Chapter 9

The Impact of the Internet of Things to Value Added in Knowledge-Intensive Organizations

Maja Meško, Jana Suklan and Vasja Roblek

Additional information is available at the end of the chapter

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Abstract

This chapter has focused on the importance and influence of Industry 4.0 and consequently the Internet connected technologies' creation of the value added for knowledge-intensive organizations and society. The chapter considers the development of knowledge management through different periods; it has focused on its importance during the use of social media and the rise of the Internet of Things. The goal of this chapter is to achieve a better understanding of the impact of knowledge management processes to the value of knowledge that is established by the extent of knowledge sharing within the organization and with suppliers and customers (knowledge sharing outside the organization).

Keywords: knowledge organization, Internet of Things, innovative economy, value added chain, knowledge management, organizational changes

1. Introduction

In the last 25 years, as a rapidly developing discipline, knowledge management (KM) has become the utmost important source for organizations that aim to raise efficiency, innovation, and hence the competitive abilities [1, 2]. During this period, the theory of knowledge management has also been developing [3] due to the recognition of knowledge as a fundament for competitiveness and the key to business success [4].

Handzic [5] defined the fundamental purpose of knowledge management as collecting, organizing, and processing knowledge into a form that is useful to all employees. An important role of knowledge management is shown in applications that exist in the organizations, such as intranet, enterprise resource planning systems (ERP), and customer relationship management systems (CRM). Such applications store transactions and customer data for business

decision-making processes [6]. With launching the Web 2.0 and social media, these processes are running outside the organization [7]. According to the fast adoption of the social media platforms and mobile applications in the last 10 years, organizations have faster (in real time) and easier access to the knowledge that is created in human living environment [2]. The Internet transformation of the digital industry is still in progress; the artificial intelligence, big data, and connectivity indicate the certainty of a new round of digital revolution [8].

The concept of Industry 4.0 has launched the fourth technological revolution, which is based on the concepts and technologies that include cyber-physical systems, the Internet of Things (IoT) and the Internet of Services (IoS). Industry 4.0 is based on perpetual communication via Internet that allows a continuous interaction and exchange of information, not only between humans and machines, but also between the machines themselves [9]. This communication interaction influences the establishment knowledge management 4.0. The trend of the social customer relationship management (social CRM) for an emergent concept that integrates classical customer relationship management (CRM) and social media is leading toward the establishment of a communication channel for the continuous exchange of information about the needs and individual situations in real time to e-retailers, healthcare, manufacture, housekeeping, coworkers, customers themselves, energy suppliers, etc. [10].

This chapter has focused on better understanding of the impact of the Internet of Things on organizational changes in knowledge-intensive organizations. The contribution of the article is mainly conceptual.

2. Transformation from knowledge economy to innovative economy

The transformation of "traditional heavy industry" into the technological development-oriented economy proceeded in the middle of 1980s in twentieth century [11]. The economic period of knowledge economy has influenced organizational changes in strategies, structures, and management styles [12].

The emergence of the Internet in the early 1990s of the twentieth century (period of the Internet or digital economy) has influenced the rise of the third wave of capitalism. The Internet launched the new institutional revolution in the globe. Consequences have been seen in increasing the importance of networks and crowds in relation to market institutions. Internet revolution is based on a population size (N), the resources feeding supply sub-system (F) encompassing both the natural resources and food system, and accumulated technological and scientific knowledge sub-system (K). The key factors N-F-K have an important influence on human development and economic growth [13].

The technological development forces organizations that are based on the Taylors paradigm hierarchy into the changes of the business processes that consequently lead to the changes of the organizational structures. Organizations must have in mind that their role in a new "smart technological capitalistic" era will be not only to provide the development of a high-tech information and communication technologies, but also to support the social innovative projects and thus have an impact on social and economic development of the society [14].

