

HOW TECHNOLOGY ENHANCES COMMUNICATION. A PERSPECTIVE ABOUT THE FUTURE NETWORK ENTERPRISES

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Abstract: *The network enterprises have appeared after the industrial revolution, and they have been studied indeed as a revolution in doing business. With the rise of the new informational platforms, a new type of network enterprise has appeared: a more collaborative, efficient and fast moving one; and thus, network society was born. Since then, there have been recorded changes in the human society, from the human behaviour with regards to technology, to the business models, with regards to efficiency. This paper aims to reflect a model of the new network society, from a collaboration and communication point of view, as well as to emphasise the importance of adapting to the new network society requirements. After an overview of the conceptual terminology and the theoretical approach of both the network society and the network enterprise, the paper identifies five dimensions of the network enterprise that will be used to describe the enterprise of the present as it is now, as well as to suggesting improvements for the one of the future.*

Key words: *network enterprise, network society, collaboration, communication.*

1. Introduction

The 21st century is defined by Jan van Dijk „the age of networks” (van Dijk, 2005, p. 2). As also Castells suggest, the society is evolving into a collection of nodes, defined as networks, which leads to a revolution in the society, basically a reconfiguration of human activities with the help of the Information Technology. The evolution of the internet as the environment, and of the hardware technologies, as devices, enabled a major shift in the society, from human behaviour,

employment and entertainment, to the speed of information processing and ITC capabilities that were hard to imagine in the past. The impact of IT on the new society is tremendous as it improves the way people relate to work, leisure and socializing, and everything is strongly correlated with the way communication has been redefined.

As the society evolves, there have been studied both improvements and impediments in human interaction. On the one hand, redefining time and space facilitates improvement in socializing and opens new

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perspective of improving business models. On the other hand, people start leaving in an asocial world where safety in socializing is more important than face-to-face experimentation. Each individual gathers a new identity, created in a safe virtual world, where the rules are probably easier to influence. Furthermore, Dijk highlights the drawbacks as “because it is available in huge amounts, information can never be fully processed by the recipient” (van Dijk, 2005, p. 2).

Independent of the perspective, one thing is certain: new patterns of thinking are developed inside the human mind due to technology aid, new possibilities arise, a sense of “be in touch with the society” is becoming more and more casual. Both people and societies process more information than ever before, are more connected and share a more or less mediatic mind focus, marketing has evolved and the perspective of the masses on technology itself has improved.

2. What is a Network Enterprise?

The network society has aroused after the industrial revolution when the business patterns have been changed. The production, distribution and even the market needs have been changed. As Castells describes in *The Rise of The Network Society* (2010, p. 164), the new informational and global economy has the main characteristic of a redefined organizational model based, but not fully dependent, on the continuously technological innovation. “It is the convergence and interaction between a new technological paradigm and a new organizational logic that constitutes the historical foundation of the informational economy” (Castells, 2010, p. 164).

Definitions of the network society vary slightly from new relationships in the media networks that are replacing the face-to-face, more personal communication, as van Dijk

suggest, to the social structures and networks which process and manage the information they gather with the use of IT. This shift to a more collaborative mediatic society affects the new society at all levels, from economic, political to cultural. Castells establishes the idea of networks as the key units of the modern society, while van Dijk still considers individuals, groups and organizations at the centre of it. With all these, van Dijk recognizes the changes that have occurred due to the information society. The society is refocused on science, rationality and reflexivity, the economy is starting to be characterized by “information production”, the labour requires high knowledge in order to manage the tasks of information processing, and the culture has become a media culture with a new set of signs, symbols and meanings (van Dijk, 2005, p. 19). With the rise of the web 2.0 technologies in general, not only opinion leaders shape the society, but also the masses have a great voice and they are becoming slowly the new leaders.

Inside the Network Society, numerous Network Enterprises were formed. A network enterprise is just one atom of the complex system the society of present is made out of. A network is a collection of nodes, each node being either individuals or organizations, which are linked by a relationship. Van Dijk (2005, p. 24) defines a network “as a collection of links between elements of a unit. The elements are called nodes. Units are often called systems. The smallest number of elements is three and the smallest number of links is two. A single link of two elements is called a relationship. Networks are a mode of organization of complex systems in nature and society”. Networks are ubiquitous, and each individual can be part of different networks, social, business or interest oriented.

