IMPACT OF CORPORATE NETWORK COMPETENCES ON THE COMPETITIVENESS OF COMPANIES

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Abstract

According to our research companies that have closer connections with their clients, suppliers and research institutes use the latest digital/network tools proactively, their organizational and inter-organizational relations are technology oriented, they are more likely to achieve success in research and development (innovation). Existence and development of network competences have a positive impact on corporate culture, inter-organizational technical co-operation, on openness and integration as well as on further innovations. The research plan envisaged making 30 interviews. In the preparation of the sample, we planned to interview in 80% representatives of companies where either digital innovation or the use of digital networks plays a crucial part in their business profile. The remaining 20% were intended to be made up of manufacturing and service companies. The analysis of the sample monitored the way companies and organizations allocated supplementary resources on behalf of information management in order to develop competences and to implement digital innovations. From the results - as suppositions for a future quantitative survey to test - we can state the followings: Using digital network solutions for the purposes of networking is mostly typical of large B2C enterprises, or firms and organizations where the development of (natural) networks plays a crucial part in their business profile (non-governmental organizations). The staff of companies with a "digital profile" play a leading role in terms of utilizing informal professional communities and networks (both online and offline). This mostly involves professional communities, professional platforms and meetings.

Keywords: Network, competence, digital embeddedness, education

Introduction

Our goal was to examine both online and offline networks mapping them on an interface of two measurable success-indicators. One of these indicators had been defined as a set of achievements gained by a competitor. It is related to figures of effectiveness, growth and sales. We had labelled this indicator as the "*competitive advantage"*. We had labelled the other indicator as the "*visible success indicator"*. The indicator of visible success had been generated from the results of marketing, brand awareness, PR and to partners' and consumers' loyalty. The analysis of the sample monitored the way companies and organizations allocated supplementary resources on behalf of information management in order to develop competences and to implement digital innovations. We assumed a close correlation between the results of measurable success-indicators, investments and developments. Furthermore, this research also focused on the size of companies, industrial embeddedness and on the profiles of the analyzed networks for a deeper understanding. A literature review preceded the empirical work in order to clarify the conceptual framework of the hypotheses and in order to set up the framework of the questionnaire.

Network competence

The basic category of the research is network competence which we analyze with reference to activities both online and offline. Business and organizational networks have been facing the breakthrough of online communication, growing data resources and vulnerability, the transparency of partner and trust-based networks and, also, security risk. In a digital environment the continuous development of networks and network competences as well as the redefinition of offline networking channels and competences are also important for an effective and successful operation of networks.

A network is conventionally understood as the sum of hubs and that of the hubs' linkage. Within each framework we analyze the connections among digital social, business and sophisticated users' networks. These are dynamically changing systems built on network competences or via developing network competences. Quantity, quality, centralization or decentralization of linkages in close correlation with digital-technological innovations, with the use of online networks will all determine the rationale of these complex networks.

We assume that the function and decision-making processes of offline networks are under the influence of digital platforms and online networks primarily because the Internet is a scale-free network. Besides, scale-free frameworks are extremely resisting to occasional errors, so a great number of randomly chosen points can be removed without ruining the coherence of the framework. However, on the other hand, these frameworks are really vulnerable in case of a targeted attack because the removal of relatively few points could ruin the biggest hubs of networks − and they might disintegrate. We analyze networks with reference to their spots of risk, vulnerability and effectiveness: we map how much they attend the logic of scale-free networks in the use of online networks.

To operate a network or organization network competences are needed that manage processes of decision, promote effective organizational communication and the competitiveness of the company concerned. As long as progressive and interactive understanding and skills cooperate on various levels of an organization, network competences can prevail (Edgar – Lockwood, 2008), and effectiveness as well as competitiveness improve. The use of digital tools and the rapidly changing digital environment deconstruct certain network competences, and set up or weaken the importance of others.

