INDUSTRY CONVERGENCE AND BUSINESS NETWORKS IN THE TELECOMMUNICATIONS SECTOR – A THEORETICAL APPROACH

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Abstract

The telecommunications sector is today characterized by turbulent markets, rapid technological development and intense competition. Another not widely known characteristic is convergence – the merging or moving together towards one common point. Research shows that e.g. the telecommunications industry is converging with the media and information technology industries, a process which *per se* can be referred to as industry convergence. Other convergence processes also exist and their driver lies in technology and technological convergence, but the paper concentrates on analysing industry convergence from a business network perspective. The fact that firms from previously adjacent industries are crossing industry borders in search of business opportunities also affects existing, established business networks. Therefore, the paper explores the notion of industry convergence and its link to business networks, especially strategic and emerging networks in telecommunications from a theoretical point of view. The paper asks questions whether it is possible to strengthen an actor's position on an emerging market via strategic networks and whether actors may impede or restrict the process of industry convergence through strategic networks. The issue of industry convergence therefore poses implications not only concerning how the telecommunications industry will develop, but also concerning how business networks change and develop in a converged environment.

Key words: industry convergence, telecommunications, strategic networks, emerging networks

Introduction

Business networks have been explored and researched already for a longer period of time. There is little we do not know about how networks emerge, how they develop and how relationships between actors are structured and evaluated. However, there are several abstract factors that affect the development and outline of the networks, which deserve more attention in academic research. For instance, the rapid pace in technology development in most industries puts strains on existing actors. Technology is often seen as the prime driver of change in various settings. For instance, crossing over industry boundaries is becoming more and more self-evident for modern companies, which aim at providing mostly bundled services to their customers. What these border-crossing companies in most cases fail to recognize is the mechanism, or driver, behind their activities and search for more lucrative markets. Telecommunications companies, for instance, are increasingly driven by technological development and enhancement, which leads them to previously adjacent industries and markets and vice versa, i.e. companies separate from the telecommunications industry seek to enter based on technological improvements. The telecommunications market is in a process of development and change due to different internal (consumer demand, competition, pursuit of value creation) as well as external factors (technological convergence, liberalization, globalization). The players (or actors) are seeking their places and trying to position themselves on the market through e.g. extensive networking and co-operation. This process of seeking strategic positions and business opportunities is affecting the value-creating processes within the networks as well as the structure of the core networks which exist in the telecommunications sector. New entrants are changing the structure of business networks as the actors and their activities change over time. A single member entering, positioning, repositioning or exiting from the network causes change to the entire network.

During the past decades technology has undergone a fundamental change regarding communications, which has lead to a convergence of three areas, namely *information technology*, *media* and *telecommunications*. These areas are converging into one single area or one unified market. Some also include the broadcasting sector as a converging area to telecommunications. The effects of convergence of telecommunications and computing technologies was detected already in the 1970s (see e.g. Gaines, 1998), but began to have a major social and commercial impact only in the 1990s. There are several different typologies and classification of convergence and depending on the way the concept is defined it implies different meanings. In this paper, convergence is narrowed down to industry convergence. One of the current issues on the telecommunications market is that it is, and has been for a long time, in a period of transition. Industry boundaries are blurred, due to various factors, and actors find themselves crossing over the old boundaries and serving previously adjacent industries.

In the light of this context, this paper examines business networks in the telecommunications sector. The aim of this study is to explore *whether industry convergence affects business networks in the telecommunications industry*, analyzed from a theoretical point of view. It is possible, on the other hand, that business networks indeed are the ones causing industry convergence to take place, as actors co-operate more frequently than before in order to create value and access resources and capabilities. The paper is conceptual and theoretical, focusing on business networks in a telecommunications setting, which in one way or another is affected by industry convergence. The study will not limit itself to any particular geographical or national telecommunications industry or market. Rather, the aim is to explore the issue of industry convergence and its link to business networks in this given context. This is carried out through analysis of secondary data, i.e. the paper is solely theoretical and explores the link between industry convergence and business networks in the forms of strategic networks as well as emerging networks. Therefore, the theories used in the paper concern industry convergence theories and strategic network theory and combines these two in a proposition: *strategic networks (will) play an important role in the industry convergence process and actors' wish to master the markets of telecommunications*. Business networks are bound to be affected by convergence processes, which are increasingly being identified in the telecommunications sector. Technological developments have lead to companies from separate industries sharing technology (and knowledge) bases and hence coming to compete and, perhaps, co-operate with each other.