In sociology, there have been numerous theories about network interconnectedness, links and ties. For instance, Granovetter

(1976, p. 1361) gives the definition of network ties: “the strength of a tie is a (probably linear) combination of amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie”. In Mark Granovetter study, the results considering networks highlighted that the stronger the tie, the more willingness to help, and the higher probability that information retrieved is not new. From a network enterprise point of view, innovation is much more likely to happen with the help of the weak ties, if the information dissemination, thus communication, runs easier.

Roland S. Burt presents another perspective, and it is referred as the structural holes versus network closure as social capital. Burt defines the social capital as the metaphor in which “the people who do better are somehow better connected. Certain people or certain groups are connected to certain others, trusting certain others, obligated to support certain others, dependent on exchange with certain others.” (Burt, 2001, p. 32).

Moreover, the author highlights the connection between the position in this kind of structures and the characteristic of it as being an asset in its own right. Referring to the structural holes, Burt describes them as “an opportunity to broker the flow of information between people, and control the projects that bring together people from opposite sides of the hole” (Burt, 2001, p. 35). If there is a structural hole between two groups, it is not implied that the groups are unaware of each other’s existence, but it is more an individualistic approach, where each group is more concentrated on its own interest. This perspective also reveals the fact that individuals with contact networks rich in structural holes are more open to seize opportunities, because they have access to information and can filter it more efficiently than in a bureaucratic context. The author concludes that the two concepts, the

structural holes and the network closure can be integrated one in another, but in terms of productivity, structural holes are much more supported by the empirical reviews than the network closure.

In an increasingly changing environment, organizations need to become part of networks in order to diminish the major technological disadvantage and to increase knowledge, best practices, and competitiveness (Dodgson, Gann, Salter, 2008, p. 133). The competitive advantage comes from a smart and sustainable integration of the latest technologies, best practice processes and continuous innovation.

3. The Economy of a Network Enterprise

Castells (2010, p. 77-78) rises into discussion the “new economy”, which gathered characteristics that were never before present in the world’s economy: informational, global and networked. The new economy is informational because, as the author states out, all the capabilities of the new enterprises, from productivity and competitiveness, are directly correlated with the “capacity to generate, process, and apply efficiently knowledge-based information” (Castells, 2010, p. 77). Globalization brought with itself the increase in scale of activities as production, consumption and products and services circulation, with the reorganization of labour force, access to raw materials, markets, information and technology and specialists, all these being correlated inside a network or linked between economic agents. The global characteristic is strongly related to the emergence of networks. The new economy is networked because “productivity is generated through and competition is played out in a global network of interaction between business networks” (Castells, 2010, p. 77). Moreover, Castells points out the importance of the technological achievement of the last decades, as the products of

information technology industries are, on the one hand, information-processing devices, and on the other hand, information processing itself. This leads to a restructure in the economy, as this process impacts upon all economic activities and “make it possible to establish endless connections between different domains, as well as between elements and agents of such activities” (Castells, 2010, p. 78). From these endless connections between economic agents, and with the aid of information technology, the network enterprise has been created.

During the shift brought by the IT innovations, the structure of the enterprises has flattened. Successful companies no longer have a vertical organization, but a horizontal one. Flexibility to adapt to the new market conditions and the speed characterized by the new economy is a vital focus to big companies and constitutes a competitive advantage of the small and medium size businesses. The horizontal organization enables collaboration throughout the networks; as it implies interlinking with the supply chain in a more flatten way with the aid of internet and information systems.

There are some characteristics of network enterprises that make them function properly, rise profit and be competitive in the network society. Information Technology is involved in every step of the process connects every node and keeps the system stable. Wood & Smith (2005, p. 54-80), Smite (2012, p. 23-27), Castells (2010, p. 501) and Dodgson, Gann, Salter (2008, p. 141) offer a list of five important principles of a network: interactivity, interconnectedness, openness, simultaneity and focus on collaboration.

3.1. Interactivity

As the Macmillan Online Dictionary suggests, if interaction is a link between objects, a process by which different things

affect each other or change each other, or the activity of being with or talking to other people and the way that people react to each other, interactivity is defined as the possibility of jointing computing capabilities between users always connected with a system, and the capability of one system to react to the users' commands. It can be assumed that interactivity devolves out of interaction. A ground characteristic of interactivity is the real time response.

Steuer (Wood & Smith, 2005, p. 54-55.) is one among the first to introduce the concept of telepresence, linked with the sensation of vivid in an online environment enabled by the physical senses. The degree of interactivity depends on the capabilities of the system to respond in real time. Steuer defines three dimensions of interactivity. Firstly, it is the response speed of a network, and how long it takes the users to retrieve specific information. Secondly, it is the range, or how much a user is technically allowed to manipulate a virtual environment. Finally yet importantly, Steuer emphasises upon mapping, or what actions of a user are related to the reactions in the virtual environment. The ability to manipulate an object with the help of technology is another aspect of telepresence in use. Telepresence does not only help businessmen hold meetings, but also medical doctors perform surgeries.