Digital tools and platforms, online networks and ICT innovations rely exclusively on digital and network competences, and their continuous improvement is of uttermost importance because accumulating amount of data and their supply chains within the organization and in inter-organizational relationships are determinative. The online data collection and the interpretation of the results on the organization or that of the partner/concurrent organization imply separately analyzable competences. Our indirect target is to point to an emerging effect that makes the analysis of network competences indispensable: this is the so called big data or data boom. The network of data and contents are facing a serious challenge in the digital environment. The growing amount of data, that come from sensors, social media networks, online knowledge sharing and from lots of other resources, brings up basic questions for the handling of data resources and induction, network innovations and network education.

Basic questions

Our research questions are the following: How do social and business networks, that use the Internet as a scale-free network, measure the vulnerability and risk of digital/online networks? Furthermore, how are they getting ready for big data's effects, how can they make advantage of them. Do communication and education decrease vulnerability and risk? How much does it depend on the size of the company/firm/organization/network? How much does it depend on the industrial or other embeddedness of the company/firm/organization/network? How determinately do they consider the technical-digital embeddedness and how much do

they consider the human/organizational decisions? Which one of these two promotes effectiveness? What is the connection between the size of the network and the level of competence?

Theoretical Background

The Framework of Networks: Relatedness, Tight Bonds and Vibrations

The network, as defined above, is the sum of the hubs and the links connecting them. Due to the infrastructural development of digital environments various and effective tools are available via online and social networks (Gloore et al., 2012). Within business and organizational networks, the nodes belong to the same sector's interconnections or to that of different sectors. The wiredness or a particular node involvement makes the organization more sensitive and influential in the network information flow. Theories of competitiveness emphasize the importance of taking care that a company or organization would not keep the network under control, otherwise it will be less effective and innovative and they would be seeking profit with the help of others' initiatives and creative solutions. It is important to try to understand: they need to see and know how the network operates in terms of the associated partners, and how they see their positions from there (Anderson – Håkansson – Johanson, 1994; Dodgson, 1993; Håkansson – Ford, 2001; Mattsson, 1997; Wilkinson – Young, 1994).

The relationship of these companies and organizations can be divided into online and offline networks, and can be examined according to these dimensions. Information management, the most recent digital network services, the use of digital tools and programs require additional resources. The question is how much these resources can be regarded as an investment, and how they support the company's or organization's competitiveness. The offline networking competence from this viewpoint is also indispensable because traditional fiduciary and risk mitigation tools have an important role. The so-called network quakes according to their extent and strength have various effects on the operation and effectiveness of companies and organizations. It is therefore an important issue for the members of the network how they can reduce this kind of vulnerability and what crisis management solutions are used online and offline concerning their networks in order to be able to preserve their position and innovative capacity (Csermely, 2009).

Offline and Online Networks: After the Digital Turn

As we have mentioned earlier, exploiting the potential of online networks is crucial for corporate and organizational relationships, and, presumably, for their business and social communication and decision-making chains, that use the most recent digital and online tools and competencies, they might become more competitive compared to the sector's other companies and the organizations. However, we assume that the online network extensiveness, its importance for the company, using the latest digital tools, and the importance of the education all depend on the profile of the company, its size, and on the staff generations represented.

Trusting a network (Krackhardt - Hanson, 1993) the legitimacy and strength of nodes, streamlined network management, issues of safety versus effectiveness are present both in online and offline networks, but in different ways, and - at the same time - also interconnected with one another. Innovations and effectiveness support the openness, and trust and security supports increasingly exclusive and restricted network solutions. So when we talk about offline and online networks after the digital revolution, it is a fundamental question where the boundaries of the development of the network, of the point of view and that of online-offline network competences are. To what extent does competitiveness strengthen the node's place within the network and the trust, and when should restrictions be launched for cost cutting, returning investments in order to save security functions? How should competitiveness and

the proportion of expenditure, the investments of the communicable and demonstrable competitiveness be optimized?

