# KNOWLEDGE MANAGEMENT (KM)
# - Insights in the digital context

## Introduction

This paper presents an overview of key literature that has informed the Knowledge Management (KM) Critical Capability (CC) of IT-CMF in the digital business context. The paper highlights the key insights that underpin the KM CC, and presents an up-to-date view of key thinking in this area.

The goal of an effective KM capability is to get the right knowledge, to the right people, at the right time, and thereby improve the quality of decision-making within an organization. In light of the digital transformation of organizations, the scope of this activity has changed, even though the fundamentals remain. A digital organization needs to re-think and possibly re-invent its business model, so that it continually learns from interactions with customers, suppliers, and partners in the ecosystem in order to remain competitive. These shifts in the organization and the ecosystem give rise to new challenges and questions associated with the growth of relevant data and associated changes in terms of how data, information, and knowledge are stored, disseminated, analyzed, communicated, and used.

## The Fundamentals of Knowledge Management

The use of IT to facilitate and help manage knowledge is a relatively new development, but the problem of how to store knowledge so that people can find it and then use it has existed for millennia. KM must be understood in the context of the complexity of this problem. The relationship between data, information, and knowledge is often discussed as an introduction to the problem of KM, as explained in, for example, Alavi and Leidner (2001). The traditional view is that they exist in a hierarchy of complexity starting with data and finishing at the 'apex of knowledge'. KM is then the application of appropriate management techniques to maximize the quality of what happens at the 'apex of knowledge' and its subsequent usefulness to the organization. The nature of how this process works in practice and the relationship between data, information, and knowledge is, however, disputed. Tuomi (1999), as an influential example, argues that data makes sense only after we have information, and that information emerges only after we already have knowledge. As discussed by Alavi and Leidner [1] this reversed hierarchy of knowledge is shown to lead to corresponding changes in terms of developing information systems that support knowledge management and effective learning. If understanding and knowledge must precede information or data for them to make sense, then the order and manner in which systems present information may also need to change. It must also be accompanied by other methods of ensuring that a shared knowledge exists to support the use of data and information. They finish their review of KM with the conclusion 'that information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms' (p.109) [1].

Knowledge is a subjective understanding which can be formalized into an external source as information (e.g. in an article), which can then provide a framework for data to be interpreted. The distinction between tacit knowledge (in someone's head) and explicit knowledge (in an external form) is a divide well established in the literature and also within related fields such as information sciences; for example, Buckland's distinction between 'information as thing', 'information as process', and 'information as knowledge' [2]. Buckland's model proposes that knowledge or information systems can store explicit knowledge ('information as thing') and this should facilitate learning and practice processes ('information as process') that eventually lead to tacit knowledge ('information as knowledge') and appropriate actions or decisions. The fundamental challenge of KM is that it manages or coordinates entities or 'things' (e.g. documents, data), which may in themselves appear relatively straightforward, but the process by which they are used by humans to develop and then apply knowledge is often nonlinear and unpredictable.

## Relevance of Knowledge Management in the Digital Context

The environment in which organizations now operate is much more volatile and erratic than when the KM discipline was established, and organizations need capabilities to operate and react to this changing environment [3]. The major shift that has happened in KM arising from the new digital landscape is the increase in the amounts and types of data, information, and knowledge that are available, and the associated rise in the number of people who can therefore provide and use these for an organization [4]. This has influenced the relationship between data, information, and knowledge, and changed the power relationship between different stakeholders. It has also exacerbated the problem of the need for contextual or indeed expert knowledge to 'make sense' of data [4], and raised challenges in finding effective ways to judge the trustworthiness and authority of information coming from so many new and often unfamiliar sources [5]. The rise of the 'internet of things' in which objects can provide data [3] has the potential to recharge KM as a management practice but also raises new ethical and organizational dilemmas. Knowledge integration from this new range of sources rather than knowledge production becomes a key challenge and some existing KM processes and models are unlikely to be 'fit for purpose'. This also affects how KM relationships are managed within the wider organizational structure as the range of organizational units that collect data, and are thus potentially relevant as knowledge sources, is growing.

Organizations are becoming increasingly global and social web technologies, by providing access to both knowledge context and content, can assist in overcoming the barriers of distance and time engendered by increasing internationalization and enable distributed organizations to thrive [6]. This increased potential for knowledge sharing, however, also engenders the risk of knowledge loss or knowledge security breaches and it becomes necessary to facilitate knowledge sharing whilst also ensuring it does not pose a threat [7]. The ubiquitous nature of knowledge sharing also raises some changes in terms of assessing quality and currency, as the central control of knowledge collection is losing ground.