Strategic and emerging business networks

In the industrial network approach, both sellers and buyers are seen as active partners, and they seek to explore different benefits from, in essence, various economic exchanges. Most firms are dependent on distributors and suppliers for goods and services, since companies have only limited sets of resources by their own, and the firms resources can often be changed rather slowly and at considerable cost. Therefore companies must develop relationships with other actors to enhance their own resources and to gain the benefit of those others. As a consequence of this interaction with other actors, the companies will be bound together by *actors*, *resources* and *activities* creating high interdependency between them (Håkansson & Snehota, 1995). Different actors in the industrial system carry out activities and control resources. When actors perform activities, they use (change or exchange) resources. Activities are linked in activity chains and resources are tied to activities as means used by actors when they perform activities.

These issues constitute the basis of the network approach. However, industrial networks have been researched from a variety of perspectives. A complementary view on networks is that of strategic networks (Jarillo, 1998; Gulati, Nohria & Zaheer, 2000; Möller & Rajala, 2001). Considering strategic networks allows us to understand industry structure in a more refined way since industry participants can be seen as embedded in networks of resources, information and other flows. Strategic networks are *intentional* with strategic objectives, and the density, multiplicity and reciprocity of inter-organisational ties distinguish strategic networks from more evolutionary network forms. Strategic networks potentially provide a firm with access to information, resources, markets and technologies (Gulati et al., 2000). Such networks can influence the nature of competition in the industry. Strategic networks also play an important role when it comes to entry into a specific industry, as networks may serve as entry barriers for firms trying to enter the industry. A strategic network may impede the movement of firms within an industry as well as firms entering an industry. Thus, networks can serve as a source of both opportunity and constraint (Gulati & Nohria, 2000). The notion of strategic networks depicts that strategic business networks are *intentionally* developed and managed networks (Möller & Svahn 2003). As Möller and Rajala (2001) point out, strategic business networks pursuit *strategic* business goals that are shared and mutually beneficial among the network members. The members of a strategic business network also have a mutual understanding of which organizations belong and do not belong to the network. In other words, the network should have clear boundaries. Also, a strategic business network often has one or several key players. These assume a more visible role in developing and managing the network; but it does not necessarily mean that the key player(s) would possess total control of the network.

The most important aspect of strategic networks is that of being intentionally developed. In the case of emergent or emerging networks, these networks rise due to changes in industry structure, the rise of new markets and niches, etc. They play a vital role in the telecommunications sector, as the sector is characterized by rapid development. Players are constantly changing and the fact that new players enter the markets and compete with the same technical bases as the incumbents, shows that the sector is in a turbulent situation, where the market scene changes rapidly. In such an industry it is impossible to separate emerging networks from the research context, as new players seek their positions both on the market and in business networks. It can easily be assumed that technology plays a vital role in the emergence of networks in the telecommunications sector. Lundgren (1995) shows that new industrial networks emerge carrying new technological systems and new networks of exchange relationships. This does not necessarily mean that these networks are new. They can constitute a re-organization of an earlier state of the network including some novel elements.

Möller and Svahn (2003) have distinguished between three types of networks or value systems as the authors call them, namely (1) stable, well-defined value systems, (2) established value systems with incremental improvements and (3) emerging value systems with radical changes. In this context the third alternative value system or network is of relevance. Svahn (2004) notes, that emerging networks are characterized by a search for innovations and new business opportunities. The emergence of networks is characterized by uncertainty and radical changes in the field. Such an uncertainty is able to create business opportunities, but the actors must however be able to sense and “structurize” it. Möller and Svahn (2003) furthermore suggest that actors in emerging nets try to provide services in new ways, which

may lead to radical changes in value activities. Möller, Rajala and Svahn (2005) point out that emerging value systems are created in order to develop and commercialize new technologies, products or business concepts through these nets. This predominantly has implications for the way a network is structured and developed over time.

These emerging networks might even be equivalent to strategic networks, at least in theory. Actors in the telecommunications sector engage in activities in such networks that will provide them with some kind of benefit, whether it is access to infrastructure, technology or new target groups. The focus in telecommunications is heading toward offering bundled services, i.e. one provider is able to offer fixed telephony, mobile telephony, broadband access and cable TV in one and the same subscription (For instance, France Telecom has launched a so-called triple play offer including TV, ADSL and VoIP in the same subscription and is more or less a pioneer in bundling services in this way.). This inevitably affects the way actors compete and co-operate and foremost to whom their relationships are established. Who can provide one actor with all the necessary equipment, infrastructure planning and implementation as well as capacity – and still have a large customer base which leads to profitable outcomes?