Operating along algorithms generate common platforms and network management for companies' management, logistics, organizational development, project management, administration and other corporate and organizational functions' online associate frameworks. They are less flexible between two stages of development, their codification limits usability, and their infrastructural vulnerability could lead to the vulnerability of human network as well.

Information economy, knowledge economy and the network economy model was to call attention to the fact that networks are resources in themselves: within a network technological innovations can spread more easily, and it is easier for companies and organizations to adapt to each other, they have a greater influence on each other to increase their effectiveness and competitiveness (Bharadwaj, 2000; Seltzer - Bentley, 1999; Vergeer - Pelzer, 2009).

Network Competence, Education and Connectivism

Competence as a sum or as a framework of skills is closely related to the concept of a network. Social capital, the Internet or the digital community - professional platforms' management - just to name a few – assume complex capabilities. Network management capabilities and skills (Möller - Svahn, 2003; Ritter - Gemünden, 2003) define a definite competence-portfolio (Vlasyuk, 2010).

The concept of network competence applies to offline and online network management and network control, to self-learning solutions and to organized education at the same time. Traditional offline forms are moving to some extent to online networks and online frameworks are newer, platform-oriented stage among competences.

The sustainability of digital networks and the increase the competitiveness altogether assume continuous innovation and competence development as well as education: recent developments represent at the same time pre-studies, research and the company's/organization's opportunities or expectations to ease its whole network's competence. The development of competence is in this sense system-levelled and includes within the network all those who are involved in the innovation. Developed or adapted solutions are therefore not solely individual components: they also operate as restructuring devices (Henderson - Clark, 1990). Along proper network and digital competences in the digital environment, rapid changes make it possible for companies and organizations to achieve competitive advantage fast and/or on the long run (Grover - Kohli, 2013), and their success can be communicated, marketed, visible, and − in terms of marketing and in partner/customer loyalty − a leverage. As far as the involvement of related resources is concerned it is the process that is in the focus (Partanen - Möller, 2012: 491), where it is important to develop competences continuously. In operation management of networking competence co-operation, collaboration, competition and perceptibility (Vlasyuk, 2013: 970-971) − all enhance the visibility and representation of success. Within networks an online community space or a knowledge-sharing portal can have a featured terrain that is being co-developed by an increasing number of organizations based on social media and interactive content services. The activity started earlier in forms of mailing lists and, later, via forums provided some space for communication, and by now social network sites have largely shifted to this type of activity.

Competitiveness, Network Trust, Vulnerability

Networking competences are in a dynamic interaction with one another and they promote corporate competitiveness for a strategic vision (Edgar - Lockwood, 2008 and Wang et al, 2012.). It is based on the thesis that a strategic network development approach is needed

which is built on the so-called ICT fund (Partanen - Möller, 2012), and that also represents value creation (Msanjila - Afsarmanesh, 2009: 4769).

Trust is a collection of personal beliefs (Berners-Lee et. 2006: 88): competitiveness and the level of trust are fundamentally interlinked within networks. The results that mark a higher quality and creativity assume networks based on trust (Gloore et al., 2012). Trust and loyalty can be built and can feature among companies and organizations in multiple ways, but according to our study the most important question is a sustainable level of online reliability − can it be as reliable as its offline counterpart, or can the online discourse of reliability strengthen offline trust. A further question is how much these factors depend on digital tools and platforms, how much on the human factor, and what impact they would have in online and offline networks in the presence and absence of trust. What does risk imply within these networks?

Without trust the majority of online activities would not be viable. Lack of trust can have many reasons, the most significant of which is incorrect communication and information sharing and the unwillingness to share risks (Alawamleh - Popplewell, 2010). This question − among others − is answered by the MESH of companies, a response to the rapid evolution of technology solutions by results built on networks and sharing. In such networks proper resources are only available until the company, the organization or consumers need it. So these are trust products and services, where the credibility of the members of the network and their reliability are standard (Gansky, 2010). As far as trust is concerned networks' informal relationships are important. Their mapping makes the understanding of important and strong linkages possible. In the restructuring of networks and via the network dynamics these linkages may get damaged or they could develop (Sellitto, 2011: 27).

