Business Collaboration Concepts and Implications for Companies

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Abstract

Purpose – Companies engage in various relationships with external stakeholders to create attractive offerings. The purpose of this study is to describe the most common business collaboration concepts, and compare their characteristics. The concepts are evaluated in terms of their implications for companies, particularly in innovation and NPD collaboration contexts.

Design/Methodology/Approach – This study is based on the literature findings on common business collaboration concepts, analyses of their characteristics, and an evaluation of implications from a company's perspective.

Findings – The main characteristics of business network, business cluster, triple helix, keiretsu, business ecosystem, and innovation hub concepts are identified in terms of members, goals, coordination, boundaries, change dynamism, the nature of relationships, the role of knowledge, and competitors. The key implications for companies with emphasis on innovation and NPD are provided.

Research Limitations/Implications – This research is based only on literature findings and related analyses. Due to the nature of the study, many collaboration concepts are covered, which makes in-depth analysis difficult.

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Practical Implications – This study clarifies the characteristics of most common business collaboration concepts. The key implications for a company include the need for interaction with various external stakeholders to enhance innovation, opportunities and access to important resources, and the need to prepare for network changes.
Originality/Value – While many collaboration concepts are utilized in contemporary business literature, their use in scientific research varies, and the concepts have not been analyzed and compared together yet.
Keywords – Collaboration, innovation, new product development (NPD), research, stakeholder, synergy
Paper Category – Research paper

1. Introduction

Innovation and new product development (NPD) are vital for companies (Chesbrough, 2003; Cooper, 2011). Companies serving global markets cannot survive on their own in today's extremely competitive business environment, and therefore need to engage in relationships with other companies to provide attractive offerings. The potential benefits of partnering include faster access to new markets, asset flexibility, complementary and new competencies, economies of scale, expanded product offerings, improved resource utilization, new technology and products, and risk reduction (Chesbrough, 2003; Meade et al., 1997; Melohn, 1994; Shamdasani and Sheth, 1995). Successful partnering involves commitment, compatible goals, complementary skills, co-operative cultures, trust, and commensurate risk among the parties, whereas the challenges are related to the management of contracting, information, collaboration, resources, NPD, technologies, and globalization (Brouthers et al., 1995; Distanont et al., 2011; Distanont et al., 2013).

Companies cooperate in many ways, and a lot of research has been done on different collaboration models, networking, and related interactions (e.g., Dermol and Breznik, 2012). The simplest form of business to business collaboration is buying products or services from other businesses, while industry collaboration can reach out to different forms of business networks, clusters, ecosystems, innovation hubs, keiretsu, and triple-helix. The typical stakeholders that a company collaborates with in innovation and NPD contexts include customers, suppliers and other partners, competitors, and different institutions, including universities (Belderbos et al., 2004; Un et al., 2010).

The contemporary business literature utilizes many concepts of collaboration. Their usage in scientific research varies and the concepts themselves have not been analyzed and compared together yet. Figure 1 illustrates the popularity of collaboration concepts based on the amount of references found via Google Scholar between 1982 and 2012.

As can be seen in Figure 1, the term business network is the most popular among the collaboration concepts, but this term is often used in conjunction with other collaboration concepts. On the other hand, the business ecosystem and innovation hub concepts have emerged in the academic literature quite recently.

The purpose of this paper is to describe the most common business collaboration concepts and theories. Specifically, the concepts are evaluated in terms of their implications for companies, especially in innovation and NPD collaboration contexts. Accordingly, this paper addresses the following research questions.

