“Systemic value creation in knowledge organizations: aspects of a theory”

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ARTICLE INFO	Daniel Adriaenssen, Dagny Johannessen, Helene Sætersdal and Jon-Arild Johannessen (2017). Systemic value creation in knowledge organizations: aspects of a theory. *Problems and Perspectives in Management*, *15*(1), 45-54. doi:10.21511/ppm.15(1).2017.04
DOI	http://dx.doi.org/10.21511/ppm.15(1).2017.04
RELEASED ON	Tuesday, 28 March 2017

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JOURNAL	"Problems and Perspectives in Management"
ISSN PRINT	1727-7051
ISSN ONLINE	1810-5467
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
89	4	0

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Systemic value creation in knowledge organizations: aspects of a theory

Abstract

The phenomenon under investigation is the transition from an industrial society to a society that is based to a larger extent on knowledge resources. The question the authors are investigating is: What are the key value creation processes in a knowledge-based organization? The objective of the article is to understand and explain the social mechanisms that influence the development of knowledge-based organizations. The method used is conceptual generalization. The findings are linked to a new emphasis on information structure (infostructure), and a new way of organizing (front line focus), the modulization of work processes, and global competence clusters.

Keywords: infostructure, front line focus, modulization of work processes, global competence clusters.
JEL Classification: D83.

Introduction

The term "knowledge-based organizations" is used here to mean an organization that is "composed largely of specialists who direct and discipline their own performance through organized feedback from colleagues, customers, and headquarters" (Drucker, 1988, p. 3). Such an organization "is structured around information, not hierarchy" (Maciarello, 2014, p. 71). As far as we are aware, the term "knowledge worker" was used by Drucker first in 1959 (Drucker, 1959, p. 122). Berger provides a definition of "knowledge worker" that gives the term the same meaning as ascribed to it by Drucker and Maciarello; that is, that knowledge workers are "people whose occupations deal with the production and distribution of symbolic knowledge" (Berger, 1987, p. 66).

There are many examples of knowledge-based organizations: modern hospitals, symphony orchestras, universities, consultancies, engineering firms, architectural practices, etc.

The main function of a manager in a knowledge-based organization is to coordinate the flow of information between experts, and to ensure efficiency in work processes targeted at customers, users, patients etc. (Maciarello, 2014, p. 71). A manager in such an organization does not need to possess an expert's highly specialized knowledge, but he or she must be able to communicate with experts using their professional language (Bohlander et al., 2001; Mulej, 2013). In order to do this, a manager must possess contextual confidence. The manager does not need to have the same level of competence as the people he or she will manage, but he or she must have an understanding of, and be intimately acquainted with, the context (Vallima & Hoffman, 2008; Mulej, 2013). Contextual confidence will enable the manager to ensure that the intended function of the system is implemented: that the organization's primary tasks are coordinated and implemented with maximum efficiency, and that everyone's capacity to perform is exploited to the full (Beer, 1995).

In addition, a manager in a knowledge-based organization must have the ability to analyze such information as is necessary for the organization to perform. He or she must also be able to communicate this information to employees (Brockbank & Ulrich, 2006).

The knowledge workers must understand what is being communicated so that they can act in the light of this information (Maciarello, 2014, p. 72). Drucker emphasizes the point that it is necessary to have the ability to communicate information to those who will be able to apply it most appropriately and productively (Drucker, 1999, 1999a). The point of contextual confidence is that it will enable the manager to communicate appropriate information in an understandable manner. Otherwise, while the information may be completely correct, it may be completely useless for the recipient.

Early in this debate, Savage (1995) pointed out that the advent of the knowledge society was an event equivalent to the advent of the agricultural society, or the industrial society. In the knowledge society, information will be capable of rapid transformation into resources that can by applied for value creation (Castelfranchi, 2007). The knowledge society is dependent on the existence of new technology, both ICT and the internet (Vallima & Hoffman, 2008; UNESCO, 2005). While information may be transformed into knowledge that may be used in value creation processes, it is also true that knowledge not applied in a process that is subject to reflection and critical thinking may be counterproductive for value creation (Innerarity, 2012; Mulej, 2013). A key characteristic of the knowledge society is

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the status of knowledge as the central commodity that is exchanged for economic prosperity. Just as agricultural goods were the key characteristic of the agricultural society, and industrial goods the key characteristic of the industrial society, so is knowledge the primary commodity of the knowledge society (Burton-Jones, 1999). Accordingly, the knowledge worker is the main class of worker in the knowledge society, just as the industrial worker was in the industrial society and the agricultural worker in the agricultural society (Drucker, 1969, 1988, 1993, 1999, 1999a).