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During the time of economic crisis (2008–2009), the first signs of changes in business models occurred. Innovation companies gave an answer how to increase the economic growth in last few years. Entrepreneurs have begun to open up a start-up technology companies related to the development of online platforms and digital technologies [15]. The launching of a new business models based on the Internet and digital technologies affected in last few years due to the changes in the consumer behavior. The fast Internet connections and mobile technologies enable the development of the trading and sharing platforms (e.g., Airbnb, Backfeed, Fairmondo, Uber, Tapaz, etc.). Digital platforms enable individuals and business operating in real time via the Internet, which increases the range of potential customers and due to the nature of the business reduces the cost of marketing and business resulting in lower prices for goods and services [16].

Managers and leaders should be aware also of the knowledge negative aspects, because it can cause economic crisis. Control of the knowledge resources and prevent sharing of knowledge and information have a negative impact on the development of innovative society. Cause is the large gap between developed and emerging countries [17]. Pagano and Rossi [18] claim that the cause of the crisis lies at the monopoly of developed countries over intellectual rights. International agreements on trade-related aspects of intellectual property have caused a rise in the cost of investments in countries that had neither abundant inexpensive labor nor high amounts of intellectual property. The authors believe the solution to the crisis, besides changes in monetary policy, financial regulation, and standards of Keynesian economic policy, also needs a measure that will reduce the intellectual monopolization of the economy.

The innovative economy that succeeded knowledge economy introduces new approaches for the development of business models in the process of organizational evolution. The innovative smart Internet connected technologies become a system for creating and distributing the knowledge and as such they have characterized firms and many other social systems [19]. The main factor for the development of the entrepreneur idea is not any more the financial capital but a social capital, because products or services are a result of knowledge that is based on innovative ideas by either individuals or teams [20]. Knowledge and information have become a key factor for success in the knowledge economy as an innovative economy [21].

It is necessary for the development of an innovative environment to facilitate access to venture capital (e.g., crowdsourcing, kickstar, venture capital funds, etc.) and move on to the new forms of cooperation that are based on short term relations for which the duration depends on the project timeframe, provide tax relief for R&D, enhancement of intellectual property rights (patents and licenses), and facilitation of the networking organization that facilitates cooperation among businesses (e.g., clustering).

2.1. Industry 4.0 and rise of Internet of Things

A new concept of German economic policy was formed in Germany in 2011, based on high-tech strategies named as Industry 4.0 [22]. That concept raised the fourth technological revolution, which is based on the concepts and technologies that include cyber-physical systems, the Internet of Things (IoT), and the Internet of Services (IoS) [23, 24], based on perpetual communication via Internet that allows a continuous interaction and exchange of information, not only between humans (C2C) and human and machine (C2M), but also between the machines themselves (M2M) [25].

The rise and expansion of Industry 4.0 with its current fundamental concepts (**Table 1**) is based on the assumption of increasing global urbanization [26]. Demographic changes are becoming a challenge for urban renewal and development, which will have to enable the infrastructure of residents for ensuring their quality of life and sustainable orientation [7, 24]. What actually presents the phenomenon of Industry 4.0, and in which parts of the economy and the human environment it is expanding, is probably most evident from the expressions with which it is associated. These fundamental concepts of Industry 4.0 and the explanation of their contents are shown in **Table 1**.

As shown in **Table 1**, in order to create a smart project, smart technologies and devices have been used. A critical component for the success of urbanization and societal development will be a smart technology. It is predicted that the purpose of the technology will be aimed at collecting and analyzing data from the human environment in order to design a circular economy, increase revenues, lower capital spending, improve services, and mobility [9, 27].

An organization needs a developed business-support infrastructure as a result of initiating partnerships, which allows it access to information, advice, and education. In this model, information is changing and in such a rapidly changing environment, information is not so much important [4].