A major new challenge for KM is not so much in terms of managing knowledge content, as technology has developed to deal with this, but in terms of how people can effectively respond to, learn from, and apply that content. Learning is becoming even more important and continuous informed adaption is now crucial [8]. This is likely to also involve the ability to forget or not to act on knowledge gained from past experiences as this may no longer be valid in the current environment [9]. The traditional KM emphasis on the importance of learning from past knowledge is now challenged in some cases and different approaches may be needed for KM to support radical innovation as opposed to incremental learning [10]. The tension and the relationship between learning from previous knowledge and being able to adapt and change direction as new knowledge comes into an organization is becoming more pronounced, and this is a difficult conflict for organizations to manage. Knowledge and expert understanding is, in one sense, needed more than ever to interpret and 'make sense' of the increase in data and information coming into an organization.

The ability to effectively use and apply knowledge to actually make a positive difference to an organization is key to gaining value from KM and is most influentially discussed by Cohen and Levinthal [11] in 1990, who introduced the term 'absorptive capacity'. Absorptive capacity is an organization's ability to locate, learn from, and exploit new knowledge to meet organizational goals. Recent developments in knowledge production have made the importance of human capital even more important in order to intelligently guide knowledge exploitation [12]. This ability to transfer knowledge to appropriate action has emerged as a key critical success factor [13] in gaining value from KM. There is also some evidence that the careful use of social IT can assist in enabling effective knowledge transfer to action [6] and that technology plays a key enabling role [14] in absorptive capacity.

## Managing Knowledge in the Digital Context

In terms of developing an effective KM capability for the digital context, the priority areas to focus attention on are: strategy; culture; knowledge analysis; relationships and people; and tools and technologies, which are all covered in the revised KM CC.

### Strategy

A key issue in developing an effective KM capability is to ensure that the knowledge strategy effectively supports and reflects the wider organizational strategy. In the fast changing digital context, this means the ability to respond in an agile fashion as changes emerge. This is also increasing the importance of and the difficulty of ensuring that knowledge strategy remains effectively aligned to organizational strategy [9] and that KM approaches suit the context of the organization [10]. Strong relationships and effective mechanisms to facilitate communication and cooperation on the execution of the knowledge strategy are essential.

### Culture

There is strong evidence from the literature [11] to suggest that once organizations get left behind in exploiting knowledge effectively it is very difficult to catch up. The value of knowledge and the importance of learning from it must, therefore, be embedded in the organizational culture. Knowledge

must also be clearly seen as a strategic priority for the organization with visible and proactive senior leadership support.

### Knowledge Analysis

Knowledge analysis is an area which has perhaps been most influenced by digital transformation as new technologies which facilitate both the generation of and the potential 'sense making' from large amounts of data, information, and knowledge are becoming more common place. The traditional divide between data processing, information management, and knowledge management is shifting, and organizations need to improve at analyzing large amounts of data in ways that will provide them with new knowledge. Within the digital context, it is important to consider the effective and appropriate use of data analytics technologies. It is perhaps even more important to be able to 'ask the right' questions of the data, which is essentially a knowledge management skill, rather than a purely technical ability.

### Relationships and People

The growth of technologies to collect and analyze data and information also increases the need for those working in KM to effectively coordinate and collaborate with new stakeholders, as potential sources for useful knowledge inputs. This increases the importance of effective and creative people and relationship management, and requires proactive engagement with people or organizations who may be potential or emerging sources of knowledge.

### Tools and Technologies

The relationship between KM and IT has sometimes been a slightly reluctant one, often arising from a position in KM that emphasizes knowledge requires people and not just technology. Whilst this is the case, new technologies, particularly those with social functionalities, do provide the opportunity for KM activities such as discussion fora, chats, and learning events to be scaled up and to operate effectively in geographically dispersed organizations. In order to maximize value from KM, organizations need to actively engage in exploring and using new technologies that can support it.

## Conclusions

Data and information are now more ubiquitous than ever, but transforming them into knowledge and then effectively exploiting that knowledge remains a challenge for many organizations. Approaches to building a KM capability must focus on the organization confirming that effective KM is a strategic priority and ensuring that it supports and enables the organization's wider strategic goals. It is within this context of strategic alignment that the creative use of increasingly sophisticated technologies to support KM and facilitate relationships will deliver real value. Organizations that want to understand and improve their current KM capability maturity have a structured and repeatable way to do so in using the IT-CMF KM CC.

## Research Methods

The KM CC was developed based on the input of a workgroup of academic researchers and industry practitioners, and an analysis of relevant practitioner and academic literature. As a work-in-progress, it was also presented at a number of KM conferences [15], [16], and feedback from participants was

incorporated into the CC. In addition, before the CC was finalized, it was reviewed by selected academic and practitioner KM experts.

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