As knowledge becomes the most important value creation factor in the knowledge economy, there is also growing criticism of the prioritization of knowledge (Gross, 2010). There was similar criticism, however, during the transition from the agricultural society to the industrial society, when those who felt their position was under threat took to destroying industrial machines (Bowden, 1965, p. 73). It is reasonable to anticipate that people who feel themselves threatened by the knowledge society are those who do not have the same access to knowledge processes and feel they are being marginalized (Sennet, 1998, 2013). These people will probably counteract, ignore and minimize the significance of knowledge (Guest, 2007).

The global knowledge economy is a result of globalization (Hamel, 2012). Globalization has many different aspects. One is an expansion of the concept of free trade (Santos & Williamson, 2001). Another is the emergence of new spheres of knowledge (Ulrich, 2013). One way of looking at the expansion of free trade and the development of new knowledge is to consider our analytical models, which are based on the concept of the nation state, as undergoing change (see Bauman, 1992, p. 65).

One view proposed by Marr (1995), which concerns the development of globalization and knowledge enterprises, is that the deregulation of the money market during the 1980s accelerated globalization, because it put an end to national autonomy. Hirst (1993) and Hutton (1995) take a different view. They see the expanding market as an important driving force in the development of globalization. Another way of looking at growing globalization is to consider China opening up to foreign capital at the end of the 20th century and the fall of the Berlin Wall in 1989. As a result of these two events, approximately 1.5 billion people entered the capitalist market.

What is new about the knowledge society, in our understanding, is that production has moved from classical industrial production in the industrial society to high-technology production based on new knowledge resources, new organizational methods and new technologies in the knowledge society (White & Younger, 2013). The new knowledge workers are those who, among other things, add content to what many of us access on a daily basis in the form of knowledge resources on the internet. In Europe alone, these people comprise approximately seven million knowledge workers (Jemielniak, 2012; UNESCO, 2005). These are knowledge workers who value creative processes and who are result-oriented (Drucker, 1999a).

Unlike industrial workers, knowledge workers do not appear to identify themselves with other knowledge workers as a collective phenomenon (Sennet, 1998, 2004, 2006). They identify with their own results, opportunities and expectations, not unlike an entrepreneur or an owner of capital (see Thurow, 1999).

In the industrial society, the infrastructure emerged as a crucial factor in value creation, and included the transport of goods and energy. In the knowledge society, there is much to suggest that it is the information structure, hereafter referred to as the *infostructure*, which will be a crucial factor in value creation.

The infostructure is important for information, communications and knowledge processes, as well as for "connectance" in large dynamic systems (Ashby, 1970). Amongst other things, the infostructure enables distances and borders to be reduced and diminished. This applies to geographical, psychological, cultural and social distances and borders (Baird & Henderson, 2001). Consequently, the infostructure directly affects transactions in and across different organizations (Williamson, 2013). The development of the infostructure affects the arranging of activities within and between organizations (Boxall & Purcell, 2010).

James G. Miller (1978) was one of the first to develop a theory for infostructures in social systems. Together with his research team, he examined eleven information processes (infostructure) in a social system, which we have tried to illustrate here using symbols in Figure 2.

In addition to the infostructure, what we term the front line (i.e., those who are in contact with customers, users, citizens, patients, students, etc.) will have greater significance for value creation in individual businesses (Hannah et al., 2015). The rationale is that customers have increased competence and expect to meet someone who has equal or equivalent competence (Drucker, 1999, 1999a). Another reason is related to the fact that customers and suppliers will increasingly participate in innovation processes, more so than previously (Ramaswamy & Ozcan, 2014).