The social presence theory of Short, Williams and Christie, presented by Wood and Smith (2005, p. 80), reveals the interests of social interaction from 1976. “Social presence is the degree to which we as individuals perceive another as a real person and any interaction between the two of us as a relationship” (Wood & Smith, 2005, p. 80), meaning on the other hand the degree of awareness between two individuals in a communication interaction. The most social presence interaction is the face-to-face one, whereas virtual interaction has less social presence.

Moreover, the media – as an information technology – provides the user with different degrees of interactivity. The social presence theory emphasises on the presence of the nonverbal communication as the link between the actors. For audio only transmissions, the paraverbal language is important, and for video and audio, both paraverbal and the nonverbal languages are creating the feeling of closeness, or presence in the virtual environment. A better social presence technology already exists, as Cisco Telepresence video conference technology enables video collaboration inside a specially designed conference room where some of the seats are replaced by screens showing interlocutors in a natural size, creating the feeling of “being there”.

3.2. Interconnectedness

Castells refers to interconnectedness by analogy with the interconnected nodes of a network. Interconnectedness is more than a simple connection, is a connection that permits accessing resources otherwise unreachable. In reality, interconnectedness is a principle around which every network revolves, but in the case of the network enterprise, the correlation with the information technology is better emphasized. This principle is also the basis for all the other principles or characteristics of the network as they all are intertwining and referencing interconnectedness.

Interconnectedness is very much starting to be more present in the daily life, a trustworthy indicator being the high percentage of population who own mobile devices across the world. Mobile apps synchronize with desktop application to bring information up to date. Enterprises tend to provide more wifi connection than cable internet connection, at least in the developed countries, and this trend enables the interconnectedness characteristics of the newly emerged IT devices. More than this, a

great achievement is the cloud technology. Cloud technology not only helps devices to interconnect, but also enables simultaneous response and real time information from the market. Interconnectedness makes the communication process faster, not only machine to machine but also human to machine and as query in general happens faster, response also follows quicker.

3.3. Openness

Although openness is a principle that exists in virtually every type of network, from the network enterprise point of view it became easy to implement due to the internet, as a technical infrastructure. The internet provides mostly free accessibility and it is the platform for developing most of the information technology applications and devices that facilitate a better communication inside a network.

Moreover, Castells (2010, p. 501) highlights that because “networks are open structures, able to expand without limits, integrating new nodes as long as they are able to communicate within the network, namely, as long as they share the same communication codes (for example, values or performance goals)”, so it is acceptable to assume that the same logics is applied to the network enterprise as well.

3.4. Simultaneity

Simultaneity is the attribute of the present. It is the starting point for dynamics, up to date flow of information, including real time interaction and data retrieving. The internet made it possible for this principle to be applicable at a larger scale, shaping the way the society is constructed. The online media provided the society with the ability to redefine time and space and trigger the development of IT further on. “Simultaneity ensures our presence in the digitally networked space of online media – to be

present and experiencing events in real-time and by any distance” (Smite, 2012, p. 23). The same author cites a study realized by Saskia Sassen who was interested in simultaneity, as one of the most important aspects of the information technology based networks. In her study, Sassen compared two different networks, the global market for capital and the electronic media activist networks. Her study concluded that in case the global capital market simultaneity leads to a multiplication effect, showing, for instance, how many bank transaction operations can be performed simultaneously at the same time. In the case of the global electronic activist networks “a simultaneous decentralized access may help local actors to organize their activities which are not necessary global at all times, but which in their communication are using globally distributed networks” (Smite, 2012, p. 26). In her study, Sassen proves that a simultaneity and decentralized access allow network users to by-pass, if needed, administrations or other power authorities, so it is not required the existence of a formal global institution in order to be run properly.

Simultaneity refers to a redefinition of time and space. To begin with, space is not geographical anymore; it becomes the territory of a system that enables interaction. As Fuchs (2007, p. 52) suggests, the geographical space is made up of physical bodies that interact, the language in which they communicate and the physical surroundings. If two people interact in a virtual environment, the space is made out of the physical bodies and the technical environment. “Hence space does not imply proximity, with the help of communication technologies space can stretch across distances, the distance between interacting bodies can be enlarged, space then extend itself across geographical distances” (Fuchs, 2007, p. 52). In the traditional communication environment, for instance, the letter, the same information that arrives

in moments due to aid of IT, can arrive in weeks. Referring to time, Fuchs exemplifies that in case of a chat, the two interlocutors need only time co-presence, not also space co-presence (Fuchs, 2007, p. 55). Simultaneity enables communication in real time. There have been developed technologies that help also to retrieve massive amount of data in real time and store it in databases, enabling businesses to be more competitive in a fast changing environment.