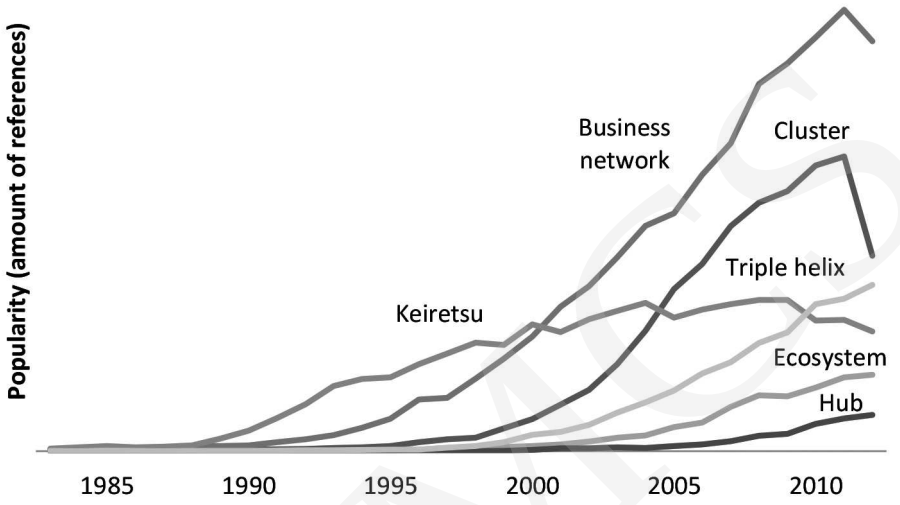

Figure 1: Popularity of collaboration concepts

1. What are the characteristics of common business collaboration concepts?
2. What are the implications of collaboration concepts from a company's perspective?

After the literature review, a summary and discussion of the findings, their implications, and future research directions are presented.

2. Research Process

This paper is based on literature findings and analyses. The research process used in this study is presented in Figure 2.

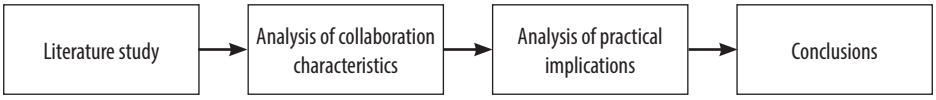

Figure 2: Research process

The research began with a literature review on the common business collaboration concepts. The literature review was conducted to explain the background, nature, reasoning, and logic of each collaboration concept. Second, the researchers analyzed the collaboration concepts, and a table summarizing the characteristics of the concepts was created. Third, the practical implications of the collaboration concepts from a company's point of view were analyzed. After the analyses, final conclusions were made.

3. Collaboration Concepts

3.1. Business Networks

The term network has been used in various contexts, such as sociology, ecology and communication. In academic research, the concept of business networks started to emerge in the mid-1980s. The concept focuses on understanding the relationships between organizations (Halinen and Törnroos, 1998).

A network can be defined as an abstract of a structure in which there are a number of nodes that are connected via specific threads (Håkansson and Ford, 2002). In a business network context, nodes can be seen as businesses or business units, and threads as the relationships between them, with both simple and complicated interactions taking place on several levels and in various ways (Håkansson, 1997). Networks can also be considered as consisting of actors that control resources and perform activities: a company is dependent on resources controlled by others, and access to resources is achieved by forming relationships with other actors, creating interdependency between the actors and their relationships in the network (Håkansson and Snehota, 1989). Business networks are "structures of inter-firm relationships that emerge and evolve through continuous interactive processes" (Halinen and Törnroos, 1998).

Business networks contain complex and systemic interdependent webs of relationships where companies and managers operate (Henneberg et al., 2010). Companies may have different types of relationships with each other simultaneously. For example, the same company can be a software supplier to a bank, the bank's partner in a common venture, a customer of the bank's services, and a competitor with competing services (Ford, 1998). Another example is the relationship between Samsung and Apple; the companies cooperate in component supply, but compete fiercely in the consumer electronics market. In recent years, business networks have expanded due to industrial restructurings, vertical disaggregation, outsourcing, and a strategic drive to focus on core competencies (Batt and Purchase, 2004). Lifecycle position can also drive strategy change (Isoherranen and Kess, 2011), thus contributing to changes in business networks.

Companies pursue collaboration with other network players to achieve their goals, and to create value for their stakeholders (Batt and Purchase, 2004). A firm's position in a network depends on the nature of the direct and indirect relationships the company creates, maintains and executes in the network. It is claimed that companies are as much a product of their network positions and roles as their strategy or management actions (Håkansson and Ford, 2002). No clear borders exist that mark and define the business network; the networks change over time, and can be intertwined and highly complex. Changes in the network are driven by a company's internal factors, their interactions in their relationships, and outside developments, such as advances in technology (Håkansson and Snehota, 1995).

3.2. Business Clusters

Most industrialized nations have adopted regional development programs designed to encourage industrial and economic development (Athiyaman, 2009). Clusters can be viewed as geographical concentrations of interconnected firms and institutions in

a certain field, and the idea of clusters suggests that regions should identify and develop their existing regional competitive advantage (Porter, 1998; Porter, 2000). A business cluster, also known as an industry or competitive cluster, can enhance regional economic growth and income, increase company productivity, drive innovation, and stimulate new businesses (Barkley and Henry, 1997; Porter, 1990).