Industry convergence and its potential consequences for business networks

Technological convergence is very often defined as the process by which hitherto different industrial sectors come to share a common knowledge and technological base (Athreye & Keeble, 2000; Fai & Tunzelmann, 2001; Gaines, 1998; Lind, 2004). Choi and Valikangas (2001) similarly present convergence as the blurring of boundaries between industries by the convergence of value propositions, technologies and markets. This definition indicates that the authors see technological convergence as equal to *industry* convergence. Porter mentioned this process already in 1985 (p. 100) by arguing that "in industries such as financial services, computers and *telecommunications* (my highlight), technological change is blurring industry boundaries and folding whole industries together". Technological convergence (or industry convergence) is referred to as a concept, which is used to link industrial sectors due to the commonality in their technological (and thus knowledge) bases, even though from a consumption point of view the industries may seem unrelated. The concept of industry convergence is some times used to characterize industrial dynamics in the new digital economy (Katz, 1996). Technological convergence has implied rapid redefinition of industry boundaries and the boundary effect has received much attention in economic research. Both Porter (1985) and Hamel and Prahalad (1994) argue that technological innovations are capable of changing the boundaries of traditional industries. Fai and von Tunzelmann (2001) point out that as time progresses industries move out of technological fields, which in previous time periods were of big importance, into other areas which are important in a later period of time. This might also explain the rich variation in actors on the telecommunications market, as incumbent operators are competing heavily with new entrants. In fact, Gaines (1998) noted that convergence is promoting a trend towards vertically integrated companies and alliances.

Gerum, Sjurts and Stieglitz (2004) indicate that industry convergence is an important concept if one seeks to understand technology and product evolution in general. Stieglitz (2004) has categorized industry convergence in four types. These types differ in their impact on industry dynamics and business strategy. Technologically convergent industries produce different goods and services, but still use similar technological competences. Stieglitz differs between two generic types of technological convergence. The first type encompasses new technologies replacing distinct technologies in established industries. This is referred to as industry convergence by *technology substitution*. The second type of technological convergence occurs when various technologies, which were previously associated with different industries, are integrated or fused together. This gives rise to entirely new markets according to Stieglitz's research and is referred to as *technology integration*. The second dimension of Stieglitz industry convergence model encompasses product-based convergence. An established product from one industry evolves into integrating product features similar to those of another product in a different industry. This *product substitution* is pursued by firms who want to expand their established products with new features from other industries. Hence, they create hybrid products based on their existing technological capabilities. Industry convergence by *product complementarity* evolves when two formerly unrelated

products develop into complements. These create higher utility for its users when used simultaneously or together.

	Substitutes	**Complements**
Technological Convergence	Technological Substitution	Technology Integration
Product-Based Convergence	Product Substitution	Product Complementarity

Tab. 1 Types of industry convergence (Stieglitz, 2004, p. 18)

Stieglitz puts forth examples of how industry convergence relates to e.g. the evolution of mobile telecommunications. Industry convergence by technological substitution led to the emergence of the second generation digital access technologies, such as GSM. UMTS, for instance, is an example of industry convergence by product complementarity, where the mobile terminal meets wireless networks and Internet services. However, product complementarity of formerly separate products also leads to new actors entering the market and exploiting the technological (and other) opportunities in the success of innovations. The model of four different types of convergence can be used in analyzing corporate strategies and competitive dynamics and Stieglitz (2003) proposes that these issues are shaped by different types of industry convergence. Empirical processes of industry convergence often combine two or more types of industry convergence and are paralleled by other sorts of innovative activities, which have nothing to do with convergence.

According to Pennings and Puranam (2001), *all convergence* processes have the impact of eroding boundaries between industries, which in turn poses strategic challenges to firms and forces them to face new technologies, consumers and needs. Industry convergence fundamentally changes both market and competition conditions as well as consumer preferences and vice versa. Intramarket competition will be increased, leading to a higher density of competition and new competitors from outside the market. Gong and Srinagesh (1996) argue that the prevailing trend in telecommunications is toward industry convergence and market competition. Lind (2004) also notes that convergence leads to a re-definition of industry boundaries. Wegberg (1995) distinguishes among convergence on the supply side and convergence on the demand side. The former indicates that industries increasingly use the same knowledge base, whereas the latter indicates that convergence leads to industry boundaries becoming blurred both within the industries and between them.

There are furthermore several research studies done in recent years, which address the process of industry convergence, without explicitly mentioning or referring to the term convergence. One such study is that of Langlois and Robertson (1995), who discuss redefinition and restructuring of industries. Industry redefinitions are referred to as the merger of two separate industries into one, and fragmentation of one into two, due to change in technology and/or firm boundaries. The term convergence is, however, never used in the study. There are furthermore, according to Porter (1985), industry boundaries that have been narrowed down by technology. Technological change may allow a firm to tailor the value chain to a particular segment, which eventually can become industries. An example of this is portable cassette players, which turned out to become a dull-fledged industry in the 1980s.

