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Knowledge management practice system: Theorising from an international meta-standard

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Abstract

The emergence of a new international knowledge management (KM) standard reflects convergence in KM practice. The aim of this study is to theorise KM from the new standard, by addressing the following research questions: what are the important themes of the standard; and what are the key mechanisms and how do they explain KM practice system from a theoretical perspective? This paper adopts a sensegiving reflective insider account using practice theory as a lens and social mechanisms as a method in theorising KM practice system. This study makes three contributions. Firstly, the paper identifies four themes from the KM standard: context-driven, performance-led, enabler-savvy and sustainably-supported. Secondly, three mechanisms emerge that robustly 'explains' KM practice system: learning and knowledge creation culture; organisational knowledge architecture for adaptive and exaptive capacity; and 'business model' for knowledge capitalisation and value capture. Thirdly, a new theoretical framework of KM practice system is developed.

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1. Introduction

Knowledge management (KM) is about to receive perhaps one of the greatest honours, as an international KM standard will be published by the International Standards Organization (ISO), giving it more legitimacy as a distinct, strategic and influential management practice. The emergence of an international standard suggests a degree of convergence of KM practice across the world, which consequently has a significant impact on theory. KM has a rich and diverse history, with roots in economics (e.g. capital and the knowledge-based economy), social psychology (e.g. reciprocation and knowledge sharing) and cognitive psychology (e.g. learning) (Lambe, 2011). Interest in KM largely stemmed from the 'new' economy coinciding with the dawn of the Internet, where the coalescence of information, ideas and 'intellectual' resources are observed to be more valuable than more traditional assets such as land and machinery. Over the years, KM in the practitioner domain has thrived, enriched by the diversity of practices (Ruggles, 1998). For example, the growth of KM has been fueled by consultants who purport that their respective KM practices endow a competitive advantage on their firms and, ultimately, their clients (Sarvary, 1999). KM's eclectic origins and mix of stakeholders have led to a diversity of perspectives resulting in several paradigms (e.g. people-centric, systems-centric), dimensions (e.g. knowledge creation, knowledge capture) and levels of analysis (e.g. organisational-level practice and individual-level behaviours) (Day, 2001).

The catalyst of this paper is the development of an international standard on KM by the ISO. As is the norm with ISO, practitioners are at the centre of the standards making process, as standards are developed *by* expert practitioners *for* practitioners (Heras-Saizarbitoria, 2011). Initiated in 2015, the new requirements standard reflects the maturity of KM, and is

intended to reify and bring together the cumulative and essential KM practices around the world (Uzumeri, 1997). The new KM requirements standard (or plainly 'KM standard') is a significant development, as it becomes *de facto* 'soft law' that will be a ubiquitous, isomorphic force (DiMaggio & Powell, 1983) in holding considerable international influence (Brunsson, Rasche, & Seidl, 2012). Given its past centrifugal trajectories, the new KM standard represents a change in direction as it is a synthesis of KM practices that will have an important influence on local and organisation-specific KM policies and programmes. This development in KM practice has the potential to change our theoretical understanding of KM.

Using practice theory as a lens, this paper makes sense of the new international KM requirements standard from a theoretical perspective. The aim of this study is to draw upon the new standard to theorise KM practice system, which is construed as the collective, systematic and coherent practices in KM at the organisational-level. To attain the aim, the following questions are addressed:

1. What are the important themes of the KM standard?

2. What are the key mechanisms in KM practice system and how do they explain KM practice systems from a theoretical perspective?

By addressing the research questions, this paper makes three contributions. Firstly, four themes are identified; context-driven, performance-led, enabler-savvy and sustainably-supported. Secondly, three mechanisms are found to robustly 'explain' the KM practice system: learning and knowledge creation culture; organisational knowledge architecture for adaptive and exaptive capacity; and 'business model' for knowledge capitalisation and value capture. Thirdly, a new theoretical framework of KM practice system is developed.