Clusters have a long history. For instance, Jingdezhen, China, has pottery and porcelain production clusters with a history of more than 1400 years (Han, 2009). There are also numerous examples of industry clusters in developed countries, such as Silicon Valley and the German automotive industry. Types of clusters include geographic, sectoral, horizontal, vertical, high-tech, historic know-how-based, factor endowment, low-cost manufacturing and knowledge services (Wikipedia, 2013). Clusters may extend downstream to customers and channels, and laterally to producers of complementarities. Linkages and complementarities across industries and institutions most relevant to the competition define cluster boundaries; geographical location is still important, but its value is decreasing (Porter, 1998).

The lifecycle of clusters contains birth, evolution, and decline (Porter, 1998). In addition, industry status affects firms' order-of-entry into a cluster. During the introductory phase, cooperation will mostly focus on product innovation and development. The evolution of industry standards directs firms' attention to the production process, and firms with manufacturing skills enter the industry. A firm with marketing skills is typically a late entrant into a cluster, since the mature stage requires focusing on niche segments (Athiyaman, 2009; Robinson et al., 1992).

A viable cluster can help a company in any industry to compete in better ways, and use the best skills and technologies available (Porter, 1998). Clusters can be evaluated based on the benefits they provide, including knowledge, skills, and R&D capacity, innovation capabilities, access to employees and suppliers, capital availability, access to service providers, networking benefits, access to specialized information, and shared vision and leadership (Porter, 1998; Rosenfeld, 1997). Besides the benefits, concerns regarding clusters include the risks of overspecialization and isolation, the dominance of branch plants that may abandon the cluster in search of lower production costs, and neglecting rural areas (Rosenfeld, 1997). Finally, the implications of clusters for companies include choosing the best locations, engaging locally, enhancing their cluster, and working collectively (Porter, 1998).

3.3. Triple Helix

The development of triple helix interaction emerged after the 1850s, but labeling it as consisting of university-industry-government collaboration has happened in recent years (Leydesdorff, 2000). The increased power of knowledge and research has opened a third mission for universities in addition to research and teaching: the role of economic development (Etkowitz and Leydesdorff, 2000).

In a triple helix, academia, industry and government form three helices that interact, overlap, and are in constant transition, accelerating innovation as well as creating new organizations and institutions, such as incubators and venture capitalists (Etkowitz and Leydesdorff, 1997). New research agendas are created at collaborative research centers

that can also be virtual (Leydesdorff, 2000). It is claimed that a university can have an enhanced role in knowledge-based innovation societies, and universities can attempt to capitalize the knowledge they produce, implying a new mode of knowledge production (Etkowitz and Leydesdorff, 2000; Gibbons et al., 1994).

In triple helix innovation, academia, government and industry cooperation is integrated, and a common mission is typically driven by government. Cooperation includes collaborative funding, R&D and commercialization processes. A triple helix creates a knowledge infrastructure where institutional spheres overlap, roles mix, and hybrid organizations, such as incubators and science parks, emerge at the interfaces (Etkowitz and Leydesdorff, 2000; Rodrigues and Melo, 2011). A triple helix is not stable, and three constant transitions exist: the coevolution of scientific research and product development; cross-fertilization from the interaction between the different academic disciplines and industries; and public policy, which aims to facilitate technology transfer (Rodrigues and Melo, 2011).

A national innovation system is characterized by the interactions between universities, industries, and government to enhance innovation (Mok, 2012). Most countries and regions are trying to achieve an innovation environment that includes university spin-offs, initiatives for knowledge-based economic development, strategic alliances between companies, government laboratories, and academic research groups. Government facilitation includes setting new rules, direct or indirect financial support, acts like the US Bayh-Dole Act, or creating new foundations (Etkowitz and Leydesdorff, 2000). The following indicators can be taken as input when evaluating the efficiency of a regional innovation system: university (e.g., the number of universities), industry (e.g., the rate of personnel engaged in R&D activities), and government (e.g., the rate of science and technology spending). The output indicators include, for example, granted patents and per capita GDP. The internal transformation of each helix, how they affect each other, and the emergence of new actors should also be evaluated (Liu et al., 2011). The city of Amsterdam provides an example of adopting a regional triple helix model for economic development (Leydesdorff, 2012).