The telecommunications industry in transition

The telecommunications market place is in a process of constant development. From a period characterised by deregulation and liberalisation, the market is now heading towards a phase of heavy competition and small opportunities of differentiation, without risking a low return on investment. There is evidence that the market is moving towards a consolidation phase (especially in Great Britain and Sweden), where small companies merge together and acquisitions lead to middle size companies growing larger (Nordic Advisor Group, 2004).

A telecommunications market can be described as consisting of maturity stages (see figure 1). The starting point is that the industry is mature and the actors are permanent. Growth is characterized as steady and slow. New actors face obstacles to enter the market. The second stage is characterized by internal and/or external forces' implications. These forces may consist of a technological breakthrough, policy change etc. The obstacles for entering the market are reduced and new actors appear on the market. The third stage shows that the number of new actors is steadily growing, the content of products and services is improving and the quality is improved. The rules are renewed and market shares change rapidly. In the fourth stage the rules are becoming settled, the number of players is reduced and some players grow due to convergence of business areas or consolidation. Unless forces that change the whole industry appear, the industry reaches a maturity stage called "end game" in the fifth stage.

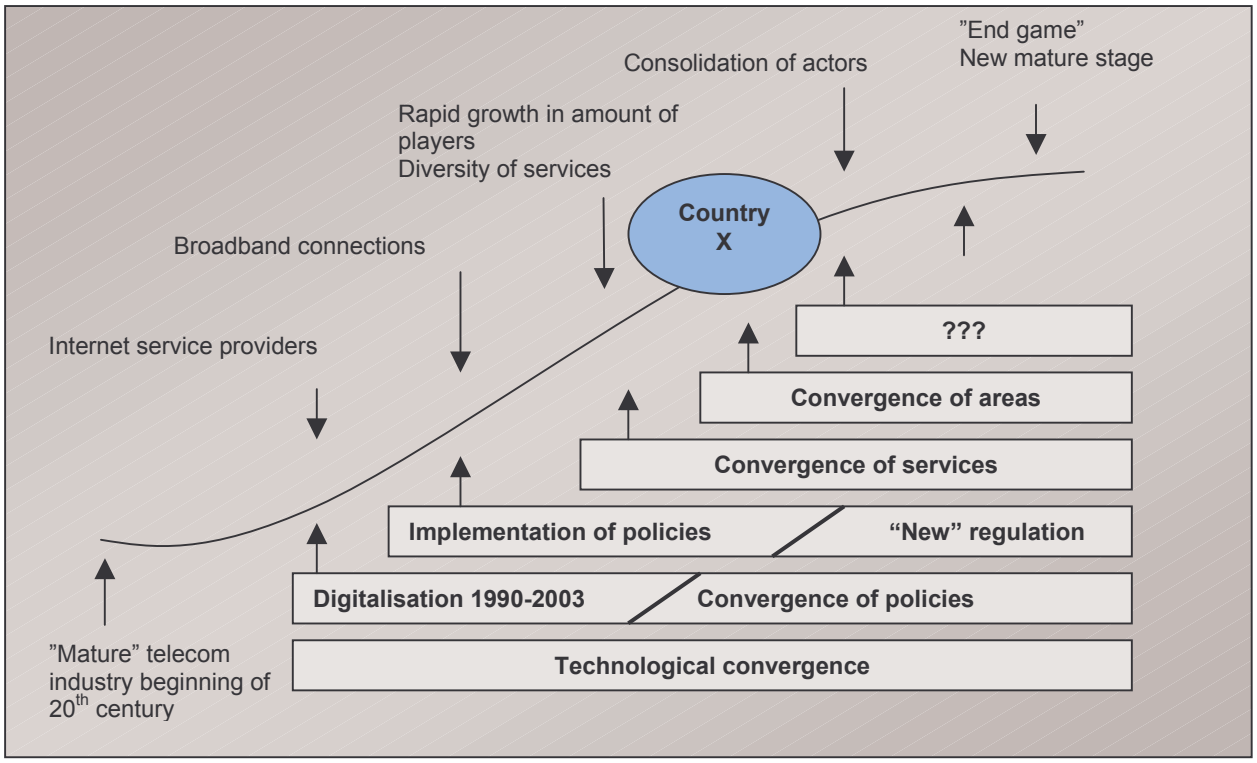

Fig. 1 Evolution process of the telecommunications market (so-called stages of maturity) (modified from Nordic Advisory Group, 2004, p. 15)