The ISO KM standard is intended for practice, specifically for organisations and practitioners to establish, develop, enhance and/or validate their KM systems, processes and practices. While the KM standard specifies what is required of organisations to be effective in

KM, the theoretical framework developed in this paper from the KM standard will enable future research to further operationalise the mechanisms/ constructs and specify hypotheses for testing. Therefore, this paper adds value to the KM standard by enabling it to be theorised and, ultimately, tested in assessing its impact. The relationship between the KM standard and the KM practice system is complementary as both practice and theory inform one another (Shepherd & Suddaby, 2017).

This study is a reflective 'insider account'. I was a member of the KM panel, and I draw upon my personal experience and learning from the KM standards-making process. I adopt a sensegiving approach, drawing upon my own experiences and insights into the praxis of KM standards-making in interpreting and construing the implications of the new KM standard on theory. I use practice theory as a lens and the mechanism-based approach as a method in developing a theoretical framework of KM practice system.

The next section reviews relevant extant literature involving the nature of ISO's standards as meta-standards, and the evolution of KM scholarship and tensions in the field. This is followed by the methodology section that provides background information on the KM standard, and justification of the sensegiving and mechanism-based approaches in theory-building. The findings and discussion section then ensues, concluding with a brief acknowledgement of the paper's limitations and suggestions for future research.

2. Literature review

2.1 International standards

ISO (n.d.-d) defines standards as "*documents that provide requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose*", while Uzumeri (1997) plainly describes them as "*description of an item*". In many respects ISO's international standards are meta-

standards (Corbett & Yeung, 2008) and "*…is the way in which an organization manages the inter-related parts of its business in order to achieve its objectives. These objectives can relate to a number of different topics, including product or service quality, operational efficiency, environmental performance, health and safety in the workplace and many more*" (ISO, n.d.-c). Uzumeri (1997) describes meta-standards as a form of management technology to develop "*rules for designing systems of item*" (p. 22). Many of ISO's international standards are designed so that they can be monitored by third parties e.g. auditors and certifiers (Heras-Saizarbitoria & Boiral, 2013). Most meta-standards fall within the continuum of 'good enough' in *satisficing* stakeholders at one end, and at the other as *optimising* standards with aspirational thresholds (Uzumeri, 1997). The difference between the two is not always clear-cut and many standards contain both elements.

Management standards can be classified in terms of technical vs non-technical, and process vs outcome (Heras-Saizarbitoria, 2011). The KM requirements standard is a non-technical standard (Heras-Saizarbitoria & Boiral, 2013) as it relates to management practice. As a meta-standard, the KM requirements standard is a form of *process* standard that specifies, systemises and formalises the management of processes to help ensure any pre-specified outcome materialises (Heras-Saizarbitoria, 2011; Hess, 2007). However, the dichotomy between process and outcome is becomingly increasingly blurred (Brunsson et al., 2012). The KM standard, like many of its predecessors from the field of management can, and most likely will, co-exist with other organisation-specific management systems e.g. quality systems.

Although meta-standards are a powerful isomorphic force leveraging upon network effects (Katz & Shapiro, 1985), there are nevertheless tensions associated with standards due to their perceived inflexibility which may impede adoption, especially as organisations differ in size, industry and history (Brunsson et al., 2012). Experts in standards-setting panels

typically endeavour to decontextualise the rules of standards to allow for implementation in every organisational context imaginable. However, in reality, multiplicity and plurality exists in standards setting, the content of standards, and in their interpretation (Djelic & Den Hond, 2014). In standards setting, experts that contribute to the development of standards may belong to different stakeholder groups with varying interests. Standards must also cater for the different 'starting points' of nation states, as firms adopting standards must do so within the context of national and local laws and regulations. Consequently, although standards and standardisation usually connote stability and sameness, they are in fact dynamic phenomena (Brunsson et al., 2012). While the KM standard reflects the same 'rules' for standards making (e.g. structure and terminology), its content contains variability that reflects the unique nature of KM practice (Heras-Saizarbitoria & Boiral, 2013).