Expression/fundamental concept	Explanation
Smart factory, smart manufacturing, intelligent factory, factory of the future	The smart factory will be more intelligent, flexible, and dynamic. Manufacturing will be equipped with sensors, actors, and autonomous systems. Machines and equipment will have the ability to improve processes through self-optimization and autonomous decision-making
New systems in the development of products and services	Product and service development will be individualized. In this context, approaches of open innovation and product intelligence as well as product memory are of outstanding importance
Self-organization	In manufacturing, processes change in the entire supply and manufacturing chains. These changes will have an impact on changing processes from suppliers to logistics and to the life cycle management of a product. Along with all these changes manufacturing processes will be closely connected across corporate boundaries These changes in supply and manufacturing chains require greater decentralization from existing manufacturing systems. This fits with a decomposition of the classic production hierarchy and a change toward decentralized self-organization
Smart product	Products inserted with sensors and microchips that allow communication via the Internet of Things, with each other and with human beings. Cars, t-shirts, watches, washing powder, etc., are set to become "smart," as their makers attach sensors to their packaging that can detect when the product is being used, and that can communicate with smartphones when scanned. Smart products are eliciting the question of invasion of privacy and consequently personal safety

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Expression/fundamental concept	Explanation
New systems in distribution and procurement	Distribution and procurement will increasingly be individualized
Adaptation to human needs	New manufacturing and retailers' systems should be designed to follow human needs instead of the reverse. It is suggested that these systems may well be a combination of robotic-like tools such as personal intelligent agents such as Siri, Viv, Cortana, Google Now, and others, which will be combined with the Internet of Things. That can become the dominant model of the interaction between buyers and sellers
Cyber-physical systems	Systems will integrate the computation, networking, and physical processes. Embedded computers and networks will monitor and control the physical processes, with feedback loops where physical processes affect computations and vice versa. An example is the control of vital human functions that allow urgent health care through mobile applications, sensors in clothing, sensors, and surveillance cameras in flats
Smart city	Smart city is defined as a city that comprises six factors in its development policy: smart economy, smart mobility, smart environment, smart people, smart living, and smart governance. It is the product of accelerated development of the new generation information technology and knowledge-based economy, based on the network combination of the Internet, telecommunications network, broadcast network, wireless broadband network, and other sensors networks where IoT as its core
Digital sustainability	Sustainability and resource-efficiency are increasingly in the focus of the design of smart cities and smart factories. It is necessary to respect ethical rules when using private information. These factors are fundamental framework conditions for successful products

Source: Ref. [2].

Table 1. Fundamental concept of the Industry 4.0 and implementations of IoT.

If management wishes that the new digital business models have an impact on increasing the added value of organizational knowledge, it is necessary to focus on:

- Definition of adoption of human communication methods in the external environment (terms of quality, distinctiveness, and ownership of data, information, and knowledge).
- How people account for the risk of sharing their content with strangers. Are people receptive to the issues of ownership and transfer of data between strangers (the problem of transmission of information from researchers and developers with external experts to help create the so-called open innovation)?
- How it affects the takeover or merger of the development organization that owns the new technologies developed by its members to communicate with experts in acquiring.

It must be realized that today the company due to globalization changes is exposed to more rapid changes in society and nature, which as such have the greatest impact on product development, operations, and ultimately to the success of the company [28]. This change caused the growth of importance of reaction in interaction with the environment in which the entity operates (headquarters, production), as well as the markets in which it sells. This means that the massive classical information passes into custom-made information known user or target groups of users with high added value [27]. Such information is transformed into specialist advice and continuous monitoring of users, while education is increasingly necessary in the fields of encouraging companies for corporations, informing about the types of cooperation and management of partnership development networks.

3. Changes in knowledge management and in the knowledge-intensive organizations

3.1. Knowledge-intensive organizations

In the case of the contents described in this chapter, the objective is to contribute to the understanding of the structures and contexts of utilization of knowledge-based resources; the question is how complex implementation of the Internet of Things as a technological instrument effects on organizational changes and adaptation of knowledge processes; and to the understanding of the relationship between innovations of IoT technologies and organizational performance. According to Porter [29], a value chain represents a key source of competitive advantage. In this case, cost advantages and successful differentiations are tracked more effectively by considering the chain of activities that organization performs with the goal to deliver value to its customers. The most products of the knowledge-intensive organizations are hidden assets. These invisible assets have presented knowledge about what the organization produces, how an organization is organized, and for what reasons [30].