In order for the front line to be an important factor for value creation in an individual business, it is crucial that it is designed to identify and use signals and information that can be used for creativity, innovation and continuous quality improvement of the business's products and services (Jemielniak, 2012).

The phenomenon we examine here is the transition from the industrial society to a society increasingly based on knowledge resources. The question we ask is: What are the key value creation processes in a

knowledge-based organization? The first aim is to understand and explain the social mechanisms and the related social processes that influence the development of knowledge-based organizations. The second aim is to investigate what implications this development will have for management roles in the future.

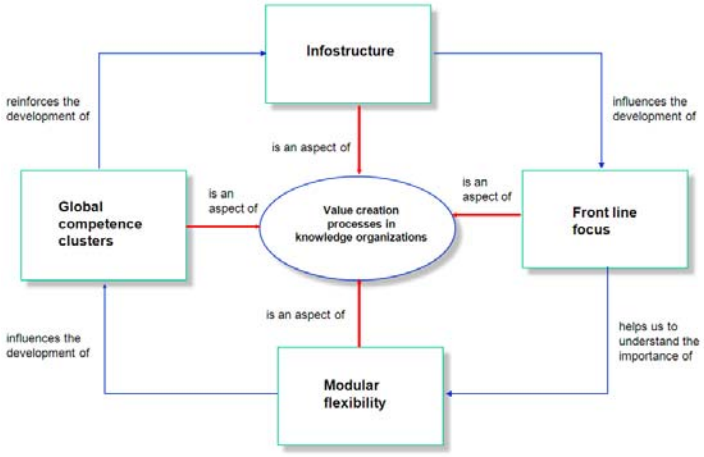

Fig. 1. Key value creation processes in the knowledge economy

1. Methodology: conceptual generalization

Conceptual generalization is the methods used in this article. It is is "a procedure applying to the whole cycle of investigation into every problem of knowledge" (Bunge, 1998, p. 9). The approach in this method is to develop a conceptual model and then discuss each element in the model. For further knowledge about conceptual generalisation see Adriaenssen & Johannessen (2015).

2. Infostructure

The infostructure concerns the processes that enable the development, transfer, analysis, storage, coordination and management of data, information and knowledge. The infostructure consists of eleven generic processes, as shown in Figure 2 (Miller, 1978).

The infostructure forms the basis for communication processes and the development of knowledge. It is also highly instrumental in establishing new networks on a global scale (Baird & Henderson, 2001). It is precisely the development of the new infostructure that enables new global cooperation networks, as well as new organizational and leadership forms (Tapscott & Williams, 2006). While the infrastructure facilitates the transport of goods, services and energy, the infostructure coordinates and integrates information resources on a large scale (Ramaswamy & Ozcan, 2014).

The eleven processes in the infostructure may be considered as nodes in a social network at different levels, for example, team, organization, society, and region, all in the global space. Together, the eleven processes comprise the totality of the infostructure (Haag et al., 2012). The purpose of the nodes is to coordinate information so that social interaction is facilitated and new knowledge developed. The idea is that when the nodes in such a social global network co-create new knowledge and innovation is developed (Hamel, 2012). The concept of infostructure may be thought of as part of Muleis (2013) requisite holism. Understood in this way infostructure is a conceptual innovation, which may lead us to make a distinction between infrastructure in the industrial society to focus on infostructure in the knowledge economy.

The assumption is that in the transition from an industrial to a knowledge economy, the centre of gravity for employment shifts (Tapscot & Williams, 2006). In the knowledge society, knowledge workers perform specialized functions related to the eleven information processes in the infostructure (Reinhart et. al., 2011). Specialization within each of the eleven information processes leads to the production of knowledge in cooperating global competence clusters (Garud & Langlois, 2002).

Each of these eleven infostructure processes is strategically important for knowledge-based organizations (Castelfranchi, 2007). Dominance of one or more of these processes allows for the possibility of control over value creation in the knowledge society (Hamel, 2012). Through control of individual processes, one has the opportunity to influence activities in other processes (Davenport, 2005). The various processes have their relative importance for value creation in the various social systems (Boisot, 1998). At the same time, they have different emphasis depending on the level that is being focused on.