This model illustrates the highlighted context of this paper so that it points out the direction of telecommunications industries. Technological change coupled with liberalization, digitization, regulation policies, globalization and the emergence of the Internet have all contributed to the current telecommunications industry and its structure. Therefore, in order to understand the changes taking place in a telecommunications setting, the context must be understood. The convergence process opens up new possibilities as well as challenges to existing actors as well as potentially new actors, their resource management and the activities they perform. According to the Nordic Advisory Group (2004), there will be a consolidation of actors before the industry (or market) reaches its maturity. At that point in time, the convergence process will already be in full motion and integrated itself among all actors in the industry. The actors must respond to this in some ways and this paper boldly proposes that strategic networks could perform as a fruitful outcome in managing the complex environment in telecommunications, as intentionally developed networks may benefit actors as they develop common technology standards, product or services, handset features and so forth.

Implications of convergence for telecommunications operators

The phenomenon of technology convergence has led to personal computers decreasing in size and increasing in mobility, whereas in parallel mobile telephones have evolved towards rich terminal devices, both hence converging into multiradio access mobile computing stations. However, considerations mainly on end-user focused opportunities, such as new business models for application development enabled by this paradigm shift, have represented the most obvious effects so far, and have been subject to technology strategy planning for actors in this area. The European Commission (1997) expresses fear of Europe failing to take advantage of the opportunities provided by convergence. Europe could be left behind as other major trading blocks reap the benefits of convergence. The strategic implications of convergence have only recently become the focus in research and are therefore not widely known for sure, rather only assumed.

The widespread adoption of Internet standards in telecommunication systems has been one of the most visible facets of convergence within the information and communications technologies sector (ICT). Depicted by the mobile device industry, the evolution of mobile handsets towards personal computing units has lead to the introduction of new applications and service opportunities. This eventually forces the underlying infrastructure networks to cope with the evolution and telecommunications operators to invest heavily in the upgrading of these networks. The Internet Protocol (IP) has especially been labeled the new main network-level communication standard and this creates potential for changing the competitive environment drastically: in the 1990s, during the Internet pioneering years, circuit-switched telephone lines were used as means to connect to the World Wide Web (www) through analog modems, whereas today the Internet is being used for carrying telephony (voice) services. The first voice over IP (VoIP) handsets have been introduced, pushing the session initiation protocol (SIP) as the new open standard (Schneider, 2003). Eventually this will lead to the complete shift from circuit-switched communication towards packet-switched data transmission. As a consequence, once the entire content transmitted by the operator is implemented as packet-based data transmission, with no technical differentiation between voice and data anymore, operators will sooner or later have to modify their back-end infrastructure towards a full IP-based core (Hacklin et al., 2004). This migration will on the one hand assure operators' future compatibility with Internet systems thereby enabling them to implement the full range of service offering opportunities for their customers. On the other hand however, this will cause an unbundling of data and services for incumbent operators, forcing them to a strategic ambivalence and opportunism, i.e. repositioning themselves into to separate competitive environments in a respective manner. In the role of a data carriage provider, they will compete on bandwidth, speed, price and quality of services, whereas as a service provider, the operators will compete with any provider of similar services connected to the Internet (Hacklin et al., 2004).

Another widely known strategic implication of convergence and a "new competitive landscape" is an increased reliance on corporate networks and strategic alliances (Gomes-Casseres, 1996). A reorganization driven by changes in the competitive environment on the global market often sees convergences as the main driver (see e.g. Kaluza et al., 1999). Since government barriers on different markets were lifted, a large number of telephony and cable TV companies entered (and are still entering) growing markets and hence, the new players are threatening the market position of established actors. Numerous competitors in the industry are dependent on products becoming more and more substitutable. In such a case, companies increasingly need to compete on price (Kaluza et al, 1999). Also, according to Clements (1998), convergence encourages the arrival of new players exploiting niche markets. Day and Schoemaker (2000) point out, that players in established industries are familiar, whereas players in emerging industries, or emerging technologies, most often are new or unknown. New players on the market force traditional actors to enter, for instance, the entertainment market in order to maintain profitability. The arrival of new players exploiting niche markets suggests that this stage of industry convergence could be the bridge between what is already happening at the technology level and what will eventually occur at the level of services and markets (European Commission, 1997). This clearly indicates technological convergence as leading to industry convergence. In established industries, the domain of play is clearly defined, while emerging industries have a formative or evolving domain of play. Fransman (2000) suggests that convergence will create new opportunities for both incumbents and new entrants in the firm of new technical possibilities and new market opportunities. The competition will, however, be

increased in three forms, namely between companies, between products/services and between technologies (e.g. VoIP competing with traditional fixed telephony; fixed versus mobile services; ADSL versus cable modems). The increased competition can on the other hand result in new threats to incumbents and to shakeouts.