Organization is an open system that is affected by the external environment with emphasis on the global nature and constantly changing requirements of customers, suppliers, and market conditions (nature conditions, the legislation, customs, taxes, and religion). The value of external system is featured as the ability to solve problems and needs of our customers. According to the information about customer behavior, organization can establish a policy for the customer relationship management (CRM) and suppliers develop a marketing strategy that provides market positioning and design of brand loyalty [3]. Web platforms become an important source of knowledge about the customers and with help from information getting from web platforms and Internet connected products, organizations have created the content value chain. This is achieved by linking complementary organizations and respective organizations with their distributors and customers [31].

The external effects on the organization are evident in organizational effectiveness and relevance of the activities in the field of R&D of individuals and groups within the organization

and the organization's contribution to society [7]. The purpose of networking between organizations is the tendency to develop and implement technology solutions and processes that will enhance the organizational added value and bring added value to the customer in the form of utility value. Linked organizations that constitute the value chain have to reach decisions on strategies to increase the added value (e.g., acquisition, accumulation, and divestment) with a consensus with partners. In order for successful participation to occur in the value chain, organizations have to identify common goals, be complementary, and trust each other [32].

Internet saturation is influenced on changing the Internet architecture (architecture principles named Kondratieff cycle that began in 1970). The sixth Kondratieff cycle is started with new Internet technologies and it is predicted that IoT and big data will change the KM in next few years [33].

Drucker et al. [34] used the term "knowledge work" such as the fact that knowledge is a key resource in most organizations, not capital land or labor. Knowledge combined with experience helps in decision-making and innovation. The economy, which is variable and uncertain knowledge, appears as nonstatic phenomenon.

Drucker [35] had, at the end of the 1980s, pointed to the emergence of a new organization based on knowledge, consisting of experts, subject to share their experiences (and thus gain quick response) with their colleagues, customers, and the leadership of the organization. He named it as the information-oriented organization.

Zack [36] defines knowledge-intensive organizations by their process, place, purpose, and perspective, which will be discussed briefly and including the case of smart health services.

- *Process*: This includes application of existing knowledge and creation of knowledge. Knowledge sharing within organization provides benefit based on past knowledge, increase of teamwork, creation of new knowledge, and emergence of opportunities for experimentation and learning.
- *Place*: The knowledge-intensive organization, people, and supporting resources are creating and applying knowledge by continued interaction. The organization is seeking for knowledge wherever and connects with anyone who can help it to learn.
- *Purpose*: The organization should establish a corporate culture that will enable sharing, exploitation, and use of internal organizational knowledge in everyday working processes. Organization uses information and information technologies in order to ensure performance of these processes. The knowledge-intensive organization focuses on who needs to work with whom instead for whom.
- *Perspective*: The organization is holding its knowledge-oriented image regardless of the service or a product that is provided by it. Knowledge and learning are the primary criteria for evaluating organizational working processes, location, and relationships with customers. It is what, and how it learns from the customers. The cost of learning is investment in future innovations, not a cost.

Mahesh and Suresh [8] and Gummesson [9] identified three types of knowledge-intensive organizations, based on knowledge perspective:

- Manufacturing organizations: knowledge-intensive work is limited to the research and development departments. A narrow group of employees is tied to creating knowledge-intensive decisions and creation of a value-added chain within this context. Cognitive and social distances are lower among the employees in departments and higher at the entire level of organization.
- Consulting firms, legal firms, and pure play technology organizations: knowledge constitutes a major part of the output. The value chain depends on the ability of processing specialist knowledge of employees in the firm. Social and cognitive distance is smaller in all parts of the organization.
- Information, communication, and consumer-oriented technology organizations: these organizations have a diverse business network, producing and marketing a wide range of customized business and technology products and services. Investment in high technology and innovations represent key factors for their existence. This causes a perspective distance between the middle and the bottom level of hierarchy of the organizations. The consequences are visible in slower responses to market conditions. The measures cannot be thought cross the organizational hierarchy quickly. This has led to problems in achieving set goals of management at the business process level and the transfer of responses of organizational changes from the lower to a higher management level.

