp and paper industry were achieved by the Žilina region with increasing values of LQ to 0.812. The largest cellulose and paper producers are located in this region, such as Mondi Business Paper SCP Ružomberok and Metsä Tissue Žilina.

In the furniture production sector, the Nitra region is dominant, with LQ values exceeding 1. Among the most important furniture producers are Decodom, Lind Mobler and Furni Finish.

The next step determined the dynamics of specialization by comparing the change in the coefficient of localization over a period of several years. Based on the results of this comparison, shown in Table 4, a BCG matrix of specialization of individual sectors was created (Figs. 2, 3 and 4).

In the wood processing sector, there are two mature regions, with Banská Bystrica region possessing the highest coefficient of localization. In these regions, it is necessary to stabilize the status of the companies and support their development through innovation. As can be seen from the BCG matrix of specialization and

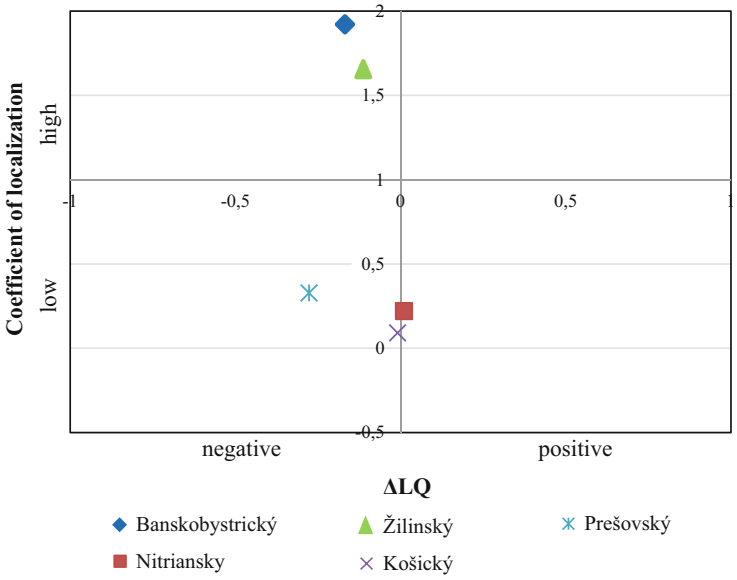

Fig. 2 BCG matrix of specialization and changes in the wood processing sector in selected regions of Slovakia

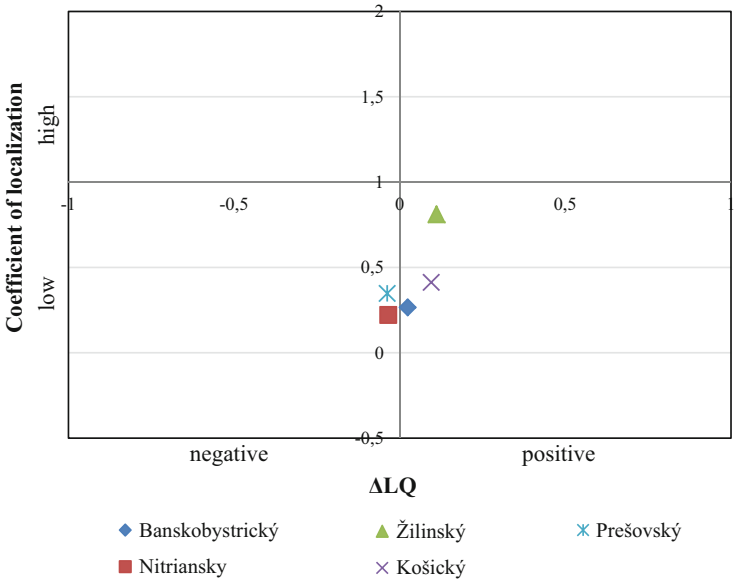

Fig. 3 BCG matrix of specialization and changes in the pulp and paper production sector in selected regions of Slovakia

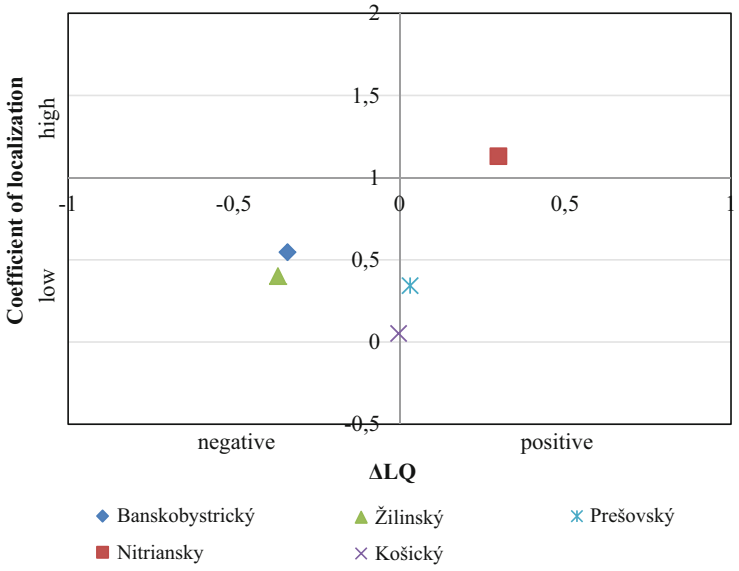

Fig. 4 BCG matrix of specialization and changes in the furniture production sector in selected regions of Slovakia

changes of Pulp and paper production in regions (Fig. 3), the key region is Žilina, located in the "EMERGING" quadrant, which represents companies which require investment in order to retain their position. However, if finances are secured in the region, the possibility exists of a move to "STARS", which increases their level of growth.

The Nitra region was also recognized as a "star" of the furniture production sector. Other regions have a low level of specialization, which is confirmed by their status in the matrix. They lie mainly in the "TRANSFORMING" quadrant, and do not show any signs of greater development. By contrast, the Nitra region contains a group of companies with increasing degrees of specialization.

From the summarization of the results of the coefficients of localization and the changes thereof, we can conclude that the best localization for a potential WPI cluster is in the Banská Bystrica, Žilina, and Nitra regions oriented between the cities of Zvolen, Banská Bystrica, Žilina, and Topol'čany, in which the most important companies of the WPI are located (Fig. 5).

The proposed solution, which only considers companies operating within the WPI, is by no means a final proposal. Other institutions, connected to the WPI companies which form the so-called soft infrastructure of the cluster, are part of the cluster. From information on the stakeholders of the cluster, it can be seen that research institutes, educational institutions, interest institutions, consulting and information institutions, and logistics companies are found within the regions of the localized cluster. The proposed localization of the cluster therefore seems to constitute a sensible solution.

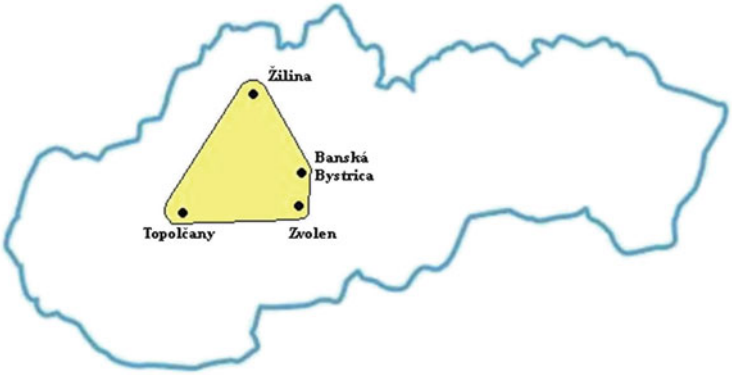

Fig. 5 Localization of the WPI cluster in Slovakia

4 Analysis of Relationships Between the WPI Sector and Other Sectors

For the purposes of discovering the relationship between the WPI sector and other sectors, a methodology of questioning was used. Information from the managers of all the important companies from the WPI relating to cooperation with entities in other sectors, as well as the importance or priority of supply-consumer relationships, was gathered by means of a questionnaire. Based on the data gathered, vertical and horizontal relationships of the potential cluster were determined (Fig. 6).

The strongest relationships were observed between suppliers of input material and wood processors at the first stage, and between raw timber processors and furniture producers. Timber suppliers, timber producers and forest harvesting companies should therefore be part of the cluster. The largest suppliers of timber in Slovakia are Lesy SR, GOE, and municipal forest enterprises, which together account for 50 % of timber production. The possibilities for the supply of input material are geographically linked with the location of forest harvesting. According to data on the area of managed forests in Slovakia, Žilina region has the highest share of forest area (56 %), with significant areas also found in Banská Bystrica region (50 %) and Trenčín and Prešov regions (49 %). We investigated the regional distribution of timber stock and the volume of forest harvesting (Table 5).

It may be observed that the largest amount of timber stock is found in the Banská Bystrica and Žilina regions, where the realized volume of harvest is the highest amongst all regions of Slovakia. This data confirmed the suitability of the chosen localization for the WPI cluster.

Effective supply relationships with the cluster should be supported through the inclusion and involvement of institutions linked to suppliers of input material, mainly research centers in forestry:

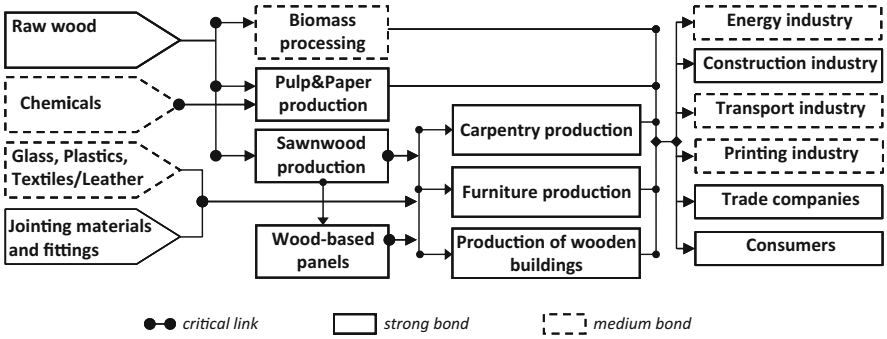

Fig. 6 Horizontal and vertical relationships within the cluster. *Source*: Processed by authors according to Loucanova and Zauskova (2008)

Table 5 Forest harvesting and timber stock in 2012 in Slovak forests (by region)

Region	Forest harvesting (m^3 not including bark)	Timber stock (m^3 not including bark)
Bratislava	252,579	17,701,264
Trnava	217,128	13,883,885
Trenčín	345,334	55,028,520
Nitra	805,278	18,259,505
Žilina	2,087,528	101,987,653
Banská Bystrica	1,913,440	111,578,989
Prešov	2,108,313	89,837,913
Košice	1,072,010	63,906,388

Source: National Forest Centre (2012)

- The National Forest center (NFC) located in Zvolen is a contributory organization focused on ensuring complex forestry research, expert assistance, forest information systems and the preparation of details for forest management plans;
- The Forest Ecology Institute, located in Zvolen, is oriented towards complex and basic theoretical and methodological research into the ecology and biology of introduced and domestic tree species and other organisms functionally linked to the tree species and their ecosystems;
- Lesy Slovenskej republiky Banská Bystrica, GOE, whose main task is to manage forests and other property owned by the state of Slovakia.

5 Creation of the WPI Cluster Map

If the cluster is to fulfil all of its functions, it must cooperate with other institutions offering engineering, software, ecological services, transport companies, research institutes, organizations of interest, professional associations, schools, and

legislation. The institutions which form the soft infrastructure of the WPI cluster were mentioned in Sect. 3.1. In this section we show the proposed WPI cluster map as a visualization of relationships between the WPI cluster participants (Fig. 7).

We suggest the Slovak Association of Wood Processors as a viable cluster management organization. The Slovak Association of Wood Processors would carry out activities to promote the expertise and economic, legal, and social interests of its members, represent them before unions and other employer associations, government, parliament, foreign associations and other corporate entities and natural persons. It would participate in negotiating financial support from the state. The supporting organization for cluster managers is the European Cluster Excellence Initiative (ECEI). Its outcomes provide a methodology and instruments for the support of cluster organizations with the aim of providing greater opportunities and abilities to manage clusters and network cooperation.

The cluster would represent an open association of companies with the possibility of accepting new members, but the selection process would have to adhere to strict criteria, in order that the joining company would not disturb the harmony of the cluster.

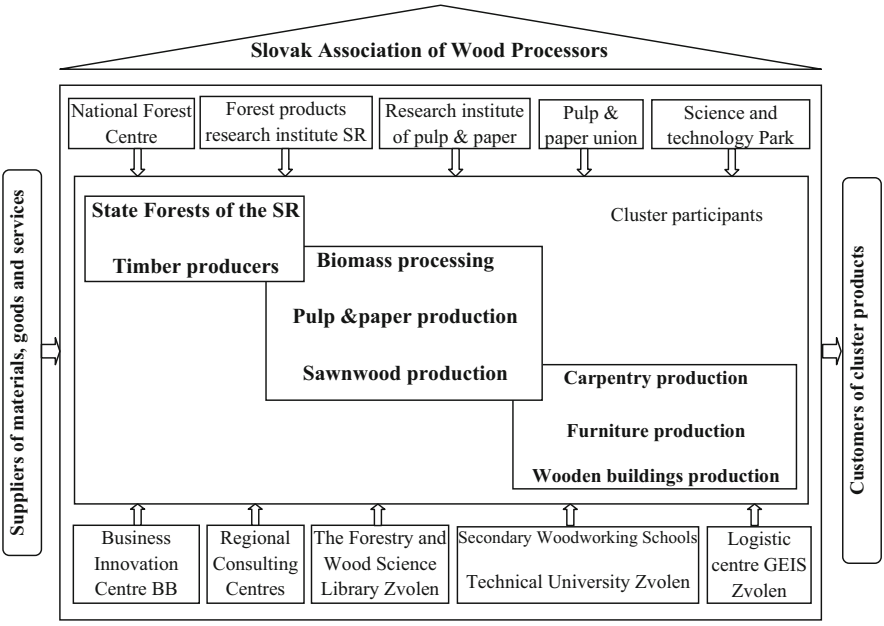

Fig. 7 Wood processing cluster map

6 Conclusions

Successful regional economies are specialized to varying degrees. The competitive advantage of a certain location is the synergy of competitive advantage of particular specializations in the locality. Association in a cluster offers better, more effective access to suppliers, specialized services providers, a more qualified work force, and the transfer of knowledge and open innovations. This contributes to the increased competitiveness of the cluster members.

The cluster of companies in the wood processing industry enables small- and medium-sized companies to compete on the global market. Creation of the cluster helps to solve persistent problems, among which can be grouped: low production of domestic timber, ineffective cooperation between producers and processors of timber, low rate of innovation activities, and modernization of production systems. The companies and institutions in the cluster will have a common goal, namely the effective utilization of the potential of timber. Cooperation inside the cluster will allow small- and medium-sized companies to gain access to the results of research and development with minimal finances needed for their own research, easier access to sources of assistance for innovation and the modernization of production, and decrease the costs of promotion, logistics and distribution. The success of the cluster strongly depends on the willingness of the cluster members to cooperate, successfully implement changes in their in-plant management system, share knowledge and realize open innovations. The key role lies with the cluster management organization and its capacity to manage the activities of the cluster by successfully choosing a suitable management system and the tools needed to make it work.

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The Process of Cluster Management

Lilla Knop

Abstract The goal of this paper is to present the process of cluster management, adopting the assumptions of the contemporary network approach to trends and changes in the understanding of the essence of management. The concept of cluster management is based on the coherent and balanced development of knowledge, structure and trust—the KST concept components—promoting the realization of the conscious idea of a cluster, while assuming the strategic intermittence of the environment. The significance of each of the management levels (strategic and operational) is dependent on the intensity of operational activities and the breadth of horizontal problems solved by the cluster. The interweaving strategic and operational levels emphasise the necessity of diversifying coordination mechanisms. One such example is in the existence of a solid cluster structure, which supports the network and the operational activities of the cluster. Another mechanism is the existence of integration structures based on the assumptions of cluster governance, which are responsible for the effects and strategic future of a cluster. The effectiveness of this cluster management process model is supplemented by the following cluster management functions: shaping, activation, configuration, mobilization, animation, synthesizing and learning.

1 Introduction

The turn of the century brought about numerous changes in the perception of economic processes. The networking stage of development of the economy (Czakon 2012; Benkler 2006) began in conjunction with the liquidation of the barrier relating to the high level of capital investment of individual entities. Considerable expenditure was spread into small parts constituting the property of entities functioning in the network. Apart from corporate models popular in the

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twentieth century such as Ford or General Motors, partnership and network models emerged which were not new, but have gained a new meaning. At the turn of the twentieth century the usage of assembly lines was regarded as rational and effective. Likewise, the turn of the twenty-first century saw the development of the notion of 'economies based on knowledge' associated with the production, processing and diffusion of information. Management studies so greatly appreciated the role of networks that, apart from economies based on knowledge (OECD 1996) and network societies (Castells 1998; Benkler 2006), there is clear justification for highlighting the importance of another characteristic of contemporary times, namely an economy based on networks (Czakon 2012: 13; Sroka and Hittmár 2013).

Both theory and practice relating to this issue indicate that intensifying the development of networks contributes to the appearance of questions on their efficiency and effectiveness as well as the intentionality of actions and the ability to manage them successfully. The development of the network paradigm has significantly influenced the essence of the understanding of the notion of management. Taking into account the current level of knowledge, it might be assumed that the existing practical definition of management, according to which it is basically aimed at pursuing goals through proper planning, organization, motivation and control over the use of resources, is insufficient, since it does not include numerous other actions and objects (contract, relationships) which may also be taken into consideration (Niemczyk 2013: 43). Management is currently heading towards a broader conceptualization, assuming that the nature of the surrounding reality more often generates managerial problems characterized by complexity, changeability and ambiguity, all being a result of diversity (Bratnicki 2011). Discussion on the subject of networks as research objects leads the researchers to narrow the research area, especially when we reach deeper into the internal processes and seek solutions to improve their effectiveness.

The challenges which accompany the modern economy have created and distinguished numerous network solutions which are subject to wider investigation, one of which is clusters (Czakon 2012: 51; Niemczyk et al. 2012: 144). For approximately a century now, clusters have been treated more as a group of organizations, and have only recently become the subject of intense research and scientific discussions in the field of management sciences. Modern clusters, as an example of a network, play a crucial role in knowledge creation, supporting innovation, the implementation of innovations, improving skills and developing new competences (Porter 2007: 2). Clusters are networks which concentrate autonomous entities representing different environments which, based on the principles of coopetition, create new value and fulfil the needs of numerous stakeholders.

The goal of this article is to present the process of cluster management, adopting the assumptions of the contemporary network approach to trends and changes in the understanding of the essence of management. The discussion is based on a broad analysis of the literature, as well as on longstanding research on clusters, in this case involving a detailed analysis of 17 clusters functioning worldwide, chosen as a result of work and projects carried out by the author over the period from 2005 to

2011. Moreover, the author has taken part in numerous research projects conducted in Poland and abroad, which has allowed for a broader view of the cases analyzed, and has facilitated the formulation of concepts and recommendations in terms of clusters. The work undertaken involved the creation of several clusters in Poland; the assumptions inherent in Polish cluster policy as well as the analysis of several dozen clustering policies from throughout the world turned out to be particularly useful in verifying the concept.

2 Development of the Network Paradigm

The network paradigm results from the observation of social and economic reality (Czakon 2012: 25). In the words of Hakanson and Shenota (2006), 'an organization is not an island'. This means that there is interdependence with specific, identifiable and clearly connected entities in the environment, with which an organization strives to create values. Czakon (2012) provides a concise presentation of the fundamental assumptions behind the network paradigm as compared to the conventional paradigm in management studies (Table 1).

The use of the network paradigm in the management of networks, especially clusters, is particularly important. It is the next evolutionary step in the understanding of the management process and explores the essence of understanding clusters. In the past decade, clusters have become the subject of many studies, among them the processes of initiation and development of clusters in the region (Karlsson 2008; Henning et al. 2010; Pachura 2010); the creation and development of clusters as a network of companies and institutions (Breschi and Malerba 2005; Stachowicz 2006); in particular SMEs (Parrilli 2007; MacGregor and Hodgkinson 2007); as

Table 1 Network paradigm vs. conventional paradigm

Conventional paradigm	Network paradigm
Organization's environment is nameless, anonymous	Environment constitutes a specific approach
Organization's environment remains beyond its control	Organization partially controls its environment
Objective market opportunities	Opportunities exist in a network which recognizes, conditions them and enables their use.
Hierarchical control over resources	No need for hierarchical control over resources
Competitive advantage dependent on effectiveness of configuration and exploitation of resources in the company	Competitive advantage dependent on structure, position and relations within the network
Frequent changes in the conditions of the environment	Conditions of the environment might be stabilized by networks

Source: Czakon (2012: 28)

social networks (Castells 1998; Stachowicz 2006); or as a means of developing competitiveness, innovation, diffusion of knowledge, technology transfer (Carayannis and Campbell 2006; Breschi and Malerba 2005; Brzóska 2013), and so on. Most problems are solved, however, at levels of geography and the region where clusters are used as one of the tools of regional and spatial development. However, Martin and Sunley (2003) note in their analysis that clusters are such a flexible concept that it is difficult to find a universal model without the use of other fields of science. Through the development of the network paradigm, management studies have provoked numerous questions regarding novelties and differences in the current understanding of clusters. These phenomena describe clusters not so much as a group of organizations that are only a "random cluster", but as "conscious and intentional actions" that may be activated, configured, planned, coordinated and evaluated. According to Czakon (2012: 234), 'networks enabled the effort to consider a wider perspective: in a network paradigm, researchers, instead of '*focusing on the trees, observe the entire forest*'. It creates a new reality, not only in terms of defining clusters, but also a broader view of cooperation strategies.

3 Evolution of the Management Process

The traditional concept of the management process involves actions which come down to implementing simple procedures and projects characterized mostly by closed and strongly deterministic decisions. It must be emphasized that conventional functions of management have not disappeared; yet its connotations have changed, the scope of variability has become broader and new activities have appeared (Niemczyk 2013: 44). The same author presents a change in approach to the understanding of management which can be said to correspond to changes in approach to strategy (Table 2).

Changes in the definition and understanding of the idea of management result from the economic and social development of the surrounding reality. The abovementioned attitudes indicate that management should be regarded as problem-solving in the context of established assumptions. However, the assumptions and problems, taking into account the number of details they include, may be strategic and operational in nature, and the level of functionality indicates a certain evolution. According to J. Rokita (2011: 8), solving problems related to management must be characterized by holism and not reductionism, whereas management constitutes a complex creation of the future activities of the organization or network or the sum of simple rules of conduct.

Table 2 Evolution of the management process

Approach to strategy	Understanding of the management process
Planning approach (1945–1973)	Management as planning, organizing, motivating, control over optimal use of resources
Positional approach (1973–1982/1984)	Management as planning, organizing, motivating, control over proper allocation of resources in context
Resource-based approach (1982/1984–2008/2010)	Management as influence on the shape and development of key competence
Innovative-entrepreneurial approach (2005–now)	Management as activation of new resources, configuration and opportunities for action
Network approach (2010–now)	Management as obtaining and shaping networks of resources and relations

Source: Niemczyk (2013: 39, 45)

4 The Process of Cluster Management

Certain studies revealed that cluster management is based on conducting operations in an environment characterized by turbulence, uncertainty and high complexity. This is nothing revelatory in relation to management practices—yet clusters define their own problems which, among others, concern (CLOE 2006; Scheer and von Zallinger 2007; Buhl and zu Köcker 2010; Sölvell 2008): resistance to cultural differences and the need to change mentality (switch to 'cluster and cooperative thinking'); the need to create a common environment and inspire others; justification of public and private investment in the area of cluster development; uncertainty as to the continuous engagement of key stakeholders; strong external competition; changes in the regulatory environment; rapid technological changes; lack of experience in professional cluster management; financial instability in relation to the activities in the field of cluster management; and multi-sectorial cluster orientation and the conflict of interests of many concerned environments. Lindqvist and Sölvell (2011) went further by introducing the concept of "gaps" which occur in relation to the development of the cluster, especially in relation to innovation.

The main premises which indicate the requirements and problems inherent in cluster management relate to both theoretical and practical solutions. The points thus far presented create a specific image of the cognitive challenges and gaps faced by clusters. The subject literature offers numerous research papers which do not allow for the reconciliation of cognitive standpoints, while there are few studies which synthesize the current discussion on the issues of network or cluster management. The summary, based on the network paradigm, uses discussions conducted by Messner and Meyer-Stamer (2000) in respect to clusters, and Czakon (2012) in relation to networks.

Assuming that cluster management involves the solution of problems resulting from the implementation of established objectives, key issues revolving around strategic and operational problems are presented. The discussion builds on the new approach to strategy based on innovation and an entrepreneurial as well as network approach, which regards management as the generation and acquisition of new

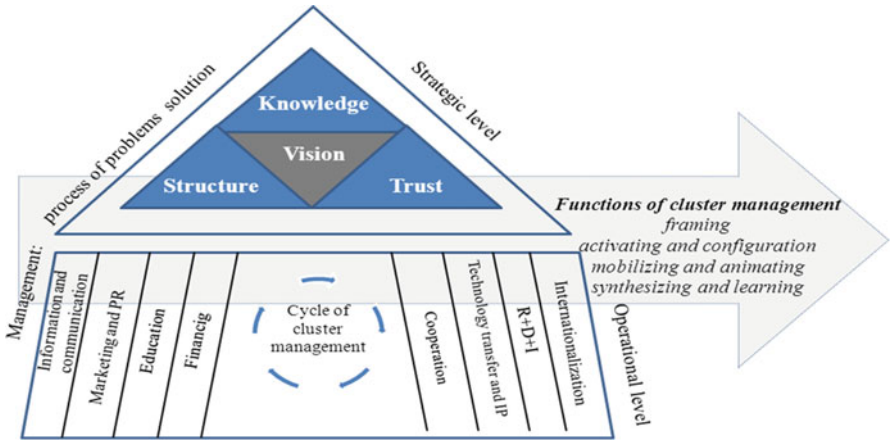

Fig. 1 Network management functions

resources, configuration, opportunities for action and forming a network of resources and relationships.

The strategic level of cluster management is focused on the idea, policies and goals behind the functioning of a cluster. The next indicators describe problems related to value creation (knowledge), issues of coordination and inter-organizational resource configuration (structure) and determinants of trust (trust) affecting the stability of the relationships in the cluster. The criteria adopted in the synthesis are associated with key areas of management and are consistent with KST (knowledge-structure-trust) components. The cluster team is primarily responsible for the efficiency of the cluster initiative. Cluster management and team members support the initiative as part of their daily responsibilities. As this is a cumulative process, the overall performance of the cluster initiative is considerably influenced by cluster management and the cluster team. The main tasks for the operational cluster management can be divided into several fields of action: information and communication, training, co-operation, marketing and PR, internationalization, technology transfer and IP, D + R + I, financing. These activities can be realized in the cluster management cycle. Figure 1 presents the process of cluster management in its entirety.

The functions of cluster management are a supportive element in the process of strategic and operational cluster management. Taking advantage of the assumptions of the network paradigm, Järvensivu and Möller (2009) presented four network management functions which might be applied in the description of the 'function' of cluster management: framing, activating and configuration, mobilizing and animating, and synthesizing and learning.

5 Strategic Management of Cluster

Assuming that organizations operate in environments where strategic discontinuity is constant, an organization's key abilities are considered to be: continuous learning, adaptation and development, revitalization, reconstruction and reorientation in order to maintain a sustainable and distinctive position in the market. Clusters have become a solution which to a large extent creates, animates and supports these activities through specific concentration, complementarity, but also organic variability, resulting from the setting of new goals and creating methods for their implementation, while balancing the interests of different groups of organizations.

Any discussion of the conditions which explain the process of strategic cluster management is limited to three basic components: knowledge, structure and trust joined by the common ideas and policy of the cluster. The abovementioned conditions have become the basis for developing the concept of KST (Knop 2013; Knop et al. 2008, 2011). Broadening the understanding of each of the components indicates that we not only describe each as an element of a certain whole, but also draw attention to the connections between them, their cohesion (a system of links) and dynamics. Consequently, in terms of a system we deal with a collection of elements and connections between them, while in terms of a process we indicate the development (evolutional, sometimes revolutionary) of these components, with the assumption that any change in one of them brings a necessary change in those remaining. These interactions are strong and multidirectional. A key component in the KST concept is knowledge, which is a means of value creation, thanks to which a certain level of competitiveness and innovation can be achieved (Sölvell 2008). Hence, the fundamental question that cluster members are obliged to answer: how, based on cluster knowledge (formed, exchanged, perceived and learned) and its transfer, do we create a certain level of individual and collective competitiveness? In order to be able to discuss the development of knowledge in the cluster, one must be aware of its transferability, the ability to aggregate and appropriate. Value creation in a cluster requires order and space for cooperation. Therefore, further components of the concept are structure and trust. Structure defines the competence and distribution of 'powers' and resources in the cluster together with the dynamics of changes (concerning e.g. current projects). The balance of 'forces' in the cluster is based on particular relations, which form various types of bonds. These connections not only increase trust, but also shape specific competences supported by the proper ecosystem of the cluster. As a consequence, the structure of a cluster becomes a component responsible for the processes of coordination and configuration of cluster resources. The development of relations and narrowness of the structure underpin these processes. The final component which influences the stability and durability of a cluster is trust, which, as a key element of social and relational capital, draws attention to the area (quality, systems) of communication in the cluster, the cooperation climate created due to the conditions of cooperation, and the no less important feeling of openness (to new ideas, new partners, network participants and so on) while obeying established rules and regulations. On the whole, the solution provided allows us to describe, analyze

and, most importantly, evaluate the effectiveness of established solutions. Strategic cluster management is closely linked to the choice of cluster management models, which are discussed in several publications (Knop 2013; Brzóska 2007).

6 Operational Management of Cluster

Furthermore, one must also bear in mind that with strategic decisions come operational activities which may be implemented by coordinators or supporters. These actions are essential in terms of cluster management as a whole; however, they do not have to be realized by one entity, such as a coordinating organization, but by numerous organizations together with the development of the cluster ecosystem. These activities include (CLOE 2006: 20–26; Knop 2013): *information and communication*—detailed databases, interviewing participants, website, suppliers and services catalogues, bulletins, regular events, business trips, study visits, monthly summaries of information, press releases; *marketing + PR*—marketing information and materials, shaping the identity of a cluster, national and international PR, advertising, tools for reinforcing the image of a cluster, fairs, company visits, presentations for major clients, lobbying; *training and education*—analysis of educational requirements associated with the development of a cluster, promoting and mentoring talented employees, enhancing the qualifications of employees, organizing regular events: workshops and seminars, study visits for employees, joint learning with other companies, cooperation with R&D and educational institutions; *internationalization*—opportunities to participate in international events, conventions, access to topics, clients and trends, supporting international cooperation, support for internationalizing companies, network activities among comparable/complementary international clusters, organizing external visits in a cluster; *cooperation and activation*—initiating and supporting cooperation projects, establishing relationships with potential project partners, cooperation with R&D and educational institutions as well as suppliers of specialist services, establishment of specific support programs, support for innovation development; *technology and IP transfer*—databases on technologies, seeking investors, intellectual property protection rules, supporting commercialization processes, cooperation in terms of carrying out new projects and devising business plans, supporting the implementation of new products; *R&D&I*—research on the development of a cluster, analysis of the cluster's competitiveness and innovation, setting trends of development, cooperation with academic entities; *financing*—establishing rules for financing coordinating entities, indicating the scope of remitted services, membership fees, participation in projects which enable the financing of coordinators.

These activities can be realized in the cluster management cycle, which was presented by PricewaterhouseCoopers (PwC 2011: 8). According to this model, operational cluster management represents a continuous activity (not merely a project) which is cyclical in nature. It is a complex, interactive, non-linear process, which contains the following steps: (1) define—cluster vision, management mission, strategy objectives, key performance indicators, key uncertainties (this step is

part of strategic cluster management); (2) design—actions, communication platform, monitoring and evaluation systems, agreements with stakeholders; (3) implement—actions as designed (e.g., networking, providing information, lobbying, collaboration, education, cluster promotion); (4) monitor—monitoring indicators, review progress, identify problems in planning and implementation; (5) evaluate—the results (identify key evaluation questions, facilitate the evaluation process, analyze the results); (6) revise—objectives and uncertainties, report to stakeholders. This model of the cluster management cycle may also be used in project management.

7 Functions of Cluster Management

Determining the 'functions' of network management is based on attempts already made to conceptualize the issue. Ojasalo (2004) indicates the need for network leaders to search for key networks in the environment, identify the strategy of dominant actors, as well as develop and implement operational activities. With reference to the theory of complexity, Meyer et al. (1998) emphasize that the role of a manager is to influence the amount of acceptable improvisation, the nature of cooperation, rhythm of innovation and number of acceptable experiments. The functions of cluster management are based originally on the classical approach. The following discussion is strongly based on Järvensivu and Möller (2009) and McGuire (2002). Basic cluster management functions could be labeled thus:

- *farming* in a cluster corresponds to planning in hierarchies, and fulfils the requirement of managing value-creating systems. This function is managerial work on creating an understanding of the value that the cluster creates; how the cluster may approach the creation of this value; and communicating this knowledge among the actors in the cluster. This function connects farming and planning—especially in terms of strategy, objectives or action plans. This is not a "planning" function, since no actor by itself can plan the value which is to be created. In conclusion, planning is related to formal objectives, plans and evolution indicators, while farming is the process of creating an understanding (mutual endeavors), as well as the process of interaction and negotiation among the actors;
- *activating and configuration*—this function is focused on the structure or the patterns of cluster actors, activities and resources which are necessary in creating the targeted value. This is not simply "organizing", but is rather the work of identifying and recruiting the actors, resources and activities, and interacting and negotiating with the actors in a cluster ecosystem. These actors possess the resources and capabilities to undertake the activities necessary for the creation of value, with the ultimate goal that the actors will activate themselves as part of the value-creating cluster;

– *mobilizing and animating*—this function corresponds to motivation in hierarchies, but is concentrated on animating and building commitment among actors towards mutual value creation. In summary, mobilizing and animation are about building a sustainable and stable cluster structure based on trust, commitment and co-opetition.
– *synthesizing and learning*—this function is focused on monitoring, facilitating and learning interaction patterns among actors, resources and activities, not only constituting a list of indicators, but also the processes of monitoring and continuous improvement.

In conclusion, the basic functions of cluster management presented are similar to classical functions, which makes them easy to use; and at the same time are different in the sense of having numerous actors, commitment, value creation in networks (both with clear and unclear structures) and so on.

8 The Concept of Cluster Governance

Shaping the processes of management, monitoring, supervision or joint governance in the cluster is a matter which has been discussed since the point at which decisions relating to cluster development ceased to be dependent solely on the policies of local or regional authorities, and enterprises began to take active involvement in decision-making processes. Initially, as the clusters were tools in the hands of public authorities, basic decisions were made and activity indicators were formulated. It can be noted that since the emergence of issues relating to assessment of the competitive or innovative position of a cluster, and enterprises became the main animator of actions (essentially following the studies of Porter), increased interest has arisen not only in cluster management but also in cluster governance. Actions aimed at supervising the cluster are based on two crucial premises: the network paradigm and the stakeholders theory. In the first case we turn to three basic mechanisms of coordination: hierarchy, market and network.

The basic study which enables the explanation of the issue of cluster governance in the network paradigm is an article by Jones et al. (1997), who described the meaning of network governance in terms of the development of social aspects. According to their definition, network governance is '[. . .] a select, persistent and structured set of autonomous firms (as well as non-profit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges. These contracts are socially, not legally, binding'. Among further such literature (e.g. Peters 1998; Powell 1990; Miles and Snow 1992; Meuleman 2008; Poppo and Zenger 2002) a publication worth mentioning is the synthesis proposed by Rhodes (1997), who presented four applications of the notion of network governance: *governance* through minimal intervention of the country, using markets and providing 'services' on this basis; *governance* as corporal order, with emphasis

mainly on issues of clarity, reliability and responsibility, based on control; *governance* as a socio-cybernetic system of interdependence between business, social and administrative entities; and *governance* as self-organized networks, in the sense that networks develop their own policies and shape their environment.

Another notion which has been broadly analyzed is that of corporate order, perceived by the OECD as a network of relations between a board of directors and their supervisory authorities, stockholders, and other groups involved in the functioning of the company (Ministry of the Treasury in Poland 2004: 32). According to Jeżak (2010), '[. . .] the corporate governance theory is not merely limited to the analysis of the traditional owner–manager or principal-agent relationship. It also involves the role of other interest groups, the so-called stakeholders (creditors, employees, clients, suppliers, local community)'. As stated by the same author, the fundamentals of the understanding of corporate governance lie in two key cognitive perspectives, namely the ownership perspective and the stakeholders' perspective.

