

KNOWLEDGE MANAGEMENT IN THE DIGITAL ERA

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Abstract. *Knowledge management research is increasingly dynamic and complex, reflecting the cross-disciplinarity of this field. Knowledge management, meaning knowledge creation, acquiring, deposit, analysis, transfer etc., is tightly related to data technologies, to digitalization of organizations, with digital technologies. The present research highlight the importance of technologic infrastructure in knowledge management, showing how previous studies considers this more a logistic issue. Relevant relationships such as the between knowledge management and big data, artificial intelligence, smart technologies, apps, as well as innovation are not so present in the existing literature. Digital infrastructure and technology provide the basis for connecting to artificial intelligence, as well as to natural human intelligence. The relationships with human decision-making processes have to be deeper investigated, as well as the impact on human and organizational behaviors.*

Keywords: *knowledge management; digitalization; digital transformation; big data; artificial intelligence.*

Introduction

Although knowledge management is a relatively young direction of research, due to its interdisciplinary implications and practical relevance for all types of organizations, the literature in the field increased exponentially. This is reflected in the growing number of conferences and publications dedicated to the field. Some of these journals are among the top rated by Clarivate Analytics (former Thomson Reuters – ISI), which reflect the importance and the complexity of this field.

Most of the studies associated with this domain are related to the economic environment – where, not by chance, the concept originates. To better understand the specific evolutions in the theory and practice of knowledge management we recommend the following publications: Kakabadse, Kakabadse and Kouzmin (2003), Anand and Singh (2011), Becerra-Fernandez and Sabherwal (2014), Bratianu (2015); Omotayo (2015), Cerchione, Esposito and Spadaro (2016), Massaro et al. (2016); Hislop, Bosua and Helms (2018).

Especially during the past decade, the attention of knowledge management researchers extended towards nonprofit organizations and public organizations (Garlatti et al., 2014; Massaro, Dumay & Garlatti, 2015; McEvoy, Ragab & Arisha, 2017). The research

on knowledge management in the context of public organizations goes in several directions: management style/leadership; organizational culture & intelligence; organizational development and innovation; technology; intellectual capital; knowledge sharing; stakeholder management (Pinzaru, Zbucea & Vitelar, 2018). As easily observed the relationships between knowledge management and technology (Butler et al., 2008; Cong & Pandya, 2003; Janowski, Pardo & Davies, 2012; Wiig, 2002) are very relevant to better understand this field.

The more recent research on knowledge management in nongovernmental organizations (Buheji et al., 2015; Hurley & Green, 2005; Rathi, Given, & Forcier, 2016; Tatham, & Spens, 2011; Zbucea & Leon, 2015) shows that knowledge management helps an NGO to be more flexible, to relate better to the needs of stakeholders, to better satisfy the needs of their beneficiaries, etc.

Knowledge transfer, both inside the organization and outside, is key to successful management of all types of organizations. Transfers of knowledge between departments could lead to increased effectiveness across the organization. External knowledge could be integrated into internal processes for increased performance and better relationships with stakeholders and partners. Knowledge management is increasingly important for all sorts of organization because it positively influence the competitive advantage and business performance (Argote & Ingram, 2000; Zack, McKeen & Singh, 2009; Lee et al., 2016; Kianto, Hussinki, & Vanhala, 2018), but also because it is in line with the new vision on business – strategies as platforms rather than pipelines (Van Alstyne, Parker & Choudary, 2016).

Knowledge management, meaning knowledge creation, acquiring, deposit, analysis, transfer etc., is tightly related to data technologies, to the digitization of organizations, with digital technologies. The current research highlights the importance of technologic infrastructure in knowledge management but approaches it more like a logistics issue (Butler et al, 2008; Cong and Pandya, 2003; Janowski, Pardo and Davies, 2012; Wiig, 2002). Therefore, the present paper aims to understand better the relationships between Knowledge Management and Digital transformations.

Digital transformations and the impact on business management

All types of organizations are implementing the digital change. Again, the academic literature is more focused on business context, followed by the public one (for instance e-government or smart cities). Less attention is given to nongovernmental organizations, although they are eager to take advantages of the facilities offered by the digital era (Zbucea & Leon, 2015).

What is digitalization? Despite the continuous presence of the concept in a professional environment and the actual evolutions in the economy and society, one can observe that the academic research covers only partially this concept. The business environment is already embracing the digital transformation. For instance, an SAP study developed in 2015 already showed not only the profound transformation of businesses due to the digital economy, but also that 86% of the respondents considered the transformations beneficial for their organizations, and 70% said that digitalization presents more opportunities than threats (SAP, 2015).