2.2 KM scholarship

The scholarship of KM has gained from its rich historical roots and paradigms, but its distinct vernacular and form can arguably be traced back to Sveiby who recognised a new breed of firms that did not rely on traditional production capabilities and material capital, but on their employees' creativity and knowledge for competitive advantage (1990, 1997; 1987). As a nascent field, he simply defined KM as *"the art of creating value by leveraging intangible assets"* (Salojärvi, Furu & Sveiby, 2005, p. 1). Drawing upon various works such Polanyi's (1966) notion of tacit knowledge, who posited *"We can know more than we can tell"* (p. 4), the field of KM started to develop and increase in sophistication e.g. recognising the nuances between tacit and explicit knowledge (Nonaka, Takeuchi, & Umemoto, 1996), at an accelerated pace in the early 1990s.

In its formative years, the construct of knowledge management was largely linked to epistemological debates e.g. knowledge as justified true beliefs (Nonaka, 1994), and learning

concepts e.g. individual learning (Akbar, 2003), and social learning (Mavin & Cavaleri, 2004). Such contention is reflected by Wiig (1997), who emphasised the importance of individuals for organisational outcomes, as he defined KM from a micro-level perspective in terms of *"activities related to fostering individual behaviours that lead to innovation and discovery, knowledge creation and improved knowledge use"* (p. 402). Indeed, much of the early debates on KM concerned the term 'knowledge'. For example, Nonaka and colleagues (1995; 2000), developed the Socialisation, Externalisation, Combination and Internalisation (SECI) model that shows the interaction between explicit knowledge and tacit knowledge, while Wiig (1993) asserted that the purpose of knowledge drives the way it is organised based on the principles of completeness, connectedness, congruency, and perspective and purpose.

Over time, 'emic' constructs started to emerge in the field, such as knowledge sharing (Kasper, Lehrer, Muhlbacher, & Muller, 2013). The evolution of KM arguably transformed it from an interdisciplinary to a transdisciplinary concept (Russell, Wickson, & Carew, 2008), embracing micro e.g. learning, and meso levels such as the link with dynamic capabilities. The competitive advantage offered by KM was underscored as strategy (Spender, 1996) and other management fields began to confer peer recognition to KM. The strategic nature of KM was given credence by new definitions of the construct such as that offered by Quintas, Lefrere, and Jones (1997),*"Knowledge management is the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities"* (p. 387). The strategic role of KM was further expanded by the works of Davenport and colleagues (2010; 2001; 2001) who explored KM from the perspective of organisational structures, processes and systems, and in industry, specifically in management consulting. The seminal work of Alavi and

Leidner (2001) was also important in further advancing an information technology perspective on KM.

Nevertheless, KM's development has not been without criticism. For example, Alvesson and Karreman (2001) have argued that the term 'knowledge management' itself does not make sense. They contend KM is an "...*ambiguous, unspecific and dynamic phenomenon*" (p. 995) and posit that some KM authors define knowledge so broadly it becomes meaningless, while some do not define the term at all. Therefore, they ask, how can one manage something that one cannot even define? Ultimately, academics such as Alvesson (2001) and associates (2002; 2001), and Armistead and Meakins (2002) conclude that KM largely represents a range of management approaches to simply enhance learning and codify knowledge.

However, criticism on KM's limitations did very little to discourage its research even despite prevailing tensions in the field (Swann & Scarborough, 2001). KM continues to be studied in tandem with many other constructs in different contexts. For example, Bogner and Bansal (2007) examined the role of KM in attaining high firm performance; Zheng, Yang, and McLean (2010) examined the mediating role of KM in the relationship amongst organisational culture, structure, strategy, and organisational effectiveness; while Torugsa and O'Donohue (2016) examined the role of KM in transformative innovation. In addition, KM has also been investigated in national contexts, for example, Collinson (2001) examined the practice of KM in American and Chinese research and development units; McNulty (2002) explored KM practices in a UK healthcare firm; with Valentim, Lisboa, and Franco (2016) investigating KM in small and medium-sized enterprises in Portugal.

Nonetheless, given the breadth of research in KM, it appears anomalous that the construct is not strongly underpinned by indigenous theoretical foundations. In lieu, KM has borrowed theoretical underpinnings from other management fields, such as organisational

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behaviour at the micro level, and strategic management at the meso level. Theory borrowing is a legitimate endeavour (Whetten, Felin, & King, 2009) especially when scholars attempt to develop new theory. However, Hazlett, McAdam, and Gallagher (2005) argue that such efforts of theory borrowing will come to nought especially if scholars are not clear on a construct's foundational paradigm. For example, a significant challenge to KM is that it traverses both computational e.g. Dehghani and Ramsin (2015) and organic paradigms e.g. Garcia-Penalvo and Conde (2014).