Proposition 1: In the knowledge organization there will be a change in emphasis from infrastructure to the infostructure.

Fig. 2 shows a schematic diagram of the infostructure processes. These processes relate to Miller (1978), but are conceptualized by us.

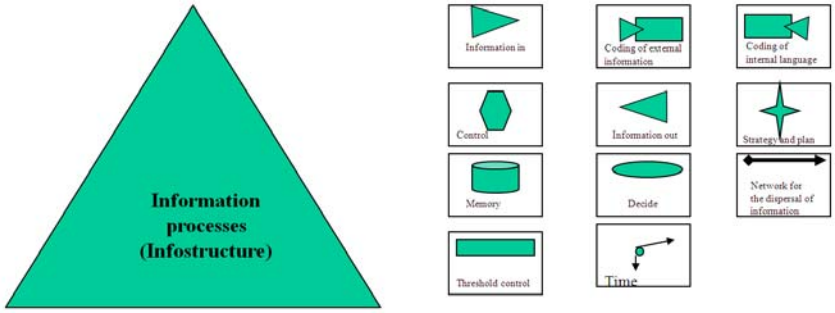

Fig. 2. Infostructure processes

An example of a system that has been especially affected by the change in emphasis from infrastructure to the infostructure is the postal service in various countries. As the emphasis in social development began to emphasize the infostructure with a relative deemphasis of the infrastructure, parts of the postal functions were taken over by other information carriers. An example of this is email in various networking solutions, which is represented in Fig. 2 by the symbol *network for the dispersal of information*. The consequences of this for postal services have included both the closure of post offices and the dismissal of many employees, as well as the change of functional areas and competence. The main development was a greater emphasis on various information processes as shown schematically in Fig. 2.

How the knowledge society develops is not immediately apparent, because its production processes do not follow the logic of the industrial society (Hamel, 2012; Tapscott & Williams, 2006). The production logic of the industrial society is being replaced by the new and different production logic of the knowledge society. The new logic is created by creative production on the internet, an extreme focus on innovation, and a situation, where global competence clusters replace local industrial clusters (Tapscott & Williams, 2006; Thurow, 1999). One of the consequences is a stronger focus on the infostructure, and thereby a decrease in the industrial production logic framed by, among others, Michael Porter (Porter, 1998, 2004).

Where one is placed within the infostructure is important with regard to the impact and influence one has within the organization. This position, coupled to the goals of the organization, i.e., what it is designed to do (Beer, 1995), is decisive for determining the influence one has within the organization (Innerarity, 2012).

When the competence of customers increases, it is reasonable to assume that they expect to meet high levels of competence in their dealings with the organization. This can lead to a shift of focus in the organization logic of knowledge-based organizations, from hierarchical positions to the front line. The front line in organizations consists of those people who are in close contact with customers, users, suppliers, etc. (Jemielniak, 2012). If this assumption is correct, the development of both the infostructure and focus on the front line will lead to major consequences for the role of management in the future.

3. Front line focus

If it is correct that information and communication processes are essential for value creation in the knowledge society, which Reinhart et al. (2011) claim, competence in the front line will be crucial for efficient organizations. It is in dealings with customers that these processes can culminate in that which is creatively new, and where knowledge is transformed into value creation for the customer (Hamel, 2012). This can also be derived from both theory and practice related to open innovation processes (Chesbrough et al., 2008). The rationale is that the competent customer will prefer the competent supplier (Prahalad & Krishnan, 2008). A necessary condition to achieve this is that the bureaucratic structures are deconstructed, and competence, service, information and decisions are moved to the front line (Hannah et al., 2015). If this doesn't occur, it could hinder restructuring and be a costly element of knowledge-based organizations (Jemielniak, 2012).

Creativity and innovation are prerequisites for value creation in the knowledge society (Prahalad & Krishnan, 2008; Hamel, 2012). Bureaucracy, with its stabilizing thought mode, has difficulty in adapting to rapid changes because change dynamics are not bureaucracy's primary thought mode (Bauman, 2011).