Building cluster governance refers to two key perspectives combining network and corporate governance concepts. The two concepts are joined by a diversified network of players. Ultimately, cluster governance, as a system of joint governance of complex networks, consists of selected and involved representatives of government, business, science and civil society aiming to ensure and verify the implementation of the objectives of the cluster based on the balanced development of KST concept components. The roles performed are social in nature and the key tool is the monitoring system. While determining basic models of cluster governance, Meuleman's typology (2008) may be applied to present certain such examples: the *participation model* (normative concept) (Lovan et al. 2004), promoting the individual and collective participation of different environments in managing the cluster with the use of particular groups; *nodes model* (Shearing 2001)—a structured form of participative management, in which key players and other participants cooperate in order to realize enterprises; actions based on 'nodes' of networks and partnerships; *culture model* (Bang 2004)—based on reaching consensus—a combination representing a new form of top-to-bottom steering based not on hierarchical but self-disciplined relations resulting from values and rules established in the cluster; *civil society model* (Schedler 2006)—referring mainly to civil society and its active cooperation; discussion model (Hajer 2003)—based on public debates and meetings, somewhat idealistic, in which joint discussion is believed to enable the discovery of solutions to problems; *reflective model* (Beck 1997)—complexity and uncertainty require a reflective approach, that is to say, an attitude where cluster leaders and coordinators as well as its participants operate in a changing environment, which should be explored and educated; *adaptation model* (Nooteboom 2006)—developing solutions which appear to best suit the identified problems. A key feature of adaptive management is common education and flexibility. The proposed areas around which the notion of cluster governance revolves are to some extent in line with the issues of cluster management. The basic differences which may be discerned in relation to modern solutions concern a few issues (Table 3).

Table 3 Cluster management vs. cluster governance

Features	Cluster management	Cluster governance
Key assumptions	Organizing and coordinating the activity of the cluster in accordance with the adopted strategy and development models	Verifying strategic assumptions of the cluster aimed at fulfilling the needs of various environments
Key players	Cluster manager or management and supportive entities	Representatives of four environments: business, science, authorities and civil society
Responsible units	Cluster organization	For example: cluster council, supervisory board or other groups
Responsibility areas	Managing and increasing general cluster efficiency. Evaluation based on network indicators	Shaping 'order' which enables realization of objectives. Evaluation based on cluster monitoring indicators

Source: Knop (2013: 309) and PWC (2011: 20)

According to PricewaterhouseCoopers, cluster governance should not be considered the equivalent of cluster management, but is rather about the actual management of the cluster—serving the needs of cluster stakeholders, planning and current allocation of resources, current monitoring, and so on. Cluster governance is about ensuring that the cluster is well-managed (represents the interests of cluster stakeholders—quadruple helix; refers to the appointment of cluster managers and the evaluation of their performance, setting vision and cluster strategy, approving action plans) (PWC 2011: 20).

The differences presented indicate a set of circumstances in which a cluster manager is appointed and individuals responsible for the implementation of current operations may appear. This situation is characteristic of the administrative unit model, and sometimes the developed hybrid model (Provan and Kenis 2008). In other words, we might separate the functions of cluster management and cluster governance given a set of circumstances in which we are able to indicate the person and unit responsible for the implementation of a strategy. However, there are also self-organization and leader (or leaders) models—in which managerial and supervisory functions grow over time, combining them and creating accountability for individual actions not at the level of the cluster manager, but rather certain organizations, groups, or the entire ecosystem.

9 Conclusions

The existing approach to clustering has developed a number of tools which allow us to determine the concentration of the cluster, the specialization thereof, its connections and the level of its density. However, a coherent concept has not yet been developed for the coordination of the cluster, nor the management of processes, particularly those aspects which act to reinforce joint ventures and relations. The

problems presented and pitfalls associated with cluster management, together with research which has been conducted over the last decade, have facilitated the presentation of an authorial concept of cluster management.

In conclusion, strategic cluster management is a stream of actions and decisions which, according to a set of approved meanings and objectives as well as intentional and emerging events, enable value creation, configuration and coordination of resources within the cluster, and allow companies to aim to achieve stability and durability in relationships. The concept of strategic cluster management is based on the coherent and balanced development of knowledge, structure and trust—the KST concept components—promoting the realization of the conscious idea of a cluster, while assuming the strategic intermittence of the environment. Groups of actions and decisions are explained on the basis of characteristic management models, monitoring and cluster governance.

The concept of cluster management process presented herein—a pyramid model—is based on the assumption that the high concentration of problems decreases with what can be described as the important departure from operational realities to cover a wider scope of interweaving interactions as described in the KST concept. The significance of each of the levels (strategic and operational) is dependent on the intensity of operational activities and the expanse of horizontal problems solved by the cluster. The interweaving strategic and operational levels emphasize the necessity of diversifying coordination mechanisms. One such example is in the existence of a solid cluster structure [based on its ecosystem (Knop 2013; Olko 2015)], which supports the network and the operational activities of the cluster. Another mechanism is the existence of integration structures based on the assumptions of cluster governance, which are responsible for the effects and strategic future of a cluster. The effectiveness of this cluster management process model is supplemented by the following cluster management functions: shaping, activation, configuration, mobilization, animation, synthesizing and learning.

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Managerial Challenges for Networks and Beyond

Włodzimierz Sroka and Bożena Gajdzik

Abstract Networks are increasingly visible in a growing number of sectors. However, as with individual companies, not all networks will succeed, but only those which are able to build and maintain their competitive edge. Dynamic changes in the business environment, especially since the turn of the century, have made it difficult to imagine a network functioning in the absence of managers. As in the case of a single company, they are the prime determinant of whether the network will succeed. Indeed, a good manager can do so more efficiently and effectively than a weak one. The goal of the paper is thus to present the major challenges facing network managers. Perceptions of managers within networks, the basic functions and competences of network managers, the roles played by managers depending on the structure (type) of the network, as well as practical research results in this area and challenges for network management, have all been described in this paper.

1 Introduction

Globalization and technical and technological changes, combined with deregulation and demographic changes, have created a new competitive reality, which imposes greater demands on modern companies. To make such organizations more efficient and able to adapt to new business conditions, they are obliged to constantly seek out new mechanisms and concepts of operation. It is claimed that one such possibility is offered by network structures which allow both flexibility

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and productivity (Prokopenko 2000). It is even believed that the individual company will no longer lie at the hub of its business network, but rather will have to participate in numerous technology-enabled and social networks. To be able to participate, the business processes of all network members will necessarily be compatible, and information will need to be portable—a formidable challenge (Vervest and Zheng 2009: 4).

Changes in technology linked to the globalization of products and services also affect market dynamics and bring about greater uncertainty in terms of demand. This essentially means that the company's competitive position depends on its ability to understand these changes and respond appropriately to meet these requirements (Nix 2000: 27–28). Regardless of whether the company operates independently or within a network organization, such a set of circumstances means new challenges for managers. It should be emphasized that these challenges are significantly greater in network organizations, which generally consist of a number of companies (sometimes dozens or even hundreds), often from different countries and cultures. This is mainly due to the fact that it is managers who determine whether a network will succeed or fail. Taking the network assumptions into account, managers link individual intentions with the strategy of the network, which often requires a change in perceptions, thinking, and the understanding of the organizational reality.

From network structures arise new organizations which link the interests of numerous business entities. Therefore, this issue is of particular interest to both theorists and practitioners of management. The goal of our paper is thus to present the major challenges facing network managers. Perceptions of managers within networks, the basic functions and competences of the network managers, the roles played by managers depending on the structure (type) of the network, as well as practical research results in this area and challenges for network management, have all been described in this paper.

2 Image of the Manager in Network Organizations

When creating an image of a manager in network organizations, one should look at the functioning of the companies in the global economy. The disappearance of national borders, inter-penetration of cultures, tolerance of different value systems, the development of knowledge and information, as well as functioning as part of international teams are regarded as some of the determinants shaping the image of the manager in a network organization (Liberman and Torbiörn 2000).

Decision-making within network structures is linked with doubled levels of risk, in that a decision is both an internal action of the organization, being the choice of

the targeted solution in the context of its operation, and at once is also an intra-network action due to considerations of responsibility for the functioning of the entire network. One may even claim that network contextuality increases the complexity of decision-making processes, as a greater number of problems require solving. The assumption of Kutschker and Bäurle (1997: 105–106) is that the functioning of modern organizations should be considered as dynamic, as a process, rather than static. The creative ability of the decision-maker in network organizations affects the quality of decisions made in the area of network strategy.

Each manager in the network has his or her own way of solving problems. In fact, routine decisions do not require the application of complex decision-making techniques. However, in risky situations, decision-making becomes more complex and requires more information, as well as detailed analyses. This generally means that the image of the manager as the decision-maker changes within network organizations. The plethora of information which reaches managers operating within networks means that he/she has to select from it and distinguish important data from that which is less important.

Heterarchy is also a determinant of the decision-making process in the network organizations, which is to say that hierarchical structures give way to organizations whose structures are equivalent to a large extent. Heterarchy separates privileges and opportunities for decision-making amongst multiple managers (Fairtlough 2005). Implementation of heterarchy does not, however, mean the complete elimination of the hierarchy. This relates to the lean hierarchy—which is characterized by "controlled disorder" of information—and decision-making network structures (Müler 1997: 84).

The role of a manager in the network is extended to negotiation activities (Mintzberg 1975). A manager acts as a negotiator within his or her company, as well as between the company and its network partners, and finally between the company and its environment. The scope of the negotiations is determined by the specificity of network links between the companies (the scope of cooperation, the strength of the links within the network, number of organizations in the network, international scope of the network, and so on). This means that the more extensive the network and the greater its involvement in markets in different countries or regions, the more business negotiations take place.

It is further believed that among the entities within the network structure, the requirement to learn is more or less "mandatory". Managers are required to have both knowledge, as well as the ability to create a learning environment within the network (Sroka et al. 2014). Knowledge transfer and building intellectual capital is more important within network organizations than in entities outside the network structures. This results from an additional component of the learning process, namely intra-network learning. Besides learning within the organization and the acquisition of knowledge from the environment, this component brings together the

network entities and binds them in a somewhat stronger manner, in terms of the implemented business strategy.

The logical continuation of any discussion on the work of managers within network organizations is to strive for leadership on many levels: intellectual (the managers' level of knowledge), moral (ethics, network co-responsibility), as well as psychological-physical (physical fitness, ability to build interpersonal relationships).

Managers operating in networks are also required to appreciate the benefits of coopetition, and the ability to deal with the "network organizational rules". An important prerequisite for the smooth functioning of the network is the elimination of the traditional context of thinking in terms of one organization only.

The specific image of the network manager is also related to human resource management. Network structures which go beyond the boundaries of a given country (the internationalization of activities within network links) result in the implementation of new solutions in the field of human resource management. There are issues of multiculturalism, changes in motivation systems, the delegation of workers to work abroad, to give but a few examples. Therefore one can state that a 'clash' arises in terms of the image of a network manager functioning in international business structures: universalism and tradition on the one hand, and the ability to acquire a new international identity on the other hand. International business conditions often give rise to the need to negate the existing rules and ways of doing business.

The interpersonal role of managers in the network is greater than in entities operating independently. In fact, managers are regarded as formal representatives of various organizations, as well as serving as connectors between the network members. Therefore, the scope of interpersonal contacts is extended. Managers in the network structure are intermediaries between their own company and other members of the network.

The organizational role of the managers in network structures can also be extended, in the sense that in addition to the "hard" elements (specific and clearly defined, such as a fixed range of activities and authorizations, the mandatory principles of behavior, scope of responsibility, links between entities), there are also "soft" elements (vague, interpersonal relationships, values, traditions, ethical standards, and so on). The essence of organizational roles, especially the "soft" elements, is influenced by many factors, including the expectations of network participants, the prestige associated with functioning within the network structures and so on. Table 1 presents the importance of particular managerial roles in the functioning of network structures.

Table 1 Importance of particular managerial roles

Role of the manager	Network level
Decision-maker	Achievement of expected results and planned goals of the network
	Ability to manage changes at the organizational level and within network structures
	Ability to harmonize the goals of the organization with the goals of the network
	Ability to undertake multi-faceted cooperation with organizations creating networks
	Systematic and holistic thinking
	Flexibility in operations and customer orientation in the context of additional value created in the network
Connector	Ability to select information and find out relevant information
	Ability to communicate by taking into account the complexity of the phenomena and external factors (cultural norms, ethics, tradition)
	Ability to manage time (reasonable separation time between work in the organization and work in the network structures)
	Ability to share knowledge at the level of network structures
Representative	Representing both the interests of organization and the network
	Ability to attract new organizations to the network structures
Employer	Broadening the scope of employees' competences
	Employment in new positions resulting from the necessity of network functioning
Organizer	Focus on the merits (competencies, tasks, activities, responsibilities), and socio-cultural elements (acceptance of cultural diversity, ethics, honesty, loyalty, etc.)

3 Basic Functions and Competences of Network Managers

The importance of managers to network effectiveness has been confirmed by the research of numerous scholars (e.g. Batterink et al. 2010; Rampersad et al. 2010). This is because, as with single organizations, innovative networks need to be managed thoroughly (Heidenreich et al. 2014). From the perspective of network managers, an innovative network consists of sets of vertical and horizontal relationships established among various organizations. Such relationships must be orchestrated; a network manager is therefore closely involved in all the activities of a network and interacts regularly with all participants, thus representing the ultimate reference point regarding the allocation, coordination and management tasks which arise in an innovation network. The employment of a network manager should enhance the core management functions in innovation networks and thus contribute to their overall performance.

It is claimed that by appointing a dedicated network manager to administrate, coordinate, and regulate, the management of tasks is bundled and centralized within a single entity (Landsperger et al. 2012). Therefore, the employment of a network

manager should enhance the core management functions in networks, which in turn should have a positive effect on performance (Heidenreich et al. 2014).

The management of interorganizational relationships in an innovation network comprises four core management functions (Landsperger et al. 2012):

- selection function—the inclusion in and removal of participants from the network; the better a network member, in possession of valuable resources, the more opportunities for the network and thus its relational performance,
- allocation function—ensuring the efficient coordination of resources and tasks and their allocation in the network,
- regulation function—providing rules for cooperation and ensuring clear and transparent communication between the network participants,
- evaluation function—capturing members' performance contributions, as well as provision of all necessary information to the members, as well as regular documentation of network progress. Landsperger and Spieth (2011) claim that doing so enhances performance in terms of both structure and the achievement of goals.

Generally one can state that the implementation and execution of the four core management functions contributes to the relational and structural performance of the network, as well as facilitating the successful achievement of set goals.

An aggregation of competencies is necessarily included within network structures, which include the competencies of individual employees, the competencies of individual organizations, and even the competencies of local and regional authorities as well as the other members of the network. As a result, the competencies of the entire network are obtained (Fig. 1).

Managers, as representatives of particular organizations, are in possession of both universal competencies (required for a given position from all or nearly all managerial staff), and specific competencies relevant to certain functions. In general terms, this means that within the network, the competencies occur at the level of individual organizations, as well as in relation to the network structure (Table 2).

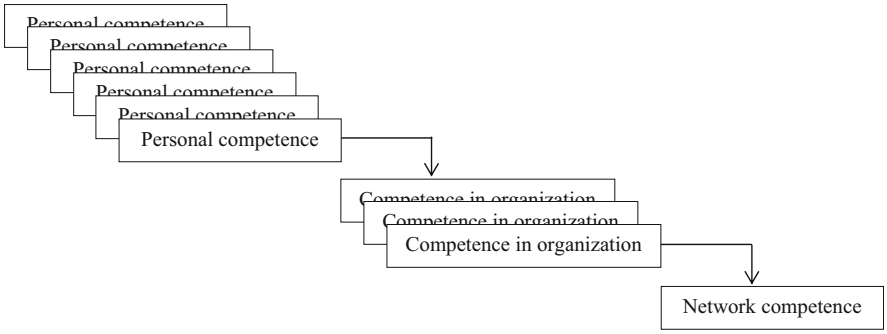

Fig. 1 Aggregation of competencies in the network structures

Table 2 Competencies of the managers: organization level vs. network level

Organization level	Network level
The ability to shape and effectively implement the mission, vision and strategy of the organization	The ability to shape and effectively implement the mission, vision and strategy of the network
The ability to achieve goals	The ability to achieve joint goals
The ability to manage different areas of business	The ability to manage joint areas within the framework of network structures
Knowledge and professional skills enabling compliance with all management functions	Knowledge and professional skills enabling compliance with all management functions through connecting the interests of the organization and the network
The ability to use appropriate methods, techniques and tools to manage and improve processes	The ability to use appropriate methods, techniques and tools useful for improving multilevel processes within network structures
Efficient and rational use of resources: human, financial, physical as well as time and information	Efficient and rational use of resources, with special attention paid to time and information
The ability to efficiently communicate and exchange information	The ability to efficiently communicate and exchange information (more information resources at the network level than at the organizational level)
The ability to work as part of a team	Networking ability (greater complexity of processes and phenomena than at the organizational level)
The ability to act as a representative of the organization against the environment	The ability to act as an ambassador of network structures against the environment

Source: Based on Le Deist and Winterton (2005) and Oleksyn (2006: 30–31)

4 Structure of the Network and Roles of the Managers

Network organizations are characterized by a multiplicity of forms and possible types. They are specified on the basis of a multi-criteria approach and one-criterion approach (e.g. Snow et al. 1992; Achrol 1997; Piercy and Cravens 1995; Inkpen and Tsang 2005; Sroka and Hittmar 2013). The criteria used in the framework of such approaches include: the number of member companies and the number of agreements signed; the goals of cooperation; the dominant logic of value creation; the specific nature of the operation and the degree of involvement of partners; and the relevant time horizon. The multiplicity of types of networks implies different challenges for managers.

From a practical point of view, the most common classification of the networks divides them into equal-partner networks and dominated networks. In the first case, the company has bilateral relationships with numerous entities. In turn, in the second case, companies establish close relationships and cooperate on various projects (Child et al. 2005: 155–156). Relationships exist between the companies in the dominated network, mainly those between a parent company and its

satellites. The interaction between the satellites is, however, limited. Thus, the management of the dominated network is similar to the management of a classic holding company.

In contrast, there is no dominant company which controls the operations of other members in equal-partner networks. In practice, this means that managers manage the network which is regarded as a portfolio of bilateral alliances. Such a network also requires determined leadership so as to plan and execute strategy, and an information system which ensures effective communication between partners. This is not easy in cases which feature somewhat loose links among equal partners, despite the benefits of such a structure.

If the network members are of similar status, and the network is built as a federation of individual members, network management is usually executed by a specialized organization which may either be derived from the network members, or be a completely neutral third party. In turn, if one of the companies occupies a central position in the network, it usually takes full responsibility for management of the network. Networks are also able to function without joint management; in such cases, all companies maintain contacts with the leading company in the network, which in turn usually manages these multiple partnerships (Gomes-Casseres 1994). In the first approach, the partners split the expenses related to the functioning of such an organization (usually as a specified percentage of its revenue), which performs a number of functions, such as:

- it is a central point for communication and the exchange of information, facilitating access to the expertise and experience of particular companies,
- it protects the network against "stowaways" through its neutrality and by observations of the individual companies and their actions,
- it acts as an archive of information on results and best practices regarding the approach to the market, and innovation,
- it maintains defined standards of behavior within the network, and if necessary applies sanctions against those who violate them (Doz and Hamel 1998: 231–232).

The second approach is related to the occupation of a central position in the network by a given company. This company, and indeed the managers thereof, perform key functions relating to the management of the network. A major feature of the central company within the network is the ability to perceive the full range of businesses carried out by the network, as well as understanding the role of individual members of the network over the entire area of the value chain. Its managers have ideas and concepts—which may sometimes emerge and evolve over time—and persuade others of the efficacy of their implementation. Such a vision is dynamic and evolves with changes in the business environment. To maintain balance in the network, all companies maintain certain operations, e.g. control of the brand or development of the systems which integrate the network. In order to maintain its power, the central company in the network has to provide a free flow of information between the partners. This also requires an effective communication system for this reason (Lorenzoni and Baden-Fuller 1995).

5 Roles of Managers in Networks: Research Results

Research carried out by Hoffmann (2005) on the roles and positions of managers in the management of networks revealed that the most important role is played by alliance managers (Table 3). On a scale of 1 to 7, where 1 means "entirely unimportant" and 7 "extremely important", the average was 6.2 points. It should be emphasized that all the responses were located above the midpoint, which may indicate that respondents also discern the importance of other roles, though do not view them as of the same degree of importance as the management of individual alliances. The majority of companies surveyed assigned only minor importance to the role of managing the multiple alliances.

It is worth noting that research carried out on a group of 46 companies (40 from the list of 500 largest companies by Fortune, as well as 6 large Dutch companies) revealed that managers who manage multilateral alliances should be located on the lower level of the organization. The reason for this is that in the opinion of the companies surveyed, top management is too far removed to have a real impact on the success of cooperation (Draulans et al. 2003).

In the context of the data presented, the results of research carried out in the steel industry (Sroka 2008) are somewhat interesting. The research included a complex functioning of the alliance networks in the sector mentioned. However, in the area of network management, the research comprised issues such as: network

Table 3 The role and position of managers in network management

No.	Role	Description	
1.	Alliance manager	Operating manager, for example, the head of a joint venture	6.2
2.	Sponsor	A person from the management of the company occupying the central position in a network, which is responsible for the development of an alliance on the senior executive level, and who is the contact person for the most senior managers of the partner company	5.0
3.	Internal consultant	A team of internal specialists providing technical support for individual tasks associated with the management of alliances (e.g. strategic analysis, integration)	4.6
4.	Manager for relationships management	Contact person for a particular alliance partner at the operational level who coordinates all cooperation with this partner	4.5
5.	Alliances coordinator	Internal contact person for a particular alliance or an internal coordinator of all cooperative activities in a specific area	4.3
6.	Alliance controller	The controller who supports and controls the development of cooperation, e.g. Member of the Supervisory Board	4.3
7.	Vice-President for alliances	The head of the central system for management of all alliances	3.8

Source: Hoffmann (2005)
Average on a point scale from 1 to 7 points, where 1: entirely unimportant, 7: extremely important

management; competence of network managers; structure (whether formal or informal); methods of conflict resolution in the network; and network performance. According to the managers surveyed, the competencies necessary in the management of alliances include (on a 1–5 point scale, where 1 means "of very little importance" and 5—"highly important"): creativity (4.17 pts.), expertise, including experience in the management of joint projects in the past (4 pts.) and the ability to consider multiple perspectives simultaneously (3.83 pts.). These competencies were assessed as most important. On the other hand, the least important were informal authority and pragmatism, earning average scores of 2.5 and 2.83 points respectively. It is worth noting that most indications ranged from 3 to 3.75 points.

6 Challenges for Network Management

The management of global alliance networks is a major challenge for their managers, as the success or failure of any co-operation depends mainly on the ways in which they are managed. Effective management and planning is the key to the success of the network and may reduce any inherent strategic risk. A well-managed network allows members to achieve a competitive advantage, both in terms of the network itself and the companies involved (Hung 2002). This means that the success of the leading company is closely linked to that of individual members of the network. Network management is essential in all phases of the existence of the network: at the stage of its creation, its functioning, and even during the final stages of cooperation (Sroka and Hittmar 2013). It should be emphasized that the support of top management is of crucial importance to the formation of the network and its long-term competitiveness. On the other hand, managers who are responsible for operational activity determine the success or failure of the network to a large extent. This is evidenced by, among others, research carried out by Doz and Hamel (1998: 231), according to which the need for both effective value creation and the capture of equitable value in alliance networks usually requires active management of the network.

In the context of management of individual alliances within the alliance network, one should emphasize the importance of personal relationships (Luo 2001). In fact, such relationships may have a positive effect during conflict resolution, enhance the flow of information, and also allow for mutual development planning. Direct personal interactions build a foundation of trust; therefore, a change of managers in partner companies may adversely affect or even alter the process of building mutual trust, being as it is a long-term process. Frequent changes in this area may thus result in a negative impact on the long-term results of cooperation (Lunnan and Haugland 2008).

The multiplicity of network types implies different challenges for managers. In addition, the matter is complicated by the fact that networks evolve due to possible changes in external conditions, or the desire of stakeholders for a change in strategy, and so on. Unforeseen events may occur which in turn can significantly

affect the continued functioning of the network. Irrespective of the reasons, it is important to attempt to predict the possible directions in which a network may evolve. This is mostly determined by the aspirations of partners and their relative contributions. Basically, however, the evolution of the network will be conditioned by the forces and weaknesses of the parties and the relative importance of every member's contribution to the group. For example, the ownership rights to oil or coal would be viewed as a highly valuable contribution. Other examples include intangible resources such as a particular brand, marketing, technology, patents, and so on, and it is to be expected that the party who brings such assets to the network will be more important than a partner whose only contribution is facilitating access to the market.

The issues of uniform leadership and a shared vision of all network members are of key importance in network organizations, and are especially important in equal partner networks, in which there is no clear leader. It should be noted, however, that it is not always necessary to create a separate structure for the management of the network. Typically, such a structure is created in large networks in which strong internal competition between particular companies exists (Bamford et al. 2003: 241). In cases in which one strong company is located at the center of the network, it usually manages the activities of other members, and a shared vision is designed to connect partners, as competition between them erodes the cohesion of the network (Hwang and Burgers 1997). In turn, the role of leadership is to make team decisions and discipline those participants who try to "break out" from the network structure. This solution is preferred in a set of circumstances in which a company located in the center maintains a strong position on the market or has a unique product, without which the further functioning of the network ceases to make economic sense.

Under the opposite set of circumstances, there is a risk that the group may disintegrate, as networks without strong leadership tend to set off in different directions. Such a situation was observed within the MIPS group, which included companies such as Olivetti, NEC, DEC, Siemens, Daewoo, and a number of other entities; the relative weakness of MIPS in conjunction with the strength of the partners and divergent interests caused the dispersal of the parties. In turn, the group size relates to the fact that the larger the network, the more difficult it is to manage. In fact, networks which have "grown" to a large size and achieved success (e.g. Coca-Cola and Visa), usually have certain rules and principles of management. The network is thus effective and takes advantage of the resources of member companies, if it is able to combine their resources and manage them effectively.

Large global corporations apply a systemic approach to this issue. Successful transactions are carried out by proven and experienced managers. Gradually, they spread to other alliances belonging to the network, achieving a position of managerial leadership within them, depending on the effects achieved. This group is constantly extended as far as growth in the scale and scope of the group's activities. There are, however, significant limitations associated with the ability of other companies to copy such a solution. A prerequisite for its use is to have a large portfolio of alliances within the group, to which the particular managers may be

delegated. In practice only the largest global corporations are able to take advantage of such favorable circumstances, while smaller companies do not have such a privilege.

This approach is utilized by the world's largest steelmaker, ArcelorMittal. External growth is a key factor in the strategy of the group, which has steelworks located on all continents (except Australia). One distinguishing factor is that its growth is based on successful acquisitions, rather than inter-organizational cooperation. In both cases, however, a similar approach is applied.

7 Conclusions

Alliance networks are increasingly visible in a growing number of sectors (Lazzarini 2007), and are a strategy increasingly applied by leading global corporations. Some of them have portfolios covering hundreds of alliances which generate up to 30 % of total corporate revenues. This demonstrates the growing popularity of this form of competition in the market, which—according to all forecasts—will be of interest to a growing number of companies. However, as individual companies, not all networks will succeed, but only those which are able to build and maintain their competitive edge. In turn, this will be possible only if the networks are managed by qualified managers.

In "Alliance revolution. The new shape of business rivalry", Gomes-Casseres (1996: 126) claims that without leadership and joint management, or at least some of the agreed formulae for joint decision-making, an alliance network is not in a position to formulate and implement a coherent strategy. Instead, the differences between the various members of the network will result in them heading in different directions. This thesis is still relevant to today's networks. Dynamic changes in the business environment, especially since the turn of the century, have made it difficult to imagine a network functioning without manager(s). As in the case of a single company, they are the prime determinant of whether the network will succeed. Indeed a good manager can do so more efficiently and effectively than a weak one. In summary, it is worth emphasizing the key challenges and tasks which, according to Vervest et al. (2009), are facing managers in the networked world:

- building networks deliberately and for real business goals,
- forgetting command and control, and leading through values,
- bonding people via networks, obliging them to become engaged in the process, creating their own vision, setting their own goals, giving complete transparency,
- breaking down a hierarchy and finding a network solution to make people want to share in or leave the network,
- choosing carefully which networks to enter and ensuring you can leave if you wish,
- identifying network structures and working on your position within the network,
- using networks widely to link with customers and communities,

– using supplier networks sparsely in order to be efficient and economical—befriending the supplier,
– partner choice on volume—every network partner should do no less than 30 % and no more than 70 % of its business with us.

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Part III
Effectiveness of Network Management

Evaluation of the Effectiveness of Relations in Network Organizations

Irena Łącka

Abstract The conditions for the emergence of various forms of network organizations are already somewhat well-recognized. Currently, attention (of both management and economics) is focused on the functioning and effectiveness of these relationships. This refers to the various forms of interorganizational partnership, including cooperation between science and industry. Evaluation in this case is difficult for numerous reasons, e.g. the ambiguity of the concept of effectiveness, the difficulty of measuring certain aspects of relationships between researchers and entrepreneurs, the diversity of forms of cooperation and partners, and differences in perception of input and output in cooperation networks. The paper discusses the limitations and opportunities for assessing the effectiveness of the various linkages between scientific institutions and enterprises using the concept of the success map of alliances. Its goal is to present a set of indicators with which to measure the cooperation between science and industry. This discussion on the set of indicators and determinants for assessing the effectiveness of science-industry linkages is a contribution to further research on the phenomenon of cooperation between researchers and entrepreneurs in the context of network organizations.

1 Organizational Networks as a New Paradigm of Business Development

1.1 Ambiguity of the Concept of Organizational Networks

Organizational networks, also called interorganizational networks or network organizations, have been the subject of analysis of various scientific disciplines (management sciences, economics, sociology, political science, and even computer science) since the end of the 1980s, which resulted in numerous definitions of the concept all highlighting various relations in place among the network participants,

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the variety of relationships and behaviors, as well as the level of independence (Thorelli 1986; Bianchi and Bellinii 1991; Baker and Faulkner 2002; Higgins and Maciariello 2004; Phillips 2010).

The concept of organizational networks (network organizations) is therefore of a multifaceted and broad nature, with its interpretation depending on the scientific field in which the definition is created. As Sroka notes (2012: 31), sociologists treat the network as "a form of organized business activity, which contains a set of hubs (individuals or organizations) interconnected with a variety of relationships, e.g. contractual obligations, family ties. Companies may be connected to other entities through social and economic relationships, each of which constitutes a social network". From the point of view of management sciences, depending on the assumed perspective, a network organization may be seen as a modern form of organization, a new method of management, or a new method of organizing relationships between economic entities. As a way of generalizing the various approaches to the concept of network organization, it may be said that it is a relatively permanent grouping of three and/or more independent economic entities, which enter into relatively stable relations of cooperation (not competition) in order to gain a competitive advantage (Niemczyk et al. 2012).

1.2 The Concept of Development Based on Relationships: A New Paradigm of Management

The studies undertaken on this issue have created the foundation for a new paradigm of enterprise management in a volatile, uncertain and unpredictable economic environment based on knowledge. Management is to be organized on the basis of changeable relationships, technological advantage and innovations, and cooperation in the field of technology transfer (Giuliani and Arza 2008; Prahalad and Krishnan 2010; Sroka and Hittmar 2013).

In the hyper-competitive global economy, an enterprise should develop all kinds of formal and informal links, based on competence and mutual trust. While maintaining a high level of independence and autonomy, these links will provide the enterprise with access to missing skills and resources, flexibility, innovativeness, orientation for the satisfaction of needs of various stakeholders (owners, customers, employees, external partners), as well as the reduction of transactional costs and synergy effects. Organizational networks will allow for development based on qualitative changes and for the achievement of competitive advantage in the contemporary economy; all of which will improve business capability to handle short-term crises, react with flexibility to market challenges, take advantage of economic rents (innovative and relational) and maintain high growth indices in the long run (Tsang 1998; Child et al. 2005).

The activities of modern enterprises, as posited by the theorists of management and economics over the past 20 years, are reflected in established organizational

networks which can be classified according to a number of different criteria (such as organizational form, structural characteristics, the degree of formality of the network and ties between partners, and the permanence of bonds or the nature of the network layout).

The diversity of organizational networks in economic life may be categorized using a criterion of the type of relationship between the participants and the frequency of occurrence of a particular type of cooperation. In this case, we may distinguish: cooperative networks, outsourcing networks, franchise and agency networks, clusters, strategic alliances, holding networks, and public-private partnerships (Niemczyk et al. 2012). In the frameworks of these types of organizational networks, companies cooperate with other enterprises, financial institutions, commercial and non-commercial institutions promoting entrepreneurship, innovation and technology transfer, local and regional authorities, higher education institutions, research institutes, research and development centers, and non-governmental organizations. The bonds emerging among these partners have various objectives, natures, and levels of strength and depth, durability and complexity.

2 The Study of the Effectiveness of the Network Bonds Is a Challenge for Science and Practice

2.1 Theoretical Assumptions of an Assessment of Effectiveness

The conditions required for the emergence of network organizations, and the forms thereof, are already somewhat well-recognized. Currently, attention (of both management and economics scholars) is focused on the functioning and effectiveness of this type of relationship. Network organizations seek to gain competitive advantage by leveraging interorganizational relationships and the key skills and resources of their participants, including knowledge and intellectual capital. In order to evaluate the effectiveness of such connections, the applications of the traditional indicators of economical effectiveness on the basis of quantitative data are insufficient. It is also necessary to include indicators reflecting the network organization's synergy effects, which allow us to assess the quality of relationships between network partners, to reflect the stability and durability of the existing structures; their innovativeness; adaptability (the capacity of a network organization to adjust to the changeable environment); the extent of completion of the planned objectives; the network partners' capability for learning; the network's role for the sector; industry development etc. These are qualitative in nature.

In the context of any performance evaluation of the activities of organizational networks, the literature uses the term "*effectiveness*" (Borgström 2005). This notion refers to an analysis of the results of the management of an enterprise within a network (e.g. supply chains in cooperation networks). Effectiveness is, in this case,

the result of both the efficient use of resources by a network partner (this value is identified with the term "*efficiency*"), as well as of the bonds between the participants in cooperation in the network organization (Walter et al. 2001). This means that both categories of efficiency and effectiveness are interconnected and interdependent. Within a network of relationships among various entities, a value emerges (e.g. new solutions), which stems from cooperation, synergy, combined resources, skills and competences (Håkansson and Persson 2004).

The diversity of approaches to the two categories of effectiveness mentioned above can also be discussed in the context of organizational goals and in relation to the individual economic entity and its stakeholders. According to the classic definition, effectiveness of management is "the result of applying the principle of rational management in practice, which consists of the maximization of economic performance with given investments, or in the minimization of investments with a given economic result" (Michalak 2008: 55). Other scholars have an alternative approach to this concept; they point out the identification of effectiveness with efficiency, which means that an enterprise is effective when it achieves the appropriate goals. Michalak (2008) indicates that the concept of effectiveness is more complex, and may be understood in different aspects as the effectiveness of the system and resources, of internal processes, of strategic electoral force, goal-oriented and multi-criteria. The first two stances relate to the notion of "*efficiency*", while the remaining ones refer to the term of "*effectiveness*".

The understanding of the effectiveness of the system and resources focuses on the extent to which the business entity can secure the resources necessary to survive. In this case, an organization capable of procuring valuable resources achieves a position of strength within its environment. At the same time, effectiveness is identified with external performance (productivity) and the ability of an entity to achieve its goals in the appropriate manner. On the other hand, the concept of efficiency in an understanding of internal processes focuses on the analysis of the internal mechanisms of an enterprise, whose purpose is to realize the principle of rationality of management (profit-maximizing, investment-minimizing, and an increase in shareholder value).

Effectiveness is otherwise understood from the point of view of the strategic electorate. This concept recognizes the organization to be most effective if it manages to reach a balance of the interests of all *stakeholders* and to provide them with the optimal combination of benefits in relation to the investments incurred. In this understanding, it is also emphasized that the determination of the point of balance is difficult because of the elusiveness of certain benefits collected and of the investments made by various stakeholders. Effectiveness, as perceived in this manner, may also now be applied to a number of different forms of network organizations, along with the multitude of bonds therein, the variety of goals and interests of the participants of the network and synergies of resources.

Effectiveness in terms of an understanding of goals is explained as the necessity for the economic entity to achieve goals as indicated by managers. The higher the degree of achievement, the higher the level of effectiveness.