3.5. Focus on Collaboration

IT enabled the possibilities of innovation through collaboration, and collaboration implies communication. There have been made studies that proved that innovation often arises from users, with the help of collaboration (Dodgson, Gann, Salter, 2008, p. 141). The same authors suggest that drivers for collaboration can be from gaining status or need to solve problems, or even offer to the market an open source product. Another driver might be the possibility of gaining employment at companies that monitor different networks, or they can even be sponsored by companies who want to improve their position on the market. Probably the most common driver is the will to support the community and to contribute to its evolution.

Not only users and individuals collaborate, also companies collaborate with other companies on the market. For them, according to Dodgson, Gann, and Salter (2008, p. 148) it is important to collaborate, especially in the context of the network society as it, first of all, increases the scale and the scope of activities. Technological collaboration may increase scale as it expands the firms’ market share, and by the means of collaboration the firms can produce better products, increasing the scope. Secondly, through collaboration, firms share the costs and the risks. Costs are

considerable higher and higher, especially with innovation, and thus this implies risks, so sharing these means a further chance of survival. Last but not least, collaborative enterprises have an improved ability to deal with complexity. Due to the limitation of resources it is easier for collaborative firms to deal with technological complexity, as they specialize and each excel on a particular field. One of the scopes of collaboration is the transfer of knowledge, and once the knowledge has been shared and this process is considered to be finished, the partnership might be resigned. However, as the authors underline further on, “as technologies and markets are continually developing, the transferred knowledge may no longer be most appropriate for changed market conditions” (Dodgson, Gann, and Salter, 2008, p. 152).

4. The Network Society Gaps

Castells comes to ask an important question: what is the reason why the network enterprise became the organizational form of the informational and global economy? One plausible answer is that this type of work and knowledge organization “emerged in a formative period of this economy, and it is what seems to be performing” (Castells, 2010, p. 187-188). Derived from this affirmation, is the nature of this successful organization, from how much an organization is capable to generate and process knowledge, to how much flexibility resides in it, and to how innovative can become. From this point on, it is a matter of change, evolution to something new. Is there going to be a change at all? If yes, how would the neo-networked society look like? How much would the network enterprises change?

Van Dijk is but one of many who offer the perspective of the new society as an

asocial society, where people are afraid of normal socialization, forget about touch, hugs, warmth of human companionship and remain isolated in a high tech chamber, with virtual connection to everywhere in the world, with remote chatting, with doing business in a virtual stock market or building a virtual economy in a MMORPG, when a whole world awaits for them just outside the window.

Networked enterprises are no different. Similar to people, they become high tech individualities in an amorphous ocean of information and potentials, but dependent on the instable balance of human need for real socializing. Each enterprise needs to answer in its development strategy important questions like: “How much and where do I outsource?”, “What is more profitable, face-to-face or remote communication?”, “Do I leave decision making to decision making software or I rely on the manager’s gut feeling?”, “Do I rent an office building or I agree with all my employees to work from home?”. According to this answers, the fragile balance of the enterprise is either endangered or enhanced.

Both Steuer’s telepresence theory and Short, Williams and Christie’s theory of Social Presence present a scientific perspective that was not been resolved yet. In order to satisfy all the five physical senses and the possibility to interact more from a non-verbal and paraverbal point of view, innovation is needed. Up to this moment, IT capabilities only refer to senses like sight and hearing – from a human to human communication perspective – and touch – from a human to machine communication perspective. New technologies are developing but the middle cost range enterprise applications still have problems like bandwidth instability, sound and video fidelity, or limitative interface.

5. The Network Enterprise – The Enterprise of the Future

5.1. Innovation directions – 2013

In an era of Globalization and network enterprises, new technologies, increasing competition, e-commerce, strategic alliances, to be competitive is a challenge. In this dynamic network society, one way to sustain growth and performance is to foster innovative practices inside the organizations.