Trust also implies vulnerabilities – both in case of trust on tools and on human relations. Vulnerability can be reduced on the network level if the network is scale-free, so it has enough strong bonds and therefore it is more resilient to random errors, and if targeted attacks can be prevented. These formal and informal bonds on corporative and organizational level are needed to be treated carefully, their removal may be critical. So networks quakes can be prevented.

Network Competence, Strategic Co-Operation, Collaboration

The size of the organization and the organization's position within the business-network concerned provides its functional networking status quo (Wang et al., 2012). Position and linkage might only be qualified after entering into co-operation (Partanen – Möller, 2012: 491). Insight, analysis, the integration of networking competences for this are indispensable both in case of nodes with tight linkages and in case of nodes with lose ones investigating separately the speed and methodology of a node's connectedness (Watson et al., 2004). Only an overall system can be error tolerant.

Networking competence is consequently the basic question of strategic co-operation and its analysis requires the monitoring of the quality of collaboration (Partanen – Möller, 2012: 491) and that of a shared or alternative strategy (Grover, V. - Kohli, R. 2013). Competitive advantage within this networking complexity is viable via a strategic point of view supported by education.

Networking Visibility and Reputation

Visibility is a basic requirement for the nodes within networks: the extent of visibility depends on corporate profile, business embeddedness, vulnerability, risk factors and on communicational strategies and marketing/PR targeting. Competition and visibility together (Vlasyuk, 2013: 970-971) enhance the visibility of success − c.f. above. The extent of visibility has become even significant within online embeddedness: the organization, people working within these organizations, the ones in collaboration with the organization all

produce, share and traffic masses of digital data. It is of strategic importance what and which segments of these data will become available, visible, recognizable and with what implications. Just think of the fact that the good reputation of a corporation can be ruined on account of a piece of information that has gone viral on an online social platform: the impact and the vulnerability of visibility are obvious.

The online visibility of networks consequently constitutes issues of reputation and vulnerability − and these rely on organizational and inter-organizational collaboration. This implies the availability of marketing, PR, HR and data security functions and the development of competences that are needed for these for effectiveness and competitiveness.

The research

Subject of the interviews: level and impact of corporate network competences (innovative digital technologies, online networks) on the competitiveness of companies.

Survey methodology: semi-structured interviews

Population: Middle managers of dynamically changing companies based on or engaged in the development of network competences. These managers have relevant information about the subject of the research.

Sampling: Planned number of interviews between 25 and 30, specified later on by saturation analysis.

Preparation of the sample, recruiting respondents: The research plan envisaged making 30 interviews. In the preparation of the sample, we planned to interview in 80% representatives of companies where either digital innovation or the use of digital networks plays a crucial part in their business profile. The remaining 20% were intended to be made up of manufacturing and service companies.

According to the planned sampling procedure, the respondents were contacted through personal channels (in person, by phone, by e-mail) with 10% of the planned sample. After the first interviews, we asked them to recommend people from their own networks who could be relevant in terms of the research topic (snowball sampling). In the sampling procedure, first we contacted 10% of the planned total sample – a tool manufacturing company, an online agency and a company that develops portals for posting media content. At the end of the interviews, we asked the subjects to recommend experts or organizations where it would be useful to ask our questions. In this way, we contacted additional respondents. Snowball sampling worked well in the sense that one participant led us to another; the experts interviewed recommended respondents who worked in the same or a related domain. This method also helped us to include companies of different sizes in the sample, since small companies can relate to bigger ones, and the big ones are also in connection with small ones, thus we reached participants from all levels of the networks identified.

Final number of interviewees: 26 middle managers (senior managers in small companies) who have relevant information about the competences of their own company networks and could give useful answers to our questions.

Analysis

Basic data

The answers of the interviewees to each question depart along certain parameters – more specifically, some characteristics of the company determine what the respondents think of the questions we examined.