The last concept—a multi-criteria evaluation of effectiveness—takes into account both the classic perception of the term (which focuses on operational effectiveness), and the strategic aspects of the activity of an entity (its developmental opportunities, adaptation to changeable management conditions, satisfying the needs of the stakeholders, the morale of human resources, and so on). This concept may also be adapted for the purpose of an evaluation of the effectiveness of organizational networks, as these emerge in the form of agreements between separate companies (or other entities) in order to achieve competitive advantage in the long term, with differing characteristics and the potential of resources.

2.2 *A Multidimensional Evaluation of the Effectiveness of Selected Network Organizations*

The concepts of effectiveness presented above have generally been applied to enterprises and to the processes of transformation of resources therein. They may not be directly used to evaluate the effectiveness of the complex links between enterprises and various entities in organizational networks. Examples of such networks are technology alliances, in which companies enter into relations with other partners (e.g. other companies, universities, research institutes, and financial institutions).

For the purposes of evaluating the effectiveness of different forms of such cooperation, the strategic electoral force approach and goal-oriented approach can be applied. This requires, however, consideration of the formulation of objectives, the achievement of which should be assessed in relation to individual partners. It is also necessary to establish gauges and indicators of the achievement of these objectives. Attempts to create a background for an evaluation of effectiveness are hampered by difficulty in defining the type and size of the benefits collected from cooperation by the participants in the network organization and of the investments incurred therein. In this situation, finding the optimum ratio of investments to benefits for all entities within the network structure turns out to be highly problematic. This is the result of the complex nature of relations and the variety of the links in these processes, and to a degree the large number of partners, as well as the difficulty in determining and measuring the cause-and-effect relations within the framework of the network (problems with monitoring the costs and revenues of each network partner; elusiveness of results; the difficulty in separating the impact of various factors on results; and the diversity of the explicit and implicit objectives of the cooperating parties). In addition, difficulty in determining the effectiveness of relationships between partners in a network organization is a consequence of the multidimensional outcome of the activities of each of the partners, which are measured qualitatively and quantitatively, and are generally temporally distanced from the moment the links are established. The cause-and-effect relationships

between actions and outcomes are difficult to determine and to assign accurately to a particular participant in the organizational network.

The diversity of organizational networks and the areas in which they occur means that it is somewhat problematic to create a universal method of evaluating the effectiveness of relationships between different partners in such structures—each of which has its own characteristics, a group of factors which determine its origin, the method of organization, management and the evaluation of effectiveness. Apart from the general principles of evaluation of the effectiveness of organizational networks, along with the limitations inherent in delineating this category, one must also consider the individual characteristics of particular types of relationships in network structures along with the circumstances of such arrangements.

3 Forms of Cooperation of the Science and Industry Sectors

One type of network organization is that which is created through network links between scientific research institutions and companies, which may take a variety of forms and be classified according to various criteria. The most general division is into informal and formal interactions. The former emerge as a result of verbal arrangements between partners, without any formulation of the agreement of cooperation in writing or without informing an academic facility of the utilization of its scientific and research potential. They may also exist through social networks. They involve an exchange of *know-how*, transfer of information on technology, undertaking of research (at the workplace—at the academic and research facility, but without notifying its management), carrying out analyses or the formulation of opinions on the innovativeness of products.

Formal cooperation is brought about through agreements on cooperation in the field of research and development (e.g., joint research, research contracts, sale of licenses, and consortium agreements) between a scientific team, research and scientific institutions and an enterprise or group of enterprises (Xie and Johnston 2004; Berkovitz and Feldman 2006; D'Este and Patel 2007). The possible forms of cooperation within the framework of organizational networks emerging from the science and industry sectors are presented in a study by Łącka (2011). Both enterprises and scientific research institutions (universities, research institutes) may be simultaneously involved in network systems with a number of different entities in different areas of activity (business functions).

The various forms of cooperation between scientists and entrepreneurs point to the diversity of the nature of interaction between the partners. These differ with respect to the extent of formalization of cooperation; its duration and area of occurrence; the field in which parties are active; the degree of the parties' resources

involved or utilized in collaboration; number of partners; commercial or non-commercial transfer of knowledge; and so on.

The choice of the type of ties affects the strength of the commitment of partners from the science and industry sectors. Such ties are weak when knowledge transfers or licensing are gratuitous. Links of average strength are those which are associated with academic entrepreneurship or staff secondment. Finally, strong links are considered to emerge during cooperation in the form of contracts for research services, during joint research undertakings (*joint ventures*) or scientific and industrial consortia. Not all forms of interaction between scientists and entrepreneurs influence the transfer of knowledge and the commercialization of technology in the same manner. Some such forms have a direct effect, leading to the emergence of new solutions in innovation processes. Others stimulate innovativeness in an indirect manner, by influencing competencies.

The choice of the form of cooperation, as well as the number and strength of ties between scientists and entrepreneurs, depends on the location, size, nature of businesses and the sector (low-end, medium, or high-end technology), as well as on the expected benefits of cooperation, on the prior occurrence of informal contacts between partners and of formal knowledge transfer within the framework of advisory and/or expert work by scientists (Malerba and Vonortas 2009).

Regional and national businesses usually establish bilateral, long-term ties with higher learning institutions and research institutes in their area. A network of partners from the science sector is thus created around an enterprise, and those partners have, in turn, networks connecting them to more companies, universities and non-profit organizations. In the absence of such entities or the insufficient innovative potential thereof, enterprises will seek out partners in more remote areas. However, foreign enterprises cooperate with many different entities, and such links are multi-directional and materialize as a network. The higher the level of technological advancement of a sector, the more frequent and stronger the links between businesses and the science sector. The strength and nature of the cooperation is also a result of the size of enterprises. Small business entities will, in principle, participate less frequently and intensely in the direct knowledge transfer and its commercialization. However, they will make use of informal and non-commercial knowledge transfers just as often as medium-sized and large businesses.

4 The Problems of an Assessment of the Effectiveness of Links Between Researchers and Entrepreneurs

4.1 Methodological Difficulties

Transformations of the contemporary economy, which have contributed to an increase in the emergence of organizational networks, are also a factor which

influences the formation of multilateral links between the science and industry sectors. It is necessary to develop the methodological tool-set in order to assess the effectiveness of such cooperation on both a micro- and macro-scale. At this point there still exists a lack of appropriate methodology for assessing the effectiveness of the links between the science and business sectors. Attempts to formulate such methodology encounter considerable difficulties resulting from a number of conditions, for example the ambiguity of the concept of effectiveness, difficulties in the measurement of certain aspects of knowledge transfer, the diversity of partners and their diverse outlooks on investments and effects of cooperation, etc. Similar problems inherent in the assessment of links between science and research institutions and businesses were covered by such authors as Feller (2005), Perkmann and Walsh (2007) and Perkmann et al. (2011).

An additional problem in studying the effectiveness of links in innovation networks (from the macro-economic point of view) is the need to use non-current data and information on the conditions of cooperation in innovation processes, as the data is published with a delay of several years. There are difficulties in analyzing the impact of the determinantal values of the links between the public R&D sector and enterprises on the evolution of relationships between science and the economy (Geuna et al. 2003). Thus, any conclusions drawn on the basis of historical data on the effects of the impact of factors supportive of innovative processes, in terms of science and business, do not always correspond to current conditions and trends in the fields of science and economics.

Any evaluation of the effectiveness of innovation networks is hampered by delays in the publication of any information on transfer effects (e.g. product or process innovations, patents granted, sold know-how or licenses), data regarding the volume of proceeds from the sale of new solutions, an increase of the mid-tier and high-end technology product exports in comparison to the total exports of the company, and so on. It is thus difficult to compare the investments made to the results thereof. In addition, information on innovations often remains undisclosed for a longer time, for fear of competition. This phenomenon also relates to the fact that researchers are forbidden to publish any information on joint research conducted by scientists and entrepreneurs, as well as the results thereof, including the presentation of partial research results, and so on. This makes it difficult to determine the contribution of researchers to the development of technology used in a given industry, or to judge the effects of the diffusion of innovations in the economy. One may also discern a certain reluctance of the business entities which constitute an organizational network to provide information regarding their innovativeness, which is explicable by the necessity to protect their trade secrets.

Any problems in the study of the effectiveness of cooperation between researchers and entrepreneurs, and the results of knowledge transfer, are a result of the difficulty inherent in capturing investment and the results of the informal links among the network participants. Moreover, the lack of an appropriate tool-set may also have a certain amount influence under such circumstances. Therefore, when analyzing such relationships, indicators typical of science and technology are used, which are not optimal for such applications. A comprehensive, specialized

methodology for analyzing issues related to the processes of knowledge and technology transfer is yet to emerge. For this reason, selected elements of the existing innovation monitoring system are used (to monitor innovation, transaction balance, high-technology sectors and products, information society, and patents). One can, in this manner, distinguish groups of analyses which do not fully cover the entire set of links among participants in the innovation processes, but rather focus on selected aspects of technology transfer (mostly business-to-business), e.g. in an individual phase, plane or mechanism of the process of spreading knowledge and technology.

Another difficulty which necessarily arises in any evaluation of the effectiveness of links in innovation networks stems from the complexity therein. This complexity is partially composed of intangible elements, such as the fact that partners learn from each other the formation of certain hidden knowledge which results from interpersonal relationships. Such results cannot be gauged using quantitative measures. The problem of measurement also arises in an assessment of the capacity to absorb new solutions, which may be determined by such factors as: organizational structure; necessary organizational changes; human resources management systems present within the organization; intellectual capital and the quality of human capital; knowledge exchange systems; motivation for the activities undertaken; partners' capacity to cooperate; and differences in organizational culture. Bearing the above factors in mind, one should not only apply quantitative measures (which only indirectly permit the evaluation of selected aspects of cooperation), but also use qualitative measures.

An assessment of the effectiveness of links in organizational networks, between representatives of science and business, is further complicated by the diversity of economic sectors and areas of technology. They are characterized by the diversity of market conditions; the degree of competition; fostering demand; the length of the life cycle of the product and technology; the intensity of changes in the particular set of circumstances which apply to each of the economic operators; the policy of the state toward the sector in question; and the diversity of entry barriers. The differences between sectors result in difficulties arising when attempting to draw comparisons between transfer outcomes, the activity of researchers in cooperation with the economy, and the innovativeness of business entities.

4.2 Measuring the Effectiveness of Innovation Networks and Cooperation Between Science and Industry

Despite the imperfections of the methods and tools used to this point in the study of links between science and industry and the transfer of technology, they do not completely exclude the possibility of measuring these phenomena. For this purpose, three basic gauge groups are used:

1. **Input gauges**: Including all types of costs and expenses indicators (e.g. expenditure on R&D activity, indicators describing the level of education, the quality and quantity of staff of the science sector); the group of indicators is extensive, but may only indirectly reflect the intensity of the innovation processes or of cooperation during projects; they allow us to determine the resources and effort related to the study and acquisition of technology; they are most commonly used by enterprises, and less frequently by science sector institutions, however, research facilities make more frequent use of them than do higher education institutions;
2. **Gauges of the effects and impact of transfer processes**: Including a smaller number of indicators, which means that the effect aspect of the transfers is generally underestimated; these gauges include indicators displaying the effects of investments in activity and permit the evaluation of the results of actions taken by participants in the innovation process (e.g. the proportion of companies implementing innovations, share of new products, or significantly modernized products in total sales); they become the basis of an assessment of the effectiveness of innovation treated as investment; their shortcoming is the low level of accuracy which results from their indirect nature and difficulty in the "valuation" of the innovation as an effect of knowledge transfer;
3. **Spillover gauges**: Containing the fewest indicators. Studies to determine the appropriate methods to assess the impact of innovation processes and knowledge transfer on the environment, and the so-called *spillover* benefits, are ongoing; their purpose is to establish the scope (subjective, objective, spatial) and the rate of the ongoing transfer of knowledge and technology from the realm of science to economy; this group of gauges enables us to evaluate the degree of innovation and its influence upon other companies, consumers and society.

Examples of such gauges relating to particular groups were presented in studies by Seppo and Lilles (2012) and Wunsch-Vincent (2012), and may also be used for the evaluation of processes of knowledge and technology transfer from the realm of science to economy on both a macro- and micro-scale. They are primarily quantitative in nature and may relate, to a limited extent, to the effectiveness of innovation networks from the point of view of strategy and existing relationships.

4.3 Success Map of Alliances of University and Business

The presented problems, constraints and possibilities of measuring the links between the sectors of science and industry, and the effectiveness thereof, point to the need to create a comprehensive system of measuring its investments and effects. The quantitative and qualitative assessment of key aspects of cooperation serves this purpose. This system should address all dimensions of cooperation and conduct checks using a variety of measuring techniques, measuring frequency, the temporal horizon of the impact of a given indicator, and information. The solution

to such a task is the idea of measuring the success of alliances of enterprises and higher education institutions as proposed by Perkmann et al. (2011).

The creation of such a success map includes four stages—input, activity within processes, output and impact, which corresponds to the previously presented areas of analysis of technology transfer and the connections therein. The proposed indicators reflect these aspects of relationships within the innovation process which are causally related to the desired results. A success map may be used to assess the success of cooperation between an enterprise and an academic institution, but also to examine cooperation between an academic facility and an enterprise or other partners within the framework of an organizational network in the area of innovation (after selecting the appropriate gauges).

The input stage describes the possibilities of accessing the resources of cooperation—the human resources at the disposal of the parties (qualified academicians), along with their motivation for innovation activity and for cooperation with industry, as well as for taking entrepreneurial initiative (e.g. their own business within the framework of academic organizations, or spin-offs).

The second stage of the success map is the activity inside the processes, which is determined by HR-dependent factors. Conducting high-quality research which fulfils the requirements of industry requires an appropriately motivated, multidisciplinary research team. In addition to the personal inclinations of scientists, a motivating factor is remuneration, obtained in exchange for the use of the time and knowledge of human resources and for the use of research and development facilities. It is also possible to establish a different form of financial compensation (e.g. a share of profits, shares in the future company, or stock options).

Utilization of the vast research potential of the scientists, together with the provision of quality research of substantial importance to the enterprise, to the sector, to science and the economy, all lead to the third stage of the success map. Namely, this constitutes the possibility of training, learning and furthering knowledge for representatives of both the industry sector and of science. A pooling of resources and the subsequent synergy, conducting research, and development activity in the framework of the alliance between science and industry should lead to the emergence of new knowledge (overt and covert); to knowledge-sharing between partners; as well as the creation of new value (knowledge and a relationship based on trust and a willingness to cooperate). The new knowledge may be implemented by the industrial partner in the form of new solutions.

Thanks to an improvement in the quality of the human capital of the researchers and entrepreneurs, as well as the acquisition of new skills and competencies, new perspectives emerge which permit stakeholders to take advantage of the knowledge discovered—such as innovative ideas and concepts. They may inspire researchers to further their activities, and thus may lead to still more innovation, which may perhaps be commercialized in future. Furthermore, the newly-created solutions are often used outside their original field, bringing about the diffusion of innovation. All the events described constitute the final stage of the success map.

A study by Perkmann et al. (2011) features detailed measurement gauges which correspond to the individual stages of the success map and the individual

components. These gauges are both quantitative and qualitative in nature. The authors also indicated the possibilities (sources) of acquiring these indicators, applicable to both partners.

The idea of measuring the effectiveness of links between academic institutions and enterprises in the form of a success map of the alliance is, indeed, comprehensive and coherent in nature. Its authors developed a system of measuring and evaluating the process of highly complex and multidimensional cooperation, which facilitates the circumnavigation of the majority of problems and obstacles in studies of the effectiveness of such relationships. It also enables the description of relationships in innovation processes, determined by numerous factors. This concept makes it easier to compare and monitor the investments made and the outcome of cooperation (by making use of the indicated gauges aligned with the individual components of the analysis). If prepared to function as a decision-making tool for entrepreneurial processes, it may also be used by researchers to assess the effectiveness of their cooperation with entrepreneurs.

5 A Proposed Set of Gauges to Assess the Effectiveness of Links in Innovation Networks

The measurement of the relationships between academics and entrepreneurs within the framework of the success map of an alliance must begin with determination of the input indicators. They may be divided into five groups, all of which describe the essential elements necessary for cooperation, which are contributed by science and research institutions and enterprises alike. This group's indicators relate to the resources of R&D institutions and of companies, the potential of academic staff, and the motivation of the scientific unit and the enterprise to establish cooperation. In order to measure the individual components of cooperation, it is necessary to use the following gauges from each group:

- resources of the science and research unit—R&D investments; budget revenue of the higher education institution (institute); the volume of revenue from non-statutory activity (grants, private grants, revenue from commissioned and contracts); the amount of contributions from industrial sponsors; the amount of finance obtained from private sponsors for scholarships; the number of researchers;
- potential of the research staff—the number of publications; quotations; completed projects; research reports; patent applications and patents;
- motivation of scientists—the number of previous agreements (contracts) with industry within a higher education institution or research institute, either in the form of an organizational unit or in its entirety (e.g. joint research, advisory and consulting services); activities in the science and research unit aimed at creating links with the industry (e.g. creation of a formal policy for sharing the proceeds of the commercialization of research results); the amount of resources set aside

by the academic unit for use in cooperation; the attitude of the researchers towards the obtained and future benefits of cooperation with entrepreneurs;
- company potential—quality certificates (ISO); the prior experience of entrepreneurs in cooperation with scientific and research centers; membership of research associations or groups; participation in industrial and scientific consortia or clusters; the number of research employees; structure of employment with regard to the work undertaken and education;
- company motivation—the number of prior contracts (cooperation agreements) with universities or research institutes; links with universities (entrepreneurs being lecturers or graduates); and the attitude of the entrepreneurs towards the obtained and future benefits arising from cooperation with scientists.

The next stage of the evaluation of links between academic units and enterprises in the framework of innovation processes is an assessment of the internal processes which take place during cooperation between entrepreneurs and academics. For this purpose, quantitative and qualitative indicators are recommended. On a cooperation success map, these indicators will serve to determine the activity of the entities inside the processes, depending on the quality of human resources (researchers and entrepreneurs). These resources determine both the quality of the research and the possibility of achieving satisfying results on the one hand, and on the other the ability to cooperate, transfer knowledge, learn and communicate, and solve problems which may emerge over the course of the cooperation. An assessment of the internal process requires those gauges which enable measurement of the extent of achievement of these skills and the strength and durability of ties between scientists and entrepreneurs. The following indicators are proposed for these purposes: the intensity of the interaction; the number of participants in the research team representing the scientific body and in the enterprise; the number of meetings, seminars, and workshop sessions; the number of representatives of the business sector participating in conferences and seminars organized by the academic partner; the number of agreements on cooperation and completed joint research projects as the result of knowledge exchanges and of work as part of an innovation network; the duration and durability of relationships; the number of agreements on cooperation, completed and continuing in subsequent periods; opinions regarding the benefits gained from cooperation; opinions on problems and difficulties which may have arisen during cooperation; evaluation of conflict-solving mechanisms between partners; the form of closure of cooperation (e.g. upon achievement of the planned goal, termination of the contract, or one partner assuming control of the project going forward), opinion as to the degree of satisfaction gained from cooperation; and the diversity of relationships between scientists and entrepreneurs (cooperation participant/employee/graduate).

Obtaining information on these indicators requires the undertaking of qualitative studies in the form of direct interviews with the parties to the relationships, which will elaborate both the scientists' and entrepreneurs' views on the process of cooperation and on the evaluation of some of the elements therein, as well as a final assessment of the process of cooperation.

The third stage of the measurement of relationships between science sector units and industry entities will be to measure the results of cooperation. A variety of indicators can be used for this purpose, such as the number of patent applications; the number of patents; revenue from the sale of licenses; the number of publications and joint publications; the number of post-doctoral and PhD positions offered within the framework of cooperation; the number of PhD, MA or MSc papers stemming from cooperation; the intensity of cooperation; the number of *spin-off* companies resulting from cooperation; and the number of meetings, seminars and workshop sessions.

The last phase of the measurement of the links between scientists and entrepreneurs requires the determination of the impact (influence) of cooperation upon the partners, other entities, the region, the economy and society. Depending on who is the recipient of the analysis of the relationships and on the evaluation of their impact, selected indicators may be used. This group of indicators is most suitable for an evaluation of the effectiveness of the links between science and industry. In this case, numerous indicators can be used to analyze the impact of relationships between the entire R&D sector and industry, including GDP; GDP per capita; fluctuation of economic growth (GDP variability); employment growth and changes in the structure of employment; the employment rate for graduates of higher education institutions; the rate of quotations of the scientific literature in the scientific quotations index; number of patents; number of patent applications; knowledge-absorptiveness of production; share of foreign investments in GDP; volume of exports of high-technology products; and the share of high-technology products in total exports.

One must be aware of restrictions placed on the indicators used. Not all changes to indicators reflecting the national or regional economy or industry must be purely the result of knowledge transfer between the science and industry sectors. An increase in the number of quotations of the scientific literature does not necessarily mean that the technology will be commercialized and contribute to an increase in GDP. An increase in GDP per capita may not always arise from technological progress in the economy, or the implementation of new solutions developed by researchers. In sum, while assessing the impact of an innovation network upon its environment, one must exercise caution in using individual gauges, and must attempt to capture the actual extent of the influence of such cooperative undertakings.

For the purposes of assessing the impact of links between enterprises and academic and research units, slightly different indicators may be used. These include the following: an increase in the productivity of the enterprise resulting from the implementation of a novel solution (the result of cooperation between scientists and entrepreneurs); increased market share of the company; the share of sales of new or upgraded products in terms of the total shares of the enterprise; share of sales of new or upgraded products for the enterprise in terms of total sales; share of exports of mid-tier and high-end technology products in the value of a company's total exports; a change in the employment structure of the enterprise resulting from technological and organizational progress; number of *spin-off*

companies established as an effect of cooperation between scientists and entrepreneurs; number of *spin-off* companies successful on the market; number of patent applications and patents (as a result of cooperation between scientists and entrepreneurs); number of solutions implemented, volume of revenue from the sale of licenses; amount of funding obtained for R&D activity (undertaken in conjunction with the academic or research unit).

Quantitative data is the most important source of information on parties to the relationships, as well as the forms, activities, results and impact of innovation networks upon the environment. It is relatively easy to find and analyze. Such data, however, is insufficient in that it will never allow us to obtain the answer to the question of "why" and "how" cooperation was established nor how it progressed. For this purpose, it is necessary to obtain qualitative data, through interviews, discussions with expert groups, workshops, and the analysis of case studies. Such methods not only enable researchers to determine the existence of cooperation and the results thereof, but also to discover the views of the participants regarding its causes, circumstances, benefits or problems.

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The Evaluation of Business Excellence Within Network Enterprises

Miriam Jankalova

Abstract A network enterprise is currently found in an environment of global hyper-competition with growing uncertainty, discontinuity, chaos and paradox. This means that something special is required to provide added value. It is understood in the way in which an enterprise is de facto successful, extraordinary and has achieved the status of Business Excellence. Empirical evidence reveals that there are currently methods enabling the assessment of the status of Business Excellence, to which companies aspire to achieve. The question is which of those methods is the right one, as its choice depends mainly on the degree of its usability for the needs of the complex assessment of an enterprise, on the determination of "whom and to what purpose the assessment serves", on the object and subject of the assessment, as well as on knowledge of current trends in the assessment of Business Excellence status. It is for this reason that many enterprises have understood that application of universal methods in the current competitive environment is somewhat hazardous in practical terms. Just as every person is an individual, so every enterprise is unique and is characterized by individual needs, wishes and the environment. The aim of this contribution is to determine whether there is any method (tool, technique), by means of which it would be possible to assess the achieved status of Business Excellence, taking into account constant changes in the global business environment. The partial aim is the characterization of the Business Excellence concept, including individual methods (tools, techniques) currently used for assessing its status.

1 Introduction

Network enterprises are currently, in the environment of global hyper-competition, subject to growing uncertainty, discontinuity, even chaos. This is manifested also by the fact that not all of an enterprise's actions provide customer satisfaction, nor does every occurrence of satisfaction increase an enterprise's share of new

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customers, nor is each increase in the number of customers reflected in the successful survival of the enterprise due to the ever-stronger competition on global markets. The fact is that it is no longer enough for the product merely to be high quality, to be liked and to comply with the demands of consumers. The market requests further added value—namely, also that the enterprise is de facto successful, extraordinary and achieves the exalted status of Business Excellence.

The notion of Business Excellence originated at the beginning of the 1980s from an intensive discussion between American government experts, scientists and industrialists regarding the manner in which to achieve competitive advantage for American enterprises and their products on domestic and foreign markets. As such, Business Excellence represents more than pure theory or an instruction manual. It is an important methodology for actions across all areas of enterprise management, and is the process of constant improvement of all aspects important to individual stakeholders, i.e. employees, shareholders, customers and society. In other words, it does not represent any condition subject to finite time periods, but is an endless course of actions that may be taken only by those whose drive is formed by precisely formulated objectives, and who possess the resolve to carry out their implementation. It is the consistency of the improvement process and the satisfaction of the groups involved which determines the achieved level of Business Excellence (Fig. 1).

2 How Can a Company Recognize Its Own Success?

Each network business company has most likely been, at one time or another, given a similar question, which it was usually obliged to answer itself: Are we successful? Will we be successful? What is success? Which factors impact the success rate? How can success be achieved?. . .

The word success rate (success) is defined in specialized vocabularies as (JULS SAV 2003, 2004) the "positive result of an effort, undertaking". In this case it is not a definite (unambiguous) definition, as the "positive result of an effort" can represent something different for each company or party involved. According to the author's own study, for many managers the success of a company is measured by customer satisfaction (85 %), the provision of high quality products (100 %), achievement of positive results in financial terms (85 %) and employing a large number of staff (30 %). For a different group of companies, it may mean the realization of high market share (7 %) and provision of a unique product, often for the lowest price available on the market (12 %). Such a variety of reasons clearly demonstrate that the evaluation of success in everyday life is subjective, and any attempt to define this notion is subject to inherent controversy.

One means of clearly understanding the nature of success, its importance and the necessity of achieving success in today's turbulent environment, is the knowledge of enterprise success factors, also known as critical factors, key factors, or strategic determinants of success.

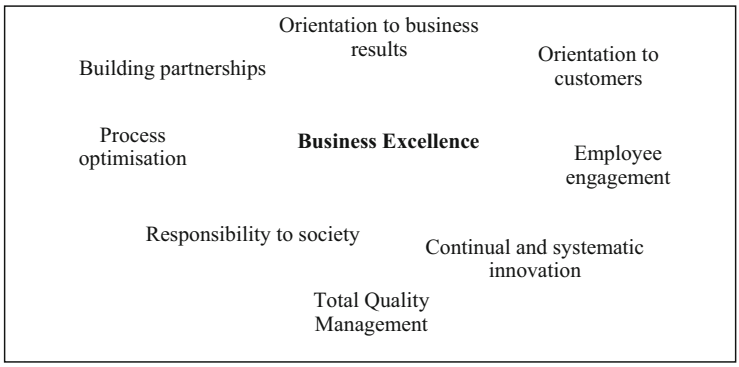

Fig. 1 Business excellence

With regard to the concept of Business Excellence, to assess the success of a company purely based on a single factor becomes subjective as the status and functioning of such factor depend on the interaction between the external and internal environments. Due to the abovementioned facts and without regard to the differing intensity of impact of some factors on a company, we may encounter various concepts, both in theory and in practice, of the defining factors in a company's success (Sayles and Chandler 1971; Martin 1976; Rockart 1979; Baker et al. 1983; Cleland and King 1983; Locke 1984; Chung 1986; Hoffmann 1986; Nagel 1986; Schultz et al. 1987; Pinto and Slevin 1987, 1989; Morris and Hough 1987; Jacobs 1992; Koontz and Weihrich 1993; Tukel and Rom 1995; Pinto and Kharbanda 1995; Belassi and Tukel 1996; Peters and Waterman 2004).

Is it possible to generalize factors affecting success rate based on such concepts? No, because the impact of a certain factor in a particular business is more dominant than the impact of other factors. According to the results of the author's own study, the group of success factors cannot be clearly delimited, even for two companies active within the same industry sector. The actions of the interactive environment can play a significant role for one company and the development of new technologies, the course of events in the global economy or the portfolio of services provided to the other company. Peters and Waterman (2004), authors of the study "In Search of Excellence—Lessons from America's Best-Run Companies" were also aware of this fact. This study contains the results of analyses of the activities of 62 business companies in the form of typical, generalized factors, which were more recommendations (guidelines) rather than a prescribed group of factors impacting the achievement of Business Excellence status: to be active; to be close to the customer; to have autonomy and business spirit; to increase productivity through employees; to adhere to activities which create company values; to keep to what the company is able to do; to create simple organizational patterns and loyal employees; and to utilize the art of connecting centralized and "free" management. The American magazine Fortune has also contributed to stimulating knowledge in the area of identifying factors affecting success rate. Based on a study performed in

1992, the magazine set criteria for the determination of the best companies as follows (Veber 2000): management quality; product quality; the ability to innovate; assessment of long-term investments; financial ability; the art of utilising people's abilities; responsibility to society and the environment; and the utilization of company assets. The German economist Kurt Nagel (1986) was also no exception, as he reiterated the fact that not only monetary, but especially non-monetary factors affect success rate—known also as non-economical or non-financial factors—which are substantiated in order to meet the requirements of a company.

The aim of this chapter is to determine whether there is any method (tool, technique), by means of which it would be possible to assess the achieved status of Business Excellence taking into account the constant changes in the global business environment. The necessity of conducting an analysis of this specific area is implied by the following statements:

- each sector has its own specifics and it is therefore inefficient to apply methods which are universal, able to be implemented into various environments and fail to take into account all aspects of the respective sector and the interests of the specific enterprise,
- globalization is related to the entrance of capitally powerful and technically advanced network enterprises onto multinational markets, which consequently brings about the growth of international competition, international trade, innovations related to technological changes and the rapidly progressing internationalization of markets; not only these factors but many besides provide a different view of the business environment, whereby they put service providers, technology manufacturers and suppliers into new positions within an assessment of the status of Business Excellence.

3 Dimensions for Evaluating the Status of Business Excellence

Discussions related to the substance, significance and application of the assessment process itself to the corporate environment was to a large extent influenced by the American pioneer of quality management W. Edwards Deming (1900–1993) with his well-known PDCA cycle, published in 1939, and the statement that "only that what is evaluated can achieve improvement" (Veber 2000). The German philosopher Rudolf Hermann Lotze (1817–1881) introduced the term 'value' as that which is of significance and validity only for the subject, whereas value is not the product of the will of the subject, but is rather objective as a generally applicable form of desire and behavior (Cakirpaloglu 2004). According to the approach of the Czech literary scientist Josef Hrabák (1912–1987), value is variable in time, related to human interests, and fulfils the function of orientation points which everyday practical activities follow (Hrabák and Štěpánek 1987). When we are restricted to the given definitions of value, it is possible to delimit the notion of assessment,

defined in specialized dictionaries (JULS SAV 2003, 2004) as the process of determining value; the examination, evaluation, and appraisal of people, performances, prices; measurement; balancing; criticism of the status achieved; rating. It thus means, in the sense of the aspects mentioned, that evaluation is an integral function of corporate management with the aim of identifying key success factors and thus of securing Business Excellence status for the enterprise. Practice shows that the starting point for an evaluation of the process is knowledge of the dimensions for evaluating Business Excellence status, which are related to the identification and analysis of success factors of the enterprise, but also its adaptation to the current and expected development of the external environment (innovative potential of the enterprise, creativity of employees, social responsibility of the enterprise).

The word dimension, in terms of vocabulary, is a descriptive attribute or characteristic of the object and can be assigned different values. It may be defined as a range, a distance; in mathematics, the number of independent coordinates defining the position of a point in space; in geography, a length of time or spatial dimension. Currently, this term is encountered in different areas and at different levels of life—it goes to the dimensions of quality of life, the universe, culture, personality, education, and globalization. In the area of Business Excellence the term is associated with the following questions:

- what will be the object of the evaluation?
- whom and to what purpose will the evaluation serve?
- who will be the subject of evaluation?
- how will the evaluation be carried out with respect to the specifics of a particular enterprise?

It is not an easy task to find the answer to such a question as it is related to the identification and analysis of the success factors of the enterprise, but also to the adaptation of the enterprise to the current and expected development of the external environment. On the other hand, not all influences of the external environment may be controlled by the enterprise, nor may all of them act in a similar direction. What constitutes a threat to the existence of one enterprise can at the same time represent an important opportunity for the further development of another. In order to benefit from a more illustrative interpretation, the following explanation can be stated.

3.1 What Will Be the Object of the Evaluation?

Enterprise, pursuant to Slovak Republic legislation (Commercial Code No. 513/1991 Coll. as amended), means the "*set of tangible*, *as well as personal and intangible components of entrepreneurship*". The notion of enterprise includes objects, rights and other property values belonging to an entrepreneur and serving the operation of the enterprise, or which ought to serve such an end, with regard to their nature. According to the approach of Viera Marková, enterprise is a "*form of*

entrepreneurial activity, *within which tangible*, *financial and human resources are connected in one enterprise unit with closed value turnover*, *with the aim of producing useful values for the needs of customers and for the satisfaction of one's own needs*". Network enterprises, also known as inter-organizational networks, are a relatively young organizational phenomenon.

If only the internal success factors of the enterprise are perceived as the object of an evaluation of Business Excellence status, focus would therefore naturally turn to individual components forming the enterprise as a whole. The problem faced by many enterprises relates precisely to the identification of components themselves, as the object of evaluation cannot refer only to results, but primarily to the management of the enterprise. This was confirmed by the enterprises interviewed, which consider products (the quality, price, availability and reliability thereof), employees and management of the enterprise to be the objects of evaluation. The evaluation of outputs de facto prevails, whereas a complex evaluation of the enterprise and processes participating in the creation of individual outputs is missing. With regard to such relationships, we can consider employees, processes and products to be the objects of evaluation (Fig. 2), provided that one basic condition is met: as the achievement of Business Excellence status is evidence of the success rate and exceptionality of the entire enterprise, it is not sufficient to perform a partial evaluation (an evaluation only of particular success factors of the enterprise), but rather a complex evaluation of the enterprise taking into account all corresponding external factors such as customer satisfaction and the responsibility of the enterprise to society.

3.2 Whom and to What Purpose Will the Evaluation Serve?

Jaromír Veber (2000) claims: "The starting question of any evaluation is to find out 'whom and to what purpose the evaluation serves.' Various subjects would want to find out various types of information on the same enterprise in relation to what they would want to use the obtained information for". According to our own research findings, traditional subjects requesting an evaluation of the enterprise include:

- enterprise management (evaluation is the core of control processes, i.e. it fulfils the function of a controlling tool, as it enables comparison of the data obtained with plans; evaluation outputs in their summary form serve to take corrective or preventive measures),
- bank institutions (whose attention is focused on data which is of monetary nature, as the main reason is the interest of the enterprise in receiving capital from the bank institution),
- investors (who are interested in an evaluation of the enterprise in case they are considering the purchase of shares, bonds, bills of exchange or investment in the form of providing capital, technology, spaces for performance of business activity and so on),

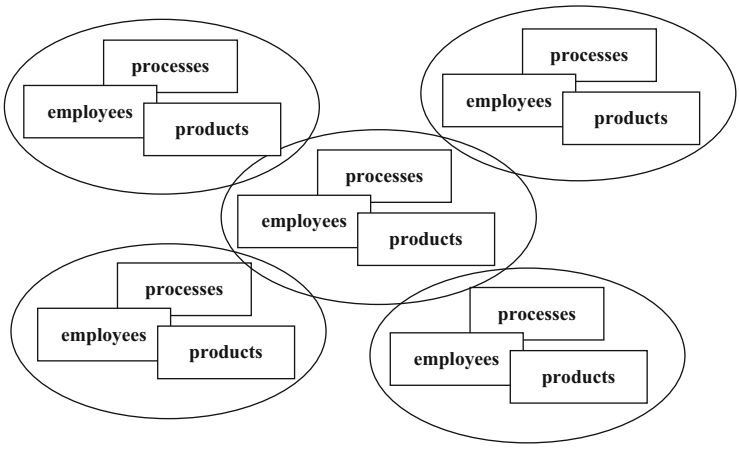

Fig. 2 The object of the evaluation of Business Excellence status

- shareholders (whose attention is paid to the development of key ratio financial indicators, including indicators of market value such as share price, net profit per share, dividend revenue and so on, which is determined by their own interests and position within the enterprise),
- executive bodies (the aim of evaluation is to obtain a complex view of the circumstances of the enterprise, i.e. they use data which is not only monetary in nature),
- suppliers (whose interest is focused on the current and future payment ability of the enterprise, as well as the development of key ratio financial indicators in the area of financial ability, indebtedness and rentability),
- customers (evaluation can fulfil the function of a control tool; in addition to monetary data, the following are also monitored: product portfolio, quality and reliability of products, technological and product innovations and so on),
- financial authorities (in relation to submitting tax declarations with regard to income tax, which is based on data from financial bookkeeping),
- statistical authorities (for purposes of statistical determination and the processing of basic data characterizing respective enterprise, these can function as data of the following nature: establishment of the enterprise, scope of business activities, form of business, employment status, unemployment rate, structure of employees, amount of average gross wage, foreign investors (inflow of direct foreign investments), trading income and so on).