Furthermore, most literature on convergence in the ICT sector shares the belief that convergence will lead to mergers and alliances (Borés et al, 2003; Bower, 2001; Gaines, 1998). Indeed, this is the case of industry convergence, as industry boundaries become blurred. The nature of competition is changing due to technological uncertainty, market uncertainty and huge, risky investments. Alliances are established either through horizontal cooperation (e.g. in order to reach economies of scale) or via vertical cooperation (focuses on a single actor's place in the value chain in order to offer bigger profit margins). Through the establishment of alliances a firm positions itself on the market (Borés et al., 2003). Duysters and Hagedoorn (1998) present that companies from different industries and technological fields combine their efforts as a part of a concrete process of technological convergence. However, the authors also think that firms were basically unaffected by technological convergence during the period of 1980-1993 and criticize firms for still doing the same instead of redefining their core competences and core business. According to Bower (2001) a company bets that a new industry is emerging and tries to establish a position by culling resources from existing industries (whose boundaries are blurring). In his study on the U.S. M&A over $500 million between 1997 and 1999, Bower found that industry convergence is behind 4% of all M&As. Duysters and Hagedoorn (1998) point out that in the past decade, the number of strategic alliances made by firms has increased substantially, especially in high-tech industries.

Lind (2004), moreover, notes that the vision of convergence has justified a number of mergers and acquisitions within the ICT sector. Many of these eventually failed even though several resent mergers appear to have survived in what Lind calls a "post-convergence" marketplace by creating viable business model in the re-defined "converged" market. Tarjanne (2000) point out that industry players clearly are forced to rethink their strategies as market structures and value chains are being transformed. These actors know that they alone do not have all the necessary skills to compete in a converged market and therefore alliance activities have been taking shape. Tarjanne identifies alliances mainly on the horizontal level between similar players such as network operators (compare TeliaSonera). Vertical integration is taking place to a lesser extent and mainly between players in different sectors that seek to match complementary skills or perhaps move into higher margin areas.

Other implications of convergence include change in core competences (Duysters & Hagedoorn, 1998; Kaluza et al., 1999; Pennings & Puranam, 2001), change in regulatory issues (Cawley, 2000; Clements, 1998) and value chains deconstructing into value networks (Freeman & Louçã, 2001; Kothandaraman & Wilson, 2001; Li & Whalley, 2002; Sabat, 2002) within the telecommunications industry. This eventually transforms industry boundaries and creates new competitive spaces. As the value chains deconstruct into value networks, a multitude of entry points into value networks emerge. New players from other industries appear, as they see new opportunities form in the light of the technological convergence process backed up by the opening up of markets, as well as their reconstruction. The environment that players are facing is increasingly complex and market positions are threatened. One means of coping with the new challenges is for the companies to put effort into developing their dynamic capabilities or positioning themselves within the value networks in an appropriate and productive way.

Summarizing discussion and analysis

Introducing industry convergence and strategic/emerging networks, conclusions can easily be drawn, but in the end they become merely speculations without empirical contributions. However, it is evident from a theoretical point of view that industry convergence has the possibility to deeply impact business networks and may lead to firms engaging in intentionally developed, strategic networks in order to respond to the external environment characterized by convergence processes. These processes can be, alongside industry convergence, technological, functional, regulatory and digital as well as infrastructure or market convergence. The basic point is that the telecommunications sector is heading towards a converged environment, where industry boundaries are no longer clear due to the increased similarity of

technological bases among actors. The reactions to this convergence process can be seen in the way business networks develop and change and in the way new networks, emerging networks, are established. There is also a possibility to examine reactions to convergence in strategic networks, as they may be the ones which enhance the convergence processes and fuel them, as they are intentionally developed and may serve as basis for actors active in converged environments. A number of mergers and acquisitions have been established due to convergence (Borés, Saurina & Torres, 2003; Bower, 2001; Duysters & Hagedoorn, 1998; Gaines, 1998; Lind, 2004), why should not networks be established for the same reason? It is a possibly fruitful situation to acquire information, technology and resources, as the competition tightens and new players enter markets dominated by traditional players.