An example of a knowledge-intensive organization and its features in the period of the fourth industry revolution is presented in case of the digital-health companies and processes of a smart home health care.

In the case of a smart home, health care is going for the system where embedded computers and networks are monitoring and controlling the physical processes with feedback loops where physical processes affect computations and vice versa. All information is stored in clouds and digital-health companies enable the exchange of health data [37].

The concept of the smart home health care enables ill people to stay home as much as possible and continue living a quality life. Such digital healthcare platform is not only influenced by organizational changes of a health-service but also by decreasing costs of this service. McKinsey research showed that implementation of patient self-services with using digital channels instead of the direct physician visit, or patient self-management solutions can produce net economic benefits of 7–11% of total healthcare spending [38].

Control of vital human functions can be presented as a case study; this allows urgent health care through mobile applications, sensors in clothing, sensors, and surveillance cameras in flats (e.g., integrated in the house or smart phone application) monitoring the patient and sending information to physicians [10, 3].

In the case of a process of a smart home health care, the integration and sharing information are the key concept. It is going for the process of knowledge management 4.0 whose characteristics are defined by the following [39]:

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- Big data are acquired directly from the things and users. Information is analyzed and saved in clouds;
- Information is shared in real time. Content is available online. There are no limitations for sharing information between people or things. The development of Internet technologies resulted in creation of knowledge and its easier sharing in external organizational environment.
- In the case of personal data, it is necessary to allow access only to authorized personnel. High level of privacy and strong data protection should be provided.
- Information sharing and collaboration is going on via wireless communications between people, between people and things, and between things.

3.2. Creation and the importance of knowledge management

Marshall et al. [33] defined KM as a process in which we are trying to figure out what kind of human capital lies in the minds of individuals and the shift in organizational capital, to which he is able to access a large group of individuals, each of which depends on the development of the organization.

Nonaka [26] claims that the production of knowledge at the individual level, which is available to others, is the pivotal activity of the organization, based on knowledge-creating company. The author emphasizes that it is a permanent process that takes place at all the levels within the organization, which may, in certain moments, occur in unexpected forms. He claims that the quantitative data acquisition of new knowledge—increase efficiency, reduction of costs and improvement of return on investment—is not sufficient for knowledge management. It recalls the importance of rapid response to customer needs, creating new markets, and innovative products.

Rowley [40] identified KM as a definition, acquisition, use, maintenance, and disposal of the assets of knowledge, for the purpose of increasing the value and benefits of all stakeholders.

Epistemology is claimed on what knowledge is valid in research, how that knowledge is presented, and what kind of knowledge is found in knowledge-intensive organizations, society, environment, and specially with using and analyzing the information obtained from social media and Internet of Things in the virtual world (e.g., big data clouds storage) [15].

The creation of new knowledge is not just a matter of processing objective information. The point is that the creation of new knowledge depends on the exploitation of tacit knowledge and often highly subjective knowledge of each employee within the organization [20]. In addition to the tacit knowledge, it is necessary to be vigilant even in explicit knowledge (knowledge of official records, such as patents) and the importance of their mutual interaction in the development of new products or services [7].

Kogut and Zander [23] share knowledge in the organization on information and "know-how." They believe that knowledge is based on the competencies of individuals and the principles of the organization, through which relations between individuals, groups, and members of

the business connections are arranged and coordinated. The authors present the conclusion that organizations exist only because they are better able to transmit and share knowledge as a market. This conclusion follows from the premise that organizations are able to process and store large amount of information than individuals [41].

The development of knowledge management can be divided into three phases (**Table 2**). First phase appeared in the mid-1990s, and it can be classified as a classical knowledge processes development phase. The main feature of this period is that knowledge is sought outside the organization. The task of the organization is to capture, decode, and share the knowledge in organization and its environment. The procedures of knowledge management begin after the creation of knowledge, and the next processes are knowledge development and its transformation into practice. Organizations were highlighted in this first phase of the integration of knowledge in business processes [42].