3.4. Keiretsu

Six horizontal keiretsu networks have dominated Japanese industries. Mitsui, Mitsubishi, and Sumitomo originate from a pre-World War II zaibatsu (monopoly), whereas Dai Ichi Kango, Fuyo, and Sanyo developed around major banks in the post-war period. At the beginning of this century, Sumitomo and Mitsui merged into Sumitomo Mitsui Banking Corporation, and Sanyo became part of the Bank of Tokyo Mitsubishi group. Horizontal keiretsu are complemented with vertical keiretsu, which typically form around a large industrial company, such as Toyota (McGuire and Dow, 2009).

A keiretsu can be viewed as a network organization, containing a group of nodes and their relationships, which has a common purpose and will to cooperate (Tagawa et al., 2012). Keiretsu relationships do not fit directly into market or hierarchy categories, and their transactions differ from the typical market mechanisms. The Japanese competitive advantage in complex products is argued to come partly from value chain governance; instead of markets (arm's-length relationships) and hierarchies (vertical integration),

Japanese firms rely mainly on hybrid governance or strategic alliances. The value chain is very specialized, information sharing is high, and coordination is effective, which result in improved learning and product development (Dyer, 1996).

Keiretsu can also be viewed as a power-dependence system, where powerful members can emphasize growth, while others are subject to monitoring and focusing on profitability (Kim et al., 2004). Keiretsu has evolving boundaries, multiple and embedded ties, and a complex structure. Keiretsu are divided into vertical and horizontal keiretsu, but these two often overlap (McGuire and Dow, 2009). Horizontal keiretsu ties include lending, equity, and personnel ties, which result in an intertwined financial stakeholder network. Horizontal keiretsu provide access to stable financing, insulation from market pressures, reduced risks, information sharing, and mutual assistance. The criticisms include higher borrowing costs, over-investment, and poor performance (Dyer, 1996; Lincoln et al., 1996; McGuire and Dow, 2009).

Vertical keiretsu have a clear control structure with a core manufacturer and key suppliers at the network's center. Shareholdings are asymmetric, and suppliers may have just a small amount of holdings in primary companies. Vertical keiretsu provide supervision by the core firm, increased coordination, long-term orientation, reduced governance issues, lower transaction costs, assistance, innovation encouragement, lower costs, and better performance. Downsides include a limited scope of customers, the inability to change suppliers for standard products, limited innovation driven by the needs of the core firm, and the tunneling of profits (Dyer, 1996; Lincoln et al., 1996; McGuire and Dow, 2009).

Most Japanese suppliers cooperate with customers, but only affiliated suppliers (kankei kaisha) belong to keiretsu. The parent company typically has a minority share of the kankei kaisha, and transfers senior executives (yakuin) to work at the supplier. The kankei kaisha usually sell most of their production to the affiliated customer, whereas independent suppliers (dokuritsu kaisha), such as Bridgestone, have many customers (Dyer, 1996).

In some cases, keiretsu governance modes change from traditional toward arm's-length contracting and top-down administration. For instance, the standardization trend in the auto industry has reduced the need for keiretsu governance, and globalization and economic weakness have also made Japanese firms question their business practices (Ahmadjian and Lincoln, 2001). In spite of recent changes, keiretsu continue to be important in Japanese OEM-supplier relationships (Aoki, 2008). The recent evolution has been characterized by decreases in debts and cross-holdings, reduced buyer-supplier ties in vertical keiretsu, and fewer board and personnel exchanges (McGuire and Dow, 2009).

3.5. Business Ecosystem

An ecosystem is typically considered to be a biological system. Ecosystem analogies include industrial ecosystems, the economy as an ecosystem, digital business ecosystems, social ecosystems and business ecosystems (Peltoniemi and Vuori, 2004). Today, the boundaries between a company and its stakeholders, such as customers, suppliers, and partners, have become more flexible, and new market mechanisms and intermediaries

are emerging (Purdy et al., 2012). The concept of the business ecosystem was first presented by Moore (1993), who utilized many ecological metaphors.

The logic in ecosystem thinking is that companies must proactively develop mutually beneficial relationships with customers, suppliers, and competitors (Iansiti and Levien, 2004). A business ecosystem is "an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world" (Moore, 1996). The economic community produces goods and services for the ecosystem members (customers). Other organisms include the suppliers, lead producers, competitors, and stakeholders. The companies coevolve capabilities around a new innovation: they cooperate and compete to support new products, satisfy customer needs, and finally build succeeding innovations. Other players adjust to the rules set by the lead players. The leaders can change, but the community values the role of the leader, which enables the members to move toward a shared future and benefits (Moore, 1993; Moore, 1996).