The new standard highlights the advent of a new trajectory in understanding KM as a practice, collectively undertaken in a systematic manner at the organisational level. A practice theory lens deems KM as a social practice (Reckwitz, 2002; Stadler & Fullagar, 2016), which through continuous application results in skilled performance (Whittington, Molloy, Mayer, & Smith, 2006). Practice theory helps to explain organisational phenomena by focusing on the practice of KM rather than the field or the practitioner (Nicolini, 2012). The development of an international KM standard, which represents a 'unified' view of KM practice system, provides an important opportunity to develop an indigenous theory of KM practice system.

3. Method

3.1 The context of the KM requirements standard

The ISO was established to develop meta-standards to increase uniformity, enhance quality, improve international cooperation and interoperability (ISO, n.d.-a). Standards have evolved from focusing on technical specifications, to include products and, at present, to encompass management systems. The development of standards, typically derived from the need to synthesise best practices and harmonise relatively mature management practices, can stimulate further advancements in a field.

ISO are dependent on the agency of national standards bodies to nominate and supply panel experts, convenors, and provide logistical/ administrative support (Heras-Saizarbitoria, 2011). The development of standards are generally undertaken within the fora of technical committees (TC) (ISO, n.d.-b), which in the case of the KM standard is 'TC 260', whose primary remit is to develop Human Resource Management standards (ISO, n.d.-b). TC 260 has published eight ISO standards with 11 under development (ISO, n.d.-b). TC 260 has 27 members as participating countries, with 23 observing countries. The KM standard was initiated mid-2015. An expert working group was established in developing a KM standard, consisting mostly of consultants and senior organisational personnel involved in KM and a minority number of academics (Tamm Hallström, 2004).

3.2 Sensegiving approach

This paper is a reflective 'insider account' that adopts a sensegiving approach. I was a member of the KM panel. Prior to academe, I was a consultant for approximately 10 years with a number of international consulting firms, including two of the 'Big 4', who are leading organisations in KM practice. At present, as an academic in the field of organisational behaviour, I have research outputs in knowledge sharing, workplace learning (and knowledge creation) and innovation behaviour.

Sensegiving is a cognitive process (Cornelissen, Clarke, & Cienki, 2010) that concerns providing a prospective account, which typically follows from the retrospective sensemaking process, and which in this case was undertaken by KM panel members in considering the views of other practitioners, as well as their own experiences on 'what works' (Sandberg & Tsoukas, 2015; Weick, Sutcliffe, & Obstfeld, 2005). The sensegiving approach adopted in this study is characteristic of many interpretive- and phenomelogical-based investigations that involves researchers' understanding, evaluation and interpretation of the empirical data e.g.

Sharma and Good (2013). Figure 1 contains a summary of the sensegiving steps undertaken in this study. The starting point is to identify themes from the KM standard. The second step has two stages; i) interpreting the themes from practice to mechanisms for theorising, and ii) validating the mechanisms against extant theories related to KM. Finally, the last step involves developing a KM practice system theoretical framework.

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3.3 Mechanism-based method

K. Weber (2006) argues that mechanisms are 'tools' used to "…*elaborate, sharpen, transpose, and connect theories...*" (p. 121), while Stinchcombe (1991) posited that mechanisms "*bits of theory about entities at a different level (e.g., individuals) than the main entities being theorized about (e.g., groups), serve to make the higher-level theory more supple, more accurate, or more general*" (p. 367). An example of a mechanism is 'markets', which are widely used to explain economic phenomenon (Anderson et al., 2006).