In the first period of development of knowledge management, it was lead to the conclusion that knowledge has to be produced in a social environment. It has been established that the knowledge is generated through the processes of individuals. The creators of knowledge are obliged to care for its accuracy. In the process of cooperation between individuals both within the organization and in the external environment, it comes to sharing knowledge [42, 43].

The second phase started around 2003 with the launch of the Internet 2.0-based knowledge processes.

The second phase of knowledge management is characterized by the awareness of the importance of external information and knowledge to the organization. Providing access to external information and knowledge, including their involvement in the value chain creation is of utmost importance. Important characteristics of knowledge organizations are in their advantageous utilization of superior information technology and highly skilled employees (knowledge workers) that is able to implement its innovative activities into realization [44, 45].

Classical knowledge processes	Internet 2.0-based knowledge processes	IoT knowledge processes
Knowledge based on the data acquired from the intranet, CRM. Data is saved in local servers	Information is accessed and stored via clouds and platforms like Google and Facebook	Big data acquired directly from the things and customers. Analyzed and saved in clouds
Local time and personal limited access	Business or private content is available on any device, any place, and any time	Real time. Content is available online. No limitations for sharing information between people or things
Organization limited networking; information sharing and discussion via email or intranet	Internet 2.0 provides online relations between the customer and supplier. The discussion is limited to the matter of content and physical data entry	Information sharing and collaboration via wireless communications between people, between people and things, and between things

Source: Ref. [39].

Table 2. Differences between classical knowledge processes and the IoT knowledge processes.

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The emergence of the Web 2.0 has had a significant impact on the development of the third stage of KM. During the period after 2005, with the development of social media, web portals were integrated [7]. Knowledge thus became available outside the organization and management, which is one of the critical factors of business success [46]. Von Krogh [45] proposed the theory that the Web 2.0 applications are not necessarily included in the context of KM, but simply a means of enabling access to knowledge. By integrating information and communication technology (ICT) into products, the von Krogh theory is a basis for the understanding of next third phase of knowledge management development. The IoT has influenced the development of new knowledge management generation (**Figure 1**) that is arising from the phase of integration between people and people with documents and passes to the phase of connection between devices. KM processes are also located between the consumer and the manufacturer or service provider.