The bureaucratic model was effective for its time, where stability was the primary focus. In the knowledge society, however, change processes are the primary mode because globalization, rapidity of information processes, focus on innovation, and the rapid spread of innovation lead to dynamic change processes (Prahalad & Krishnan, 2008). Creative destruction will probably be normal in such a situation, because the pace of change increases in the global knowledge economy (Hamel, 2012). This could lead to demand for major reorganization and increasing pace of change in the industrial society (Rooney et al., 2008, pp. 55-57, 160-161).

A common feature of the knowledge society seems to crystallize as structural links, or "connectance" in Ashby's model (Ashby, 1970). It seems possible that continuous changes in structural connections will lead to customers' expectations, wants and needs changing (Ramaswamy & Ozcan, 2014). Coping with these continuous changes presupposes that organizations have sufficient variety in their capabilities so that they can match customers' competencies, which is related to the "law of requisite variety" (Ashby, 1970). It is reasonable to assume that the capability must exist where the customer interacts with the business - in the front line. Sufficient competence in the front line, satisfying customers' requirements, will be a decisive competitive factor for businesses (Nordhaug, 1994). If competence in the front line is crucial, and the front line is largely identical with where decisions are taken, perhaps bureaucratic structures will be less important for decision-making processes in knowledge based organizations (Davenport, 2005).

Competence in the front line, collective learning structures between businesses, customers and suppliers, and flexibility as a structuring mode will in such an organization be key creation processes (Hannah et al., 2015).

Requisite variety in competence, in relation to the individual customer, presupposes an information system in the front line that focuses on continuous change in the customer's needs and wants. In addition, the organization will have a competitive advantage when they have an organizational learning system that focuses on interaction between the organization, the customer and supplier (Haag et al., 2012). Businesses that are able to change their form of organization to a focus on the front line, and develop work processes connected to new technology that focus on cooperation in the global clusters of competence will be in the forefront of the global knowledge economy (Hamel, 2012; Jemielniak, 2012).

Proposition 2: Competence, service, information and decisions are moved to the front line in the knowledge organization.

The frontline focus helps us to understand the necessity and importance of modular flexibility (Garud et al., 2002), which we will elaborate on in the next section. A figurative presentation of the discussion in this section is shown in Fig. 3.

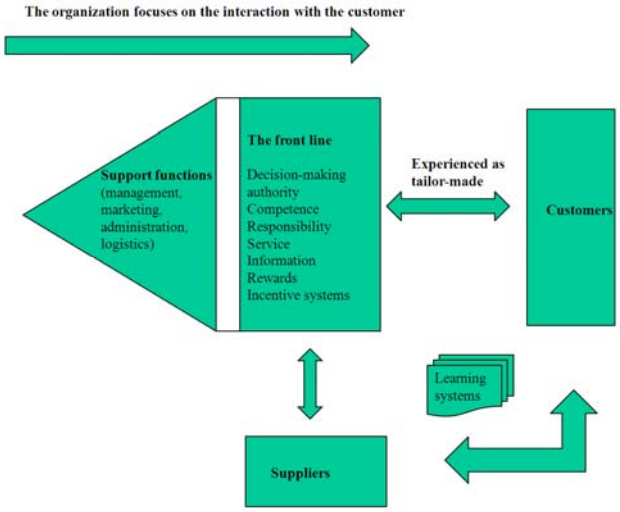

Fig. 3. Frontline focus

4. Modular flexibility

The modulization of value creation is termed here modular flexibility (Garud et al., 2002). Modular flexibility may best be understood as the globalization of production processes, and extreme specialization of work processes with a focus on core processes (Gershuny & Fisher, 2014), not unlike the concept of functional differentiation developed by Luhmann (1982). Of course, the economist Adam Smith as early as 1776 described a similar process when he delineated the structured activities of a pin factory. What is new in the global knowledge economy is that modular thinking is systematized on an unprecedented global scale, and that currently new technology and infostructure are used to streamline this modular logic (Brynjolfsson & McAfee, 2014).