According to the Oslo Manual, there have been identified four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation. Hans Georg Gemuenden defines innovation as “a process, involving multiple activities, performed by multiple actors from one or several organizations, during which new combinations of means and/or ends, which are new for a creating and/or adopting unit, are developed and/or produced and/or implemented and/or transferred to old and/or new market-partners.” Innovation is correlated with novelty, and novelty is portrait as a lack of familiarity with a service or product. “For innovative companies, novelty or newness of processes is an ongoing feature. Novelty increases the uncertainty within activities (how to do them).” (Browning and Sanders, 2012, p. 8)

It is hard to determine a generalized innovation trend, when innovation is, on the one hand, a competitive advantage of a company, so mostly secret, personalized and dependent on the growth vision and the market expectations, and on the other hand, culture and economic dependent on the region of the world the company activates on. Innovation trends are subject of subjectivity of some large companies which survey the markets. One such company is ACCENTURE which realizes technological change trends from some years now.

ACCENTURE identified seven dimensions of the 2013 seven technological

trends: relationship at scale, design for analytics, data velocity, seamless collaboration, software-defined networking, active defense, and beyond cloud. Relationship at scale refers to redefining customer relationship and redesigning them for a more personal approach: consumers are not a cookie file anymore, but real people with real needs. The trend is about customization of experience for every interaction with the consumer. Design for analytics happens when for businesses collecting the data is not an issue, but collecting the right data and then designing applications for it is a challenge. Together with data variety and volume, data velocity helps fostering the insights and making the right decision before the window of opportunity closes.

Seamless collaboration is about the employee collaborative work with increasing productivity by the usage of social networking. The software-defined networking allows companies to remove complexity and reduce costs turning the network into a flexible asset. Server virtualization reduces costs of hardware, space and power, and enhances the capability to run applications everywhere.

The sixth trend, active defense encourages businesses to go beyond prevention, understanding that malevolent attacks will happen and the need to be one step ahead infractors is needed. Last but not least, beyond the cloud rises not the question whether to use cloud solutions or not, but how to enhance cloud capabilities to increase benefits.

5.2. Innovation Potentials – 2020

How innovation will look like in the near future is both a matter of imagination and a matter of secrecy. Corporations with large budgets for research and development tend to have a very strict confidentiality policy, so one can take a glance on how future will look like only from official marketing campaigns

and advertized vision statements. At a quick search on the internet, a few companies are rated better on their shared vision of the future: Corning, Microsoft, and Intel.

I proposed an analysis of these companies' vision videos on the five dimensions of a network enterprise, interactivity, interconnectedness, openness, simultaneity and focus on collaboration, and highlight the improvements suggested for the year 2020. The analysis is based on the frequency of appearances of different dimensions in the video in order to be able to make a ranking among them. At a first glance, all movies show different sides of future lifestyles, from both a personal, educational and professional perspective: different types of people are followed through a small period of time, from waking up, doing daily activities, enjoying life with their children, to the children's learning experience and the parents' professional interaction with the working environment.

Results of the assesment

Table 1

	Interactivity	Interconnectedness	Openness	Simultaneity	Collaboration
Corning	7	6	3	5	7
Intel	2	4	2	3	1
Microsoft	7	7	5	5	6

Since the videos are clearly part of the marketing campaign, and there is a clear need to differentiate one company from the other, and one platform from another, the table presents less about the possible future in a holistic manner, and more about product differentiation. Intel did not do well at the collaboration dimension not because there was a lack of collaboration among people, but because there was barely any screen time with people collaborating.

Overall, the three companies agree on the need of interconnectedness, interactivity, openness, simultaneity and collaboration, and envision these dimensions at a next level, with a more easy way of integrating technology in the day-to-day life. They improve the learning and communication aspects and reduce the response time of the device, all in a very intuitively built environment where different types of touch and commands become second nature to the user.

6. Conclusions

After a short review of the technology of the present and the envisioned technology of the future, one can conclude that, first of all, network society has impacted the world in an irreversible way, and from this point on, forward is the only possible direction. The way of doing business, learning, shopping, interacting with family and co-workers has improved and will be improved in terms of efficiency: interactivity and interconnectedness not only are not going to be a distraction anymore, but will leverage work potential, collaboration, idea sharing and increase the overall productivity, building in a social aspect in the daily professional work.

In the vision of 2020, not all the network society gaps have been answered. There is still the taste and the smell that need to be integrated in the digital world in order to create a mimic, almost natural, telepresence. Touch, on the other hand, has been integrated in a very intuitive way in coordinating the technology and human-computer interface. Technology in general, not only wearable IT, can be considered, from now on an extension of the human body as it responds accordingly to its needs. The network enterprises will grow even more connected and the personalized web will most likely be a normal feature of the future.

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