Industry convergence and the typology presented by Stieglitz (2004) already indicate several new opportunities for actors, as for instance, new markets arise due to *technology integration*. In the telecommunications industry, several services and products are the result of technology fusion or integration, disruptive innovations or the rise of general purpose technologies. Technology is the sole driver of these developments and eventually technology will hit business networks from several different perspectives. Thus, it is of great relevance to understand such issues as industry convergence and its potential impact on actors and activities within a given industry. Who anticipated that cameras would be integrated with mobile phone devises? This feature is becoming the standard for all mobile handsets and nobody questions it. This is a typical example of *product substitution* and it a result of numerous collaborations among actors in the telecommunications industry and the computing or information technology industry. VoIP represents the crossroads of the Internet and fixed telephony and has lead to the suffocating situations of many companies, as they are forced to build an IP-network in order to stay competitive and keep the possibility of offering attractive bundled services to their customers. The underlying prerequisite for industry convergence is identified as technological change. Technological change takes place between companies; change and innovation does not occur due to a single new technology, but rather due to the development, synthesis and application of a bundle of different technologies, which are both new and existing across the network.

Strategic networks also either enhance or prohibit the entry of new players, as noted by Gulati et al. (2000). Forming strategic networks may become a strategy for incumbent and “traditional” actors in the telecommunications sector in order to control the industry and network boundaries. Of course, such measures depend on the resources available within the network, as many new players possess relevant or revolutionary resources that might prove beneficial and useful in the overall network. In this sense, it is also possible for the strategic network to make use of the convergence processes in general as well as the industry convergence process in particular. The actors within a strategic network may intentionally seek new actors for the network that possess valuable resources and capabilities which are required in the new converged market places. In some ways strategic networks may evolve to become emerging networks, or vice versa, as the construct much depends on current technology and its development, its implementation and usefulness. The goal of strategic networks is mutual benefit and it is widely known that all actors do not have all the necessary skills to compete in a converged market, e.g. service providers without a network infrastructure have to lease capacity in order to offer telecommunications services. Strategic networks are, as already noted, a source of opportunity to enter an industry or market. Crossing borders is, according to convergence research, very much common among actors in converging environments. The flow of new actors will change the formation of existing business networks in the telecommunications industry and eventually the whole industry, enhancing parts of other industries such as information technology, media and possibly even broadcasting. As the telecommunications market is often referred to as an emerging market, due to rapid technological change, this means that the players are often unknown (see Day & Schoemaker, 2000). There are of course established and well-known actors such as incumbent operators, mobile operators and internet service providers, but new players will eventually push the traditional actors towards new positioning and strategies. At this moment in time, it is difficult if not impossible to predict the form of the telecommunications industry and its business network formation beyond convergence. A strategic network may also be formed in order to develop common technology standards (compare GSM, UMTS, Wi-Fi, which are all outcomes of extensive co-operation between large players in the global telecommunications industry), develop technology (development of mobile handsets to encompass features such as camera or computer software compatibility), and so forth.

In summary, this paper argues that business networks need to be re-evaluated in markets characterized by rapid technological developments and convergence, as certain external forces are becoming more and more influential on actors and their activities. Industry convergence implies that boundaries between industries are blurred and players cross over borders seeking new opportunities, enabled by the increasing similarity in technological bases. Thus, technological convergence has given rise to industry convergence and a number of other convergence processes not included in this paper. As convergence indeed is seen as a process, rather than a phenomenon that strikes only once, the question of which came first – the chicken or the egg – is raised. It could be possible that the activities performed by actors in a given market or industry gives rise to convergence processes rather than convergence being the factor that sets different processes and developments within a sector in motion. Strategic networks are intentionally developed and may be a part of convergence processes as companies co-operate in order to access resources and capabilities they themselves do not possess. Håkansson (1987) notes the existing structure of a network possibly acting as a brake of innovation. On the other hand, the notion of convergence may force actors to enter alliances, co-operative agreements or change their position within business networks in order to survive. Thus, "strategic networking" may be a convenient way to cope with the turbulent market environment, increasing competition and rapid technological development in telecommunications. However, empirical data is required in order to support and validate such a proposition.