These are fundamentally individual subjects forming the interacting environment within the enterprise. In practice, the most frequently occurring subjects requiring evaluation include, without regard to the localization or scope of business activities of the enterprise, the following: company management, investors,

suppliers, customers, and financial and statistical authorities, which are also documented by our own research findings.

3.3 Who Will Be the Subject of Evaluation?

The subject of evaluation can be the enterprise itself (a network enterprise such as a mother or daughter enterprise), or an external company dealing with this issue, respectively. From the point of view of the process of performance and the outcome of the evaluation enterprises, the following dilemma is posed: *Which is more beneficial, an evaluation conducted by our own company or by an external company*? The majority of enterprises prefer their own employees, although in such cases an important role is played by taking into account the needs of individual interested parties and the method of performing the evaluation.

3.4 How Will the Evaluation Be Carried Out With Respect to the Specifics of a Particular Enterprise?

The choice of suitable methods (tools, techniques) of evaluation depends especially on the object and subject of evaluation, as well as on knowledge of current trends in evaluating Business Excellence status. Despite these facts, numerous managers as well as external companies most frequently utilize 'traditional' methods such as financial analyses, audits, SWOT analyses and market research focused on the determination of customer requirements. This is brought about by the object of evaluation, the subjects requiring evaluation, the purpose of evaluation, but especially by an indifference and unwillingness on the part of enterprises to approach "less traditional" methods than those used so far. It is a matter of fact that a network enterprise, without regard to its size, structure or maturity, can apply various methods (tools or techniques), but the question at hand is which of the methods mentioned is most suitable, as each enterprise is placed within a specific environment and takes care of its own interests, not least with regard to aspects of the respective environment in which it finds itself.

As it is necessary to perform a complex, rather than partial, evaluation of the enterprise (a network enterprise such as a mother or daughter enterprise) in analyzing the achievement of Business Excellence status, guidelines in this case may be tools of the following nature: models of Business Excellence, individual systems of indicators (Balanced Scorecard, TQM-Scorecard), Six Sigma method, and TQM-controlling.

4 Trends in the Assessment of Business Excellence Status

The starting framework for the determination of the achieved level of Business Excellence is formed by models with fixed scales of criteria, based on which it is possible not only to objectively assess individual enterprises, but also to mutually compare them. Both theory and practice currently offer various holistic models (Table 1). Examples are the EFQM model in Europe, the Deming Prize model in Japan and the Malcolm Baldrige model in the USA. As regards the structure and method of assessment of the EFQM and Malcolm Baldrige models, they are almost identical and are based on three crucial pillars which form the core of TQM—current observation of people, processes and results, projected into individual principles of Business Excellence. The Deming Prize model is a separate category, which differs from the previous models not only through its structures, but also through the assessment process. Industry professionals consider it to be the most complex, and at the same time the most demanding, basis for the assessment of Business Excellence status.

The assessment of Business Excellence status is, in the present day, no longer only an issue for multinational institutions, as evidenced by national and regional models, which predominantly imitate the aforementioned EFQM and Malcolm Baldrige models—yet it was the implementation of a localized perspective in the respective country or institution which gave the assessment of Business Excellence status in the respective country an element of significance.

Another form of assessment of Business Excellence status is the ISO 9000 series, which in recent decades has become something of a forerunner to other Business Excellence models, due in no small part to the extensiveness and duration of assessment. The present reality is evidence of the fact that clients regularly require proof of the implementation and functioning of quality management systems from their suppliers, conforming not merely to the requirements of ISO 9000 standards, but primarily to the requirements of the ISO 9001 standard criteria. However, such certification does not provide any guarantee that an enterprise which complies with standardized requirements will therefore provide better products and services than the competition. In fact, numerous managers make the mistake of believing that certification represents the end of the quality control process. The certification is but an accompanying step, which should certify that what the enterprise does, it does well. It ought to be viewed not as an objective in itself, nor that fulfilment of the standards negates the need for further such activity, but on the contrary as merely the beginning of the path to Business Excellence.

The globalization process and pressure to achieve and maintain the competitiveness of an enterprise on both domestic and foreign soil have influenced the rapid growth of sector standards with properties of the following nature:

- they respect the validity of the ISO 9001 standard,
- they stipulate special requirements specific for the respective sector,
- they are not generic, contrary to the standards of the ISO 9000 series,

Table 1 Selected holistic models

Region/ country	Name of award	Model
Australia	Australian Business Excellence Award	National model
Canada	Canada Awards for Excellence	National model (unique)
Europa	The EFQM Excellence Award	The EFQM Excellence Model
China	China Quality Award	National model (developed from Baldrige Criteria for Performance Excellence)
India	The Golden Peacock Business	The Golden Peacock Business
	Excellence award	Excellence Award Model
Japan	Deming Prize	National model (unique)
Singapore	Singapore Quality Award	National model (developed from Baldrige Criteria for Performance Excellence)
USA	Malcolm Baldrige National Quality Award	Baldrige Criteria for Performance Excellence

- procedures of certification are usually more demanding than ISO 9001 standard procedure, inasmuch as
- certain sector standards already include the requirement for environmental protection, the safety and protection of one's own employees, as well as the principle of social responsibility, all of which are not included in the ISO 9001 standard.

An example of this is the TL 9000 telecommunication standards, which through its structure and content radically contributed to a decline in the so-called cost of poor quality (COPQ), which is still considered a problematic issue in the management of telecommunication enterprises. The number of certified enterprises is growing, and it is expected that in the near future the TL 9000 standard will become the basic precondition for building any relationship between client and supplier.

Why is it then that there are still enterprises which do not take into account the above facts and base the assessment of Business Excellence status primarily on the monitoring of monetary criteria and indicators? Certain examples illustrate the point:

- five groups of ratio financial indicators with various structure and informing ability, reflecting five groups of enterprise management: liquidity indicators; activity indicators; indebtedness indicators; indicators of rentability (profitability); market value indicators,
- indicators such as EVA, MVA, ROCE, NAV,
- fast credit (Bonity indicator model, Kralick quick test, Zmijewsky's study, Deakin's, Maraise's, Ohlsona's, and Bleiera's model) and bankruptcy indicators (Z-score model, Argenti's model, Taffler's model),
- pyramidal systems of indicators.

The evaluation of Business Excellence status based on monetary criteria is performed especially for the purpose of fulfilling the external needs of the enterprise with the aim of finding a capital provider or party interested in purchasing the enterprise. This in essence is a discussion of a typical case in which the task of the evaluation process outcome is to represent the enterprise in a unique light, i.e. to provide basic information related to the general success and economic ability of the enterprise. Evaluation based on the monitoring of monetary criteria and indicators is also appreciated by the owners and executive management of the enterprise, as it provides them with important information related, for instance, to the rate of evaluation of contributed capital, as required by shareholders with regard to the amount of risk related to the respective area of business; amount and structure of assets; sources; revenues; costs; trading results; cash flows and so on. Monetary criteria and indicators provide a retrospective view of the financial situation and development in the enterprise, on the grounds of which it is possible to determine the risks and potential success of the enterprise. Data from financial and managerial bookkeeping, as well as data contained in accounting reports, is used as a starting point. The practice is proof of the fact that accounting is unable to capture the full range of facts which would reflect the actual dynamics and variability of factors influencing the general status of Business Excellence—which is proven also by the absence of areas such as management and organization, orientation to employees, orientation to customers, market and competition, products, and suppliers.

This does not mean that the monitoring of monetary indicators and criteria is entirely unimportant or ineffective. On the contrary, such practices provide a retrospective view of the financial situation and development of the enterprise, on the grounds of which it is possible to determine the possible risks and potential success rate of the enterprise. Yet in itself this is insufficient, as the achievement of business success and excellence requires something more than just "pure" forms of indicator systems (such as the DuPont system), which are the answer to what was occurring, and not what is currently occurring. It therefore requires individual systems of indicators which not only take into account financial data, but also data on the satisfaction of customers and employees, and on individual processes inside the enterprise.

In many countries this is related to the Balanced Scorecard system and its four perspectives, considered by the BSC creators to be the basis for several enterprises. However, both theory and practice do not bear out this opinion, the evidence for which is the determination of different perspectives, namely independence from the strategic orientation of the enterprise itself. Despite its unparalleled contributions and irreplaceable position in the management of each enterprise, it is not the only system which is able to assess enterprises and the achievement of Business Excellence status. Enterprises implementing the TQM strategy currently apply the extended TQM-Scorecard system with the aim of achieving Business Excellence status not only in terms of financial objectives, but also taking into account the satisfaction of customers, employees and quality of processes.

The last group of methods constitutes Six Sigma and TQM-controlling, which can appear to many enterprises as if they were ‘new’ or ‘innovative’. However, the ‘new’ means only their ability to arrange proven concepts of management and best quality methods into one sophisticated process, the output of which is the achievement of Business Excellence status. These are essentially methods based not on theory but on practice, as they focus their attention on the procedure and assessment of individual steps therein, leading to Business Excellence status. For instance, the Six Sigma method expresses the achieved level of this status by means of an indicator, which in practice means that anyone viewing this figure is able to understand whether the enterprise has improved, declined or stagnated, and how far it is from achieving the set target value. On the other hand, the TQM-controlling method, which is also not representative of an isolated part of the enterprise, integrates and implements often non-joinable ideas, trends, tools and techniques of the modern business world into one system.

5 Conclusions

As every person is an individual, so every network enterprise is unique and is characterized by individual needs, wishes and its environment. From the perspective of the abovementioned aspects, this means that corporate vision and strategy must be taken into account for the needs of the assessment, i.e. a specific approach taking the requirements of the global business environment into account:

- orientation to strategic aims of the enterprise, as they are the starting point for planning, management and control of results,
- simple structure, i.e. intelligibility and comprehensibility,
- accuracy of criteria and indicators used,
- ability to adapt to changes in the enterprise,
- support of the benchmarking process, enabling comparison to other enterprises,
- multidimensionality, i.e. on the one hand providing data on customer and employee satisfaction, and on overall results achieved, as well as data related to the image of the enterprise, assessed with a suitable combination of financial and non-financial indicators, and on the other hand containing data related to individual processes in the enterprise,
- subject to orientation to the customer,
- taking into account the objectives of employees related to the working environment, opportunities for development and so on, which will contribute to an increase in the motivation, satisfaction and productivity of employees,
- subject to orientation to the process, because only thus will it become the source of information related to the consumption of time, quality and costs.

The first recommendations in the aforementioned situation are from data contained in Table 2, which classify the methods presented (tools and techniques) based on set criteria in relation to the requirements of the global business

Table 2 Requirements of the global business environment versus methods of assessment of Business Excellence status

Requirements for the method of assessment of Business Excellence status	BE models	TL 9000	Individual systems of indicators	TQM-controlling	Six Sigma
Adaptability (specific sectors)	2	1	1	2	1
Self-assessment	1	1	1	1	1
Benchmarking	1	1	1	1	1
Simple structure	3	2	2	3	3
Intelligibility	2	2	1	2	2
Orientation to customers	1	1	1	1	1
Orientation to employees	1	3	1	1	2
Orientation to process	1	1	1	1	1
Complex assessment of the enterprise	1	2	1	1	2

Source: Jankalová (2012a)
Explanatory notes: 1 (complies fully), 2 (complies partially), 3 (does not comply at all)

environment. With regard to the aim of the contribution, individual systems of indicators are most suitable for the requirements of the assessment of Business Excellence status. However, results from the author's own research have confirmed that such a form of assessment is currently lacking. This is reflective of the object of assessment; subjects requiring assessment; the purpose of assessment; but especially the indifference and unwillingness on the part of enterprises to approach more "unconventional" methods than they have been using to date.

The second recommendation under the specified circumstances is the proposed Business Excellence (BE) index, which represents a discriminatory function enabling the differentiation of enterprises from four aspects, namely (1) the quality of the enterprise (including product quality; the personal quality of employees; and process quality), (2) corporate social responsibility; (3) The innovative potential of the enterprise and (4) The financial results of the enterprise. This important viewpoint is included in the form of partial indices: quality of the enterprise (i_q), corporate social responsibility (i_{csr}), innovative potential of the enterprise (i_{ip}) and financial results of the enterprise (i_{fr}), the degree of importance of which is expressed by assigned weights in relation to the evaluation of service quality (Jankalová 2012b):

$$I_{BE} = 30.0 \times i_q + 25.0 \times i_{csr} + 15.0 \times i_{ip} + 30.0 \times i_{fr} \quad (1)$$

Even though globalization has changed society's way of thinking, such issues as presented in this chapter are manifested in the majority of companies, including the executive management of several of them. Business Excellence represents reform for any enterprise, but its achievement requires a continuous circle of evaluation, because only through the evaluation of results will the potential for complex improvement within the entire enterprise be realized. Which object and subject or

method (tool and technique) are chosen by the enterprise depends only on the enterprise itself, because correctly identified methodical bases (dimensions) of evaluation will result not only in the evaluation of business success and exceptionality, but especially in determining the potential for continuous improvement within the whole enterprise. The question remains whether they only wish to survive or rather to discover the path to previously unimaginable levels of quality, to earn a position of strength on the market and eventually to achieve the status of complex improvement in the form of success and exceptionality in terms of Business Excellence.

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The Economization of Network Business Models

Adam Jabłoński

Abstract Business activity nowadays is shaped by mechanisms based on emerging, new paradigms, one of which may be a network paradigm. Also, in the current economic crisis, it is particularly important for companies to actively strive for an improvement in performance. The crisis has created a new perspective on management. In the course of the scientific discussion, the author attempts to answer the following questions: What is the result of using the network business model? What is the relationship between the network environment and the network business model used? What is the relationship between the use of the network business model and the resulting specific economic rent? The purpose of this paper is to discuss the term of the economization of company network business models in relation to the expected levels of performance achieved by a company. The author argues that the mechanism of economization of the network business model depends on the specific business context of the company, and that this context shapes the current network environment. In this paper, the interpretative approach has been applied.

1 Introduction

In the current economic crisis, it is particularly important for companies to actively strive for an improvement in performance. The crisis has created a new perspective on management. All strategic and operational activities are subordinated to achieving the predicted results, determining the success of the implementation of objectives set by the company. It follows, then, that the economization of the company and its key attributes may be an important factor enabling the company to ensure a continuous state of readiness as is necessary in a crisis. Such economization may relate to strategies and business models of the company. Seeking the most suitable definition of company strategy in terms of its economization, it is worth recalling

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the definition of Bowman (1974: 47), who as early as 1973 wrote that strategy is a continuing search for rent.

An interesting question is whether a similar approach as to strategy can be applied to a business model? Is the objective of the business model a continuing search for rent, or rather, is it a guarantee of the company's ability to obtain it? The question is not an easy one. If we assume that the goal of strategy will be the materialization and operationalization of the business model towards achieving the expected level of performance, a business model will be the configuration of material and non-material resources forming a platform for creating and offering a value proposition to customers and creating the appropriate logic of generating income. If we assume that strategy is a set of key objectives, initiatives and creative management mechanisms at the strategic level, determining the implementation of the overriding company's goal, the structure of the business model will support the main function of strategy—the search for economic rent. Thus, the economization of the business model is increasingly becoming an important element nowadays.

Both the strategy and business model operate in a certain environment, which most often takes the form of a network environment at this point. This environment shapes new business models—so-called network business models which operate in a network, meaning that economization also takes place within this network.

In the course of a scientific discussion, the author makes an attempt to answer the following questions: What is the result of using the network business model? What is the relationship between the network environment and the network business model used? What is the relationship between the use of the network business model and the resulting specific economic rent?

The purpose of this paper is to discuss the economization of company network business models in relation to the level of expected performance achieved by a company. The author argues that the mechanism of economization of the network business model depends on the specific business circumstances under which the company operates, a context which shapes the current network environment. An interpretative approach has been applied to this paper.

2 The Economization of Company Business Models: A General Dimension

According to a dictionary of the Polish language, economization can be understood as making something more economical. In the relevant Polish literature, Stabryła (2006) further defines the term of economization, which in his opinion constitutes efforts made to improve cost-effectiveness. This involves choosing the most effective (best) possible action in terms of the set goal and the conditions which limit this goal. This large variety of activities is reflected in the law of rational management, which combines the general demand for efficient (organized) action and an assessment of the efficiency of individual parts which make up the organized whole

(object) (Stabryła 2006: 234). The concept of economization can be applied to business models of companies.

According to Neely and Delbridge (2007), a perfect business model:

- draws a boundary around what is done,
- explains how to connect internal processes with external customer requirements and strategic objectives.

A business model is a conceptual and architectural implementation of business strategy and the basis for introducing business processes. It is also a proposal of company value for one or several segments of customers, and the architecture of the company and its network of partners, for creating value and relationship capital in order to generate profitable and sustainable revenue streams (Osterwalder and Pigneur 2002).

Johnson (2010: 22) defines the business model as a representation of how the company creates and delivers value for both the customer and company. The business model is a reproduction, in a particular place, time and business space, of the structure of links of the factors which guarantee the fulfillment of the current internal and external needs of the stakeholders, which allows the company to gain competitive advantage and which is the creation of a future platform for company growth and development, ensuring the continuity of business operations. Such an understanding of the business model allows one to change strategic thinking which involves building competitive advantage through the agile and flexible implementation of business decisions in a system "from the current business model today, to the business model tomorrow" (Jabłoński 2008: 19).

When analyzing the presented definition of the business model, in relation to the criterion of company performance, one needs to ask the question of what the economization of the business model is and why it is implemented.

The economization of the business model means constructing a combination such that will generate the maximum rate of return. In this approach, the economization of the business model may involve choosing such components that will determine the growth of company value in all conditions, as the deterministic nature of matching key resources will be linked to positive feedback measured by the maximization of economic rent.

The economization of the business model will, therefore, be associated with:

- selecting such components of the business model, which, by overlapping, will generate the maximum rate of return,
- making the business model operational in such a way that it provides a continuous ability to create value,
- monitoring its growth rate by means of value-controlling mechanisms,
- shaping its integrity to produce results more quickly than its competitors,
- ensuring the coherence of the business model towards its maximum efficiency in economic terms,

– searching for configurations of the business model which will provide a platform for synergy with the strategy that, in this perspective, is a platform for achieving the assumed results.

The economization of the business model can be implemented by maximizing the achievement of various economic rents from the exploration and use of the business model resulting from a given set of business circumstances. The context of business determines how a given concept of strategic management is applied in practice.

3 The Network as an Environment Conducive to the Economization of the Company's Business Models

As we live in an age of strong networking, not only of the economy but of the entire ecosystem, the network environment creates new areas of business development. At the company level, it determines the shape and image of business models materializing as high company performance. Therefore, the network-based approach determines the place of conducting business in the context of a network and a system of interactions in the business ecosystem. Hakansson and Snehota (1995: 26) define the network as three interrelated categories: network participants, resources which they have at their disposal, and the actions they take. In turn, Martin-Rios (2014) defines inter-firm networks as voluntary agreements of independent businesses, which include the exchange and sharing of knowledge.

Jarillo (1993: 6) understands the network as a grouping of organizations such that at least one of them controls the flow of material and non-material resources (including knowledge) between other organizations.

Ghauri et al. (2003) draw a major distinction between vertical and horizontal interfirm networks, defining the first as 'cooperative relationships between suppliers, producers and buyers, aiming at a solution for marketing problems, improved production efficiency, or the exploitation of market opportunities', while horizontal networks are 'cooperative network relationships among manufacturers who want to solve a common marketing problem, improve production efficiency, or exploit a market opportunity through resource mobilization and sharing'.

A categorization of networks by Hooley et al. (1998: 201) gives us the following types: empty (hollow networks), variable (flexible networks), virtual (virtual networks) and with added value (value-added networks). In turn, Achrol (1997) divides networks into internal (internal market networks), occasional (opportunity networks), marketing (marketing channel networks) and mixed (inter-market networks).

While designing a network in the form of orchestration, one is obliged to analyze the competence and implementation abilities of the network as a whole, and not just as the sum of single links.

4 Relationships with Stakeholders as a Platform for the Economization of Network Business Models

Business models of companies, designed to gain competitive advantage in the market, have inherent elements of efficiency. The efficiency of the business model can be measured by the volume of economic rent obtained during its life cycle. The design of the business model determines the type of economic rent. A specific business model generates specific value from the relationship. In any model based on the relationship, the entities around which value is created are stakeholders of a company which is part in the network. The company implements such a model efficiently, depending on its appropriate configuration and the interaction of the company with its network environment.

A relationship model may be based on the principles of inter-area synergy proposed by De Wit and Meyer (2007: 196), who define forms of synergy as:

- synergy through sharing resources,
- synergy through coordinating positions,
- synergy through integrating activities.

De Wit and Meyer also define eight groups of external entities, which the company can or must interact with. They are divided into market and context-based entities. Market entities are individuals and organizations which take value-creating activities or consume their results. Context-based entities are entities which intentionally or unintentionally determine the conditions under which market entities operate through their behavior. Stakeholders are groups on which the survival of the organization depends (Mitchell et al. 1997), and are individuals or groups who may influence the activities of the organization or are influenced by the actions taken by the organization (Freeman and Reed 1998: 832). Clarkson (1994: 853–886) defines stakeholders as "risk-bearers." In his opinion, "voluntary stakeholders of the organization bear some sort of risk due to the fact that they invested human or financial capital or something valuable in the company. Involuntary stakeholders bear some risks as a result of the company's operations."

Therefore, stakeholders of whom the network is comprised play a particularly important role in the relationship-based business model. At the same time, a model of common value can be created, which is a set of creative mechanisms of strategic management aimed at finding a strategic balance of expectations of all entities involved in the creation of company value through the business model.

In Fig. 1 the bold lines and circles represent elements to which the respective approaches require managers to pay attention. In the context of stakeholder theory examined in terms of a network, the concept of the ego network is of special importance. Everett and Borgatti (2005) define ego networks as those consisting of a single actor (ego) together with the actors to which they are connected (alters) and each of the links among those alters. These networks are also known as neighborhood networks or first order ego neighborhoods. The attraction of ego networks is the ease of collection of data compared with collecting data on entire

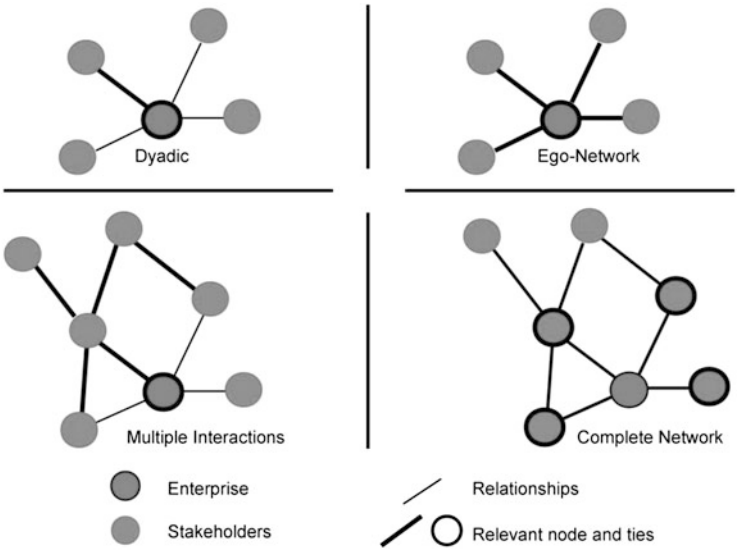

Fig. 1 Approaches to stakeholder networks. *Source*: Sciarelli and Tani (2013)

networks. Information on alters, including how they are connected, is usually obtained entirely from the ego.

Vandekerckhove and Dentchev (2005: 230) have argued that a network perspective on stakeholder management can facilitate the discovery of new opportunities by entrepreneurs. In particular, they have stressed that a strategic network environment for a firm is one that is characterized by high centrality and optimal density. Such a network design overcomes the unrealistic assumptions underlying the hub-stakeholder model, i.e. of dyadic entrepreneur- stakeholder relationships and exhaustive information on stakeholder expectations. They have developed a heuristic approach for the identification of network opportunities which consists of mapping the network environment in two distinct ways: interaction mapping and issue mapping. By comparing the two mappings, network opportunities can be identified. The relevance for entrepreneurs of this heuristic model, and of a network perspective on the stakeholder environment in general, lies in the potential to discover opportunities for the development of new ventures by altering their perception of their stakeholder environment and by structurally changing the flow of information within their stakeholder environment. This is achieved through network engineering—identifying and engaging with specific stakeholders—as a process towards high centrality and optimal density.

Relationships with stakeholders can contribute to the economization of the network business model by, inter alia:

– building a business model with the use of stakeholders of maximum value,
– generating returns on any relationship, while always directing its efforts towards the transactions entered into,

– eliminating unprofitable relationships,
– searching for mechanisms of value creation from the relationship-based network with stakeholders.

5 The Economization of Network Business Models

In the network-based approach, a company itself may be a network, may conduct business activity within the network, and may also participate in a number of networks of both formal and informal character, while benefiting from the web (Web 2.0 Internet) as a source of creative knowledge of the market, competition, technology, and so on.

Voelpel et al. (2005) claim that the business model in the network-based approach is the concept of core values offered to customers and the configuration of the network of delivering value consisting of one's own strategic capabilities and other values in the network (e.g. outsourcing, alliances) and the constant attempts of the company to change and meet stakeholders' objectives.

Global network models can be built by creating partial models (Table 1).

A network business model goes beyond its own company, in that part of its components are formed as a result of the activity of other business models. Their presence in the market stimulates and conditions the existence of this model (Jabłoński and Jabłoński 2013). According to Palo and Tähtinen (2013) a networked business model guides the manner in which a network of companies will create customer and network value by developing a collective understanding of business opportunities and shaping its actions to exploit them. The development of the networked business model involves developing and testing the service, and bringing it to market. The market is created and shaped by a networked business model aiming to demonstrate a viable business network. Figure 2 presents the elements of networked business model development.

Table 1 Partial models

No.	Partial models
1.	A model of "forgetting" outdated organizational structures and management systems
2.	Configuring cooperative structures of value creation
3.	A model of transferring information within the network
4.	A financial model of a virtual company
5.	A model of relationships and creating added value with customers and network cooperators
6.	A model of relationships and creating value with competitors
7.	A model of creating value through products and services
8.	A model of transferring value in the network through products and services

Source: Perechuda (2013: 108)

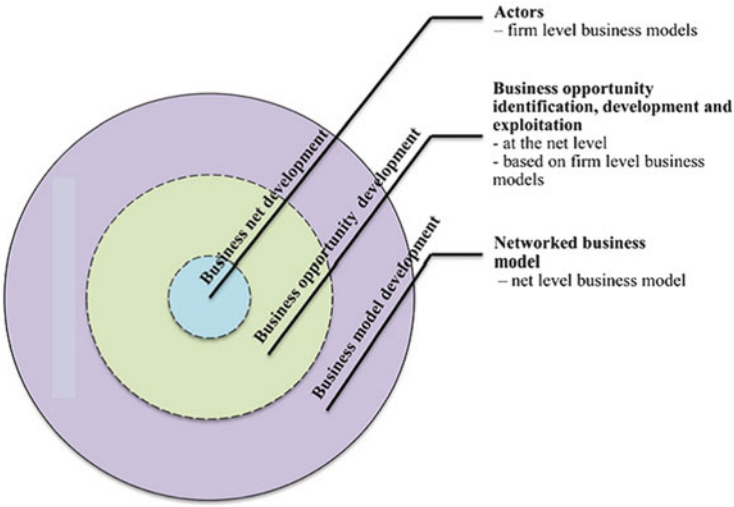

Fig. 2 Elements of networked business model development. *Source* Palo and Tähtinen (2013)

The components of this business model are delivered to the resulting company business model (included in the existing business model) through networks centered on the company. The network nodes are present in numerous networks; those whose business models feature cooperation with companies of different dimensions (as well as nodes of numerous networks) may, as a result, find unique components via the network, which in their own configuration can ensure competitive advantage on the market.

Shaping the network business model is a process. First, individual companies shape their business models. They are separately operating entities and are not interested in broader cooperation with other companies. The next stage is the search for planes of cooperation through various forms of initiation of cooperation. The third stage of business model development—in order that it meets the attributes of the network model—is entering into special cooperation agreements in the form of solutions such as, for example, alliances of a relatively permanent nature. The final stage of network business model development is the integration of the components which shape it and constitute the system. Subsequently, the configuration of the network business model will necessarily be fully or partially consistent with solutions from a different business model, as the existence of one of them may determine the existence of the other and vice versa.

The result of the network operation is so-called network rent, a concept highlighted in Polish literature by Niemczyk (2013b: 38). In his opinion, the basic types of rent emerging in network systems include:

– rent from lower transaction costs and lower costs of hierarchy,
– rent from appropriation of value created through other members of the network,
– rent from network creation and diffusion of knowledge,
– network effect (Niemczyk 2013b: 38).

Niemczyk also claims that network rent most likely does not constitute the most attractive means of achieving economic gain. In general terms, it is not based on what could be considered as significant progress in the discipline of management science, most probably due to the fact that it refers to a different logic of value creation. From a network perspective, a company is a combination of contracts; thus this perspective of perceiving business is completely different from the traditional one, demanding the concentration of activities around resources. Here the contract is an object of optimization, standardization, formalization, development, reengineering, and so on (Niemczyk 2013a: 115).

The basic assumptions shaping the business model—network relationships in terms of the economization of network business—can be presented as follows:

- a business model does not exist without a network,
- some components of business models (for example, value propositions for customers) depend on network activity,
- the business model is based on the cooperation of the company with at least one partner. There must be integration of a minimum of one component of the business model with another model,
- the development of the business model depends on the development of other business models,
- the strength of the relationship and the activity of players in the network ensure the cohesion and sustainability of the business model (Jabłoński and Jabłoński 2013),
- the network-based approach can be applied to virtual high-technology companies, where innovation is the driving force behind the business model,
- since the network strives for balance in the long term, it is best suited to circumstances characterized by chaos, where survival is not the decisive and most important goal of the company,
- the network can be supported by using company organizational structures based on the concept of Project Management,
- continuous tension in the network is important, thus strong momentum is required to move the business model,
- the network is an effective tool for inducing rapid growth and economies of scale in a short time,
- the network is more suitable for innovative business models built in a revolutionary manner,
- the network is more compatible in terms of the confrontation of management mechanisms with marketing mechanisms (especially Internet marketing),
- the network is more appropriate for e-business models, and often companies in the early stages of development.

The driving forces of the network business model which provide it with the appropriate dynamics in the network for the achievement of high efficiency can be presented as follows:

- relationships and the strength of relationships between network actors through a company's participation in numerous networks,
- the resources possessed (internal components of the business model) may be configured with the resources (components obtained from the components of business models of other actors in many networks in which the company participates),
- the structure of stakeholder networks (their value and the dynamics of their migration) centered on the company acting as a node in the network,
- the dynamics of active participation in a number of networks and the dynamics of joining them,
- the dynamics of the transfer of knowledge from networks in which the company participates,
- the dynamics of innovation created for the company through its participation in several networks,
- the ability to build trust within the networks in which the company participates.

To sum up, the economization of the business model based on network theory may involve, among others:

- building network business models composed of components derived from other network members, whose key factor is their uniqueness, which can be a source of high rates of return,
- searching for value and returns from the network through participation in the network.
- Searching for returns through accelerating business processes by participating in the network (faster access to information, knowledge, technologies, solutions, relationships, exchange, cooperation, internationalization, innovation, and so on),
- achieving rates of return by establishing relationships with the stakeholders who constitute a network,
- attracting high-value stakeholders thus facilitating the mutual exchange of value in the network.

6 Conclusions

The network environment is favorable to the emergence of company network business models. A network is created by dynamic relationships with stakeholders. The economization of network business models is becoming one of the key priorities of strategic management for companies. The degree of economization of the business model depends on the set of business circumstances under which a company operates, which determines its use of the appropriate concept of strategic management. Networking dynamically induces the company's ability to achieve high performance, which is the effect of using network business models.

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Structural Pathology in Inter-organizational Networks and the Decision-Making Autonomy of Its Members

Joanna Cygler

Abstract In inter-organizational networks, organizations choose to set up multilateral relations when cooperation creates significant opportunities which can be achieved only collectively. However, members operating within network structures are obliged to bear specific costs, which are linked to the reconciliation of the self-interest of the network members with preferences resulting from joint operations. Often, the interests of individual firms—belonging to the network—are mutually contradictory. Therefore, the settlement cost may appear in the overall costs of the decision-making process of the network members. The decision-making autonomy of the network member depends on several conditions: a strong position in the network structure, access to both strategic (for the network members) or scarce resources, innovativeness, control of resource flow, operational interdependence, and the character of ties between nodes. Companies opt for cooperation in the inter-organizational network, if the benefits derived from participation are higher than the costs relating to operations within that business constellation. However, numerous pathologies can be detected in inter-organizational networks. They are identified in various areas of network activities; however the most spectacular pathologies are of a structural nature as they quickly eliminate benefits achieved as a result of collective and multilateral cooperation. The main structural pathologies concern: position in the network structure, the formalization and strength of ties within the network, and the density thereof. The chapter clearly demonstrates that structural pathologies in inter-organizational networks may result in the erosion of benefits gained from multilateral cooperation. These pathologies also increase the cost of functioning in the network, including a significant or even total loss of decision-making autonomy for network members.

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1 Introduction

The last 30 years have seen a considerable rise in interest in multilateral cooperation amongst companies leading to the creation of inter-organizational network structures (Borgatti and Foster 2003). Research studies on networks in business and economics have been inspired by achievements in the field of mathematical programming designed to resolve transportation and manufacturing issues in the mid-twentieth century (Dorfman et al. 1958) as well as abundant studies in sociology (Coleman 1990). Furthermore, Casson and Della Giusta (2008) applied the concept of networks in physics (electrical circuits), civil engineering, information technology, biology (network of neurons), or anthropology (family ties). The multitude of research studies inspired by the concept of networks reflects the diversity and complexity of phenomena and processes which occur when operating and functioning as part of multilateral cooperation. Networks have somehow become fashionable owing to the superior and unquestionable gains which may be achieved by members of the constellation (Gemünden et al. 1998; Gössling et al. 2007). The benefits of the network stem both from collective operations and opportunities for cooperation with specific partners (who possess key resources which are necessary for the achievement of competitive advantage by the network and its members). Nevertheless, functioning within a network is not all beneficial, as firms are forced to bear costs, e.g. certain concessions that include the limitation of decision-making autonomy compared with other members of the network. The extent of any loss of full decision-making autonomy is primarily determined by structural factors within the network. Some studies in recent years have dealt with issues relating to phenomena and processes impeding the generation of such benefits (Dyer and Hatch 2006; Leick 2011). Network pathologies may have various causes (both endogenous and exogenous) and affect various areas of its operation. Structural pathologies have been increasingly frequently mentioned as the key inhibitor in the generation of network benefits (Cygler and Sroka 2014). The aim of this chapter is to provide a description of limitations to the decision-making autonomy as the cost of gaining benefits from functioning in an inter-organizational network. At the same time, new structural pathologies may pose a real threat to the existence of network members due to both the simultaneous erosion of benefits from the group and the increasing loss of decision-making autonomy by the members of the system.