Davis and Marquis (2005) analogise that mechanisms are not so much about the nuts-and-bolts (i.e. the details) but about the cogs-and-wheels (i.e. the big picture). Anderson et al. (2006) provide an example as they argue that mechanisms help *'to understand how a watch functions, the important items are not the moving hands or the winding knob but rather the internal cogs and wheels and how they enable the translation from winding a knob into the movement of the watch hands...mechanisms allow us to see beyond the surface-level description of a phenomenon'* (p. 103). Mechanism-based theorising seeks to identify the way concepts interact to generate the observed phenomenon and why observable relationships may exist (K. Weber, 2006). Indeed, Anderson et al. (2006) suggest that mechanisms show

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an assembly of elements, and describe how parts interact in explaining '*how and/or why one thing leads to another*' (p. 103).

Mechanisms, in sharing a similar perspective with practice theory (Nicolini, 2012), are viewed as toolkits used as a resource to solve the puzzles related to theory. Hedström and Swedberg (1998) argue mechanisms act as an intermediary between description and storytelling. Mechanisms are a problem-driven approach to theorising (Davis & Marquis, 2005). Davis and Marquis (2005) state that the term 'problem-driven' approach is not only intended to mean providing solutions to real-life problems but to also distinguish it from a paradigm-driven approach that begins from *a priori* theory to be tested as a hypothesis. They argue that given the complexity in today's world, the 'sometimes true' approach offered by mechanism-based theorising provides more versatility in making sense of specific phenomenon in an organisational field.

4. Results

4.1 Step one - Identify themes from the KM standard

Using practice theory as a lens, in particular the notions of *field*, *habitus*, *agency* and *cultural capital* (Bourdieu, 1977; Nicolini, 2012), four themes were identified: context-driven, performance-led, enabler-savvy and sustainably-supported. Standards are 'rules for everyone', however, for it to gain acceptance, it needs to allow for context to be considered and incorporated so that it is implementable by most, if not all, organisations irrespective of industry, size, resource availability and technology-intensity. Therefore, the standard must be context-driven, as organisations need to consider their immediate *field*, containing unique logics and schemas, in identifying their KM needs. The context-driven theme means that KM practices are situational and variegated. Current practices and future aspirations are important considerations as this shapes what type of knowledge is important; how knowledge is created,

cultivated and transformed. For example, a high degree of codification may be more crucial for firms in highly-regulated industries, such as medicine and health, and financial services (Thompson & Walsham, 2004). Figure 2 summarises the four themes:

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insert Figure A2 about here

Performance-led is the second theme. Performance resonates with one of the most pivotal justification of KM, and that is knowledge, in whatever shape or form, must be an asset. Performance-led means that KM practice must be results-orientated. This theme is a *habitus,* an implicit conviction*,* which reflects the motive for KM and may include actions such as establishing performance indicators to link KM activities with key result areas. Although this is an instrumental way of perceiving knowledge, this assumption shapes the premise of why most organisations practice KM. Nonetheless, while the term 'performance' invokes images of financial gain, 'performance' may also include indicators that are important to other sectors e.g. number of individuals assisted by a charity in the voluntary sector.

The third theme, enabler-savvy, broadly conceptualised to include infrastructure and instruments used to drive or support KM, is the vehicle for *agency* in which KM is practised. Infrastructure may be an organisation's technological environment, while instruments may include organisation policies such as incentive schemes. There is an almost-indefinite list of enablers of KM (to drive KM as well as to remove barriers to KM), however not all may be relevant. Enabler-savvy means that organisations must be practical and canny in their choice of enablers and in the manner, and timing, of how they are used and combined. Taking the

lead from the context-driven theme, the bundle of enablers that an organisation employs is dependent on its priorities.

The final theme is sustainably-supported, which essentially is the systemisation of the administrative aspects of KM; the *cultural capital* of KM practice that enables actors to mobilise authority e.g. cognitive frames used to develop organisation-wide knowledge templates. Sustainably-supported denotes that organisations must have appropriate means e.g. role such as a KM officer or manager, to help maintain KM-specific/ related technologies and systems e.g. communities of practice portals for research and development staff. In some sense, this theme may be synonymous with the 'backroom operations' of KM. Sustainably-supported concerns optimising the operations of KM and how such processes are recorded. Of the four, the context-driven theme pertains to epistemology e.g. types of knowledge, whereas the other three are orientated towards the management field with strong organic proclivities (Hazlett et al., 2005).