Digital era imposed a digital economy – meaning that the tendency for most organizations is to use exclusively digital information in a hyperconnected system (Tapscott, 2015). This evolution influences all managerial processes, including knowledge management, as well as marketing strategies, customer relationship management, the way products/services are provided and sold, employment practices, as well as other business processes (see a brief review in Pinzaru, Zbucnea & Vidu, 2016). Among these transformations, the decision-making processes – starting with the collection of data and storing of knowledge, going through their analysis, to how and when the decision is released – are influenced (Kurti & Haftor, 2015; Loebbecke & Picot, 2015; McAfee & Brynjolfsson, 2012).

A very important consequence of digital transformations, with a strong impact on business practices, is the big data (Crişan, Zbucnea & Moraru, 2014; Günther et al., 2017; Loebbecke & Picot, 2015; McAfee & Brynjolfsson, 2012). Big data is an important asset for an organization but it also implies numerous challenges. Some of the questions associated with it are: What to collect? How to use it? Do we have the necessary competent employees? Big data encompasses large quantities of knowledge, but mining it is a complex process, which is not only related to the organization but also to the public – privacy and trust are the most evident. Therefore, the management of this knowledge is a complex endeavor.

Jed Cawthorne (2015) analysis how knowledge management strategies applied to data and big data contribute to the development of actionable insights (Figure 1). This process is mediated by tacit knowledge existing in the organization, by previous experience, and by formal processes coded in business intelligence. Both tacit and explicit knowledge are galvanized for better decision-making and producing added value.

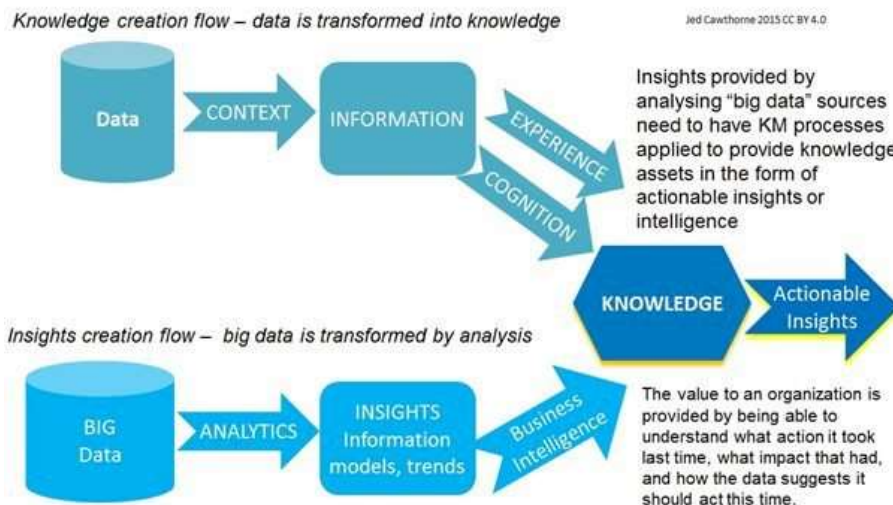


Figure 1. Knowledge management and big data. Source: Cawthorne, 2015

Business models have changed in this context. The impact of digitalization is complex, blurring the lines between organizations. It facilitated a new form of economy: sharing

economy. This multifaceted form of business is intertwined with knowledge management (see various aspects in Vătămănescu & Pînzaru, 2017).

Knowledge management and digital technologies

When we think to the digital era, inevitably, words such as ITC, smart devices, the internet, IoT (Internet of Things), digital infrastructure pop-up in our minds. This is quite natural because the processes associated with the digital economy are not possible without all this new universe. Therefore, it is fully explainable that the academic literature on knowledge management highlights the importance of ITC infrastructure.

Several publications on knowledge management highlight the importance of technology for effective KM strategies (Butler et al, 2008; Cong & Pandya, 2003; Gold, Malhotra & Segars, 2001; Janowski, Pardo & Davies, 2012; Marwick, 2001; Wiig, 2002). Technology facilitates the obtaining, the storage, the transfer, as well as the analysis of knowledge. Adequate infrastructure involves also designing a knowledge architecture, and it is a precondition for effective knowledge management (Gold, Malhotra & Segars, 2001). Since the beginning of the discussion, the accent was put on explicit knowledge (Marwick, 2001).

Technology is not only a storage of knowledge. New technologies ensure dynamic and timely use of knowledge. We talk about complex platforms, multi-purposeful, wide knowledge management system infrastructures (Lee & Hong, 2002). We also stress that not only IT infrastructure but also other organizational factors stimulate knowledge creation (Chou, 2005).