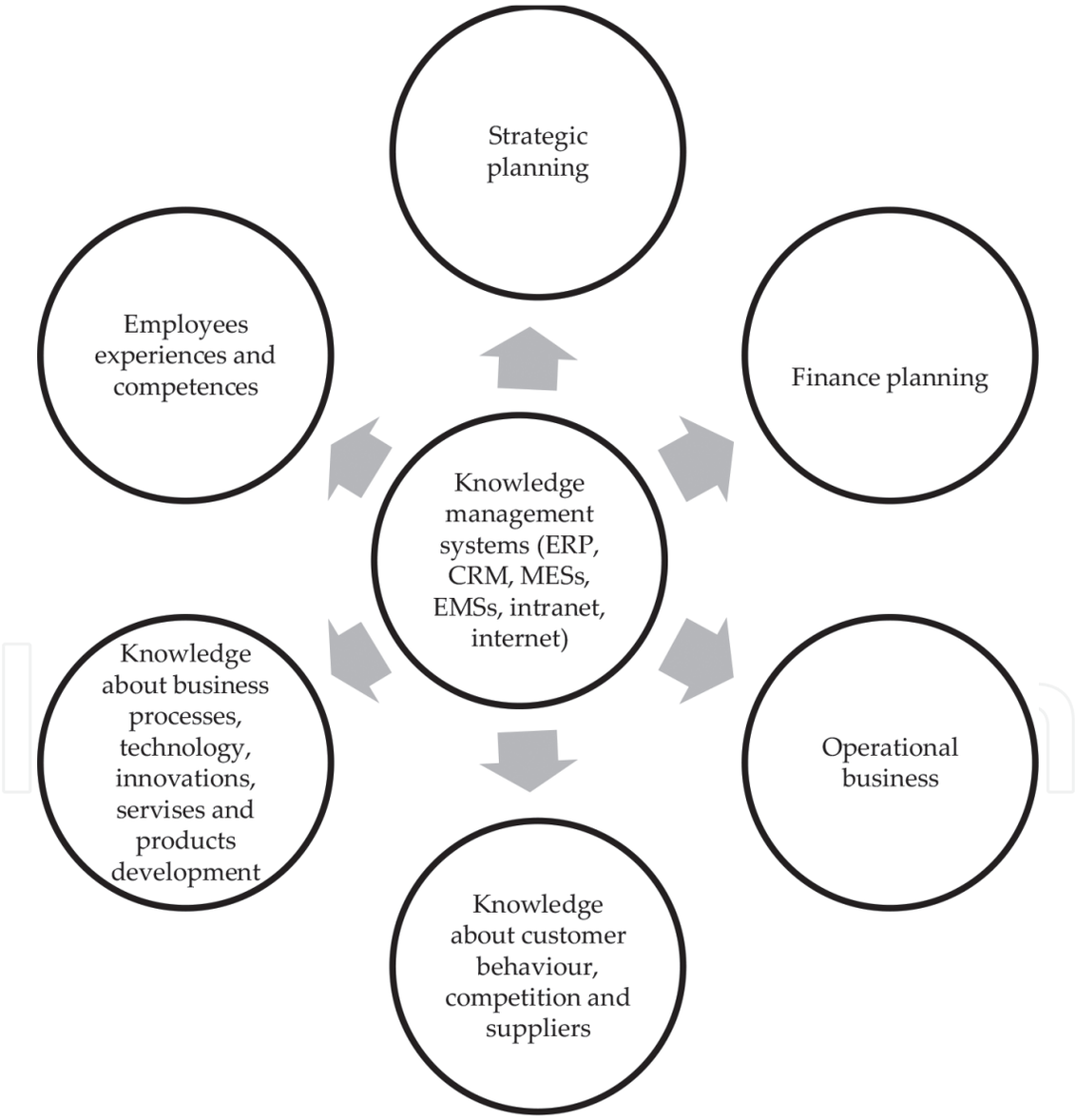

Figure 1. Implementation of the knowledge management system in small and medium company. Source: Authors.

Industry 4.0 is based on mobile computing, cloud computing, and big data. The importance of cloud computing and mobile computing for Industry 4.0 lies in the provision of services, which can be accessed globally via the Internet. Services can easily be integrated and used [2].

For the establishment of the IoT and the course of the processes of knowledge management, companies set up a circuit between product and service: (i) radio frequency identification (RFID); (ii) wireless sensor networks (WSN); (iii) middleware, (iv) cloud computing, and (v) IoT application software [37]. This system can operate both with the help of people and artificial intelligence. The data collected with the help of these systems is saved in clouds. Products integrated with cloud computing in the field can provide data that enable a predictive maintenance, and to provide information about optimization possibilities in production. The use of integrated networking and integration of products into Internet data will allow for far reaching possibilities to collect data [47]. Instead of single data points or short intervals, a continuous stream of data is now available. The huge amounts of data available can now be used to continuously analyze and optimize production. This enables fostering of predictive analytics [48]. Such system is based on big data analytics, which enables, for example, the informing of vehicles that are driven in a column, the distances between them, events on the road in front of them, weather conditions, etc. The drivers of vehicles—thus not only based on geostationary information—know the route, but with the help of sensors and connectivity between vehicles, receive notice of current dangers on the road [37, 15].

3.2.1. Processes of knowledge management in organizations

Organization must develop an organizational culture to the level of employee awareness that knowledge sharing is presenting a fundamental concept for the firm, which enables further growth of the organization. The process includes the identification of the knowledge, sharing knowledge, knowledge acquisition, collection, and storage of knowledge and refresher [49].