4.2 Step two – Mechanisms for KM practice system

4.2.1 Interpret themes from practice to mechanisms for theorising.

"*Nothing is quite so practical as a good theory*" (Van de Ven, 1989, p. 488). The themes provide insight into the essential mechanisms that make up KM practice system. The three mechanisms are i) learning and knowledge creation culture, ii) organisational knowledge architecture for adaptive and exaptive capacity, and iii) 'business model' for knowledge capitalisation and value capture. The first mechanism, learning and knowledge creation culture, is premised upon the culture e.g. Schein (1990), and cultural theories e.g. Douglas (1970, 1986), where learning to create knowledge is part of a group's set of values, which underpins their assumptions and guides their behaviour. These values are shaped by organisational structures, which in turn reinforce those structures over the long-term.

Secondly, the organisational knowledge architecture for adaptive and exaptive capacity mechanism is the design of organisational systems, technologies, practices, skills and behaviours (Becker & Huselid, 2006) that facilitate the storage, transformation, co-option and diffusion of knowledge (Andriani & Carignani, 2012) throughout the firm (Fiss, Marx, & Cambré, 2013). Finally, 'business model' for knowledge capitalisation and value capture mechanism, is an outcomes-orientated configuration of how an organisation derives benefit from its KM practice system, directly e.g. commercialising intellectual property, or indirectly e.g. via product innovation. The term 'business model' is appropriate as it is used to describe how organisations capture the value that they bring to the market (Magretta, 2002). Each of the four themes contributes to the mechanisms in different but significant ways.

For the learning and knowledge creation culture, the context-driven theme influences specific modalities of learning culture such as the importance placed on formal or informal learning. The performance theme implies that knowledge must not only be prized by organisational members, but that they must also have a mind-set that KM should and can contribute to some aspect of performance within their firm. A sense of confidence in the utility of KM practice lies not just in the cognitive domain (i.e. rationale reasoning) but also the affective domain, in which people appreciate and value the role of knowledge to the extent that KM practices becomes an implicit assumption that guides behaviour within the organisation. As for the enabler-savvy theme, examples, including reward schemes and coaching programmes, may be used as enablers to foster a learning and knowledge creation culture. The theme of sustainably-supported plays a major role in strengthening a learning and knowledge creation culture, by formalising KM-specific roles and operations that signals to staff that the organisation is genuine and purposeful about its KM initiatives; this helps to shape mind-sets and the organisation's culture.

For the second mechanism, organisational knowledge architecture for adaptive and exaptive capacity, the context-driven theme shapes the design of the architecture such as the orientation in the use of technologies e.g. to use technology to primarily codify knowledge or to use technologies to connect people to exchange tacit knowledge. Organisations must be able to develop appropriate and relevant structures, technologies and processes, to allow knowledge to be stored, transformed and exapted in a manner that facilitates the attainment of organisational performance goals. Enablers help to determine how well knowledge is transformed from one form to another, bundled for synergies and how well it is applied. This includes adapting knowledge for use in other ways, or co-opting the knowledge for other business units. In addition, the sustainably-supported theme contends that a KM 'back office' can help to sustain KM practice system by developing meta-knowledge management processes and procedures.

The third mechanism, 'business model' for knowledge capitalisation and value capture, is shaped by context, for example, in directing how new knowledge is embedded in a firm's value proposition e.g. adopting a servitization model from a product-orientated approach. As the performance theme strongly suggests, KM should not be practised for the sake of it, as organisations must be cognisant of how new knowledge created will be 'monetised' e.g. licensing of intellectual property. The performance theme suggests that a 'business model' of knowledge capitalisation and value capture is crucial in ensuring organisational outcomes are realised. Enablers relate to instruments used within a 'business model' to capitalise on knowledge capture value. For example, using social media and other web-based channels for crowd-sourcing to lock-in communities for marketing and sales. The sustainably-supported themes ensure that the practice 'pays' for itself in a sustained a manner e.g. KM budget linked to the attainment of a number of performance indicators. The business model is long term-orientated involving, for example, deepening licensing partnerships to collaborate in

other ways. Table 1 illustrates the relationship between the themes from the KM standard and the mechanisms.