2 Decision-Making Autonomy in an Inter-organizational Network

Studies on inter-organizational networks have revealed that organizations choose to set up multilateral relations when cooperation creates opportunities for benefits exceeding those achieved in market transactions and hierarchical structures

(Williamson 1991). They will also choose to cooperate when the transaction costs of hybrid forms are relatively lower than in the case of extreme solutions such as market transactions or hierarchical structures. With the increasing complexity of the environment (in particular with the increasing prevalence of hypercompetition) and the inability to achieve benefits independently, cooperation—and in particular multilateral cooperation creating network structures—has gained importance (D'Aveni and Gunther 1995). Any analysis of such networks focuses mainly on the benefits generated as a result of multilateral relations. Major benefits include both operating risk reduction for firms (members of the network) and less opportunistic behavior (Yaqub 2009), which are the effects of increased trust between the parties (Morgan and Hunt 1994; Doney and Cannon 1997; Achrol 1997; Rindfleisch 2000). Equally important is the reduction of costs, as they can be split between several members of the network at the very least (Walker and Weber 1984). Additionally, multilateral cooperation increases the transactional value of the network members compared with other organizations operating in the business ecosystem (e.g. suppliers, clients, competitors), who do not belong to a network (Clarke-Hill et al. 2003). Cooperation within the network is treated as a non-zero-sum game (Jarillo 1998; Brandenburger and Nalebuff 1996), and with repeatable mutual transactions (Rapaport 1988; Axelrod 1984; Heide and Miner 1992) the network members strive to jointly generate benefits. Organizations functioning within network structures show greater flexibility, and achieve benefits from specialization, scale and range (geographical and sectorial) (Dunning 1997). They also gain faster and more cost-efficient access to information and knowledge (Lin and Fang 2009; Sroka et al. 2014) as well as to other valuable resources (tangible and intangible), which otherwise would be too costly or even impossible to acquire (Zaheer and Bell 2005; Henderson and Cockburn 1994; McEvily and Marcus 2005). The existence of a network enables the transfer of both explicit knowledge and tacit knowledge (Polanyi 1966). Explicit knowledge is expressed in quantitative and qualitative terms, while tacit knowledge is of an informal, non-verbalized and intuitive character. Consequently, the transfer of tacit knowledge is not explicit, nor are its effects distinctive or of a stepwise character (Sroka et al. 2014). Both tacit knowledge and explicit knowledge form a basis for the competitive advantage of the network (Barney 1991). As a result of the co-creation and transfer of knowledge and information, network members prove to be much more innovative (Kodama 2009) than other firms functioning independently. This concerns high-tech industries in particular, such as ICT, aviation, biotechnology, and the automotive industry (Greve et al. 2014). The transfer of knowledge requires specific qualifications from the parties, such as creativity, openness to change, ability to implement knowledge, and efficient knowledge absorption (Zahra and George 2002), ability to facilitate knowledge diffusion (Liu et al. 2014), cooperation skills (Lambe et al. 2002; Cygler 2010) and discipline. Multilateral cooperation enables the creation of a competitive advantage that is unique and extremely difficult to reproduce or substitute. Cooperation within the network allows its members to gain access to strategic resources. At the same time, access to scarce resources is effectively restricted for outside organizations, whose strategic position thus

deteriorates; as a result, the benefits of multilateral cooperation are significant from organizational, market, technological and financial perspectives (Cowan 2005; Gemünden et al. 1998; Scalera and Zazzaro 2011).

It is increasingly noticeable that members operating within network structures are obliged to bear specific costs. They are linked to both the reconciliation of the individual interests of the network members with preferences resulting from joint operations. Often, the interests of individual firms—belonging to the network—are mutually contradictory. Therefore, the settlement cost may appear in the overall costs of the decision-making process of the network members. The settlement cost may be reduced if the decisions taken match the preferences of the majority of the network members, and when trust among the firms increases. The cost results from the necessity of collective decision-making and problem handling. Kittel and Luhan (2013) pointed out that the cost of collective decision-making depends on the structure of the network. In hierarchical networks, the cost of collective strategic decision-making rises. In addition, diversification in the size and influence of individual members of the network is also important.

In terms of a resource-based approach, the position within the structure of a network is determined by the possession of, or access to, scarce resources (Burt 1976, 1992). Where scarce resources are strategically important for the whole network, and access to such resources is limited by a few members of the constellation, firms which possess critical resources play a key role in the structure of the network. Occupation of a key position within the structure of the network also translates into decision-making autonomy, as companies with a strong position in the network structure impose their will on other, less influential members (Pettigrew 2001). In contrast, firms which do not have strategic or scarce resources are forced to adapt to organizations which play key roles in the network. Therefore, access to scarce resources is one of the conditions for the decision-making autonomy of members in the network. Due to the dynamic character of relations within the network, companies with a weaker position in the structure will strive to reduce asymmetrical dependence. Emerson (1962) indicated that in cases of asymmetrical dependence, organizations with a weaker position in the structure will strive to change the hierarchy of importance of critical resources. Most often, it consists of promoting other resources as strategic—to which the existing key companies have limited access. The balance of power in the network may subsequently change, leading to increased decision-making autonomy for weaker operators. However, this increases the risk of a pathological situation developing due to the incorrect selection of strategic resources for the network as a result of the internal policies of the actors within the constellation, as opposed to real needs determined by the turbulent environment. Another strategy stems from the conviction that cooperating with enterprises which have complementary resources may be more profitable than working with organizations which possess similar resources. In such a case, firms which assist in achieving synergy benefits as part of cooperation may gain importance and a higher position in the network structure. Owing to strengthened cooperation with key operators, the decision-making autonomy of these weaker organizations thus increases. A third way consists of looking for other key actors in

the network, who would also have access to the resources of strategic character for the network. Accordingly, competition between existing key companies and organizations from outside the constellation intensifies. As a result, the monopolistic position of key actors in the network is limited, and consequently the decision-making impact on companies in a weaker position in the structure of the constellation is reduced (Cook and Emerson 1984).

In addition to access to resources, creation is equally important, and is particularly crucial in the case of technological networks, in which the competitive advantage is achieved through innovation by network members. The more innovative enterprises are, the greater decision-making autonomy they enjoy compared with other members of the network. It is worth stressing the importance of innovation for the competitive advantage of the network and its members. Where innovations play a key role in assisting individual organizations and the whole network to achieve competitive advantage, the position of the innovator (and its decision-making autonomy) strengthens within the structure of the constellation.

Elg and Johansson (1997) claim that the decision-making autonomy of the network's members is also dependent on the control of resource flow. Organizations controlling the flow of resources (tangible or intangible) within the network, at the same time, exert control over the members of the constellation who are dependent on the assets transferred. The span of control covers the decision-making field of dependent organizations. In spite of this, dependent organizations attempt to reduce their decision-making dependence by forming new coalitions with other members of the system or outside organizations (Frost and Egri 1991). Bankvall (2014) in turn points at interdependence as a relevant factor in structure building in an inter-organizational network. Referring to the results of studies carried out by Thompson (1967) and Richardson (1972) in the field of operational interdependence in complex organizations, Bankvall introduces a distinction, in terms of operational interdependence in inter-organizational networks, distinguishing between sequential interdependence and joint interdependence. Sequential interdependence of operations means that a company is limited in its decision-making process due to a sequence of operations or the results of actions performed by other members in the network at earlier stages of the value system, whilst joint interdependence is based on the mutuality of operations and their common direction.

Grandori and Soda (2006) addressed the issue of interdependence, taking into consideration the character of ties between nodes. These ties are considered from a perspective of strength and subsequently defined as strong or weak. Granovetter (1973) indicated that the division of ties into strong and weak is the function of certain variables: the involvement of the parties, the number of interactions (including reciprocity) and trust (friendship). Strong ties require greater involvement (in terms of time, emotions, frequency of mutual contacts) of the parties, and a higher level of interdependence. Therefore, the strength of the ties is reflected by the strength of contacts between the members of the network (Marsden and Campbell 1984). More often, strong ties have a formal and equity character rather than informal and non-equity (Grabher and Stark 1997). Strong ties contribute to higher levels of compatibility and discipline amongst the involved parties. For this

reason, companies with stronger ties are less prone to opportunistic behavior; additionally, owing to the frequency of contacts, strong ties reduce the number of conflicts between parties (Nelson 1989). Furthermore, the flow of information and knowledge within the network is much more efficient when ties are stronger; it significantly facilitates strategic decision-making by the enterprises which belong to a given network. Strong ties, however, reduce the decision-making autonomy of the organizations involved in relations within the network. At the same time, weak ties are both formal and informal, and are mainly non-equity links. Taking into account the decision-making autonomy of the network members, organizations show greater autonomy in strategic and operational decision-making when their ties with other members of the system are weaker.

In addition to the strength of the ties, another essential element is network density, i.e. the number of direct links between the network members. The greater the density of the network, the more efficient the transfer of knowledge and information and the greater the decision-making autonomy amongst members of the constellation. Companies strive to create a dense inter-organizational network in order to protect themselves against so-called structural holes which limit the decision-making autonomy of actors within inter-organizational relations.

Interdependence is also studied from the angle of the stakeholders concept (Stebbings and Braganza 2009), which is particularly useful in an analysis of inter-organizational networks if we consider the strength of influence and the ways in which it is exerted by certain members of the network on other members, as well as the resulting response (Olivier 1991). The stakeholders' expectations and the strength of their influence have an impact on the network structure, the use of resources in the constellation, and therefore on the decision-making autonomy of the network members. Based on the literature on social networks, the concept of stakeholders also addresses issues of the centrality of networks (Ibarra 1993). Centrality is a position (strength) resulting from the network structure, and not the individual qualities (attributes) of a stakeholder. Centrality may have either a formal or informal character. Increasingly often, the position in an informal structure is more significant than the position achieved in formal relations. Measures of centrality include: degree centrality, closeness centrality and betweenness centrality. Degree centrality is mainly expressed by the number of direct ties with other members (which is directly linked to network density). The more direct links a stakeholder has with other members of the network, the higher its degree of centrality. The rise in enterprise centrality brings about the autonomy of decision-making therein. Closeness centrality is the ability to independently access all other members of the network (Freeman 1979). If possible, companies strive to maintain direct contact with each member of the network. The fewer the number of intermediaries necessary for contact with any member of the network, the higher the level of their closeness centrality. This also translates into a certain level of decision-making autonomy for the organizations which are part of the network. The decision-making autonomy of enterprises is proportional to closeness centrality.

Betweenness centrality relates to the proper positioning of companies among other members of the network; it becomes a key node in the transfer of knowledge and information and facilitates contact between the parties in the constellation (Freeman 1979). A firm which features a significant betweenness centrality becomes an essential link in the relationships between members of the network. The rise of betweenness centrality entails the greater organizational autonomy of a given company, and consequently greater decision-making autonomy.

In analyzing all three dimensions of centrality, one can conclude that decision-making autonomy increases in step with the centrality of a company. Based on research results obtained by Olivier (1991), a typology of behavior of organizations within networks was designed, taking into account the density of the stakeholder network and the centrality of the focal organization (Rowley 1997). Four basic types of behavior were distinguished: compromiser (high centrality and high density), commander (high centrality, low density), solitarian (low centrality, low density) and subordinate (low centrality, high density). From among all types of behavior, only the latter set of circumstances (subordinate) enables a network member to maintain the highest possible level of decision-making autonomy. A focal organization characterized by high centrality has the capacity to exert influence on other members of the network, including their decision-making autonomy. The largest risk of losing decision-making autonomy can be observed when the network is thin (low density), and the centrality of the focal firm is considered high.

3 Structural Pathologies in Inter-organizational Networks

The notion of pathology dates back to ancient times, and the etymology of the word draws from both the ancient Greek *pathos*, meaning suffering, and *-logia* (study), and from Latin (science of diseases). Pathology is a notion which is primarily associated with medical sciences; yet nonetheless is increasingly used in other scientific fields (e.g. mathematics, physics, chemistry, sociology, psychology), including the management sciences (Cygler and Sroka 2014). Research studies have addressed phenomena and processes which diverge from accepted standards. Pathologies may also be found in inter-organizational networks. They have been identified in various areas of network activities; however the most spectacular pathologies are of a structural nature as they quickly eliminate benefits achieved as a result of collective and multilateral cooperation. They pose a significant risk to both the success of the network system and its individual members. Pathologies in inter-organizational networks are even more dangerous as they trigger a chain reaction of threats due to occurring irregularities. One type of pathologies may lead to others; therefore, structural pathologies may cause risks both directly and indirectly.

Based on an analysis of structural pathologies in inter-organizational networks, the crucial ones are those related to the position of enterprises in the constellation, the network density, and the choice of relations between the actors.

One of the key structural pathologies concerns the position of a company in the network structure. Most often, abnormalities occur when the key position in the structure is assumed by firms which do not possess key resources (tangible or intangible). This may happen when informal links in the network prevail over formal ones. Business practice shows that, in addition to formal ties, the network creates an informal system of links of a social character. Social networks are characterized by integration and support business links between stakeholders, enabling the enhancement of trust between network members. Firms are more open to cooperation under such circumstances. In healthy inter-organizational networks formal relations (economic) have a greater impact than informal (social) ones. Pathology occurs when business relations are dominated by interpersonal ties. In some cases the economic success of a stakeholder is determined not by its achievements but by personal contacts. One example includes a phenomenon observed in Russia and known as *blat* (Ledeneva 2009), where an informal exchange of favors constitutes a stimulus for both personal and business achievements. A more dangerous phenomenon also noted in Russia is the *krysha*, consisting of a protective umbrella offered over business relations by politicians in exchange for financial support for political activities. Similarly to the Russian *blat*, a phenomenon known as the *guanxi* network can be observed in China, and is defined as a network of informal interpersonal relations within which favors are exchanged to facilitate business activities (Lovett et al. 1999). In the light of (western) international law, all such phenomena are treated as corruption-generating practices and are subject to penal sanctions.

Where influence exerted by informal structures is stronger than formal ties, networks are affected by pathologies, mainly in the form of excessive centralization, decision-making anarchy and the dependence of companies on key members which may therefore operate with impunity. This leads to opposition from the network members and the creation of two camps of stakeholders: sharks and minnows. Sharks are firms which achieve considerable benefits (e.g. through social connections and the exchange of favors) and dictate the rules of the game in the network. Their willingness to share expertise and information with others decreases as interdependence becomes increasingly weaker with the effects of actions which depend to a much smaller degree on multilateral cooperation within the entire network. Minnows are organizations which do not play a significant role in network structures. They give more than they take, and their level of dissatisfaction rises. They must adapt to the rules of operation dictated by the sharks, and, in extreme cases, they become fully dependent on the latter. As a result of pathological phenomena, stronger companies become ever more powerful, while weak firms become even weaker and more dependent (also in terms of decision-making) on the group holding power within the network. Furthermore, trust in business partners decreases, while the risk of internal competition, more frequent conflicts and brutalization of behaviors within the network rises (Chen 1996). As a result, the negotiation positions of the parties stiffen, and additional contractual safeguards and securities must be put in place.

In addition to the risks associated with pathologies which are caused by the position in the structure of the network, new threats result from network density, the issue of which is extremely complex. This is due to the fact that pathologies occur both in networks which are too dense, and in those which are too open and thus feature numerous so-called structural holes. In the case of a high density network, at the most extreme stage the network is closed, i.e. direct ties exist between all network members. The relationship between the occurrence of pathology and network density is a parabolic function.

Networks in which companies enjoy considerable structural autonomy are characterized by commonly occurring structural holes (Burt 1992) which reflect the lower density of the network. A company has structural autonomy when it is linked to other network members that are not in turn directly tied with each other (a structural hole occurs). It then has control over its partners and resources, which circulate through direct links. In extreme cases, when stakeholders have contact with other members of the network only and exclusively through a relationship with one company which enjoys a high level of structural autonomy, they may become entirely dependent on that one partner. Thus, the level of dependence is so considerable that it may lead to permanent dependence, not least in terms of decision-making. Organizations with greater structural autonomy show a higher level of competitiveness than those which have enjoyed less structural autonomy (Gnyawali and Madhavan 2001).

In networks which are too loose (so-called open networks) the transfer of knowledge and information is significantly extended (in time and itinerary—number of intermediaries) and distorted (Kenis and Knoke 2002); in addition, stakeholders become less innovative and competitive (Ahuja 2000). Due to limited access to information, members of the network take up opposing positions, while privileged groups (sharks) and subordinate organizations (minnows) are formed. Operations in the network are affected by destabilization and centralization. At the same time, it is extremely difficult to reach any agreement on the norms of conduct in the network; consequently, opportunistic behavior becomes increasingly frequent. In open networks the risk of internal competitive behavior rises (Raub and Weesie 1990).

The entirely opposite set of circumstances may be observed when, together with increased density, the network is closed as in the aforementioned extreme case. In closed networks, all members are mutually interconnected. Due to the lack of access to new information, the level of competitiveness of enterprises in the network decreases. With the progressively closed processes within the network, a stronger tendency to internal competition and aggressive behavior is visible. As a result, the network faces challenges symptomatic of an insufficiently large aquarium, where limitation of space intensifies conflicts and the aggressive behavior of its users with respect to scarce resources. At the same time, the members of the network split into weaker (dependent in organizational and decision-making terms) and stronger members (those which dictate the rules of the game in the network).

The connections between network members are also susceptible to the risk of structural pathologies. In studies on these types of ties in inter-organizational

networks, the issue of the strength of ties was most often taken into account. Networks generate both strong and weak ties. Such ties have an impact on the relational embeddedness of the network (Hite 2005). Networks deal with pathological situations when ties between members are created and used inappropriately, leading to a reduced capacity for generation of benefits within multilateral cooperation (Jack 2005). A system of ties which are too strong may excessively stiffen the network and reduce its flexibility, which impedes the formation of the competitive advantage of the system and its members. In extreme cases, with numerous strong ties in place, a company will be trapped in the network, without having the capacity for autonomous action (Capaldo 2007). It will also be dependent in its decision-making process, and consequently may lose organizational and decision-making autonomy. Additionally, strong ties may generate abnormalities, such as the transfer of redundant knowledge (Hansen 1999), decreased innovation of stakeholders, or the intensification of oligopolistic coordination. On the other hand, due to loose ties in the network, the transfer of complex knowledge is not as efficient as when ties are strong (Bergenholtz 2011). As a result of the considerably lower frequency of contacts (compared to networks with strong ties) firms exchange mainly non-redundant knowledge (Hansen 1999). Members of networks characterized by weak ties must show greater independence. Knowledge which is transferred using such ties is aggregated in its nature and requires additional and individual interpretation and application by members. In most cases, the choice of weak ties becomes an incentive for opportunistic behavior, economic spying, and may ultimately lead to unbalances in the constellation (through rising levels of internal competition) and the erosion of benefits from cooperation. Ties which are too loose may result in the disintegration of the network.

The choice of ties in a network should be treated in context. In the case of coopetitive networks (Cygler 2010) companies tend to choose strong ties (large organizations in particular). On the other hand, in the case of design networks, which most often comprise small firms, network members will tend to prefer weak ties (Chen and Hwang 2008). Furthermore, with the development of network ties, preferences regarding the selection of their type change as well, meaning that the significance of such ties also changes over time. The same ties may be indispensable to the proper development of the network, while as a result of transformation and strategic transitions, ties may generate pathological aspects and hinder the development of the entire constellation.

4 Significance of Structural Pathologies in Networks for the Limitation of the Decision-Making Autonomy of Stakeholders

Companies which choose multilateral cooperation are aware not only of the benefits achieved, but also of the inevitable cost relating to operations within the network. When deciding to join the network, they are mostly driven by consideration of the benefits which may be achieved. Nevertheless, functioning in the network itself clearly shows that the benefits achieved have their price, a partial loss of decision-making autonomy being just one such example. Renouncing even a part of decision-making autonomy depends on several factors, such as: possessing scarce resources; differences between particularistic interests and the interests of all members of the network, or of those who form the group of sharks in the constellation; the position occupied in the network (the stronger the position, the higher the level of decision-making autonomy); operational interdependence; or finally the system of ties between the actors. Often, firms become aware of, and experience, a loss of their decision-making autonomy only when they have already been involved in multilateral cooperation. The experience seems to be even more acute when opinions of their own contribution to the network and its development strategy are shown to be overly optimistic.

The analysis of structural pathologies in inter-organizational networks has proven that they may result in the erosion of benefits gained from multilateral cooperation (Cygler and Sroka 2014). At the same time, structural pathologies increase the cost of functioning in the network, including a significant or (in extreme cases) total loss of the decision-making autonomy of the network members. The loss of decision-making autonomy of firms is both a direct and indirect consequence of pathological phenomena occurring in the network. Direct consequences should be considered in the context of network density, network centrality, inadequate choice of ties, or the selection of companies as key players when in fact they do not possess key resources for the network. On the other hand, the reasons for the limitation of decision-making autonomy, as an indirect consequence, should be associated with network instability, together with a lack of respect for the adopted rules of the game in the network. As a result, on the one hand, members of the network will tend to take a more opportunistic approach (greater decision-making autonomy); and on the other hand, symptoms of groupthink will become visible, leading to limited decision-making autonomy amongst stakeholders. Being aware of the temporary character of the network system, weaker firms (roaches) believe that it will be easier for them to survive in turbulent environments by adapting to the rules imposed by key companies. The behavior of firms which exert power in the network (even in the short term) will become destabilized. Consequently, structural pathologies occurring in the network negatively affect the decision-making of those organizations which do not play a key role in the constellation. In a network characterized by a multitude of pathological structures, it is difficult to clearly determine the real contribution of the companies

for the whole system, and therefore its place in the structure of the constellation. Hence, behavior that is typical for hypercompetition is likely to occur when the stakeholder's behavior becomes more aggressive within the network than outside of it. Such a set of circumstances may become a real threat to the existence of organizations in the network due to their inability to achieve the expected benefits and the risk of losing decision-making autonomy, and consequently also organizational autonomy.

5 Conclusions

Functioning in an inter-organizational network is an unquestionable opportunity for companies to achieve superior and unique benefits, but also entails significant costs. The costs of multilateral cooperation include *ex ante* costs (those which occur before joining the group) as well as *ex post* costs (which arise when already operating in the network or after leaving it). The analysis showed that the loss (even partial) of decision-making autonomy of the network members is an *ex post* occurrence which often constitutes a disappointment for firms, which become aware of the extent of decision-making dependence when they have already been involved in multilateral cooperation. Although the issue of decision-making autonomy seems to be crucial to the functioning of the network, as yet it has not been explored to any substantial degree, and constitutes a significant research and management challenge. The issue is expected to gain importance in the coming years as inter-organizational networks become at once increasingly common and more frequently affected by structural pathologies. At the same time, functioning as part of a network has become a prerequisite for the survival and development of firms in a highly turbulent environment. Furthermore, managing an organization in conditions of limited decision-making autonomy is one of the key factors for success in an inter-organizational network.

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Part IV
Network Management in Practice

The Development and Management of Alliance Networks in the Biopharmaceutical Industry

Łukasz Puślecki

Abstract The goal of this paper is to analyze the development and management of strategic technology alliances (STA) and alliance networks in the biopharmaceutical industry. In particular the analysis concentrates on aspects of alliance management, as well as the development of alliance networks in the form of Open Innovation Alliances in the biopharmaceutical industry. In addition, real-world examples of alliance networks, cooperation between companies, universities and research institutes in the Biotech/Biopharma industry in Poland and other countries will be presented. Biopharmaceutical companies are constantly looking for new and innovative paths of development of new strategies to transfer their research processes and the development of new models of alliances and alliance networks. For this purpose, they use open innovation models as an additional means of developing new products. Thanks to cooperation with universities in the framework of open innovation alliances, biopharmaceutical companies can significantly reduce risk, costs of research programs, and above all increase the likelihood of better medical therapy for patients, through joint projects with academic researchers focused on identifying disease mechanisms and the development of new drugs. Open Innovation Alliances require greater competences and skills of alliance managers and alliance management tools, particularly in the selection of potential partners, determining the area and development process of the alliance, as well as in the creation and maintenance of alliance networks.

1 Introduction

International cooperation is an increasingly important channel of diffusion of knowledge in both sectors: public and private. Its importance continues to increase, as evidenced by the number of partnerships between research centers, universities and companies. Companies are increasingly utilizing global strategic partnerships

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in order to strengthen their position, enhance core competencies and skills, and acquire technological areas which could be considered most important, in order to maintain market share. Through such partnerships, companies may gain new opportunities to share the risk of the development of new technologies, on new and emerging markets (Puślecki 2012). The constant demand for more innovative services and products requires more advanced and complex alliances between companies, containing a higher number of global strategic relationships with the involvement of many parties. Biopharmaceutical companies (BioPharma companies)[1] undertake joint projects using various types of strategic technology agreements, such as joint-venture (JV), R&D contracts, R&D agreements, joint R&D agreements, and research contracts (Duysters and Hagedoorn 2000; Puślecki 2008, 2009, 2010). Thanks to cooperation, parties can gain significant benefit from the effects of synergy, as well as reduce the risk of jointly conducted research and projects. Through new and innovative paths of development and successful strategies for the transfer of research results, biopharmaceutical companies have developed new models of collaboration in recent years, not only including alliances with partners from the industry but also with universities and academic research institutes. Such steps have enabled them to obtain much more advanced research results at both the preclinical and clinical stages, the effect of which could be jointly developed proposals for new drugs. Today's large biopharmaceutical companies may participate in numerous alliances with universities and research institutions; such collaboration allows companies to significantly reduce R&D costs, and on the other hand to introduce new solutions and technologies to the market much faster than previously (Lavietes 2012). The use of appropriate and efficient alliance management tools, as well as qualified alliances managers (nowadays also employed at universities such as Harvard or MIT, or in research institutes) makes it possible for biopharmaceutical companies to achieve a higher SRA (Success Rate of Alliances) (De Man et al. 2009, 2012; Puślecki 2011, 2012b, 2013).

The aim of this article is to analyze the development and management of strategic technology alliances (STA) and alliance networks in the biopharmaceutical industry on the basis of recent data received from ASAP (the Association of Strategic Alliance Professionals) and presented at international conferences such as 'ASAP Annual Global Alliance Summit 2012—Mastering the Art and Science of Alliance' in Las Vegas and 'ASAP Annual Global Alliance Summit 2013—Leadership. Performance. Value' in Orlando. In particular, the analysis will focus on the management and development of alliances in the form of Open Innovation Alliances in the biopharmaceutical industry. In addition, certain examples of alliance networks—cooperation between companies, universities and research institutes in the BioPharma industry both in Poland and other countries—will be presented.

[1] The biopharmaceutical sector (BioPharma) is treated as a combination of the biotechnology and pharmaceutical industries.

2 Strategic Technology Alliances (STA), Open Innovation Alliances (OIA) and Alliance Networks

Strategic alliance can be understood as a special mode of cooperation between at least two parties (competitors or partners) operating in the same or related sectors with the aim of achieving common goals which have been set up with the use of available resources, while preserving the autonomy of each partner, in a range of fields and areas not covered by the partnership agreement (Drewniak 2004: 17–18). Technological alliances are implemented primarily through joint ventures (an alliance of two or more participants forming a separate entity with the aim of achieving common goals); so-called equity alliances; or, within capital alliances and R&D cooperation agreements, so-called non-equity alliances (Romanowska 1997: 80–90).

Strategic alliances were mainly created to consolidate or outsource additional business (non-core activity). Nowadays, it is possible to discern an increase in the formation of technological alliances aimed at creating a completely new technology or entering new markets. Technological alliances are understood as strategic if they improve the long-term perspective of the product market combinations for at least one company involved in cooperation. Such strategic technology partnerships differ from other forms of alliances, for example those concluded in order to reduce costs, which are related more to control of transaction or operating costs of companies. Technological partnerships are defined as a form of cooperation which includes at least some innovative activity or an exchange of technology between partners (Duysters and Hagedoorn 2000: 640–649).

The development of innovative projects requires of companies the use of modern models of partnerships based on the principles of Open Innovation. Chesbrough (2003) defines 'open innovation' as a paradigm which states that companies can and should use external and internal ideas, as well as internal and external paths to market. This concept can be used within the framework of bilateral and multilateral alliances. The open innovation model is more dynamic than traditional alliances, as partners within an alliance are not in fact identified in the conventional, purposeful manner; relationships rely more on the exchange of knowledge and ideas during the period preceding the creation of the alliance. The main aim of open innovation alliances is to support the free flow of knowledge and ideas which will lead to the creation of partnerships aimed not only at joint innovation, but also at risk and income sharing (Wilks and Prothmann 2012).

Operators may implement technological alliances with numerous partners; however, the greater the number of partners, the greater the potential effect on the alliance management and implementation process—though the potential for achieving greater benefits is also a consideration. Modern alliances may include 10, 20 or even 100 different partners, the cooperation of whom obviously means that the establishment of a common strategy is fraught with complications. The risk of failure is also much higher, and the network interconnection is highly sensitive because of the numerous relationships between the partners. A bilateral partnership

may be transformed into the management of the entire complex network of alliances. Even a simple bilateral alliance can be difficult to manage; common goals may be clear, but each partner may have a network of other alliances in neighboring areas. Technological partnerships between two multinational corporations may contain as many as hundreds of areas of cooperation. Moreover, operators—in addition to cooperation with partners—can establish alliances and networks thereof with competitors; currently more than half of alliances are concluded with competitors. The literature identifies a homogeneous network of alliances, that is to say, a situation in which multiple partners are involved in an alliance. These relationships are frequently concluded between comparable companies and are designed to establish quality standards in the sector as well as the exchange of information between partners. The formation of such networks has an impact on obtaining the benefits of economies of scale, as well as collective learning. A portfolio of alliances is characterized by a set of separate bilateral alliances established by a single company, created in order to gain access to complementary partner resources in terms of technology, skills and competencies, and markets. The most complex structure of alliances is heterogeneous alliance networks consisting of numerous partners involved in numerous strategic alliances. In contrast to the homogeneous network, its participants may be represented by companies from different sectors, which can hinder cooperation between them, as well as the management of alliance networks. On the other hand, such an alliance could have a positive impact on the generation of new knowledge, thus making better use of the available opportunities (Chwistecka and Sroka 2008; Sroka 2008, 2012; Sroka and Hittmar 2013).

3 Strategic Technology Alliances in the Biotechnology (Including Biopharmacy) Industry from 1980 to 2006

Research figures based on the CATI-MERIT database carried out from 1980 to 2006[2] on the number of newly established strategic technology alliances represent a trend in the behavior of entities which undertake co-operation in terms of R&D activities[3]. The results of the total number of newly established strategic technology

[2] Data on the number of newly established technology alliances between companies in the Triad, in the R&D sector from 1980 to 2006, was obtained in 2010 from the CATI-MERIT database and the National Science Board (NSB—Science and Engineering Indicators 2010). This is the most recent available data on the number of newly established technology alliances in R&D. There was no information available regarding technological alliances in Science and Engineering Indicators in the 2012 and 2014 editions. Possible expansion of the database on the number of newly established technological alliances from 2006 to 2012 could be included by the NSB in its Science and Engineering Indicators 2016.

[3] This is annual data on new technology alliances formed by national or multinational corporations. Alliances can be classified by more than one technology. Biotechnology includes biotechnological pharmaceuticals. Chemistry excludes biotechnology and includes nonbiotechnological

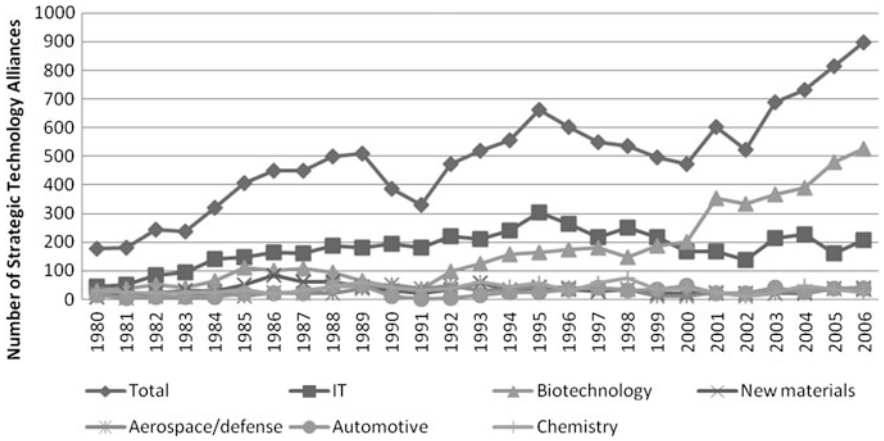

Fig. 1 Number of strategic technology alliances from 1980 to 2006 in various industries. *Source*: Based on National Science Board data (2006, 2010)

agreements suggest that a positive upward trend, with of course some minor adjustments, has been consistent for over 20 years (Fig. 1). On the basis of data from the NSB and CATI-MERIT databases, the new strategic technology alliances were mostly concluded by companies primarily in the fields of biotechnology, information technology and services. Other areas include advanced materials technology, the aviation and defense industry, the automotive industry, and the chemical industry. Annual analyses reveal a growing number of new technology agreements, with some minor adjustments. An important prerequisite for the implementation of technological cooperation in strategic technology partnerships is the positive impact of technological alliances in R&D on technical knowledge transfer and its absorption.

Transfers of knowledge in the field are relevant to the largest multinational companies, as well as the smallest individual companies which do not operate under any agreements. Absorption of knowledge and more competitive technological development will take place in companies involved in alliances, rather than those who do not participate in any agreement (Wybieralski 2008).

Taking into account the implementation of technological alliances in the biotechnology industry (Fig. 2), most strategic technology alliances were concluded in the U.S., the EU, and outside of the Triad (NT). Since 2000, one may observe a significant increase in the instance of biotechnology alliances. The largest number of agreements was concluded in 2006. The biotechnology industry is one of the most developed platforms for potential cooperation in the sectorial analysis, which is why it should especially be taken into consideration by companies willing to establish R&D alliances (both sectorial and multi-sectorial).

pharmaceuticals. Country assignment is determined by the headquarters of the companies analyzed, which participate in the alliance.

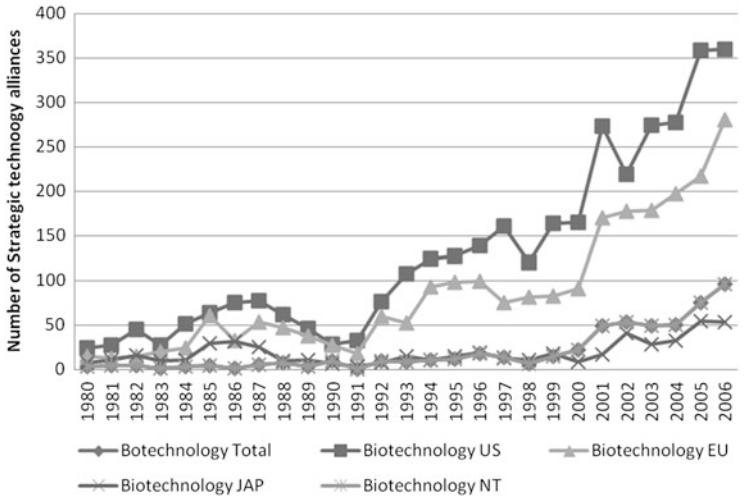

Fig. 2 Number of strategic technology alliances in 1980–2006 in the biotechnology industry (including biopharma). *Source*: Based on National Science Board data (2010)

4 Cooperation of Companies, Universities and Research Institutes in the Biopharmaceutical Industry

Companies have defined and implemented open innovation in a number of ways, including building innovative ecosystems or innovations for users, crowdsourcing, or through the creation of joint development alliances. Open innovation alliances may include partnerships between profit-based companies and non-profit organizations (e.g. universities). This form of cooperation has in recent years aroused increased interest from biopharmaceutical companies (Wilks and Prothmann 2012; Puślecki 2014). In circumstances involving the issue of custom knowledge, it is networks rather than individual companies who are a source of innovation. As such, it is of the utmost importance that these companies are able to learn. The faster the learning process is, the greater the participation of firms in collaborative networks (access to knowledge), and the greater the company's ability to use that knowledge as the basis for creation (absorptive capacity). Joining cooperation networks is a key growth strategy for biotechnology companies (Wojnicka 2004: 7). Moreover, in recent years biotechnology and pharmaceutical companies have become more involved in multilateral cooperation in the framework of knowledge networks or open innovation alliances as well as public-private partnerships (such as Pfizer or GlaxoSmithKline) (OECD 2012: 14; Puślecki 2013; Wilks and Prothmann 2012).

The results of research carried out by ASAP show that modern large biopharma companies have concluded between 20 and 40 alliances with universities and research institutions in their portfolio. Biopharmaceutical companies have been cooperating with universities for a number of years now. At the beginning,

cooperation focused mainly on individual, single projects, from small research projects to large clinical trials. Subsequently, companies decided to enter into alliances with individual academic institutions, covering a wider range of cooperation, *inter alia*: research programs, clinical trials and translational research, in order to transfer the results of basic research to practical applications. Companies have also increasingly begun to use different models of alliances, from individual links in research projects to multilateral agreements involving multiple research projects, including various models for open innovation, for example where the main role of an academic institution was the coordination—and sometimes funding—of other institutions. Compared to existing models of alliances, the organizational fluidity of open innovation initiatives increases the level of complexity in the management of alliances (Fig. 3). The alliance management in open innovation alliances plays a central role, especially in defining the alliance portal and framework, which are significant both in attracting partners and communicating the visions and expectations of the strategic alliance (Wilks and Prothmann 2012).

The participation of a coordinating institution in an open innovation alliance significantly enhances the introduction of standardization and has an impact on the effectiveness of the partnership (Fig. 4). It also provides networking links and processes between academic institutions and firms which are willing to form the alliance. The increased level of trust between companies from the industry and academic institutions, thanks to the role of the intermediary, strengthens innovation and provides support and funding for research proposals. The use of the open innovation model can significantly speed up the production process of new drugs and biotechnology products. Moreover, involvement in the cooperation of more interdisciplinary academic teams may also accelerate the production and application of new biotechnological products, meaning in practice that co-operation amongst the same researchers is highly important. With extensive contacts, thanks to interdisciplinary research teams, many aspects of the research, especially in the conceptual phase, can be discussed in a broader bands with other researchers, and thus even better justify making decisions on new or improved products (Lavietes 2012; Wilks and Prothmann 2012).