Nevertheless, studies show that technology and an ITC infrastructure are not enough for effective knowledge management. One of the main factors to be considered is the organizational culture (Alavi, Kayworth, & Leidner, 2005; Park, Ribi re, & Schulte Jr, 2004; Zheng, Yang, & McLean, 2010). It influences all processes associated, including knowledge transfer and actual effective use. The communication culture within organizations is also relevant for the effective use of digital platforms for more effective knowledge management (Bratianu, 2015).

Another aspect to be considered is that both explicit and tacit knowledge are transmitted today via online apps. A simple example to consider: organizing and networking are increasingly digital – this would not be possible without various apps. These ensure dynamic capabilities which ensure new opportunities for organizations, both large and small. Cloud computing is another transformation which influences the way knowledge is managed. Both apps and cloud computing positively influence knowledge management (Sultan, 2013; Zbucnea & Leon, 2015).

The IT infrastructure and technologies associated with knowledge management practices might also influence innovation within organizations. More interaction, fast and personalized access to information and knowledge, as well as creative analyzing techniques, might lead to increased creativity and innovation (Carneiro, 2000; Du Plessis, 2007). On the other hand, literature also stresses risks related to formalism and decreased creativity related to strict procedures and control of knowledge sharing (Swan, 1999), as well as a two-sided relationship between knowledge management processes and innovation (Teixeira, Oliveira, & Curado, 2018). Nevertheless, the latest

development of IoT provides a stimulating environment for knowledge management, innovation, and co-creation (Santoro et al., 2017). We draw attention that, at least for now, humans are the most proficient agents in knowledge creation (Bolisani & Bratianu, 2018), but technology and artificial intelligence have given a boost to this process.

Artificial intelligence and knowledge management systems and strategies

Many managers consider that artificial intelligence is positively transforming their organizations, by enhancing business processes (Davenport & Ronanki, 2018). Three main areas are identified when considering the interferences of artificial intelligence with business: *automating business processes, gaining insight through data analysis, and engaging with customers and employees*. All these areas involve knowledge management.

Nevertheless, business representatives see the impact mostly on functional aspects: better products, less work-force etc. Only two aspects related to knowledge management are highlighted: make better decisions – 35% and capture and apply scarce knowledge where needed – 25% (Davenport & Ronanki, 2018). Knowledge management systems are at the base of dynamic learning processes, and artificial intelligence determines intelligent decision-making.

At the base of artificial intelligence in knowledge management would be the existence of knowledge warehouses (Nemati et al., 2002). They would provide a platform for intelligent analysis, which will enhance the knowledge spiral: tacit knowledge sharing across the organization, tacit to explicit knowledge conversion, explicit knowledge leveraging to new knowledge, and learning by conversion of explicit to tacit knowledge (Nemati et al., 2002).

Artificial intelligence could be used to better understand the competition and the environment, being part of the competitive intelligence system by developing learning platforms for businesses and organizations. A systematic review of the academic literature shows that together knowledge management and competitive intelligence lead to better decision making and competitive advantage (Shujahat et al., 2017). They have a positive impact on developing mission statements and long-term objectives, they contribute to evaluating both the internal and external environments, they help to better design and evaluate strategies.

Despite the general optimism, artificial intelligence has not proved to be so effective. The reasons are diverse, such as the difficulty to integrate it in business processes (Miller, 2018), high costs related to complex implementation and lack of expertise, etc. (Davenport & Ronanki, 2018). Another important aspect to mention is that technologies are immature, and people are indispensable for effective outcomes. One significant example in this context is the chatbot. Although chatbots are increasingly popular and they have improved continuously, their evaluation and use are still discussed (Radziwill & Benton, 2017).

Conclusions

Both theory and practice show that ITC infrastructure is very important for effective knowledge management. This supports not only knowledge storage and sharing, but especially the latest digital transformations and intelligent devices allow for co-

creativity and innovation, for more complex exploitation of knowledge for the benefit of an organization and its stakeholders.

The most considered connection between knowledge management and the digital transformations is related to the technological infrastructure used by knowledge management strategies. While ITC platforms are vital for managing explicit knowledge, they are not the only aspects to be considered. On one hand, we observe dynamic capabilities (such as apps) that continuously influence the knowledge management processes, including by better management of both tacit and explicit knowledge. On the other hand, human factors such as communication practices and organizational culture are key for maximum exploitation of these technological/digital platforms.

While the ITC platforms connected to knowledge management strategies are very important for effective implementation, more attention should be given to the digital environment – apps, IoT, chatbots, etc. – and mostly to the human factors. Digital infrastructure and technology provide the basis for connection to the artificial intelligence, as well as to natural human intelligence. The relationships with human decision-making processes should be deeper investigated, as well as the impact on human and organizational behaviors.

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