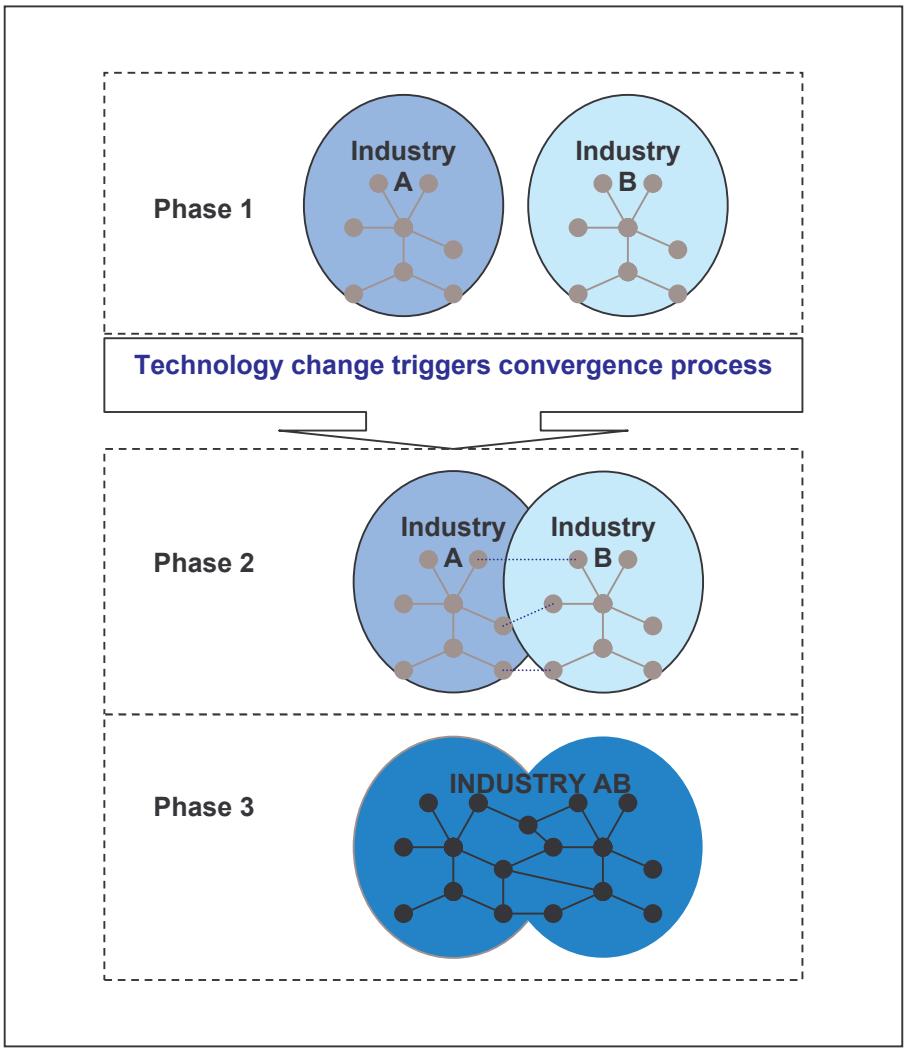

Fig. 2 Industry convergence and change in business networks illustrated

Emerging networks may furthermore be highly influenced by the industry convergence process and encompass actors from previously adjacent industries in the future. Stieglitz (2003) describes the industry convergence process very accurately as consisting of three stages. In the first stage two existing industries are unrelated from both supply and demand point of views. An outside event is able to trigger a process of convergence. This event might be, for instance, the invention of a new technology. In the second stage, the industries converge, which eventually changes industry boundaries, market structures and corporate strategies. In the third and final stage, the industries are related from a technological or product market perspective. The industry structure might be stabilized or characterized by a new process of convergence. Figure 2 illustrates the issue that Stieglitz presents and also aims at clarifying the underlying proposition in this paper, namely the problematic issue regarding business network evolution due to the convergence process. As can be seen in the figure, previously adjacent industries move toward each other so as to eventually share their technological basis. This affects the actors and their network positions as, basically, either new entrants from the merging industry seeks to enter already established networks or vice versa. The actors that exist within a converged industry might establish new, emerging networks or strategic networks in order to stay in business and remain at a competitive position in the industry, not only in various networks.

Therefore, this paper suggests the following topics to be the focus in future network research and that these questions would be complimented with extensive empirical research. Business networks are bound to be affected by industry convergence processes and other types of convergence processes as well. Industry convergence clearly implicates that actors are crossing over borders and seeking new opportunities, which is characteristics typical for the telecommunications sector. Increasing competition restructures the industry and the way business is done, e.g. traditional telecommunications operators are increasingly forced to compete on price, as mobile virtual network operators (MVNOs) and service operators alike offer cheaper minutes. Incumbent operators are today focusing on keeping existing and loyal customers rather than attracting the customers of competing operators. The issue of changing business networks due to the industry convergence process does not only concern the telecommunications industry; convergence also occurs in biotechnology, broadcasting, computing, media and other industries which are backed up by technology and move forward with the same pace as technology development does.

- Can industry convergence affect established networks in the telecommunications sector?
- Does industry convergence lead to convergence of business networks?
- How do firms use business networks in a convergence process?
- How are activities and resources divided between old actors and new actors in a converged industry??
- Do strategic networks offer a competitive advantage for its members when it comes to markets characterized by rapid technological development and strong competition?
- Which role do emerging networks play in the telecommunications market?
- Could strategic networks be viewed as a strategic action in the pursuit of competitive advantages in a new environment?

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