Business ecosystems can also be defined as "loose networks – of suppliers, distributors, outsourcing firms, makers of related products or services, technology providers, and a host of other organizations – that affect, and are affected by, the creation and delivery of a company's own offerings" (Iansiti and Levien, 2004). A business ecosystem has a dynamic structure containing a population of interconnected, competing and cooperating organizations: companies, universities, research centers, public sector organizations and other parties that influence the system (Peltoniemi and Vuori, 2004). In addition to competitive forces, constraints are set by regulators, standard-setting bodies, laws, social norms, and business ethics; the rules in the ecosystem result from the coevolution and interactions between the participants (Teece, 2007).

A business ecosystem should be self-sustaining and develop through self-organization, emergence and coevolution, which results in adaptability (Iansiti and Levien, 2004; Peltoniemi and Vuori, 2004). Ecosystems develop in four stages: birth, expansion, leadership, and self-renewal or death. Three self-renewal approaches or combinations can be used: dominant companies can try to slow the growth of a new ecosystem; they may attempt to blend new innovations into their own ecosystem; or a fundamental restructuring takes place (Moore, 1993). Each member of a business ecosystem shares the destiny of the network, and therefore, companies, such as Wal-Mart and Microsoft, create platforms for other ecosystem members to benefit from (Iansiti and Levien, 2004). Some companies participate in multiple ecosystems; for example, Samsung uses the Google and Microsoft platforms, and has also developed their own smartphone platform.

Business ecosystems can also be described via participating actors' business models (Kinnunen et al., 2013). The key questions for managers to consider include, for example, examining supplier and partner relationships that a company and competitors have, how to maintain bargaining power and autonomy, what promising new ideas exist, what new innovations could make current business obsolete, what would be required to catalyze ideas into a new and vital ecosystem, and what type of community is required to bring these ideas to the widest market (Moore, 1993). An ecosystem's health can be assessed by three measures: productivity (return on invested capital), robustness (capability to survive disruptions), and niche creation (capacity to increase diversity) (Iansiti and Levien, 2004).

3.6. Innovation Hub

Innovation hub thinking is based on the recent changes and trends in the business environments where companies operate. Instead of dominance by a single company, systems consisting of a nodal network of firms, individual consumers, and consumer communities work together to create value (Prahalad and Ramaswamy, 2004). Knowledge is distributed among many players, and companies are encouraged to take advantage of the available information, use others' ideas, and even allow others to use theirs (Chesbrough, 2003). Local uncoordinated innovation activities, regional programs, and technology parks have claimed to be evolving towards global innovation hubs (Launonen and Viitanen, 2011).

An innovation hub can be seen as the central location in a region where innovations occur, such as Zhangjiang Hi-Tech Park Pudong in China, Sophia Antipolis in France, and Silicon Valley in the US (Launonen and Viitanen, 2011). For innovations to take place, the necessary conditions must be developed (Trott, 2012). Three necessary conditions enable innovation hubs. First, the required steps of an innovation continuum must exist, including, for example, basic research, idea funneling, "angels" willing to invest, talented people, and capital. Second, the initial size of the innovation hub must exceed the critical size, and the activation barrier for nucleation must be overcome. Third, the nucleation rate must exceed the rate at which talent and ideas diffuse away from the region (Suh, 2010).

The creation of an innovation hub can be accelerated by different types of programs, organizational forms, and boundary-spanning roles among educational, private, and public domains. Network-based approaches, entrepreneurial development including sufficient venture capital, and innovation system leadership are also important (Youtie and Shapira, 2008). An innovation hub framework consists of three, partly overlapping, elements: 1) public policy activities, including innovation policy, hub infrastructure and service structures, and education and training; 2) public-private partnerships (PPP)-driven activities consisting of comprehensive R&D systems, cluster policies and programs, test-beds and living labs, and incubation environments; and 3) company-driven activities, such as the creation of successful start-ups and small and medium-sized enterprises (SME) growth, and dynamic anchor companies that enable access and growth. For instance, besides other necessary elements, the Sophia Antipolis innovation hub hosts a number of domestic and global anchor companies, including France Telecom, Texas Instruments and Toyota (Launonen and Viitanen, 2011).