Recently, a wider range of open innovation models and other forms of partnerships for therapeutic interventions for patients and new drug proposals have been used by pharmaceutical companies (Table 1). Examples of such alliances can be seen as pioneers in testing models of multilateral alliances for the development of drugs (drug development alliances). Several companies and institutions operating in this area believe that the use of open innovation models will affect the performance and development of new drugs. The goal of these partnerships is to understand the mechanisms of diseases and the discovery of new utility for existing drugs which, beyond their current curative role, will allow for the identification and development of new drugs (Lavietes 2012; Wilks and Prothmann 2012).

As multilateral initiatives, open innovation alliances include partners from different organizational structures, cultures, missions and values. They can thus create massive potential for innovation. On the other hand, they pose a substantial challenge in building mutual trust among the partners, which is extremely

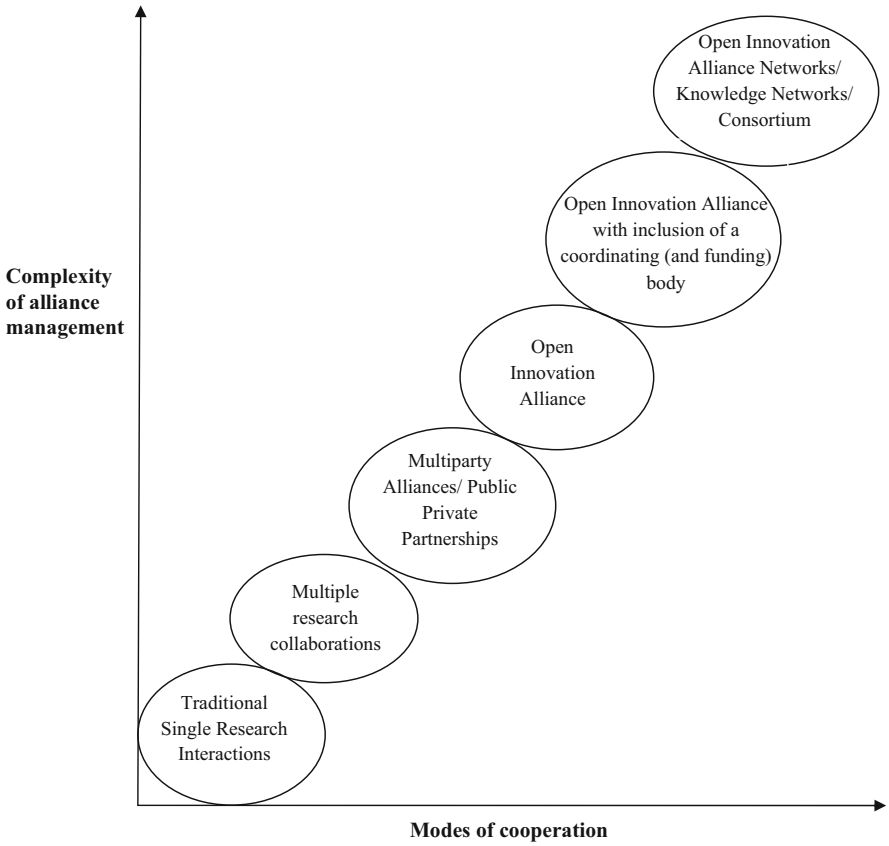

Fig. 3 Development and complexity of various Biopharma-University multiparty alliances and partnerships

important in terms of the exchange of knowledge and ideas. It should also be remembered that in open innovation alliances, each partner may have other additional goals to fulfil, in addition to general support for the vision resulting from the alliance. In this case, the main role of alliance management is to provide clear guidelines for negotiating teams as to how to consider the various interests of partners, in order that each side of the partnership will be satisfied. Therefore the management of diversity in multiparty alliances—such as open innovation alliances—is a major challenge for alliance managers (Wilks and Prothmann 2012).

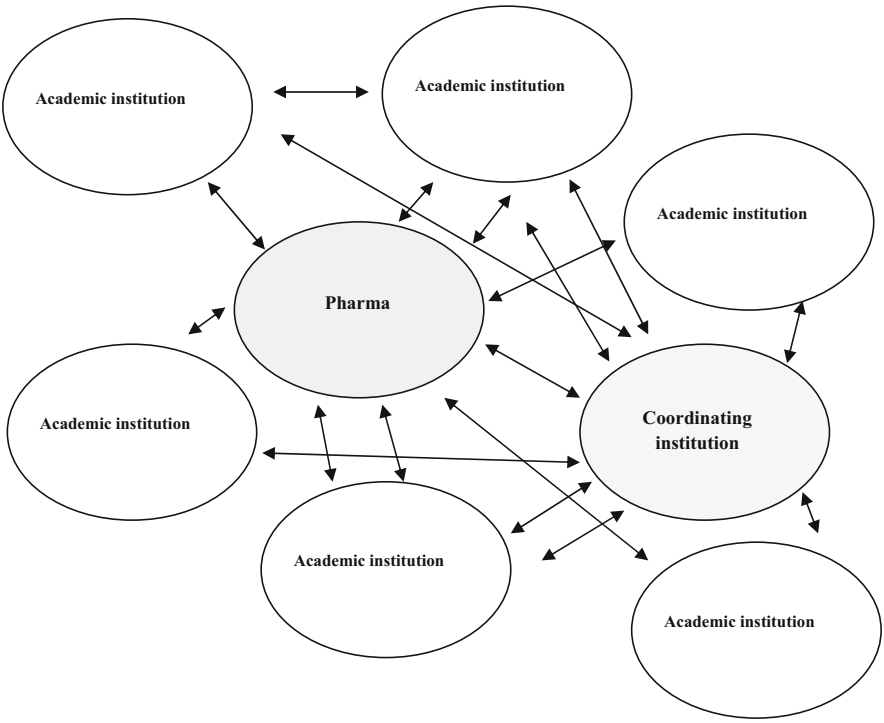

Fig. 4 An example of open innovation including an academic institution as a coordinating and funding body. *Source*: Wilks and Prothmann (2012: 45)

5 Development of the Biopharmaceutical Industry and the Possible Application of Open Innovation Alliance Models in Poland

The pharmaceutical and biotechnology industries are considered among the most innovative sectors of the Polish economy. According to secondary data from the Polish Information and Foreign Investment Agency (PAIiIZ) and FDI Intelligence Ranking, Poland was ranked fifth (equal with Russia) in the world ranking of foreign biotechnological investments in 2010, having attracted 14 in the biotech industry. FDI Intelligence ranked Poland 11th in the world in terms of attractiveness for R&D investment in the biotechnology sector. Such high rankings mainly result from access to qualified scientific staff as well as to biotechnology clusters and Science and Technology Parks (STPs). On the other hand, the pharmaceutical market in Poland can boast one of the longest traditions across all industries in the country. This market has undergone a number of fundamental changes in the last 20 years, one such example being that the predominant ownership structure has turned from state-owned into private-owned. Additionally, new regulations (such as changes in the regulations concerning the rules for trading of drugs) have been

Table 1 Examples of different modes of Industry-Academia partnerships in biopharma

Partners	Mode	Aim
AstraZeneca + U.S. National Cancer Institute + U.K. National Cancer Research Network + Cancer Research UK	Open Innovation Alliance with a coordinating body	Initial oncology collaborations
AstraZeneca + UK Medical Research Council (MRC)	Open Innovation Alliance with a coordinating and founding body (crowdsourcing)	Crowdsourcing agreement for experimental drugs
Procter & Gamble Connect + Develop + Eli Lilly	Open Innovation Alliance	Drug discovery
Astra Zeneca + National Institutes of Health (NIH)	Open Innovation Alliance	Discovering New Therapeutic Uses for Existing Molecules
NIH's new National Center for Advancing Translational Sciences (NCATS) + multiple biopharmaceutical companies	Open Innovation Alliance	Provide academic investigators with funding and access to drug candidates to explore new treatments for patients
Pfizer + CITs (Centers for Therapeutic Innovation) in San Francisco, Boston, San Diego and New York	Pharma-University Alliance	Clinical Projects
UCSF—Department of Medicine at the University of California—San Francisco) + Pfizer + Roche + Sanofi	Pharma-University Alliance	Clinical Projects, Drug Discovery
GlaxoSmithKline (GSK) + Gustave Roussy (Villejuif, France) + University of Texas MD Anderson Cancer Center (Houston, Tex.) + Memorial Sloan-Kettering Cancer Center (New York) + Netherlands Cancer Institute (Amsterdam) + Princess Margaret Cancer Centre, University Health Network (Toronto) + Vall d'Hebron Institute of Oncology—VHIO (Barcelona)	Consortium	Oncology Clinical and Translational Consortium (OCTC)
National Health Service (NHS) in Scotland + Pfizer + four Scottish universities	Public-Private Partnership	Translational Medicine Research Collaboration (TMRC)

Source: Based on data from ASAP

introduced. There have also been structural changes within the industry—a gradual increase in the number of pharmacies and pharmaceutical wholesalers, the consolidation of the above, and the growing importance of foreign pharmaceutical companies as investors (Fig. 5) (Trąpczyński 2010; Trąpczyński and Wrona 2012a, b). Over the past 10 years, the pharmaceutical market in Poland has witnessed steady

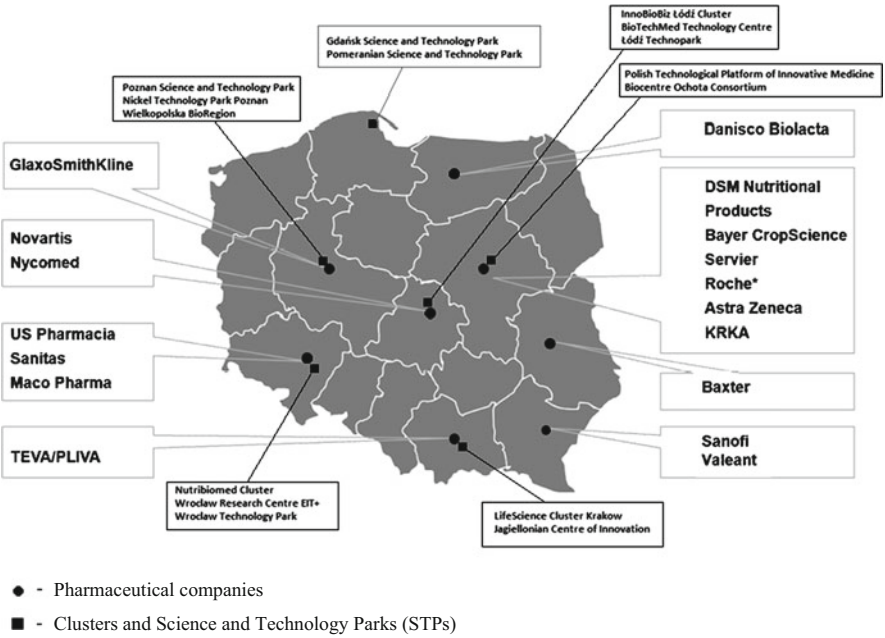

Fig. 5 The largest Foreign Direct Investments (FDI) in the pharmaceutical industry and the location of biopharmaceutical clusters and STPs in Poland. (*filled circle*): Pharmaceutical companies and (*filled square*): Clusters and Science and Technology Parks (STPs). *Source*: Based on PAIiIZ (2012: 4)

growth, reaching a value of PLN 22.3 billion in 2011. In comparison with the previous year, sales increased by an impressive 11 %. The average annual growth rate in the period from 2003 to 2010 was 6.5 %. It is estimated that by 2016, the total value of the industry will reach over PLN 60 billion. Activities in the pharmaceutical industry accounted for a 0.8 % share of GDP in 2010. Poland is the largest pharmaceutical market in Central and Eastern Europe (and the sixth-largest in Europe). Almost 80 % of all companies can be classified as micro-enterprises (PAIiIZ 2011, 2012).

According to the PwC study, any innovative pharmaceutical company participates on average in at least five projects, aimed at building a coalition inside the industry. There are a number of clusters and numerous science and technology parks (STPs) in Poland, which provide the infrastructure for the development of innovative biotechnological and pharmaceutical products—in particular, laboratory space (Fig. 5). The following clusters and STPs operating in biopharma in Poland may be distinguished: Poznan Science and Technology Park, Nickel Technology Park Poznan, Wielkopolska BioRegion, Gdansk Science and Technology Park, Pomeranian Science and Technology Park, InnoBioBiz Lodz Cluster, BioTechMed Technology Centre, Lodz Technopark, Polish Technological Platform of Innovative Medicine, Biocentre Ochota Consortium, Nutribiomed Cluster, Wroclaw

Research Centre EIT+, Wroclaw Technology Park, LifeScience Cluster Krakow, and the Jagiellonian Centre of Innovation. After analyzing the number of entities involved in the Polish biopharmaceutical industry, especially pharmaceutical companies, universities and research institutes, clusters and STPs, it may be concluded that they are able to successfully apply the model of cooperation based on open innovation alliances, particularly in biotechnology clusters.

In addition, the involvement of a coordinating institution (for instance a cluster or STP or national academic institution—such as the Medical Research Council (MRC) in the United Kingdom), may improve the process of communication, strengthen the introduction of standardization and create networks of academic institutions which are willing to form an alliance within the cluster (Wilks and Prothmann 2012). It may also contribute to greater efficiency of scientific, cultural, economic, and most of all innovative potential. Greater levels of focus by companies on cooperation with universities and research institutes may result in faster processes of product commercialization or obtaining test results, which is extremely important in the development of new biotechnology and pharmaceutical products. It is important to create alliances with interdisciplinary research teams in order to achieve such goals. Consideration should also be given to the development of multiparty alliances within open innovation alliance networks (multilateral cooperation between all biotechnology clusters, STPs, universities and research institutes as well as pharmaceutical companies in Poland) (Fig. 6). The implementation of joint activities between all partners, including appropriate alliance management tools, will contribute to the dynamic development of the biopharmaceutical industry in Poland, as well as the more efficient use of research and the innovative potential of all parties involved in cooperation.

6 Conclusions

In analyzing the development of the biopharmaceutical industry in recent years, it can be concluded that it is currently the most advanced platform for cooperation between different parties at different levels (e.g. sectorial multiparty alliances between companies, public-private partnerships, alliances between universities and research institutions, non-governmental organizations (NGOs), homogeneous and heterogeneous networks of alliances) (DeWitt and Burke 2012). Biopharmaceutical companies are constantly searching for new and innovative paths of development for new strategies to transfer their research processes and for the development of new models of alliances and alliance networks. For this purpose, they use open innovation models as an additional tool of developing new products. Open Innovation Alliances are designed to support the free flow of knowledge and ideas which will lead to the creation of partnerships targeting joint innovation and value. As multiparty alliances, they require even greater competencies and skills of alliance managers and alliance management tools, particularly in the selection of potential partners, determining the area of the alliance and alliance development

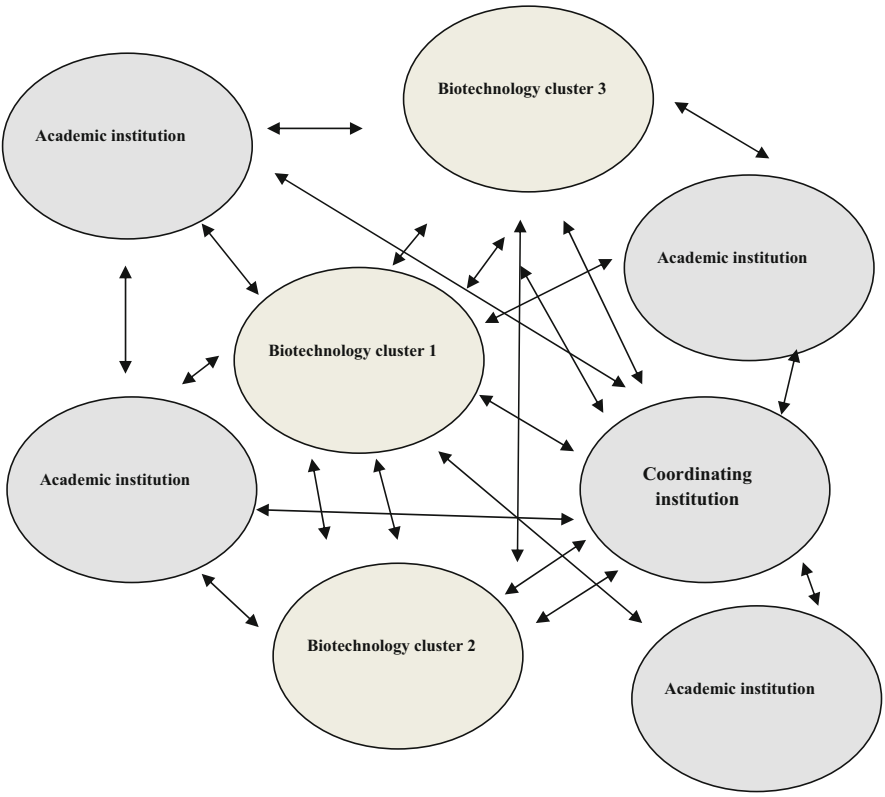

Fig. 6 An example of the possible use of open innovation alliance networks, including academic or national institutions as a coordinating (and possible funding) body in the Polish biopharmaceutical industry

process, as well as in the creation and maintenance of alliance networks. Thanks to cooperation with universities in the framework of open innovation alliances, biopharmaceutical companies are able to achieve significant synergy effects, reduce both risk and the cost of research programs, and above all increase the likelihood of better medical therapy for patients, through cooperation with academic researchers in identifying disease mechanisms and the development of new drugs (Wilks and Prothmann 2012).

Biopharmaceutical companies operating in clusters or technology parks in Poland, involved in cooperation with academic institutions, especially in the model of open innovation alliances, may also significantly reduce the risk and cost of research, and utilize the resources, competencies, technology and knowledge of partners, and thus respond more easily to changes in the environment, and most of all, quickly launch new biotechnology or pharmaceutical products. This model of cooperation may significantly contribute to the development of the Polish biopharmaceutical industry in the future.

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Management of Cooperative Activities in Sporting Organizations Within Alliance Networks

Michal Varmus

Abstract Sports in smaller countries are highly dependent on both the economy and the social circumstances of the population, and sporting organizations are under great pressure mainly in terms of finance, due mainly to a lack of management and marketing abilities and activities. Cooperation with various partners, both internal and external, is one of the possible options to overcome these problems. Common problems are, however, the selection of correct partners, understanding the relevance of cooperation and having an accurate vision of such cooperation. Based on this, the main goal of this paper is to analyze how managers of sporting organizations understand cooperative opportunities, what kind of cooperation they prefer, and problems they encounter, as well as how to solve them. Data was mainly collected in the form of a questionnaire which was distributed to 2,160 primary schools and 200 tennis clubs in Slovakia within the scope of the "Tennis to schools" project run by the Slovak Tennis Association. At the end of this paper, recommendations for improvements to the current situation are included, which may be used in the implementation and management of similar projects.

1 Introduction

Sports in smaller countries are highly dependent on both the economy and the social circumstances of the population. Parents must frequently support the sporting careers of their children without the help of a sponsor. Such expenses, in terms of both money and time, may present an insurmountable barrier for many families, and may be one of the reasons why many children are not interested in active sports. On the other hand, there are additional factors which may also have a similar negative effect.

Sports in Slovakia are currently dealing with a difficult and complex set of circumstances. Numerous sporting clubs and associations must combat the negative

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economic conditions as well as a decrease in the interest of spectators, sponsors and especially young sportsmen or women willing to invest their time in participating in sports.

One such association is the Slovak Tennis Association, which implemented the "Tennis to schools" project which was financially supported by the Ministry of Education, Science, Research and Sports of the Slovak Republic. The aim of this project was to incorporate tennis lessons into physical education at primary schools and thus widen the player base. The project was expected to create alliance networks and cooperation with professional tennis clubs which would actively support tennis lessons at schools with the vision of finding highly talented children to join the children's program at these tennis clubs. After 5 years of operation, the project is still in progress, albeit with results which have not met expectations. Certain signals point to the fact that cooperation between schools and tennis clubs has not worked properly, meaning that schools are not capable of financially supporting this project—although basic tennis equipment (tennis balls and racquets) was given to schools free of charge. Therefore the aim of this chapter is to present the main problems which have hindered the implementation of this project, and analyze its impact on stakeholders. Research was conducted so as to provide a better understanding of the current situation, for as Sroka and Hittmár (2013) claim, if cooperative strategy is to be successful, managers must have knowledge of factors that should be taken into consideration during the formation and management of alliance networks. Data was mainly collected in the form of a questionnaire which was distributed to 2,160 primary schools and 200 tennis clubs in Slovakia. Subsequently, structured interviews, statistical analysis, and document and literature analysis were applied. At the end of this paper, recommendations for improvement of the current situation are included, which may be used in implementation and management of similar projects.

2 Financing of Sports in the Slovak Republic

In 2012 KPMG conducted a study entitled "The concept of sports financing in the Slovak Republic". Data for this research was collected from 145 associations, with the exception of basketball and football associations which were personally interviewed. According to this study, there were 13,069 sports clubs and 661,000 registered sportsmen (of which only a quarter were below 18 years of age) in Slovakia at the end of 2011. The study confirmed the assumption that the state acquired more from sports than it contributed. In 2011 approximately 132 million euros was given to sports from the public budget (Ministries, Government offices and municipalities) whilst the benefit to the state and public budget amounted to 721 million euros, meaning that every euro invested in sports earned 5.42 euros for the state and municipal coffers.

The annual value of total turnover from sports in Slovakia amounted to 1.7 billion euros, consisting of several components: the cost of sports infrastructure was

Table 1 The financing of sports from the public sector from 2007 to 2011 (in 1,000 euros)

	2007	2008	2009	2010	2011
The Ministry of Education, Science, Research and Sports of the Slovak Republic	33,770	36,039	40,075	75,216	27,458
Interior Ministry of the Slovak Republic and Ministry of Defense of the Slovak Republic	7,935	7,488	7,809	9,233	7,300
Government Offices	0	1,952	10,079	8,381	0
Municipalities	97,950	120,857	143,672	200,518	97,541
Higher Territorial Units	165	196	196	154	168
Other institutions	546	581	0	0	563
Sum	**140,366**	**167,116**	**201,831**	**293,501**	**133,029**

Source: KPMG study

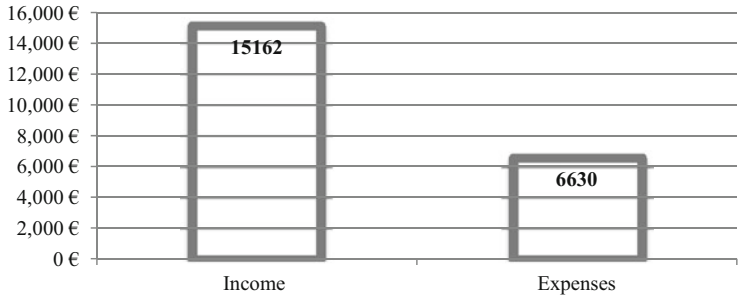

Fig. 1 Comparison of average family income and expenses incurred by each tennis player in 2011. *Source*: KPMG study

112.3 million euros; the cost of sports activities was 1.204 billion euros; the cost of sports events was 354.5 million euros; and the cost of sports administration was 25.7 million euros (Table 1).

According to the KPMG study, tennis was the most expensive sport. It is estimated that 6,630 euros was paid out by parents annually per child. Ice hockey was second at a cost of 4,200 euros. Conversely, the cheapest sports were wrestling (320 euros) and athletics (480 euros). For comparison, the average gross monthly salary according to the Statistical Office of the Slovak Republic (2014) was 786 euros in 2011 and 821 euros in the second quarter of 2014. Given that the average net income per family was 15,162 euros in 2011, the expenses incurred by each tennis player constituted 43.7 % of the average family income (Fig. 1).

It is necessary to note that this study was the subject of much criticism from sporting associations, who argued that some numbers were incorrect or misleading. On the other hand, feedback from sports clubs and associations was extremely sparse, which just goes to confirm the low level of interest from sports associations in empirical research, and their unwillingness to supply accurate data.

3 Examples of Cooperation and the Path to Success

Management of cooperation is one means of competing effectively on the sports market. Figure 2 presents the basic steps which are essential in the creation of a cooperative organization. Each organization exists in a competitive environment. If organizations have a major problem in their environment, there exists a potential incentive for mutual agreement, from which cooperation may follow. The joint organization exists in a dynamic environment which brings about change, creating a need for further negotiation (planning and decision-making). The result may be the continuation of cooperation, the modification thereof, or its termination and the subsequent return to a competitive relationship.

Communication with stakeholders is of the utmost importance during the creation stage. A need exists to select the correct segment and take account of its specifications. It is obvious that social media is highly popular nowadays, but also that users—and society in general—do not place a great deal of trust in such social networks. A more important factor is direct contact with experienced people, who in turn are in touch with organizations. Another option is the use of videos which can foster a closer connection between organizations.

Cooperation in a sporting environment can have two dimensions. One is the search for stakeholders to support the main team or teams (e.g. free tickets for students or variety competitions for children designed to create and support corporate identity). A fine example is the Pardubice ice hockey team in the Czech Republic. Ice hockey is regarded as an essential part of life and has a stable fan

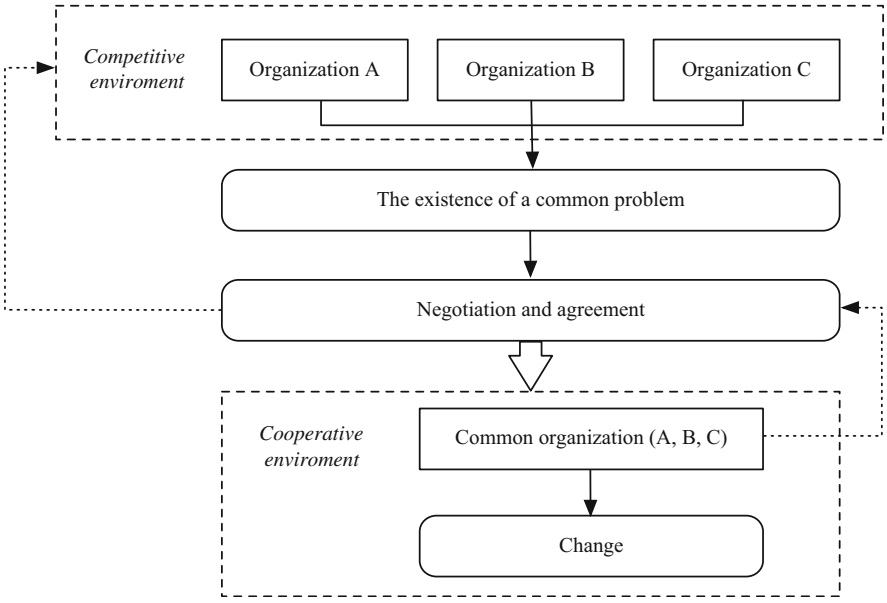

Fig. 2 The process of creating a cooperative organization. *Source*: Soviar and Lendel (2013)

base in Pardubice, proof of which is the fact that since 2006 the team has been among the European elite in term of average attendance, consistently in the top 15 clubs across Europe. The club reaches fans mostly through the sale of season tickets. After such purchases, the ticket holder may purchase two additional tickets for any game completely free of charge. As stated in the paper "Rate of visitors to hockey stadiums in Slovakia and the Czech Republic" (2013), the club also created an app for Android and iOS, which is used to provide information on club activities. Additionally, they benefit greatly from social networks (Facebook, Google Plus, Instagram) and organize a number of competitions for fans, such as the highly popular "Pernikománie" (Gingerbread Mania) which operates on the simple premise that immediately following a victory, fans may throw gingerbread with their contact details onto the ice. Subsequently, five winners are drawn and receive two tickets for the next match. Another competition is entitled "We Support Each Other", which is for primary school students and aims to find the best class fan club. Finally, a highly popular competition is organized in conjunction with the Pardubice aquatic center in which fans guess the exact result of the match. All such guesses are included in the draw, the winner of which receives two tickets to the Aqua Park at the end of the season. Obviously, the more correct tips and therefore entries, the greater the chances of success.

Another dimension, which is ostensibly tougher and more challenging, is to create a player base for the future. Frequently such initiatives are supported through federal grants. In Austria, to provide but one example, the Austrian Federal Ministry for Education and Cultural Affairs and the Federal Sports Organisation have agreed—under the auspices of the 'School and Sports' commission—to strive for improved cooperation between schools and sporting clubs. Such an initiative is designed to give rise to:

- a rise in daily physical activity time for 6- to 10-year-olds,
- the conception and formation of physical education as oriented to a responsible lifestyle,
- the reciprocal completion and optimization of opportunities for schools and clubs alike (creation of synergies).

According to the paper "School and Club in Bewegung and Sport in den Schulen Österreich", school sports competitions constitute one of the most significant areas of cooperation with respect to participation in competitive sports. For many years, a successful form of cooperation has existed between national sports federations, sponsors and school authorities, e.g. Schülerliga (school league) football and volleyball, Arbeitskreis (working group) school basketball, Arbeitsgemeinschaft (study group) school handball, or the Schools Olympics with the cooperation of the Austrian Olympic Committee. Such cooperation is characterized by:

- joint organizational and financial running of school sports competitions, from local through provincial up to national levels,
- equipment campaigns,
- further education measures, such as the creation of temporary teacher and referee courses,

- coaching campaigns in which federation coaches visit schools,
- contact with elite athletes: elite athletes visit schools or look after school teams at competitions,
- employment of federation judges and referees in school sports competitions,
- opening federation competitions to school teams (without club or federation membership),
- financial and logistical support from club foundations in the school's locality,
- implementing programs for the electronic calculation of results as appropriate to the specific conditions of school competitions.

In the paper 'Club sports start at school' (News directory, 2013) it is written that a similar cooperation model entitled "sports in schools and clubs" was established approximately 20 years ago in Germany. Karin Augustin, President of the Sports Federation, explained that the partnership provides an opportunity to inspire students to attend the sports clubs. Cooperation is mainly characterized by 515 cooperative agreements within the "sports in schools and clubs" project this year (25 more than last year), 22 of which have existed since its foundation in 1994. 306 elementary schools and 136 secondary schools participate across various sports, most commonly football (66), tennis (51) and handball (39). Any such cooperation is subsidized in the amount of 300 euros per school on an annual basis, the cost of which is shared by the Sports Federation and the state of Rhineland-Palatinate.

4 The "Tennis to Schools" Project in Slovakia

The Slovak Tennis Association perceives the current situation in junior sports in Slovakia as unfavorable, due to the fact that children have lost the motivation to participate in sport, leading to a lower total membership base. As was written by Daniels (2007), motivation is an important part of a child's readiness for youth sports and, more important, for competition. In order to help motivate a young athlete to play sports in a positive manner, one should understand and promote developmentally appropriate practices, as well as understand and promote cooperative skills within the competitive framework. A fine method of bringing children and sports closer together is to make physical education classes more attractive. To this end, the decision was made to introduce tennis into physical education lessons, meaning that children were able to try the game out during classes free of charge. Therefore the main aim of the project was to engage small children in sports, especially tennis, and subsequently to motivate children to start visiting professional tennis clubs for tennis lessons in a professional environment. This project was viewed as a means of unearthing new talent for the future.

The "Tennis to schools" project commenced in 2008, prior to which the Slovak Tennis Association analyzed the current situation, the possibility of implementation, and prospects of success. After a pilot project, in which 22 schools were involved, 400 more schools from throughout Slovakia entered the project, giving

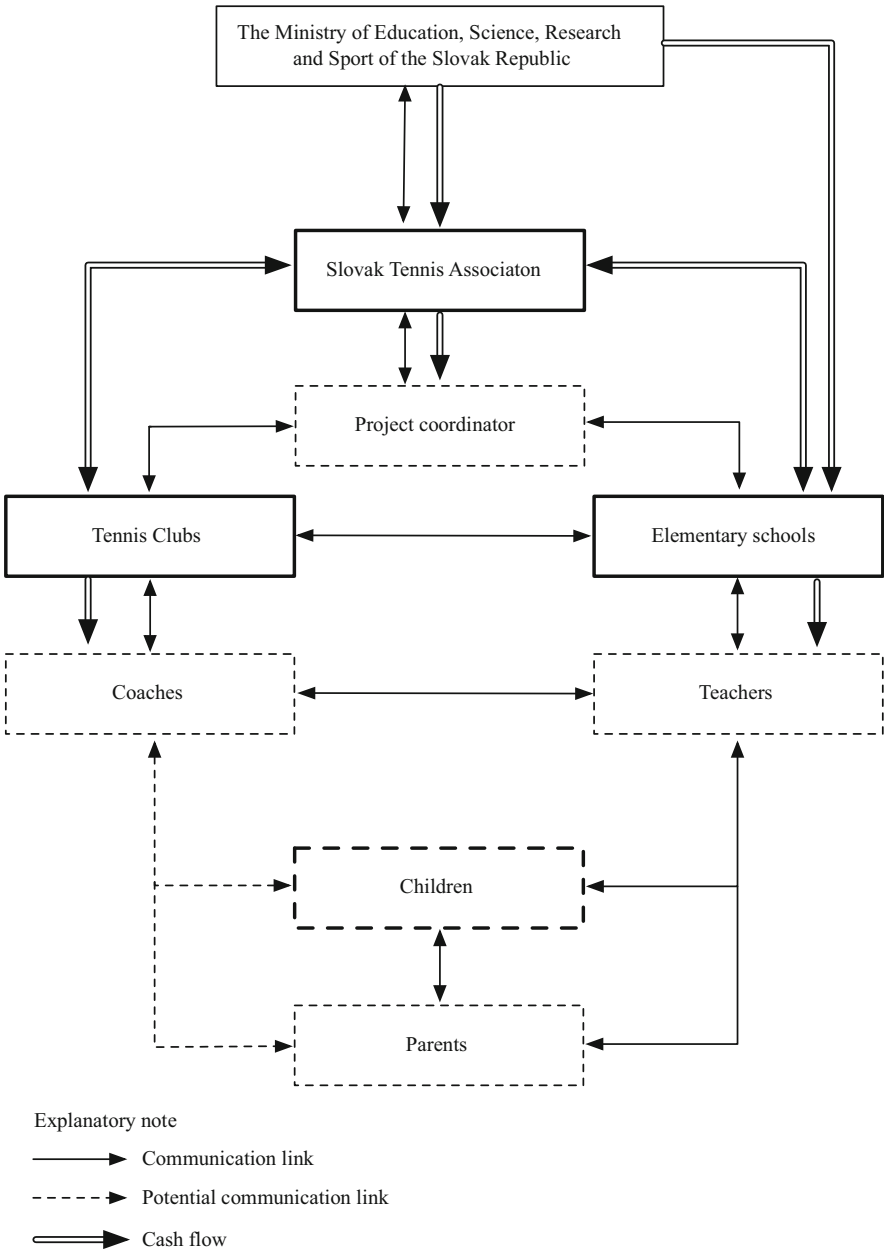

Fig. 3 Cooperation links in the "Tennis to schools" project

basic tennis lessons essentially free of charge to 9,000 children aged from seven to 10 years old. A model of this project is presented in Fig. 3.

The majority of the total financial budget is received from The Ministry of Education, Science, Research and Sports, and is used to fund the purchase of the

basic tennis packets for schools (tennis racquets, ball, nets) and for the education of teachers in order that they may learn to teach tennis in elementary school conditions. Tennis clubs also received money for development. The most important communication took the form of a triangle: *project coordinator* (*STA*)—*tennis clubs—elementary schools*, with children as the fundamental segment of cooperation. Links to children were mainly established via teachers; however, communication with parents was also viewed as important. In turn, potential communication links in the model mean that communication with a tennis club could be added to the existing links, if the child was interested in tennis lessons at a professional club—which indeed was one of the goals of the project. The model presented has, however, some bottlenecks which were identified in the research.

5 Current State of the Project: Direct Research

From January to May 2014, research was conducted which helped to demonstrate how the "tennis to schools" project is implemented and understood by stakeholders; the level of its implementation; and how cooperation links function. There were 2,160 primary schools and 200 registered tennis clubs from throughout Slovakia analyzed in the research. The first, crucial piece of information was that tennis clubs were unwilling to cooperate in this research, despite the fact that questionnaires were distributed by the Slovak Tennis Association. Only 42 tennis clubs answered the questions which gave a 13.47 % margin of error at a 5 % confidence interval. Primary schools were more active, with 425 of them participating, giving a 4.26 % margin of error at a 5 % confidence interval.

5.1 Financial Cost of the Project

The instruction process for tennis at schools required a basic packet consisting of balls, racquets and didactic materials for teachers, at a cost of 430 euros. 250 schools have bought this packet to date, while 150 schools have received it free of charge due to financial troubles. The project also required educated teachers to train small children. Such courses (free of charge) were organized by the Methodological and Pedagogical Centre (Institution for Service Teachers' Education and Training). According to the research, more than 60 % of the respondents who completed the course opined that it was helpful; though it must be mentioned that 36 % of teachers failed to offer an opinion.