The new organizing modus is characterized by classical industrial production being re-integrated into global modules, in accordance with a logic of costs, quality, competence and innovation (Karabarbounis & Neiman, 2013). This means that parts of the production will move to areas where costs, such as for labour, are low. Other parts of the production are moved to areas where they have a specific expertise, for instance, Banglore in India in the case of IT expertise. Other parts of the production are moved to areas known for design and innovation expertise (Autor et al., 2003). Metaphorically, this may be understood as a form of organization based on a "Lego principle": the individual Lego bricks are produced where they have the necessary expertise or where costs are low. Finally, the product is assembled where they have a special

competence in understanding the totality of the product. Modular global manufacturing is unified and coordinated using new ICT. In other words, it may be imagined that the overall design of the product is ready (Azmat et al., 2012; Hsieh & Klenow, 2007).

Those who feel the pressure in such a structure are the industrial workers in welfare states where wages and working conditions have been negotiated over a long period of time, and are, thus, not competitive in relation to low-cost countries (Acemoglu, 2003, pp. 1-37). Low-cost countries, however, can still have a highly skilled workforce and, thus, produce high-quality products. As mentioned, an example of this is Bangalore, India. Bangalore is the capital of the state of Karnataka. It has more than four million inhabitants and, amongst others, specializes in the education of software engineers. This example shows that it is not only unskilled and skilled labor that is ousted in the global economy, but also highly skilled knowledge workers in Western industrialized countries (Brynjolfsson & McAfee, 2014).

The logical consequence of specialization and division of labour is that it becomes progressively global, increasing competition and forcing down costs (Rios-Rull & Santaeulalia-Llopis, 2010). However, the globalization of labour and other costs leads to an increase in social conflicts (Sennett, 1998). This is, amongst other things, a consequence of established salary structures being exposed to global competition (Innerarity, 2012).

Proposition 3: Modular thinking is systematized on an unprecedented global scale

In Figure 4, we have shown the modular logic we described in this section.

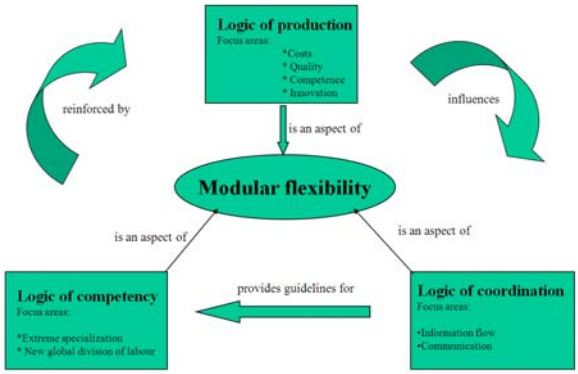

Fig. 4. Modular logic

5. Global competence clusters

Porter (1998) argues that economic growth is largely created through local business clusters. The new technology, however, promotes a new logic of information, communication and networking in the globalized knowledge economy (Brynjolfsson & McAfee, 2014). This new logic, coupled to the fact that expertise is increasingly becoming a global resource (Autor & Murnane, 2003) available in the new infostructure, makes the global competence networks important forces in value creation (Fisher, 2006). This development promotes the idea that global clusters of competence, to a greater extent than the local clusters, are crucial for the development of innovation and economic growth (Ramaswamy & Ozcan, 2014). From such a standpoint, local business clusters may be understood in the context of the global competence clusters when explaining the complexities of value creation processes in the knowledge economy (Prahalad & Krishnan, 2008).

Structurally linked competence networks that are spread globally may constitute the most important value creation structures in the knowledge society (Auto & Murnane, 2003; Gershuny & Fisher, 2014). Global competence clusters may be geographically distributed at the individual level and consist of small, tightly-knit social networks, or be small groups with expertise; these are structurally connected through the new infostructure (Brynjolfsson & McAfee, 2014). In this way, global expertise is fully utilized for innovation and economic growth (Ramaswamy & Ozcan, 2014). In other words, the global competence clusters can be viewed together with the local clusters, and it may be imagined that the connection between the two can prove to be the main drivers of value creation in the knowledge society in the future (Acemoglu, 2003). In this context, it is the structural links that are of interest, not the local clusters or global competence networks separately.