Grower and Davenport [50] consider that the processes of KM are located between the information and the source of income of the firm (services rendered or products sold). The process is based on three sub processes: acquisition of knowledge, a definition (record) of knowledge, and the transfer of knowledge and realization. The general concept model of the process stems from the fact that by coordinating, coordinated and introduced operational processes occur. Together, these processes form the system of KM as important operational processes so representing [26]:

- Need for skills: determine which skills the organization needs. This process also includes the sharing of the existing knowledge, because the purpose is to figure out which is the already known knowledge that could be helpful for the organization;
- Acquisition and knowledge creation: new knowledge is often generated also by combining existing knowledge of the transfer;
- Documenting and storing knowledge: the results of the newly acquired knowledge that is documented and retained.

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3.2.2. Organizational knowledge sources and their value

Knowledge has become a force, a power, which is providing to the organization a competitive advantage. In doing so, the organization shall establish all levers (for example, the establishment of corporate culture) that enable it to exploit and use internal organizational knowledge in daily operations [51, 30]. Knowledge, which is used in business processes, is called organizational knowledge [30]. Organizational knowledge can be found in databases, business papers, archive organization, and minds of individuals. Knowledge is in newly emerging companies typically fragmented, and it can be found in chunks throughout the organization. When an organization moves the initial period of operation and begins to grow, to make all these fragmented pieces integrated into the system KM the purpose of which is to collect, organize, and process the knowledge into a usable form, applicable to all employees (for example, in this end, the organization set up an intranet, ERP systems, CRM systems, etc.) [14].

An advantage of using the KM system is that it allows the conversion of intangible assets into useful business resources. In practice, for example, it shows in the event that the organization develops a commercial solution (technology, processes, designs presentations, etc.). In addition, hereinafter referred to license to offer in the form of advisory services (in the case of a consulting company) or in the form of licenses and franchises. An organization that purchases a license can use the existing knowledge to solve similar problems and create sources of revenue for the license vendor.

Organizations often include a KM system into the marketing strategy, especially when they want to reach out to their customer, and they are entrusted with the execution of a specific project (for example, the establishment of CRM and other software solutions to customer needs) by an external service provider. Through the system of KM as subscriber's they see what employees know about the project, which will be implemented, and what solutions have already been developed in the past.

In fact, KM as system has to ensure a more accurate communication between employees and thereby accelerate the settlement procedures and search, and providing solutions, which gives employees the ability to make better decisions [42]. It is necessary to understand that all of the obsolete knowledge that can be found inside or inside the organization is in various forms, which have to be physically moved into the KM system.

Organizational knowledge is being created on the basis of resources [9, 52]:

1. Explicit knowledge: official documents, procedural instructions, and patent;
2. Tacit knowledge: unstructured knowledge, usually personal knowledge, based on the experience of an individual;
3. Strategic knowledge: the knowledge to which access is restricted (marketing strategy, financial analysis, business contracts, software code, etc.).

The system KM is formed on the basis of the organizational structure and the company's own needs. All databases connected into a whole have represented the KM as system (**Figure 1**).

4. Conclusions

The chapter represents an important theoretical contribution to the understanding of the influence of the IoT to value added in knowledge-intensive organizations. Managers should be aware that innovative information and communication technologies are influencing the business performance in the twenty-first century.

The trend of KM 4.0 is leading toward the establishment of a communication channel for the continuous exchange of information, in most cases between machines themselves. The purpose of such automation is the individual customer-oriented adaptation of products and services that will increase value added for organizations and customers [14, 53]. Therefore, the IoT technology enables the creation of completely new products, services, and business models, which promise gains in virtually all industries [54, 55].

The findings are based on the literature review. A particular limitation of the text is that no research was made. Further researches should be focused on the effect of this direction of technology on the ecosystem. Deeper investigation of this topic could include case study with elements of implementation, testing business benefits, and social and environmental benefits with real data.

Author details

Maja Meško[1,2,3], Jana Suklan[1,2,3] and Vasja Roblek[1,2,3]*

*Address all correspondence to: vasja.roblek@gmail.com

1 Faculty of Primorska, University of Primorska, Koper, Slovenia

2 School of Advanced Social Studies, Nova Gorica, Slovenia

3 Fizioterapevtika, Institution of Higher Education, Medvode, Slovenia

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