A helpful initiative could be to send professional tennis coaches from clubs to provide assistance during the lessons. At the time of publication, such initiatives had been implemented only on a very limited scale. The average salary of a tennis coach at that level is approximately 15 euros/h, which may be paid by tennis clubs or by schools, depending on the agreement. Research revealed that more than 80 % of teachers would welcome the assistance of professional coaches during lessons.

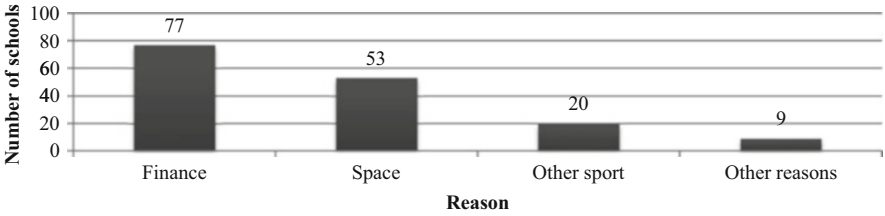

Fig. 4 Reasons why schools were not interested in the project

On the other hand, only 60 % of the respondents from tennis clubs confirmed that they were asked for such assistance, even if 78 % of tennis clubs expressed interest in assisting with tennis lessons at schools. When schools were asked why they failed to join the project, 77 schools confirmed that they did not have sufficient money for the project, while 53 schools had trouble finding a suitable space for playing tennis. In turn, 20 schools were interested in other sports, while nine schools indicated that other reasons lay behind their decision (Fig. 4).

5.2 Interest of Tennis Players and the "Tennis to Schools" Project

The project envisages that tennis clubs would take an active interest in children's tennis; therefore the basic question was whether this was in fact the case, especially if they regularly undertake marketing activities to attract young children. It is a point of interest that most of the clubs (86 %) did so, which is a highly positive fact (Fig. 5).

When clubs were asked how many young tennis players under 10 years old they had at their club, the most common response was between 11 and 20 children (14 clubs), then between one and 10 children (13 clubs) (Fig. 6). If the natural attrition rate of players is also taken into account, such responses may come as something of a nasty shock, as participation numbers were extremely low. The main reasons were: low levels of marketing communication activity undertaken by the clubs; high levels of competition with other sports; financial circumstances; demographics; and so on.

A highly positive fact was that 85 % of tennis clubs and 79 % of primary schools had some knowledge of the "Tennis to schools" project. However, in the course of personal discussions, it was observed that the depth of knowledge was very low and that respondents were unaware of the concrete possibilities offered by this project, nor of the advantages and possible benefits.

The essential basis for the success of the project was the quality of cooperation between schools and tennis clubs. However, responses to the question of whether schools and tennis clubs cooperate were as follows: 29 % of tennis clubs and 21 % of schools have cooperated with each other, whilst others had not. In turn, the reasons for the lack of cooperation were that clubs or schools were unwilling to

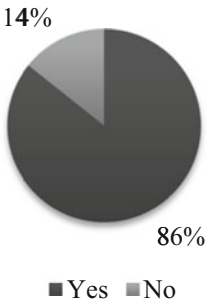

Fig. 5 Recruitment of children for tennis schools by tennis clubs

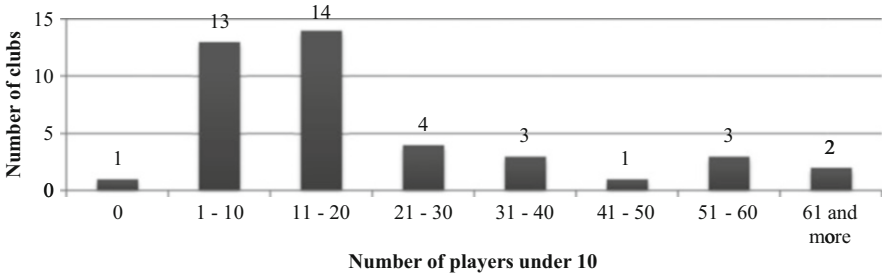

Fig. 6 Number of players under 10 years old in tennis clubs

cooperate; were interested in other sports (schools); or were not asked to cooperate. It may mean that clubs and schools did not understand the main concept of this project or were poorly informed.

Given that only 29 % of tennis clubs and 21 % of schools had participated in cooperation, this represents something of a contrast to respondents' claims of being interested in cooperation.

A highly interesting answer was obtained when clubs and schools were asked how they understood the importance of selected factors and their influence on processes and children:

– improving the relationship between children and sport,
– improvement of children's motor skills,
– a rise in the number of children interested in tennis,
– development of personality,
– co-operation with tennis clubs.

Figure 7 shows that clubs and schools were of a similar opinion on most factors. The biggest difference was related to "*Cooperation with the tennis clubs*". Schools did not ascribe much importance to this factor, while on the other hand tennis clubs claimed that it was important.

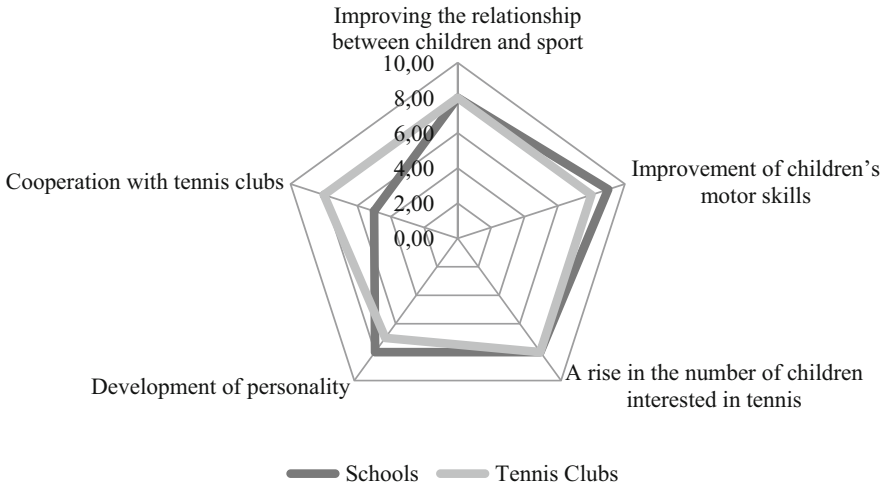

Fig. 7 Importance of various factors in the project process

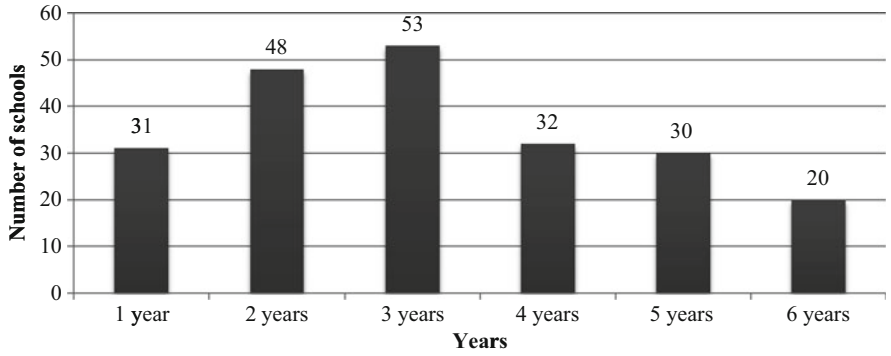

Fig. 8 Duration of participation in the project

It may also be understood that tennis clubs wanted to have an influence on children and the training process.

5.3 Functioning of the Project and Its Results

Most schools (53) cooperated within the auspices of the project over a 3-year period. Only 20 schools surveyed participated in the project for 6 years (Fig. 8).

When schools were asked whether they were satisfied with the project, more than 21 % gave a maximum mark of 10, more than 23 % gave a mark of 8, and more

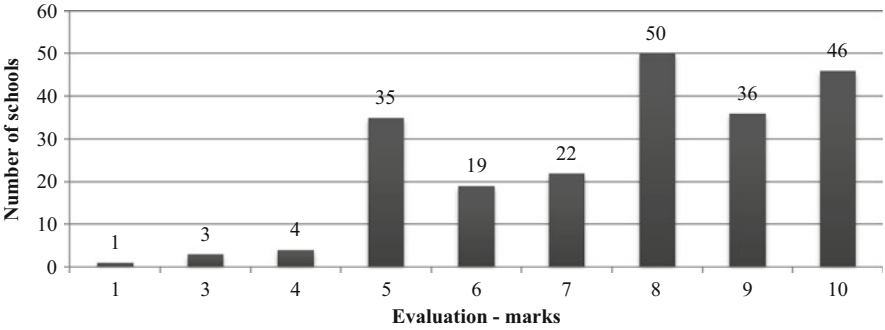

Fig. 9 Level of satisfaction with the project

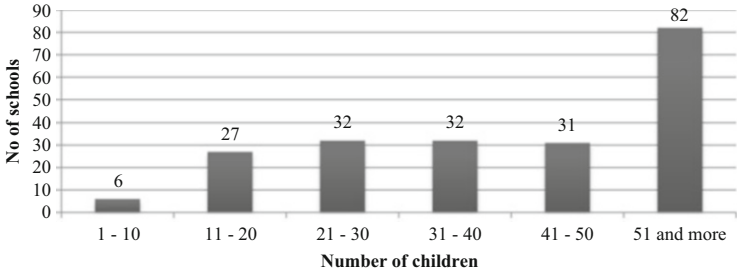

Fig. 10 Number of children involved in the project

than 16 % gave a mark of 5, all of which confirms that schools were more or less satisfied with the project (Fig. 9).

82 schools participating in the project had 51 or more children who received tennis lessons (Fig. 10). On the other hand, 67 respondents confirmed that none of the children who received tennis lessons at school went on to visit professional tennis clubs (Fig. 11). 52 schools confirmed that only up to five children did so. The most surprising finding was that 50 schools had no idea how many children played tennis at the clubs. All in all, it seems that cooperation was at a minimum (Fig. 12).

An interesting finding was obtained in a comparison of the length of time of participation of the schools in the project and the number of children involved. It appears that the most active schools participated in the project for 3 years. In turn, the greatest number of children involved were from schools which participated in the project for 2 years. Such results are certainly worthy of further research.

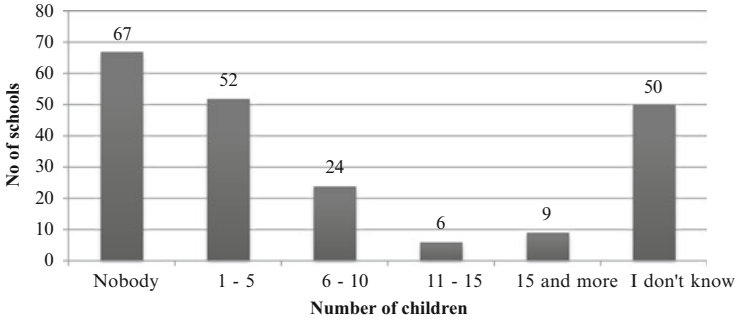

Fig. 11 Number of children who visited tennis clubs

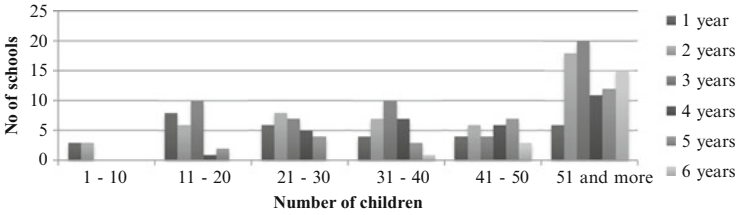

Fig. 12 Length of time of school participation in the project vs. number of children involved: a comparison

6 Education and Courses for Teachers Organized by the Slovak Tennis Association

The Slovak Tennis Association, in cooperation with the Methodological and Pedagogical Centre, regularly organizes courses for teachers from elementary schools. 30.7 % of teachers from schools surveyed had successfully completed this course; however, this figure is perhaps lower than could be expected. On the other hand, more than 70 % would be willing to undertake this course in the near future. Additionally, the majority of the respondents who had completed this course were satisfied with its educational merits, but 76 teachers failed to provide their opinion (Fig. 13).

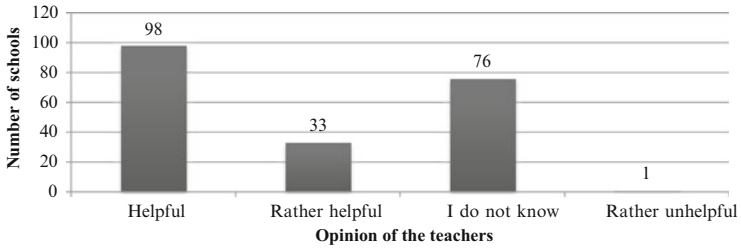

Fig. 13 Satisfaction with the courses

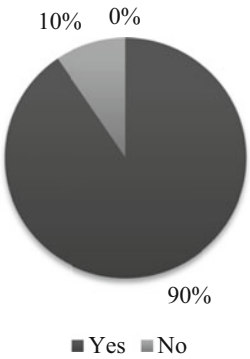

Fig. 14 Interest in tournament—Clubs

7 Mini-Tennis Tournament Between Schools

The organization of a tennis tournament amongst schools participating in mini-tennis may act as motivation for schools, clubs and children to join the "Tennis to schools" project. 90 % of tennis clubs expressed a willingness to participate in such a tournament; on the other hand, only 56 % of schools expressed interest. The main reason for a negative response was the expense involved in participation (Figs. 14 and 15).

It is worth mentioning that tennis clubs expressed a willingness to debate the conditions necessary for organizing such a tournament, especially playing courts. Most of them were willing to provide courts at fair price, and some free of charge (Fig. 16).

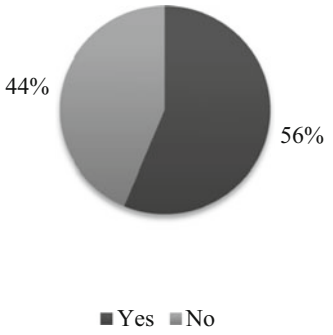

Fig. 15 Interest in tournament—Schools

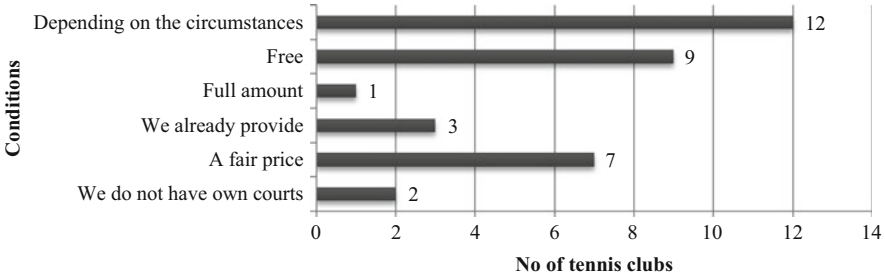

Fig. 16 Clubs' conditional offers for the provision of courts for tennis tournaments

8 The Main Research Results

The research revealed both the main strengths and weaknesses of the project in question; moreover, other questions arose after research was conducted, which will have to be answered at some point in the future. The main conclusions from the research are:

- there is a will to cooperate within the framework of the project; however, levels of cooperation are very low at this point;
- most stakeholders had some form of information on that project, but such knowledge was rather basic, confirming that stakeholders did not grasp the main idea and potential of the project;
- the main reason for the lack of real knowledge of the project was ineffective communication between the Slovak Tennis Association, schools and tennis clubs;
- one of the biggest barriers to school participation was their financial circumstances (problems);
- there were decent results at the schools in which the project was established;

– no formal register was kept of children who participated in the project at schools and in tennis lessons at professional clubs at the same time (or later). It was therefore a complex task to determine the success of the project without such a register (and would certainly be so in the future). Schools and clubs made an error in not doing so;
– clubs discerned a lack of managerial support from the Slovak Tennis Association, claiming that schools are essentially unsupervised.

After correction of the mistakes which occurred during implementation, there now exists the chance to upgrade this project and unlock its vast potential to assist sports in Slovakia and encourage participation in sports at all primary schools, not merely those which mainly focus on sports.

9 Conclusions

The management of cooperation and alliance networks is regarded as an important factor within a sporting environment. Numerous states, cities and sports clubs have discovered the benefits of this kind of cooperation. This chapter presented successful examples and the key research results of the "Tennis to schools" project organized by Slovak Tennis Association. This project has breathed new life into Slovakian tennis; however, there are numerous issues which should be improved, to which end this project will inevitably be the subject of discussion in the near future. Numerous clubs are not satisfied; but on the other hand, these clubs have not fully engaged in the project to this point. Several clubs, however, have proved that if a successful form of cooperation with schools can be implemented, the results may be excellent. Open communication and the selection of competent and responsible people are necessary for successful cooperation. One problem in Slovakia is that many, mainly smaller, clubs are not fully professional and have no professional coaches—many coaches work on their own and therefore have no real motivation to participate in this project. The professionalization of tennis clubs would be of considerable assistance here; however, only through a change of attitude will the full benefits of cooperation be realized.

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Are Inter-firm Networks Really Worth It?

Jaromir Mazel and Ida Vajčnerová

Abstract Company networks represent the coordinating organisational form between the hierarchical structure of the conventional enterprise and the market. Company networks are to be understood as an answer to the development trends of the environment of the enterprise, particularly to increasing competition on the relevant dynamic markets. The goal of this paper is to supply evidence of their efficiency on the basis of an analysis of regional networks in the field of tourism, as shown by the mountain cable car companies in the region of Oberengadin/St. Moritz in Switzerland. The positive impact of this network cooperation is more evident amongst the group of small and medium enterprises (SME) operating cable/railways in the region than in larger enterprises. The SME which cooperated in networks generated an advantage of 15–20 % as regards revenues and approximately 20 % as regards long-term fixed assets. For the group of companies with revenues exceeding five million CHF, however, the cooperation did not bring about the benefits expected.

List of Abbreviations

CF	Cash Flow
Eq	Equity
TR	Total Revenues
TA	Total Assets
CP	Costs of Personnel
KZ1	Financial Ratio: Cash Flow/Total Assets
KZ2	Financial Ratio: Equity/Cash Flow
KZ3	Financial Ratio: Cash Flow/Total Revenues
KZ4	Financial Ratio: Costs of Personnel/Total Revenues
GDP	Gross Domestic Products

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CHF	Swiss Franc
SME	Small and Medium Enterprises
SBS	Seilbahnen Schweiz/Association of Swiss Cableways Providers
BfS	Bundesamt für Statistik (Swiss Federal Statistical Office)
OECD	Organisation for Economic Co-operation and Development

1 Introduction

The term 'inter-firm networks' describes an organizational form of enterprises which attempt to use or gain a competitive advantage by means of the "interconnection of business activities based on cooperation and complex reciprocity rather than on competition. This interconnection is characterized by relatively stable relations among enterprises that are legally independent but usually economically connected and dependent" (Sydow 1992).

Business activity in networks makes sense only when it improves overall competitiveness when compared to the business activity of an individual enterprise ("solitary firm"). The term competitiveness can be defined as "a capacity that enables a firm to succeed in business competition with other companies" (Šiška 2005). "However the term competitiveness, as such, does not explain how a company can succeed on the market" (Blažek et al. 2007).

The term *effectiveness* is often referred to as successfulness, usefulness or meaningfulness, and it describes the capacity of the company to achieve its objectives. This concept assesses the appropriateness of the objectives selected by managers as well as to what extent the organization achieves these objectives. Organizations are effective if their managers choose appropriate and adequate organizational goals, and if the organization does in fact achieve these objectives. Efficiency as defined by Drucker (1967) means "doing the right things".

Efficiency is another quantitative indicator of success, frequently used in business and measured as the rate between the value of inputs and outputs. The following terms serve as synonyms of efficiency: efficacy, economic return, return of means invested into business activities. It can also be defined as "doing things right" (Drucker 1967).

In terms of financial results, effectiveness can be identified with efficiency, under the assumption that the objective of effectiveness was defined through accounting, as the difference between revenues and costs.

As these two concepts are often used ambiguously or as synonyms—indeed their meanings are sometimes even reversed in the literature—it is worth remembering the definition given by the founder of the concept, Drucker (1967) who explains the difference on the basis of the division of labor between hierarchical levels of the enterprise: "... the executive is, first of all, expected to get the right things done. And this is simply saying that he is expected to be effective ... For manual work,

we need only efficiency; that is, the ability to do things right rather than the ability to get the right things done (Drucker 1967).

The activities of successful enterprises must be meaningful (effectiveness) and efficient (efficacy). When we use this concept in the frame of inter-firm networks, then effectiveness means to achieve defined objectives which represent the negotiated compromise of all partial objectives of all cooperating partners. The efficiency of the inter-firm network depends on the amount of transaction costs that must be spent on these objectives.

2 Research Question and General Hypothesis

One of the main objectives of business research is to search for managerial and organizational factors which determine the success of an enterprise. These factors include the potential for innovation, organizational structures and forms, and so on. Attention should also be paid to configurations including "participants from other enterprises, organizations and institutions" (Blažek and Klapalová 2005). This type of research also includes the creation of inter-firm networks. This approach affirms the conclusion that cooperation in the frame of inter-firm networks brings synergies in the fields where common resources are exploited; where the changes on the market require flexible responses; or where the creation of customer values exceeds the capacity of one individual company. This approach is meaningful when there is a functional causality between economic success and the creation of inter-firm networks, in other words, when establishing network relations "pays off".

This paper's objective is to introduce specific example of network alliances in the tourist destination of Oberengadin in Switzerland and to present the results of empirical research on the effectiveness of enterprises in emerging organizational structures. The principle of emergence suggests that the value of properties of a system arising from the interconnections of its individual components is higher than the mere sum of values of its single individual properties (Emergence 2014). This principle of emergence may also be suitably applied within the framework of inter-firm networks. The basic hypothesis is as follows: "*Business activities within the framework of inter-firm networks in the selected field of tourism services* (i.e. *in the mountain cable/railways sector*) *achieve a higher level of effectiveness than the business activities of individual companies*".

3 Area of Business

The tourism industry is part of the tertiary sector and as such has specific characteristics. The basic difference between goods and services in general is that goods are manufactured whereas services are provided. Kotler (2001) defined service as

"any activity or benefit provided by one party to another. The service has an intangible nature and cannot be stored. Provision of a service does not have to be directly related to a material product."

According to Payne (1996), services differ from goods in terms of four typical properties: intangibility—services are abstract and intangible; heterogeneity—services are highly variable; inseparability—production occurs simultaneously to consumption; and perishability—services cannot be stored. In manufacturing companies, products are distributed through well-defined interfaces from one place to another. In companies providing tourism services it is customers, not products, who move between specific "transaction stages".

In the case of a tourist destination as the product, individual services are not offered separately, but rather in different combinations, represented by a combination of products, services, natural resources, and man-made attractions and information. The product offer of the tourist industry includes the services of all the providers involved, while customer demand is composed of individual requirements. The competitiveness and consistency of such a heterogeneous entity can only be achieved through an integrated approach and network collaboration among different service providers (Vajčnerová 2012).

Companies integrated in the inter-firm network providing services are characterized by:

- services of individual enterprises realized in the requested order,
- consumption of services from a customer perspective is a series of individual activities, chosen by the customer from the full range of services offered,
- ordering and selection of individual services is the client's choice, based on his or her individual preferences. It is therefore not possible to foresee the sequence of services that the customer will choose,
- the absence of central planning and management leads toward the decentralization of contacts and heterogeneous information. As a result of this decentralized provision of services, various problems arise at the stages of planning, financing, profit distributions, billing and accounting,
- regardless of the fact that the chain of services in a tourist destination is provided by different suppliers, a customer assesses the services as a single and complex experience, which is similar to the material product of a corporation.

Buhalis and Costa (2006) define the destination system as a group of members interconnected by mutual partner relationships with specific rules. The activity of each actor influences other members to such an extent that the objectives and strategy must be defined on a common basis. Tourist destination, as well as destination management, is inherently an appropriate example of building cooperation networks. Destination is a "territorial entity which is characterized by a common approach when using the developmental potential of tourism..." (Vystoupil et al. 2006). Destination management is a form of management used in a specific territory (destination) in order to increase the effectiveness of the activities associated with tourism and is based on the principle of voluntary cooperation between enterprises and public entities as well as on the optimal

exploitation and utilization of all the positive effects of interconnection with the objective of maintaining competitiveness on the market (Vajčnerová 2012). "Destinations represent virtual corporate networks . . . legally independent but economically interdependent enterprises . . . that must be managed as a whole by a superior body" (Bieger 2013).

According to Buhalis (2003), a tourist destination is defined by means of six components, known as the "6 As". (1) Its primary offer consists of tourist attractions: natural, cultural and historical potential (Attraction). (2) Secondary offer—accommodation, catering, offer of sports and recreational activities, cultural, social and other facilities (Amenities). (3) General infrastructure built primarily for the needs of the local population (Ancillary Services). (4) Accessibility. (5) Product packages (Available packets). (6) Opportunities for participation in sports, cultural and other experiential activities (Activities).

To achieve the optimum level of overall visitor satisfaction, the entire range of services must be provided at the required level of quality. The accessibility and complexity of the services must be assured through strategic interconnections, based on the platform of destination management. A virtual network of services from this perspective can be a tourist destination, for example a ski area whose final product is to provide a vacation experience to visitors. The entire set of services starts with information on the territory which includes weather and snow conditions, transport options and road conditions, access to the area, rental of sports equipment, status of the ski slopes and their accessibility by cable/railways, restaurants, entertainment, accommodation and transport to the point of departure.

While the customer evaluates the destination as a whole, the value created for the customer is fragmented into many parts within the destination. These two views are inseparable and bear implications for the cooperating enterprises, which are obliged to create a suitable integrated offer for customers. Hence, there must be an adequate benefit when compared to the incurred costs on both sides. However, this is not a static situation, but rather a set of interdependent relations where higher value for the customer creates a higher value for the company. From the perspective of the market actors, it is a constant struggle to maintain competitive capacity. It represents a challenge for the strategic and operational management of the cooperating companies. (Moreover, the absence of a centralized management system brings with it a set of problems based on the absence of common resources and the absence of a unified accounting system, amongst other issues.) From a customer benefit perspective, coordination of the total offer, as well as clarification and determination of the status of individual enterprises and their responsibilities within the service chain, is essential.

4 Environment of the Companies Analyzed

Tourism is one of the most important sectors of the Swiss economy, generating substantial multiplier effects on output and employment. Tourism represents a total share of 31.7 % of GDP in Switzerland, as well as accounting for 33 % of total

employment (according to Swiss Statistics Office data for 2009). The importance of tourism lies in its positive impact on the economy, and its status as a driver of the development of Swiss mountain areas, which cover two-thirds of the total area of the country. Tourism industry in mountain areas has gradually transformed from its original focus on simple accommodation and transportation into a platform for the creation of complex experiences (Mazel 2007).

Visitor demand includes services from various industries which may be grouped into two categories: direct services (such as ski slopes and cable transport, accommodation, restaurants and travel agencies) and indirect services (such as public transport, shops which sell consumer goods, the distribution of electricity and energies, communications devices, culture, sports and entertainment). A destination must offer its guests a complex chain of services integrating the offers of several providers. This fact is a base assumption for the development of enterprise networks.

The Oberengadin region is one of the most renowned Swiss destinations, and is also considered one of the most traditional and most prestigious areas. The destination has the quantified objective of ranking among the ten top-rated ski areas throughout the world (BEST 2014). The area is located in a rugged zone of the Canton of Graubünden, the largest in terms of area, and comprises 150 mountain valleys. The destination offers immense opportunities for the tourism industry regardless of the season. In the famous village of St. Moritz the first luxury hotel was opened in 1856, whilst the first mountain railway, named Muottas Muragl, commenced operation in 1907. In 1928 and 1948 St. Moritz hosted the Winter Olympic Games. Finally, in 1986 the name of the town was registered as a trade mark, the first of its kind—in terms of tourist destinations—on a global scale.

The local administration of each municipality in the region of Oberengadin/St. Moritz is primarily responsible for developing and maintaining infrastructure for the needs of residents. A local destination management agency acts upon the instructions of the municipality and ensures all activities for local providers of tourist services. One of the agency's most important responsibilities is for marketing communication on the tourist market. Furthermore, the municipality is responsible for the creation and preparation of complex service packages for visitors, which provides a fine example of network cooperation between the municipality, public transport, mountain cable/railway enterprises, providers of accommodation, and restaurants.

In the region of Oberengadin/St. Moritz, each of the 15 municipalities maintains its own mountain railways/cable ways, the operators of which maintain the quality of slopes, operate 37 related restaurants and own several hotels. Transport facilities mostly take the legal form of stock companies and are owned, to a large extent, by public entities. From an economic perspective, transport facilities act as independent competitors. Ownership of the mountain railways/cableways constitutes a combination of private ownership, stock-companies and local public authorities. From the perspective of a customer-oriented offer, it is unimaginable for these particular cable/railways to engage in market competition on an individual basis.

In order to facilitate access to the complete range of services available in the region, individual companies began to cooperate as early as 1962, initially in the

form of a professional association. In 1974 a joint marketing company was established as a network interconnection with a uniform system of ticketing and tariffs. A single regional cable/railway ticket was introduced, which facilitated customers' access to all such services offered in the region. This was followed by a further deepening of cooperation in the form of the unification of all transport facilities, as well as the introduction of a common credit card with an integrated system of payments which included payments for reservation, access, transport, cable/railways, etc. This system included an agreement on revenue distribution and sharing (on the basis of visitors' length of stay in the domain of the given cable/railway).

Such a form of cooperation meant demanding investments, and consequently the cooperation also involved joint steps to tackle the rising indebtedness and insufficient level of financial coverage of the long-term assets. Cooperation also focused on common destination marketing (Bieger 2013). In line with the theoretical perspective, the cooperation was tailored to the needs of customers.

All the abovementioned network interconnections took a form and structure which corresponds not only to the regional principle, but also to the hierarchical structure of the Swiss system of public administration (municipality, canton, state). The system of cooperation is implemented at each hierarchical level of public administration. Hence, cooperation networks—given this set of circumstances—are highly complex as a result with vertical and horizontal dimensions striving to manage the complex spectrum of needs of the tourist industry. These associations are built on a voluntary basis, and there is no obligation to participate. Each participant or business entity finds themselves at a different stage of the cooperation life-cycle. Each cooperative relationship is actively used, by a single participant or as a whole, only until such time as it pays off.

It can be concluded that the region of Oberengadin/St. Moritz, and especially the association of cable/railway providers, represents an interesting subject for research on the effectiveness and efficiency of inter-firm cooperation for three reasons. Firstly, the association is in a position of significant strength in the context of world-wide competition. Secondly, it has a long and interesting history. Thirdly, recent development has brought about a great deal of uncertainty as regards the further development of the entire region.

5 Methodology

The success of a company depends, in general, on business activities as expressed by economic results and financial statements (Blažek et al. 2007). As regards mountain cable/railway companies, external factors also play an important role. Vystoupil et al. (2006) mentions a difficult set of area-specific circumstances stemming from network cooperation, which must also be considered when evaluating business success.

According to general knowledge of the efficient business model based on contingency theory, it is possible to derive a simple working model of business

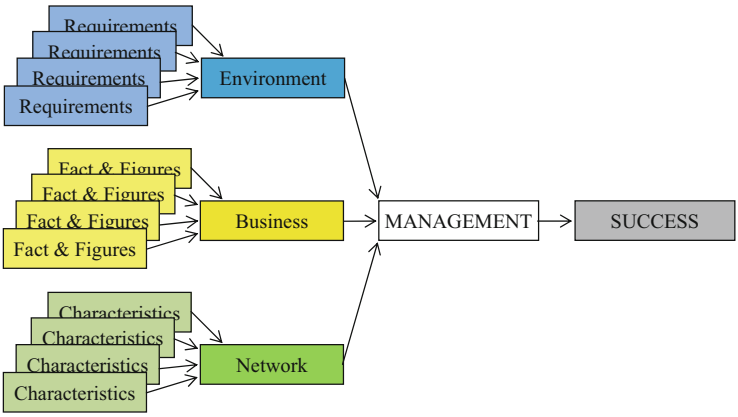

Fig. 1 Model of business effectiveness in the subsector of mountain cable/railways

effectiveness in the subsector of cable/railways (Fig. 1). Contingency theory clarifies the efficiency of an organization on the basis of the relationship between organizational structure and behavior; it also claims that there is no such generally valid organization platform which would be in itself a guarantee of success in business.)

This scheme Fig. 1 shows three groups of factors which work to create competitive advantage:

Relevant Company Environment: A set of physical, geographical and topological conditions which determine the infrastructure of ski areas at the destination.

Financial Results of the Company: Based on empirical data, companies are grouped according to their business success, using both cross-sectional and longitudinal data. Business success or failure is calculated by means of financial ratios; financial accounting data will be taken from publicly accessible resources. On the basis of a comparison of the most extreme group of companies, it is possible to identify the key determinants of economic success. The assumed relations will be examined by means of statistical methods. To evaluate the economic capacity of the mountain cable/railway we used indicators as described in the "directive of the capacity of sustainability of the cable/railways", developed by the Swiss Association of Mountain Cable/Railways (SBS). This system consists of the following indicators and recommended limit values (Bieger and Laesser 2000).

- KZ1 = Cash Flow/Total Assets
  Free cash flow, minimum value 5 % of Total Assets. This is an indicator of re-investment or the reproductive capacity of the company's operating activities. (Limits are based on the requirement for a 20-year average lifespan.)
- KZ2 = Equity/Total Assets
  The ratio of Equity to Total Assets, with a minimum of 40 %. This statistic is an indicator of a company's ability to cover its business risk with the proper funds.

- KZ3 = Cash Flow/Total Revenues
  Ratio of free Cash Flow to Total Revenues, with a minimum of 20 %. This statistic is an indicator of profitability of revenues or the degree of self-financing capacity.
- KZ4 = Costs of Personnel/Total Revenues
  Ratio of Personnel Costs to the Total Revenues, with a maximum of 35 %. This statistic is an indicator of operating costs or cost efficiency.

The results for the group of enterprises which participate in inter-firm cooperation in the mountain cable/railway subsector in the Oberengadin/St. Moritz region will be compared to enterprises which do not participate in such cooperation, giving an empirical data sample of 107 companies. The data is based on the financial statements over a time span of between 3 and 10 years; the data set consists of 3,500 values in all.

Processes Within the Network. The motivating factors for cooperation in network form at the given tourist destination were examined by means of a questionnaire survey. Insight into the internal processes and social background of businesses in the network provided valuable insights; however the validity of the findings is specific and limited to the subject analyzed.

6 Results

6.1 The Relevant Company Environment

In the study 'Climate change impacts and adaptation in winter tourism' (Abegg 2007), the authors conducted an evaluation of the reliability of snowfall in the Alps. Companies operating mountain cable/railways are aware of the impact of the global warming on their business activities in winter and implement a range of measures in several domains: (1) In the field of technology, building and construction (straightening the terrain, building new ski slopes at higher altitudes, with north-oriented positions, exploitation of glaciers and use of artificial snow, and so on) and (2) In the field of behavioral economy (customer habits, different schemes of support and financing, business cooperation and mergers, diversification and the shift from exclusively winter tourism towards year-round tourism offers, and so on).

The prevailing strategy consists of utilizing artificial snow. However, if global warming trends continue, the abovementioned measures will be insufficient to prevent the risk of a lack of snow cover. On the other hand, if the expected scenario of global warming brings hot and dry summers in the Mediterranean area, summer weather in the mountains will become more pleasant due to reduced levels of precipitation.

Due to the winter temperature increase caused by global warming, the altitude at which practicing winter sports is authorised has necessarily risen. The abovementioned scenario as such does not assume a great level of risk (the altitude

of valleys in the region exceeds the critical value of 1,500 m above sea level). More attention must be paid to the more equilibrated use of tourist facilities throughout the year.

The question which has arisen is whether the hereby presented scenario will be sufficient to maintain the economic sustainability and competitiveness of ski regions. It is apparent that more radical changes are needed (investment in the future holistic development of the destination; a profound change in the managerial culture of companies; higher flexibility as regards the fulfillment of the task at the national level; and the necessary impact of the local level of public administration which are the important stakeholders in policy-making). It is inevitable that steps must be taken to increase public awareness and to rapidly engage public authorities in regional planning and economic development. This, however, will only be possible by means of the unification of forces through the creation of a joint destination management organization.

6.2 Financial Results of the Company

Within the framework of statistical processing, a set of endogenous factors were available, from which we selected those that were relevant to the cable/railways subsector. We focused on the indicators of business success and competitiveness; based on these indicators the companies were grouped into clusters according to their business success. This enabled the identification of the characteristics which generate the greatest differences among the extreme clusters.