The usefulness of the interviews largely depended on whether we managed to interview companies of different sizes, with different activities and clientele – since in terms of networks, different problems arise in organizations with different parameters, and the individual companies can give answers to such problems based on their own characteristics.

With regard to the scope of activities, we divided the 26 companies we had contacted into two groups according to whether there were any IT products or services that played a crucial role in their business profile. More than half of the companies had a "digital profile".

The companies employing our experts have contacts with mostly corporate clients: 76% can be regarded as purely B2B suppliers, four companies serve retail/private customers as well, but their corporate customer base is more important. Only two of the experts interviewed reported that their companies focused primarily on retail customers, but their networks included corporate clients as well.

In terms of company size, almost one out of four companies employ less than 10 people, more than one third have between 11-50 employees, i.e. almost every second firm is a small enterprise. One company with 51-250 and one with 251-500 employees belonged to medium sized enterprises and there were 5 large companies: one with 501-1,000 employees and four employed more than 1,000 people.

Summary

Our research aimed to describe the system of business relations of companies through network dynamics. The wide-ranging networks of companies – the main components of which include the customer base, the partner base and the employee base – can be described with the characteristics of the networks, since the basic definition can be related to these systems. However, these systems or certain parts thereof do not always and not necessarily bear the typical characteristics of networks; for example, a customer base is not necessarily organized in a network, there are not necessarily relationships between the individual customers (nevertheless, the entire system of relationships of the company can be considered as a network).

Thus the extension of this system of relationships does not always happen with network tools. For the companies, the most important thing is to attract and retain customers – to this end, they employ various marketing methods but, apart from a few exceptions, network dynamics in the extension is less typical. Many companies perform networking-like activities to extend their networks – here, however, formal networks and their nodes play an increased role.

Competitive advantage and visible success

Based on the basic hypothesis of the research, those companies, which employ the latest digital and online tools, are both measurably (efficiency, growth, sales) and observably (marketing/brand awareness, PR, partnership and consumer loyalty) more successful than their competitors.

The interviews showed that companies that employ digital innovation appropriately can indeed gain an advantage over their competitors by using modern technology. The key question, however, is what technologies they integrate into their operation and how – the general principle in this area is "the right tool for the right purpose". Our respondents find that the applications supporting operational functions, coordination, and project management make work more efficient. Our experts attached the greatest importance to network applications that enable efficient joint work from home or in the form of teleworking – thus the digital innovation brought the greatest breakthrough in the field of resource management.

However, the introduction and operation of these systems requires an expertise that many companies lack among their resources – therefore, it is becoming more and more common that IT systems are operated by a third-party or outsourced.

In the "visible success" dimension, the online and network tools have proved to be as useful as offline methods – in this respect, our respondents did not report of any difference. Maintaining an online presence, which belongs to the dimension of "visible success", also

consumes resources; accordingly, such campaign activities are mainly performed by large companies.

Development of competences

We assumed that the networks of the analyzed segments regularly use external and internal solutions for development and self-education in the areas of digital and online innovation and competences.

In our sample, companies with a "digital profile" are firms where some kind of network or digital innovation as a provided service plays a major role in their business profile. Predominantly, these companies constantly develop their digital competences through organized and informal training, but mainly through self-education using online tools. Among traditional companies, digital innovation does not play such a crucial role in their course of business for digital training to be important. Instead, training into system management is provided when the company governance, task management or database management system are introduced.

The companies consider it more important that their main activity be smooth and profitable – training at traditional companies mostly focuses on sales or foreign languages.

Digital innovation

We also assumed that companies use competence development to be able to introduce new tools, make the increasing amount of data and the data explosion manageable as well as to allow risks to be reduced. Education is provided in several channels in several related networks.