Innovation hubs require a strong educational infrastructure with world-class universities providing new ideas via basic research and technology innovation. Government policy must enable supporting activities, including, for example, incentives for basic research and venture capital. Finally, the flow of ideas and people from other regions is needed, and innovators should be encouraged to stay in the region by offering a high quality of life (Suh, 2010).

4. Discussion

4.1. Main Characteristics of Business Collaboration Concepts

The business collaboration concepts were evaluated in terms of their members, goals, coordination, boundaries, change dynamism, the nature of relationships, the role of

knowledge, and competitors. The evaluation criteria were selected based on the key literature findings for each collaboration concept. The main characteristics of these business collaboration concepts are presented in Table 1 below.

As can be seen in Table 1, most collaboration concepts involve companies and different types of private and public institutions. The exceptions are business network and keiretsu, which mainly involve companies. On the other hand, the triple helix is clearly defined as consisting of university-industry-government collaboration. The need for collaboration among universities, administration, and businesses including companies and financial institutions is also emphasized especially in innovation hub concept. Figure 3 illustrates the cooperation among universities, administration, and businesses.

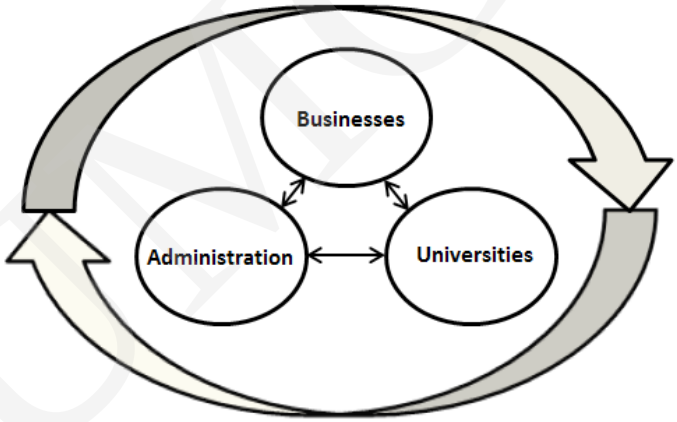

Figure 3.: Innovation through cooperation among businesses, administration, and universities

All of the collaboration concepts, except for the business network, emphasize the importance of shared goals. The same applies to common coordination. However, significant differences exist in the responsibility for common coordination. In the business cluster, coordination is typically enhanced by the government to support economic growth in the region. On the other hand, a platform provider or lead company primarily sets the rules in the business ecosystem. In the innovation hub concept, integrated coordination by a core hub organization is proposed. Keiretsu, in turn, relies on either hybrid governance (horizontal) or control by the core member (vertical). In the triple helix, the government is primarily responsible for coordination.

Differences exist in the boundaries of the collaboration concepts as well. It is hard to define clear boundaries for business networks and business ecosystems, and geographical location is typically not relevant. Geographical location is important for other business collaboration concepts, but connections to global networks are increasingly emphasized. Keiretsu is mainly relevant in Japan, but its effects must also be acknowledged in other regions, since many keiretsu companies operate in export markets.

The dynamism of change in the business cluster is a search for growth through competitive advantage. The business ecosystem, in turn, forms around an innovation, and coevolution starts to take place. Changes in business networks are driven by

	Business cluster	Business ecosystem	Business network	Innovation hub	Keiretsu	Triple helix
Type of members	Companies and institutions	Companies and institutions	Companies	Companies and institutions	Companies	Universities, companies, governments
Shared goal	Yes	Yes	No	Yes	Yes	Yes
Common coordination	Enhanced by government	Rules set by the platform provider	No	Integrated coordination critical for success	Hybrid governance (horizontal), control by the core member (vertical)	Integrated coordination, rules set by the government
Boundaries	Mainly geographical	No clear boundaries	No clear boundaries	Local but needs global connection	National (Japan), evolving boundaries	Local, national
Change dynamism	Growth	Innovation and coevolution	Interactions, company internal factors, and outside developments	Innovation through cooperation and transfer of individuals	Joint learning, industry and market changes	Interactions and transitions create new innovations and organizations
Nature of relationships	Driven by member needs but seek collective benefits	Cooperation and competition to survive	Relationships are formed to achieve goals and create value	Cooperation to create global competitiveness	Long-term cooperation with debts, cross-holdings, and personnel exchanges	Collaborative funding, research, and innovation processes
Role of knowledge	Important	Important	A resource	Critical	Important	Indispensable
Competitors	Other clusters	Competing and new ecosystems	Other networks	Rival hubs	Other supply networks	Other countries and regions

Table 1: Characteristics of collaboration concepts

interactions, company internal factors, and external developments, such as new technology. Innovation hubs aim for new innovations through integrated cooperation among members, and the transfer of individuals between organizations is seen as an important factor that boosts innovations. Changes in keiretsu are driven by innovation through joint learning, as well as by industry and market changes. On the other hand, the constant interactions and transitions in the helices of the triple helix lead to innovations and the emergence of new organizations.