Results with a 99 % level of statistical significance reveal that cash flow is an indicator which determines the most extreme differences in success between clusters. Costs, as the second most significant indicator of success, can be divided into three groups: operating costs, personnel costs and investments. The costs of financing depend on the financial structure of the company. The objective of each type of business cooperation is to reduce operating costs. The possibility of reducing the share of personnel costs is only possible within larger organizational units. Managers of the enterprise make decisions on operational opportunities.

On the basis of our data analysis, we can conclude that the opportunities for potential improvement, especially for small and medium enterprises, is possible through taking advantage of economies of scale, i.e. reduction of costs on the basis of cooperation in the horizontal networks. For small and medium enterprises, horizontal business networks represent a promising means of improving the effectiveness of business.

The positive impact of network cooperation is perhaps more evident amongst the group of small and medium enterprises (SME) operating cable/railways in the Oberengadin/St. Moritz region, when compared to larger enterprises. The SME cooperating in networks generated an advantage of 15–20 % as regards revenues and approximately 20 % as regards long-term fixed assets.

For the group of companies with revenues exceeding five million CHF, the expected benefits failed to eventuate from such cooperation, the reason being the high proportion of material and personnel costs in terms of total operational costs. For the category of large enterprises, the positive contribution of network cooperation was not confirmed.

7 Processes in the Network

The results of the questionnaire survey provide some insight as to why some theoretically expected approaches regarding the construction of mountain cable/railways in Oberengadin were not applied. On the other hand, our findings, in principle, confirm the theoretical assumptions, giving rise to the following conclusions:

- in enclosed and secluded valleys, where the offer of mountain cable/railways is perceived by the customers as a single unit, cooperation among companies is inevitable. In the past as well as nowadays, such a set of circumstances does not leave the owners of individual cable/railways with any degree of choice. The Oberengadin region has formed a vital community from all the companies in the region, geographically and topographically;
- the configuration of the network is based on the common objectives that are specified in the "operational rules". Mutual trust plays an important role;
- the trend is towards the use of economies of scale and growth in competitive advantage parallel to the size of the company;
- the main threat to the success of network cooperation is a negotiated compromise that, in the worst-case scenario, does not serve the needs of any party. Another barrier to success in business is the exhaustion of any opportunities for cooperation, reaching the maximum level of potential synergies, and insufficient support from top management;
- the main reason for cooperation, according to the data set, was given as the following argument: "we would not be here without cooperation". At first sight, this finding might appear trivial. However, within inter-firm networks of cable/railways providers, the main objective is not profit maximization or the elimination of competition. In Oberengadin, the main objective of each company is to exist on a long-term and sustainable basis and to preserve competitive capacity on the locally stagnating markets;
- although network cooperation is generally perceived positively, a look behind the scenes corrects this somewhat romantic image. Network cooperation is characterized by time-consuming negotiations of compromises. Compromises represent suboptimal solutions from the point of view of individuals, leading to the establishment of diffused responsibility. Accountability within the group is spread out amongst all the individual members, even if the individual participants have different opinions. The outvoted minority might not identify with the

decision at the group level and might be obliged to implement decisions unwillingly. Moreover, the part of the group whose opinion has been accepted may object to the "free riders" who gain profit without contributing to any form of joint effort.

The questionnaire survey provides no evidence in the sense of confirming or rejecting theoretically expected standard approaches, such as the difficulty of setting up a network in a traditional environment, a clear separation of competences of managers (for example among the supervisory board, operational management of the company and the coordination committee of the cooperation), a selection of partners, or assessment of the qualities of management. This is also a sign of practical and situational processes of business activities in the networks as illustrated by the case study of Oberengadin, marked by the desire to preserve traditional processes and structures combined with the necessary effort to modernize management processes.

8 Practical Implications

Research has shown that the increase of revenues by means of developing business cooperation in the field of mountain cable/railways in the region of Oberengadin/St. Moritz is optimal for businesses whose revenues do not exceed a total level of approximately five million CHF. Higher revenues through the association can be achieved by acquiring more clients, by extension of the marketing activities of the entire destination, and by means of price coordination. Alternatively, larger conglomerates can extend the scope of their business activities towards other sectors of tourism (accommodation, wellness, culture and innovative methods of financing), with the goal of achieving higher profit margins. However, strategic investments, in the short term, impact the company's financial profitability indicators negatively.

Larger cable/railways may try to improve profitability by increasing returns using other measures, for example, through diversification, or by extension of the range of vertical networking. The realization of these fundamental strategic decisions concerns especially large corporations with an appropriate legal form, rather than smaller corporations which cooperate freely within networks.

The current structure in the mountain cable/railway sector as regards turnover (Fig. 2) indicates that the structure is based on the system of SME enterprises. Interestingly, 8 % of the largest companies achieve 66 % of the turnover of the entire sector. By contrast, 47 % of companies are so small that their annual turnover is below 100,000 CHF (only 2 % of the turnover of the whole sector).

Theoretical knowledge is being intensively transferred into practice within the mountain/cable railway sector, as the development of the whole industry indicates. This is confirmed by the fact that the number of cableways in Switzerland in the observed period increased, while the number of businesses operating these cableways decreased. The declining number of operators shows a continuing

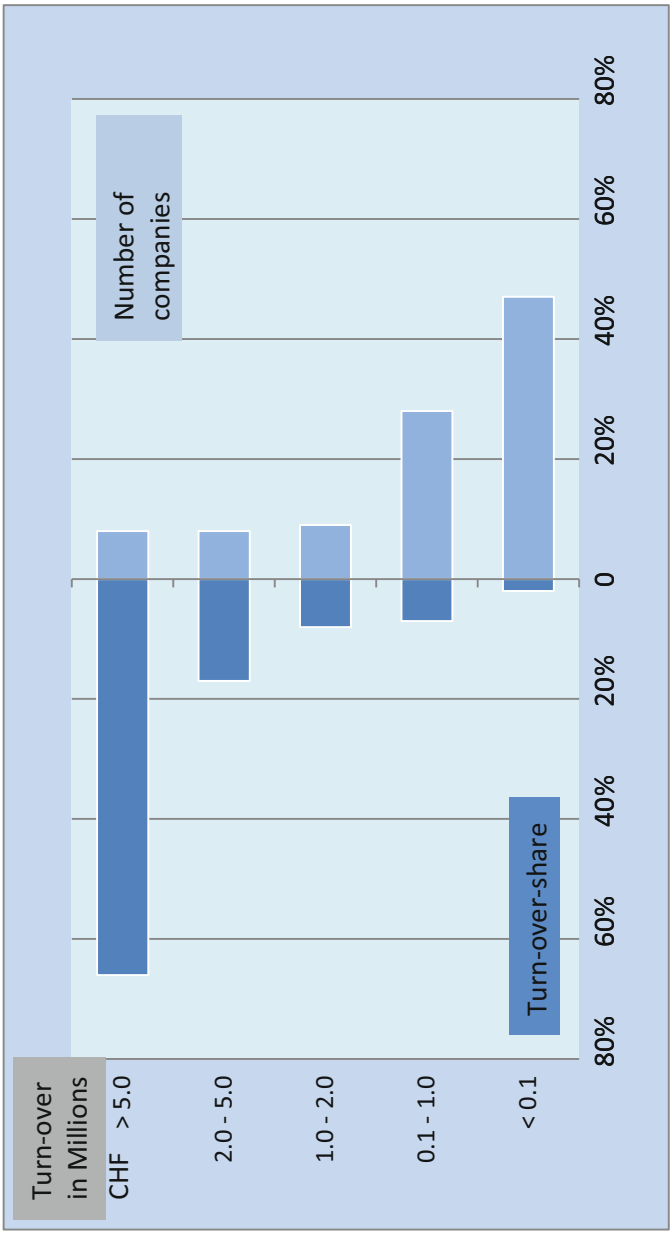

Fig. 2 Structure of the companies according to turnover in the mountain cable/railways sector (mil. CHF). *Source*: SBS (2006)

concentration in this business field and can be seen as a measure towards the improvement of competitiveness. Hence, this is in accordance with the implications of the hereby presented empirical research.

9 Conclusions

Establishing cooperative associations in the tourism industry should not be a strategic objective in itself (Greve 2014). Rather, the strategic objective of the destination management should be considered as "filling the package" with specific content. After analyzing demand at the destination, the next step is to clarify its own market position in the form of a unique selling proposition, which is clear and distinct for customers. The assets and goods must then be managed in line with the short-term decision-making of guests through a direct reservation system and through improved cooperation with tourist organizations. Another key factor is represented by the effort to extend the length of the tourist season, partly through the use of artificial snow, as well as by the extension of services to create a year-round tourist offer. The decision to increase corporate value in business networks usually activates a wider range of possible synergetic items, as positive effects emerge both internally (increased savings, shared use of common resources and assets) as well as in the external environment (improving yields through joint activities on the market).

In this context, it is necessary to emphasize one fact, namely that the evaluation of statistical data represents a highly simplistic attempt to understand reality. It is possible that there are other factors which determine the success of network cooperation, which might not have been included in the assumptions (Blažek et al. 2007). The extent of simplification may lead to erroneous conclusions. Furthermore, "it is evident that individual factors do not manifest individually ... but in their mutual interconnections" (Blažek et al. 2007).

On the basis of the above, our research cannot claim to have discovered an absolute truth regarding business networks among the mountain cable/railways providers. The contribution of this work must be seen as an attempt to present the current state of affairs in the field. It also indicates which factors are most impactful and how to face changes to this business environment. Due to the partly insufficient quality of numeric materials, any evaluation and interpretation of the results serves only as a supplement to enrich and affirm the hereby presented general theoretical conclusions.

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Using Management Tools to Manage Network Organizations and Network Models

Róbert Štefko and Peter Gallo

Abstract The concept of network organization is topical and also attractive from a management perspective. The paper deals with network organizations active in Slovakia and the EU. Based on selected real-world examples, it highlights the aspects of the application of management tools in managing network organizations; describes operations of the network structures within the EU; and shows the directions of the development of such structures in Slovakia. It also defines links in the network and communication between its various organizational units in the direction of the process management model. The network model is examined from the perspectives of process management and strategic controlling.

The concept of network organization is topical and also attractive from a management perspective. Organization is part of, and one of the functions of, management and can be examined in the entire context as the process of managing a firm which is influenced by the type of organizational structure utilized. In management terms, a network organizational structure can be seen as a tool for implementing and administering organizational strategy. It influences the vision, the development of which it facilitates, through its strategic decisions. The role of management is to create conditions such that the organizational structure and strategic managerial decisions are harmonized.

At this early stage of the twenty-first century, key managerial decisions are oriented towards strategic innovations and the knowledge-based economy. Therefore, enterprises focus their activities mainly on gaining competitive advantage through strategic innovation, knowledge, information and communication strategy. The basic concepts which are supported by management are flexibility, activity, prompt reaction to changes, and organizational learning. It is the network organization itself which helps to formulate these concepts, apart from virtual and knowledge-based networks. However, one has to take into account that organizational strategies are affected by other factors and that the network structure is just part of the mosaic. Table 1 shows the overview of possible organizational strategies related to the network organization of companies.

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Table 1 Organizational strategies used in network organizations

Area	Content	Description	Application
Organizational strategy	Structural changes	Adapting organization to market changes, e.g. according to strategic business segments	Suitable for network organizations when expanding the company and penetrating new markets
Organizational strategy	Decentralization	Breakdown of marketing functions e.g. according to products, market segments, sales regions etc	Less suitable for network organizations, too decentralized and thus may negatively affect flexibility of changes in the organization
Organizational strategy	Centralization	A summary of all marketing functions, sub-functions, marketing service functions	Suitable for network organizations, greater flexibility
Organizational strategy	Standardization	Typification and standardization of processes for purchasing, manufacturing, order processing, distribution	Less suitable strategy for network organizations
Organizational strategy	Rationalization	Automation of functions for managing processes in production, sales and management	Suitable for network organizations

Taking into account the changing and turbulent environment, it is vital that the organization reacts promptly and flexibly. By applying this process it will achieve the required efficiency of and success in activities, while also creating favorable conditions for the creation of network organization, making inter-organizational relations more effective. It thus helps to optimize its performance and reduce transaction costs, for example by using resources, capacities or activities provided by another organization in the network. Within the network organization, each of its component parts deals with key activities, while external activities are undertaken by contractors. An advantage of this organizational relationship is that network organizations may gain new information and knowledge within the inter-organizational relationship structure. The main purpose of network organizations is, on the basis of informal relations, to create clusters of organizations, and to gain a competitive advantage through cooperation. Nowadays, this is an effective shift towards successful organizational management which improves performance and the efficiency of processes in the organization.

The network organization is therefore appropriate in situations where the organization is unable to ensure sufficient resources or knowledge (Dedina and Odcházel 2007: 160) (Table 2).

Looking at these aspects in terms of Slovak trading companies as well as other types of organizations, a substantial shift is discernible. This shift is even more intensive in cases in which a Slovak enterprise interacts with another organization operating within the European Union as well as outside. Conventional ties give way

Table 2 Key characteristics of traditional and network organizations

Traditional organization	Network organization
Conventional ties	Interactive electronic ties
Use of telephone and postal services	Electronic ordering
Limited electronic communication	Electronic invoicing and payments
Limited communication with manufacturers	Direct access to manufacturers
Information is gained via telephone, postal or electronic services	Electronic access to information on products, customer services

Source: Dedina and Odcházel (2007: 160)

to interactive electronic ties. Such changes are currently visible in numerous Slovak companies. Direct electronic access to relevant information from suppliers, as well as customers, is also improving: CRM systems are becoming common practice.

As an example, we can present a network based on an equal partnership in MKEM, s. r. o. (Ltd.) as well as numerous other companies within the European Union. MKEM, s. r. o. (Ltd.) was established in 1991 and is active within the automotive industry. The vast experience accrued by the owners and upper management, together with engagement in business activities, underpin rapid growth in the area of quality electronic plugs and connectors for all types of automobiles. Despite the difficulties brought about by the unfavorable economic climate, the firm has managed to create an exceptionally flexible structure within a short period of time, enabling a team of 12 people to grow to a medium-sized company with over 150 employees, all of whom may be described as highly motivated and who emphasize the quality of their work.

The development of the company in terms of managerial and production practice through the application of the most up-to-date knowledge is shown in Fig. 1. The figure displays a mind map and shows the organization's path to success, a route suggested by upper management after consultations with consulting companies experienced in occasional networking. This vision was created on the basis of the latest theory and practice in management. The achievements of the firm confirm that the procedure selected was appropriate and that knowledge has been successfully implemented. MKEM, s.r.o. (Ltd.) may be classified as an innovative and successful company. Since its establishment, it has been a member of network organizations based on both permanent and temporary forms of network relationships. As can be seen in Fig. 2, one of the first steps taken by the firm was the creation of a network organization featuring equal partners. This figure reveals the process of creating an effective system of management grounded in the network cluster. The basic procedure is as follows:

- Network organization,
- Streamlining processes,
- Responsible business,
- Customer,
- Balanced Scorecard,
- Process management,

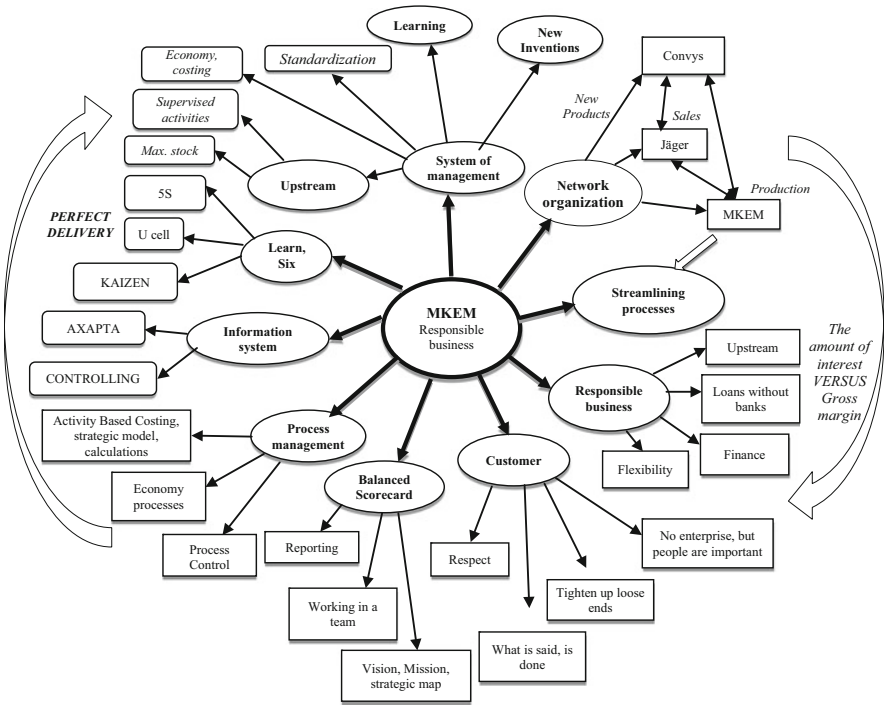


Fig. 1 The mind map of MKEM as a network organization. *Source*: Gallo et al. (2012)

– Information system,
– Learn, Six Sigma,
– System of management.

1. Network Organization The initial step towards success can be seen in Fig. 2 in the top right corner, namely the establishment of a network organization. This step is described in more detail in Fig. 2, which shows the organization of the firm and its position. In collaboration with other subjects, the firm created a so-called network organization for the international market, featuring three component parts: production, sales and project (development). It thus reacted to the requirements of the modern business environment and strengthened its position on the market for the production of automotive accessories. The network operates trans-nationally within the European Union and Switzerland. By creating a network organization, the firm has managed to streamline production and concentrate on its improvement. This has provided the company with an opportunity to streamline processes (Gallo et al. 2012).

In terms of management, network organizations do not have one level of upper management supervising the entire network, but rather a more or less spontaneous managing process carried out by each member organization. Each member of the

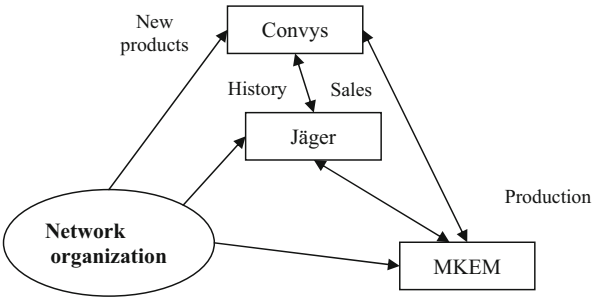


Fig. 2 The network organization

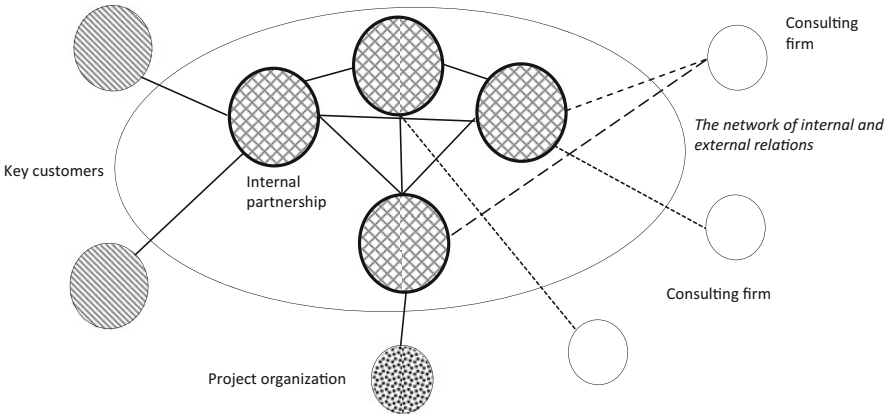


Fig. 3 Spontaneous network organization

network organization may come up with ideas and procedures based on opportunities that arise; they may also reach out to other members of the network organization. Temporary ties are created with organizations interested in the proposals submitted. All such principles are applicable in the case of the MKEM network organization, yet the links are more permanent in character. Over time, however, links may change, improve and modify based on knowledge and experience gained; which distinguishes it from a spontaneous network organization as shown in Fig. 3.

Network organizations are created for various reasons. Firstly, they may be created for the purpose of improving the management and efficiency of the system of managing particular organizations involved in the network. From this perspective, organizations focus on streamlining management through so-called transaction costs, which help to increase the profitability of the organizations involved in the network as well as their performance. This view of networks is relatively broad and ranges from bilateral to multilateral systems of management based on various managerial tools and methods. So-called hybrid organizations are formed.

Another view considers network organizations to be a separate type of organizational design, with specific management features and characteristics distinguishing them from markets and hierarchies, which may be, for example,

group decision-making, reciprocal and preferential relations, activities of mutual support, trust, informal agreements or contracts. In financial terms, these organizations combine their mutual obligations or their own assets as well as different standards in information-communication technologies, enabling network members to collaborate and streamline their activities. A characteristic feature is the presence of savings and cost-effective investment. Initiators of the network set up standards and operating rules for the entire network and monitor their compliance. They also oversee the distribution of rewards (Dedina and Odcházel 2007: 162).

In the case of MKEM, the management system was gradually altered with regard to the prevalent trends under the influence of the network organization. Such changes, motivated by the creation of network clusters, may be characterized by the following steps:

2. Streamlining Processes This played an important role in process management within the firm and in effective work performance therein. The firm streamlined processes to such an extent that it achieved maximum efficiency in the production process, which enabled it to react flexibly to market requirements.

3. Responsible Business MKEM s.r.o. (Ltd.) has had a responsible and ethical relationship to entrepreneurship since its foundation, which may be summarized as follows:

- ***Go against the flow***—this means doing things differently even if such measures may seem difficult and overwhelming at the beginning. Here lies the essence of innovations and approaches to management;
- ***Loans without banks***—this refers to the amount of loans versus trading margin. The essence of this point is that loan payments and expenses related to loans worsen company results; thus, the firm opted to reduce trading margin without being subject to unnecessary costs;
- ***Financing the firm mainly from its own resources*** and within the network organization. This partially disrupted the capital structure, but on the other hand helped to secure the firm's successful survival of the 2008 financial crisis;
- ***Flexibility***—the firm has consistently been able to react promptly to various challenges and adapt to the market (Fig. 4).

4. Customer Customer relationship management (CRM) can be summarized as follows:

- People are more important than the company
- Tighten up loose ends
- What is said, is done.

The company adheres to these principles when dealing with customers. It considers employees and customers to be the most important element of the organization and treats them as such. The successful completion of projects, tasks and activities is a significant part of customer relationship management. The last

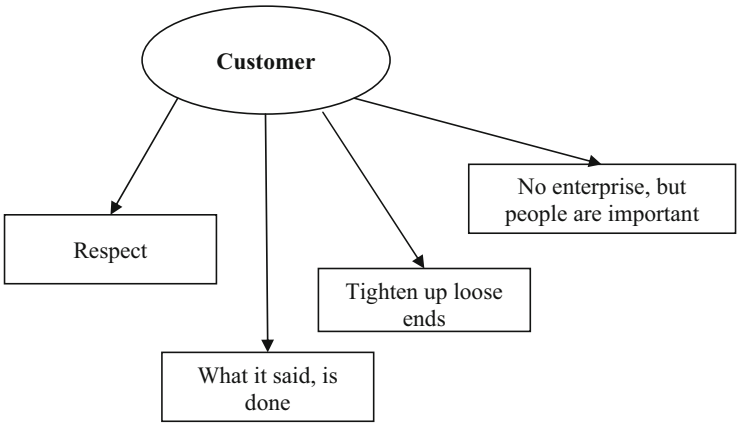
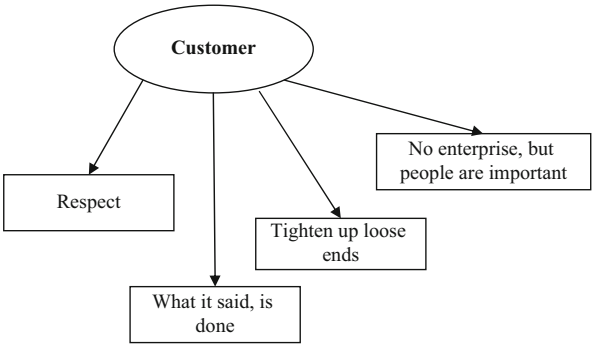


Fig. 4 Responsible business

Fig. 5 Customer relationship management CRM



statement goes to the unity of words and actions. These statements have a positive effect on employees and increase their trust in management (Fig. 5).

5. Balanced Scorecard (BSC) In 2004 MKEM s.r.o. (Ltd.) decided to implement the Balanced Scorecard performance management system in collaboration with Dominanta s.r.o (Ltd.). The first implementation phase lasted for a period of six months and completed the phase in which the structure of BSC objectives was formulated. The implementation phase was subsequently interrupted due to the fact that a balanced system of indicators was required, together with a new information system. Other organizations in the network were thereby inspired to implement their own management systems supporting the functioning of the network. The Balanced Scorecard Performance management system was designed on the basis of the following recognized theoretical procedures:

– definition of the firm's mission,
– the firm's vision for the next five years,
– proposal of a strategic map,

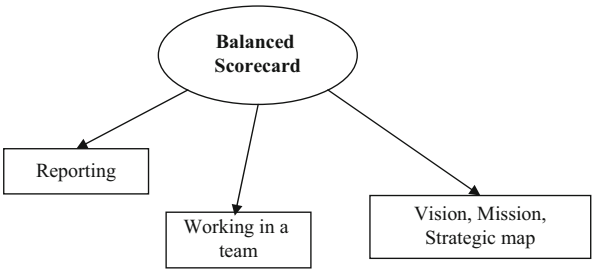


Fig. 6 Balanced Scorecard

– proposal of instruments for monitoring targets and links to sources of information,
– developing output in the form of a Balanced Scorecard report (Fig. 6).

The creation of the BSC system itself and the formulation of a set of objectives were carried out by a team of employees from within the firm. Employees created the basic BSC model during brainstorming meetings by means of SWOT analysis, benchmarking and success factors, since when such a model has been used within the firm, allowing the firm to progress and track its vision. In the final phase, the table of BSC objectives was related back to processes in the firm, as well as to monitoring the cost and potential of the process.

6. Process Management After the introduction of the Balanced Scorecard system, the firm subsequently created the system of process management, the implementation of which began during the final phase of implementation of the Balanced Scorecard system. To start with, a basic model was designed on the basis of a quality management system already applied to the BSC system. This model was used for managing processes and was improved upon. Subsequently the accounting system was transformed and process costs began to be monitored. Monitoring was done using a managerial information system linked to the controlling system. In the final stage, this model was used for creating calculation systems based on the ABC method, from which particular types of products were appreciated and compared to calculations on the basis of the total costs therein (Fig. 7).

7. Information System For reliable and accurate process management, the firm implemented a new managerial information system facilitating the collection and management of information throughout the company. The system provides a sufficient amount of necessary information on production, the technical preparation thereof, as well as purchasing and firm administration. It allowed the firm to improve their management system by providing information in real time. An innovative EIS (Executive Information System) control system, already used in a previous period, exists essentially above this system.

The EIS controlling system allows the firm to conduct analyses from different perspectives. It includes elements of financial controlling used for projecting and monitoring financial indicators, as well as managing the flow of financial

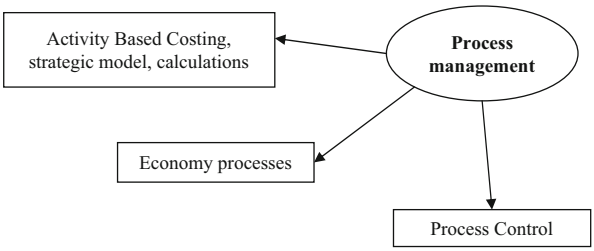


Fig. 7 Process management

information within the financial plan module. Such information is used by the Balanced Scorecard module directly connected to this system, processing data from financial controlling. Cost control, applied to monitoring costs in relation to the budget, is the second, actively used module. This also helps to create managerial profit and loss statements based on contributions. Within this system, costs are classified into calculation costs and process costs and are also used in the calculation system.

8. Learn, Six Sigma Modern methods of production management were used in order that the processes in the firm operate optimally. The firm focused primarily on two areas, namely Learn Manufacturing and Six Sigma, and can be described as the active use of improvement elements within the KAIZEN method, creating so-called U cells and 5S workplaces. In doing so the firm was able to expand its activities and improve the quality of production. The main aim was to ensure perfect supply as a sum of indicators of appropriate quality, time and volume. The indicators of perfect supply, as well as other indicators, are, as outputs of the control and managerial information system, vital sources of information for the BSC system. The most important indicator in terms of processes is process optimization quantified in terms of value-based process costs (Fig. 8).

Applying modern methods to production management, the firm created a suitable set of conditions for improving and optimizing their main processes, targeted at optimizing the indicator of 'perfect supply'.

9. Management System This can be described as the most important component in ensuring the effective functioning of the firm within the network. Numerous options and procedures exist herein, meaning that management is obliged to choose between them. Management thus made the decision to monitor some of the most important parameters as determined by its position in the network. Attention was therefore focused primarily on stocks and the effectiveness thereof, manufacturing processes and the streamlining thereof, standardization, accurate calculations and activities of benefit to the firm, and finally on the areas of standardization and preparation of production, and inventiveness.

One of the most significant success factors, which enabled the firm to survive the 2008 financial crisis, was the **inventory management system** which increased the stock to maximum levels in that year by applying the principle of 'going against the flow'. This enabled the company to overcome problems of liquidity at the critical

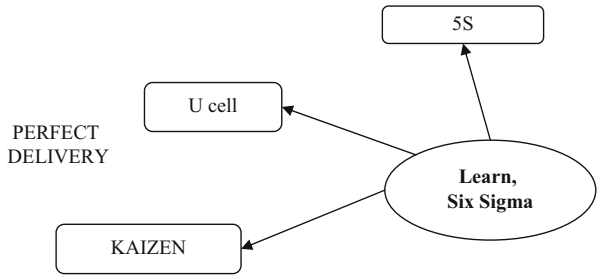


Fig. 8 Learn and Six Sigma

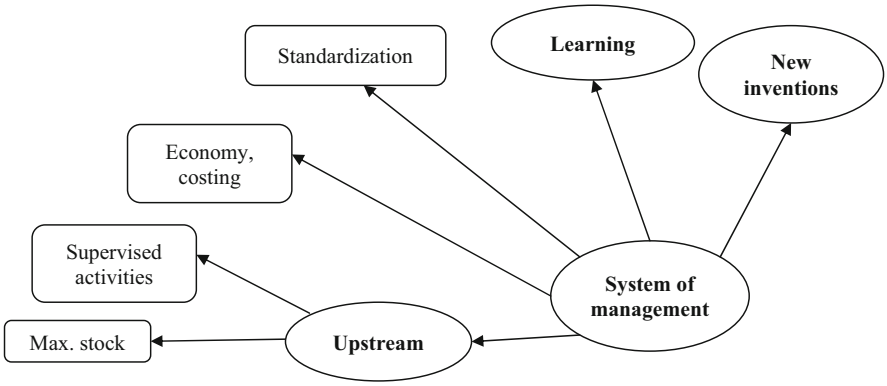


Fig. 9 Management system

period, lasting two to three months, at which point the firm returned to the conditions of normal operation. Another important element used by the firm in its management process is the **supervision of activities** within the firm through managerial information and EIS controlling systems. This also affects **standardization** which is modified dynamically and improves the quality of applied standards. Such a method helps streamline processes and encourages inventiveness (Fig. 9).

QuoVadis—'*what next*', *and/or* '*where are we heading*' *is the question the firm is currently dealing with*. The vision developed during 2004–2005 was followed until 2010; the firm's operations are currently heading in the direction set at that time. The main objective of the firm is based on human resource management underpinned by the statement 'people are important, not processes'. The firm launches its new activities supported by the latest knowledge and technologies in line with this direction. The company is a permanent element of the developing network.

Working with information is a characteristic feature of the present age, especially when transformed into useful knowledge which changes the character of work, education and the everyday life of both people and organizations. Knowledge

is increasingly regarded as the most valuable asset which requires investment and development (Antošová et al. 2013). This information, together with the development of knowledge-based systems, will greatly encourage changes in network organizations and enable their further growth.

1 Management Tools Applicable to Network Organizations

Management tools and methods which can be used by organizations cooperating in the network are highly diverse and may differ within each organizational unit in the network. Table 3 shows the overview of selected management tools corresponding to current development trends in this area (Rezač 2009).

The Table 3 shows the means by which numerous innovative ideas in management could be applied. All such tools are applied to network organizations within the entire network or its particular organizational units. Tools in the area of strategic management and their application to a network may be viewed as top of the list, followed by operations management tools. Nevertheless, all of them are equally important. Strategic managerial tools assist in the search for appropriate activities and processes, while operational tools facilitate optimal performance.

Companies create so-called inter-organizational networks amongst themselves, which are the most common form of organization formed by smaller companies. Their development is determined by various ties, such as to common resources, information, managers, suppliers, customers and so on. Companies may utilize different managerial tools. Inter-organizational networks may be created between individuals, groups, as well as information systems and enterprises themselves. This determines the use of managerial tools whose characteristic feature is the coordination and management of economic exchange relations between those involved. Control as an effective management system of these organizations is arguably the most important.

Inter-organizational networks may be created by specialized firms within the one value chain—so-called vertical networks. If horizontal networks are developed between different industry sectors, inter-sectorial networks are created; whereas if the possibility exists of creating a network which would be more beneficial to customers, so-called occasional networks are created.

In terms of duration, networks can be characterized as temporary, and usually cease to exist after accomplishing their set objectives. These may be formulated by means of a BSC table managerial tool, which is also temporary, but clearly defines the direction of a firm's activities and allows for the effective supervision thereof.

When the network ceases to exist, it may not mean that it shuts down in its entirety, but rather that part of it may remain and lead to the establishment of innovated network structures with managerial tools applied in their modified form. An interesting attribute of networks is that decision-making process is not mutual, but instead companies maintain unilateral decision-making authority and bear the related risk. When allocating resources, members of the network exchange

Table 3 Modern management tools and methods used in networks

Starting points	Application management	Methodological aspects	Managerial technologies	Managerial tools	Managerial technologies	International managerial aspects	Ethical aspects of management	Social and psychological aspects of management
			Primary	Secondary (digital)				
System approach	Change management	Managerial methods	Primary managerial technologies	Automatic technologies identification	Reporting, Dash boards	Globalization	Corporate social responsibly	General characteristics of managerial work
System theory	Crisis management	Value management	Technologies of effective management of material flows	E-business	Controlling	International management	Business ethics	Profile of managers
Operational research	Process management	EFQM—model of excellence	Technology of ensuring material inputs	E-commerce	Benchmarking	European Union	Managerial ethics	Manager competences
System programming	Quality management	Customer Value Analysis (CVA)	Mass Customization	E-payments	Ranking, rating, benchmarking	Business in the international environment	Corporate culture	Manager authority
System integration	Project management	Customer Value Management (CVM)	Typifying Order to Delivery	E-procurement	Auditing	Transnational companies	Applying ethical principles in business practice	Style of managerial work
	Environmental management	Customer Relationship Management (CRM)	Lean production, lean manufacturing	E-corporation	Due diligence	Managing and decision-making in a multicultural environment	Ethical codex	

	Knowledge management	Key Account Management (KAM)	Just-in-time (JIT)		Outsourcing	Institutional assurance of development of Slovak international management	Ethical (social) audit	
	Logistic management	Activity Based Costing (ABC)	KANBAN system		Outplacement			
	Controlling	Activity Based Management (ABM)	KAIZEN technology of continuous improvement		Teambuilding, coaching			
	Rational management	Balanced Scorecard (BSC)	JIDOKA		Franchising			
		Six sigma	Program 5S		Authorised dealing			
		Theory of Constraints (TOC)	System of guide numbers		Factoring, forfeiting			
		Methods (systems) of managing material flows	Optimized Production Technology		Leasing			
		Supply Chain Management (SCM)	Efficient Consumer Response (ECR)		Selected financial tools of international trade			
		Supply Chain Collaboration (SCC)			Futures, Hedging, option			

(continued)

Table 3 (continued)

Starting points	Application management	Methodological aspects	Managerial technologies	Managerial tools	Managerial technologies	International managerial aspects	Ethical aspects of management	Social and psychological aspects of management
			Primary	Secondary (digital)				
		Public Private Partnership (PPP)	Hub and Spoke (H+S)		Hedging			
			Crossdocking (CD)					

information, for example on product characteristics, the utilization of resources, plans, strategies and so on.

Characteristic features of inter-organizational networks are (Dedina and Odcházel 2007: 166):

- unilateral decision-making and bearing of certain risk related to regular mutual decision-making with transactional partners,
- repeated resource change specific to individual partners,
- mutual expectations of the network members including contractually specified obligations and bilateral expectations are greater,
- longer-lasting social relationships,
- limited or unspecified period of duration determined by set objectives,
- network members share information more intensively, and the range of information is broader,
- negotiation and agreement are the main mechanisms of coordination.

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