Network competences – and here, for the time being, we are only talking about natural networks – enable individuals to find their way in the relationship net surrounding them and identify those groups and individuals who, if contacted, can help them get closer to their goals. In this sense, the interviews showed that the most important network competence development method can be found within the organizations. They show the job of the individual work groups or divisions to other divisions, or, within a division, the work of colleagues to each other. Network competences are more in focus in companies where networking activities play a crucial part in their business profile. These include: non-governmental organizations and companies providing financial services.

Training preparing or accompanying digital developments is not so much about the development of network competences (unless in a specific IT technical sense), but about understanding systems that support work processes and effectively mastering their use. Such training really appears outside the internal networks of companies as well: an essential condition for effective co-operation between companies is to be able to satisfactorily manage each other's IT systems (especially in the case of the suppliers of a multinational company). The main aim of digital networks employed by non-governmental organizations developing small enterprises is exactly to develop the digital competences of its members.

Apart from this, another aim of digital developments is mostly to support work processes, to enable joint work and teleworking, database management – technical solutions play an elementary role in eliminating the increasing data quantity and vulnerability – except for the companies where, due to their activity, data handling is a particularly sensitive area: banking sector, nationwide providers with high customer traffic.

To protect the data and to reliably manage the increasing amount of data, special technical solutions are developed that require high level of special expertise (in mathematics, information technology) to introduce and manage such solutions. Thus, companies either fully outsource these tasks (a big data commission can be rather costly), or entrust the management of systems to an in-house system administrator. What the employees absolutely need to know

about the technical part of IT will reach them through the company's IT department or through organized corporate training.

Competence development and competitiveness

At the beginning of our research we thought that companies find it essential to understand and develop online network competences in order to become competitive and efficient, but offline networks are treated above all by using traditional tools to build trust and reduce risks.

Understanding and developing online network competences is really fundamental in the sense that the popularity, usefulness and efficiency of IT systems based on network solutions makes day-to-day orientation more efficient, faster and less resource intensive. As a result, the companies that use these solutions can enjoy a "competitive advantage" in this area. These network solutions are basically not aimed at expanding and building the network but rather support work processes and enable operative communication in connection with work processes.

The natural networks are indeed managed and maintained mostly in person. The interviews showed that at the international level, but more importantly in a local context business relationships are determined by the quality of personal relationships and professional values (there is the risk that personal relationships invade business life and loyalty overrides professional considerations).

Digital innovation as an investment

We assumed that the introduction and operation of digital innovation requires additional resources, which the examined segments view as an investment, and develop their material and intellectual resources accordingly.

Depending on the segment examined, the experts have a rather varied opinion of digital and network developments. It is the companies with a "digital profile" that realize the importance of developments, in particular the applications supporting work processes. However, since most of them widely use open source software, the issue of return on investment is less important.

Among the traditional companies, it is the large enterprises active in a special market environment that pay the most attention to this area. Medium sized companies generally follow the big ones after some delay, whereas the level of digital competences of small enterprises largely lags behind both at international levels and compared to local large companies. Generally speaking, traditional companies spend on digital development if it is required by their market position, or if the development is so efficient that it enables them to save resources, thus they can reduce their costs.

Vulnerability

The vulnerability of natural networks is mostly reduced by the management or an appointed company division by keeping personal contact with the customers and preserving good personal relationships.

The vulnerability of digital networks has a totally different meaning: on the one hand, technical problems, loss of data, and on the other, deliberate external attacks can cause destruction. As already mentioned, the protection of digital networks usually involves using specific technical solutions. These are not the kinds of issues that non-technical staff could manage. Therefore, the management of digital networks is either outsourced or dealt with by the company's system administrator.

Segmentation differences

As suppositions for a future quantitative survey for testing we can state the followings:

Using digital network solutions for the purposes of networking is mostly typical of large B2C enterprises, or firms and organizations where the development of (natural) networks plays a crucial part in their business profile (non-governmental organizations). The staff of companies with a "digital profile" play a leading role in terms of utilizing informal professional communities and networks (both online and offline). This mostly involves professional communities, professional platforms and meetings.

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