The types of relationships differ among the collaboration concepts. The business cluster members enter relationships based on their needs, but seek collective benefits. In the business ecosystem, constant cooperation and competition exist. Actors in the business network, in turn, form relationships to achieve their goals and create value for the different stakeholders. In the innovation hub, cooperation is necessary to create and sustain global competitiveness. Keiretsu aims for long-term cooperation that is supported by financial arrangements and personnel exchanges, whereas the triple helix involves collaborative funding, research and innovation processes among universities, industry and government.

The role of knowledge can be considered important in all of the collaboration concepts, although in the business network it can be labeled as a resource among others. The innovation hub and triple helix emphasize the role of knowledge more than the other collaboration concepts. Competition exists inside the collaboration networks, but the main competitors are outside clusters, ecosystems, networks, hubs, keiretsu and triple helices in other countries and regions.

4.2. Implications for Companies

4.2.1. Interacting with stakeholders for innovation

Besides the main characteristics of each business collaboration concept, the practical implications from a company's point of view are considered. First, the concept of innovation must be defined. Innovation and new product development (NPD) entwine, but are not equivalent. Innovation includes the management of all activities involved in creating new or improved products or processes, and innovation management aims to create the needed conditions for innovations to occur (Myers and Marquis, 1969; Trott, 2012). NPD is part of innovation management, and transforms market opportunities into the production, sale, and delivery of new products (Krishnan and Ulrich, 2001; Ulrich and Eppinger, 2012). Innovation is driven by various factors, including, for example, a company's external environment, strategy, culture, and foresight. Based on the evaluation of the business collaboration concepts, it can be argued that the main driver for innovation in each concept is the interaction between different stakeholders.

Stakeholders are groups or individuals who can influence or are influenced by the company's objectives or, narrowly defined, have direct relevance to the company's core economic interests (Freeman, 1984; Mitchell et al., 1997). External stakeholders are not formal organization members, but can still affect or be affected by the organization (Aaltonen and Kujala, 2010; Mitchell et al., 1997). A company's various external stakeholders can be identified in the collaboration concepts. These stakeholders include customers, communities, suppliers, partners, competitors, providers of complementary offerings, universities, research

institutes, government, regulators, and capital providers. Also, new types of organizations, for example, incubation environments, can be included in the company's stakeholders. Stakeholders typically have conflicting interests in the business, and these questions are addressed in the stakeholder salience literature (e.g., Mitchell et al., 1997).

In particular, the business ecosystem, innovation hub, and triple helix concepts highlight innovation driven by constant interaction between stakeholders. Keiretsu, in turn, promotes incremental innovation through information sharing and joint problem solving. In keiretsu, radical innovation may be limited, since innovation is typically driven by the needs of a single customer. The role of innovation in the business ecosystem is evident in every stage of the lifecycle: the birth of the ecosystem forms around a new innovation, incremental innovations enable growth, and renewal or death is caused by a new innovation. In the triple helix concept, universities are assumed to create commercially viable ideas that companies can benefit from.

Companies should embrace interactions in order to develop new innovations. However, a company most likely cannot interact with all external stakeholders due to insufficient resources, and therefore prioritization is needed. In addition, trust remains a challenge; i.e., how openly can a company share its ideas with others? Finally, while external drivers for innovation are important, a company also needs internal drive to create truly radical innovations.

4.2.2. Access and opportunities through collaboration

Business collaboration enables growth by providing companies with access to customers and markets in the network, which can also have global connections. Customer and market access is emphasized, especially in the business cluster and innovation hub concepts. On the other hand, from a member company's perspective, the leader's success in the business ecosystem provides opportunities for specialization and niche creation, and enables growth. Moreover, opportunities and benefits related to specialization are important in all of the business collaboration concepts. However, from a company's perspective, specialization is also a big risk, especially if there is dependence on a single or a few customers.