Co-creation is important for knowledge, knowledge transfer and knowledge integration (Ramaswamy & Ozcam, 2014; Tapscot & Williams, 2006). Co-creation involves working together to promote knowledge processes and innovation. Although competition has proven to promote productivity and economic growth, it is not necessarily this factor that should be emphasized in the global competence network. Pfeffer & Sutton (1999, p. 102) express this as follows: “There is a mistaken idea that because competition has apparently triumphed as an economic system, competition within

organizations is a similar superior way of managing". In other words, although competition promotes productivity and economic growth in the industrial society, it is not certain that the same mechanisms apply to knowledge development and sharing in the knowledge society.

Competence development presupposes just as much cooperation in the global competence network as it does competition. The constant interaction between competition and cooperation results in co-creation becoming increasingly important for value creation. This may prove to be the fundamental driving force for value creation in the knowledge society (Ramaswamy & Ozcam, 2014). The thinking in this context is that if competition is the only prevailing principle, then, everyone will protect their ideas from disclosure and knowledge development will be inhibited. If collaboration is the only principle driving the development of knowledge forward, then, it seems reasonable to assume that motivation and incentives will not be optimal for the development of new knowledge. The balance between competition and cooperation, embodied in the concept of co-creation, leads to constructive criticism and the necessary scope of knowledge that exists in the network so as to promote creativity and the innovative. Instead of a zero-sum situation, a positive-sum situation will be developed where everyone wins.

Co-creation is connected to developing complementary competence teams in a global competence network. In such a social network, mentoring, cross-functional teams and collaborative teams may be developed across cultural and physical boundaries (Sennett, 2013). In addition, this presupposes a culture in which the success of colleagues is viewed as the success of the system. Shapiro & Varian (1999: 10) also emphasize the importance of focusing on cooperation in the networked economy: "…the need for collaboration, and the multitude of cooperative arrangements has never been greater than in the area of infotech". An example of the importance of co-creation is the necessity of working together to develop standards for technology and system integrations, while competing for the products and services that will be delivered using these established standards. If there is a failure to agree on standards, innovation may be hampered and value creation and economic growth may suffer as a consequence. In such a situation, the users and customers are the losers. The example concerning the development of standards shows that *cooperation is a prerequisite for competition*, in the same way as change is a prerequisite for stability. It is always a balance between competition and cooperation that creates good solutions, like the tight rope acrobat who has to find a balance between change and stability, moving his/her arms and legs in order to maintain overall stability while walking along the tight rope.

Proposition 4: Global clusters of competence, to a greater extent than the local clusters, are crucial for the development of value creation in knowledge organizations.

Conclusion

The article's research question:

What are the key value creation processes in a knowledge-based organization?

The article has stressed the importance of five elements:

1. A new emphasis on the infostructure
2. A new way of organizing businesses, termed here a front line focus
3. A new way of structuring work processes, termed here modular flexibility
4. A new way of using competence, termed here global competence clusters

A focus on the frontline will promote a new kind of leader who does not have a position in the hierarchy, but has the same management functions in relation to customers as the hierarchical leader had previously. These people have high competence and are characterized by their ability to embrace simplicity. Further implication will be on the education system, especially at the MBA-level. Management education should focus more on the thinking in the knowledge society and to a lesser degree on the management in the industrial society. More emphasis should be made on positive psychology, positive leadership and a way of thinking, which reflect the functional differentiation developing in a globalized knowledge society.

The emphasis of the new infostructure, modular flexibility and global competence clusters requires leaders who can handle extreme complexity.

The restructuring of the world economy, which follows from, amongst other things, new technologies, new structures of cooperation, global competence networks, modulization of production, and a front line focus may lead to a polarization between information-rich and information-poor systems at various system levels. Management issues in a globalized knowledge economy should be understood as a way of thinking, not a way of action, because in the globalized economy the only thing that really matters is our way of thinking, our ability to reflect, and our way of seeing other perspectives. This would bring requisite variety holism into an education arena, and so organizational cybernetics, systems thinking and systemic thinking together could create a new way of management education which, would reflect the coming of the globalized knowledge economy.

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