Business collaboration provides access to many important resources, including knowledge, employees, and suppliers. A network makes it easier for a company to partner with other companies, universities, and institutions, because synergies evidently exist. Furthermore, a company may benefit from both private and public capital, funding, and support that are typically directed at focused business and geographical areas. Focused investments enable high-class education, infrastructure, and supporting services that are needed for the long-term success of a company. Coordination, either by public or private parties, may bring common benefits, and coordinated efforts can increase the chance of a company's success.

4.2.3. Impact of changes in the network

Based on business ecosystem thinking, each member shares the destiny of the whole network. Thus, companies should also monitor innovations and changes taking place

outside their current network. A recent example illustrates the speed and effects of ecosystem change. Former mobile phone market leader Nokia used to develop their own smartphone software platforms, and aimed to create a healthy ecosystem around them. However, Nokia's smartphone market share started to go down, and in 2011 Nokia's management concluded that the company could not remain competitive with their own ecosystem. Nokia allied with Microsoft to create "the 3rd ecosystem" in order to compete with Google and Apple, and they stopped developing their own smartphone platforms. As a consequence, tens of thousands of people were laid off and a huge structural change in the ICT industry in Finland began. The speed of change, i.e., the death of Nokia's own smartphone ecosystem, was also much faster than anticipated, which made it difficult for many ecosystem members to capitalize on their investments. Big changes can take place in a network when a dominant company changes its strategy or transfers its operations to another geographical location.

4.2.4. Final remarks and considerations

A network-based business environment poses new challenges for companies. Willing or not, a company is always part of a network or business system, since a company simply cannot exist without relationships. The questions that companies need to consider include how to choose the right networks and relationships to enter in to, how to ensure profitability with intense competition in the network, how to sustain autonomy, what type of new competition may enter the network, what alternative plan can be enacted if a rival or new network outcompetes the current network, and when to leave the network. Despite the many potential benefits of collaboration, including enhanced innovation opportunities, the practical challenges related to managing collaborations must also be tackled. These include managing win-win situations, information sharing, commitment and trust, and cultural issues.

The key points from a company's point of view include the following. First of all, a company must also look beyond the immediate external stakeholders, and embrace interaction with various parties to enhance innovation. In addition, as the roles of network members are blurring, defining and understanding customers and their needs is becoming increasingly challenging. Companies must look beyond their immediate customers to enable new innovations and value for the final customers in the network. Second, despite the obvious benefits of networking, it is impossible to interact with all external stakeholders, and the interaction is not always beneficial. Prioritization and networking skills are needed to gain the benefits and avoid the risks involved in interaction. Finally, understanding the big picture is needed, because the changes that can occur in the network can rewrite the rules of competition in the market.

5. Conclusions

Collaboration and innovation activities are critical in today's business. Companies engage in many types of relationships with external stakeholders to create attractive offerings in increasingly global markets. While partnering provides obvious benefits, challenges also persist. The present-day business literature utilizes different collaboration

concepts in numerous ways, but the concepts have not yet been analyzed and compared to each other. This paper describes the most common business collaboration concepts and theories, and evaluates their implications for companies with emphasis on innovation and NPD contexts.

The results describe the main characteristics of the business network, business cluster, triple helix, keiretsu, business ecosystem, and innovation hub concepts (Table 1). The concepts have both similarities and differences in terms of members, goals, coordination, boundaries, change dynamism, the nature of relationships, the role of knowledge, and competitors.

For a company, the key implications of these collaboration concepts include interaction opportunities with various external stakeholders to enhance innovation. These stakeholders include customers, communities, suppliers, partners, competitors, providers of complementary offerings, universities, research institutes, government, regulators, capital, and new types of parties, such as incubation environments. In addition, while collaboration provides opportunities and access to many important resources, it requires the careful prioritization of interactions and networking skills, and preparing for changes that may have substantial impacts on the network.

One of the limitations of this study is the sole use of a literature-based research method. In addition, due to the nature of the study, many collaboration concepts are covered, making in-depth analysis difficult. Recommended future study, besides addressing these limitations, could include empirical studies to test the findings, and research on suitable strategies for different type of collaborations. In addition, as network member roles are currently blurring, defining and understanding the network's stakeholders and customers, and their needs deserves more attention. Finally, whole innovation systems could be analyzed from different perspectives. This could include local innovation platform, micro- and macro-level business network, and industry segment focused views.

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