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The context-driven theme has a two-fold impact; the theme indicates that the 'shape' and 'form' of an organisation's KM practice system are influenced by its context. However, the corollary of this suggest that the mechanisms of KM must be relatively robust in a variety of contexts. Such robustness is an important feature as it makes no sense for the essence of KM to change fleetingly as contexts change. The three mechanisms are not only comprehensive constituents of KM practice but they also reinforce one another. For example, the practice culture sustains experimentation with knowledge, which results in discovering how to extract value from knowledge in which its success in turn reinforces the belief that KM is crucial. Figure 3 illustrates how the three mechanism form a virtuous cycle (Garud & Kumaraswamy, 2005).

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4.2.2 Validating the mechanisms

This section explores theories that have been used as *explanans* of discrete aspects of KM. Four theories play a ubiquitous role in all three mechanisms; the resource-based view (RBV) (Bogner & Bansal, 2007), absorptive capacity (Valentim et al., 2016), contingency (Powell & Ambrosini, 2012; Thompson & Walsham, 2004), and systems theories (Gao, Li, & Nakamori, 2002). The RBV is a paradigm-like belief (Whetten, 1989) that knowledge-based

resources are a source of competitive advantage, while absorptive capacity focuses on the sourcing and application of external knowledge within the firm. Contingency theory suggests the continuous need for firms to be cognisant of adopting a best-fit approach, while systems theory posits that KM practices are most effective when designed holistically. However, although each of these four theories play a role in each mechanism, the individual theories alone do not 'explain' KM practice system in its entirety. Table 2 summarises the relationship between the selected theories and the three mechanisms.

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The learning and knowledge creation culture mechanism is supported by constructs and theories at the micro, dyad/ group and meso levels. At the micro level, behaviourist and cognitivist learning theories e.g. Jain (2013) help to explain how individuals create new knowledge. At the dyad/ group level, constructivist learning theories argue that individuals learn from one another, with their immediate contexts and environments playing a key role (Garcia-Penalvo & Conde, 2014). The importance of cooperation and collaboration is underscored by the social exchange theory in that reciprocation can lead to virtuous circles in knowledge sharing (Konstantinou & Fincham, 2011) while the social capital theory argues that knowledge is embedded within the fabric of immediate communities e.g. the workplace (Manning, 2010). At the meso level, individual learning motivation and behaviours can culminate into an organisational culture (Rai, 2011), supported by transformational leadership (Birasnav, 2014; Donate & de Pablo, 2015), that does not just include people but also systems and processes for organisational learning (Wu & Chen, 2014). This notion is supported by the sociotechnical theory in that both 'organic' and technological systems must be optimised to

operate in an integrated manner, as Vaast (2007) illustrated in the study of online and offline KM practices.

The organisational knowledge architecture for adaptive and exaptive capacity is also supported by the constructivist learning theories, as learning from others play an important role. Other micro level constructs include affective organisational commitment, as part of a set of organisational citizenship behaviours (Swift & Hwang, 2013), that influences knowledge sharing behaviours (Casimir, Lee, & Loon, 2012). Affective trust (in colleagues and leaders) also has an important effect on knowledge sharing (Dirks & Ferrin, 2001). At the dyad/ group level, both social exchange and social capital theories play a role in connecting people, with the network theory reflecting the value of inter-organisational collaboration (Heizmann, 2011; Lai, Hsu, Lin, Chen, & Lin, 2014; Ngai, Jin, & Liang, 2008). At the meso level, organisational culture and learning enable a continuous stream of knowledge creation, while the sociotechnical and systems theories argue for the holistic design that links and reinforces architectural constituents, supported by transformational leadership that stimulate creativity in the adaptation and exaptation of knowledge. In addition, dynamic capabilities, although generally conceptualised as an outcome of KM practices e.g. Cepeda and Vera (2007), can also in turn effect KM practices e.g. Villar, Alegre, and Pla-Barber (2014), specifically in shaping how well firms can modify their KM practices to fit with new environments. The 'business model' of knowledge capitalisation and value capture mechanism has its roots at the meso level of intellectual capital theory (Lonnqvist, Sillanpaa, & Carlucci, 2009) with knowledge capitalisation (Hsu & Sabherwal, 2011) and innovation as a form of value capture (Hall & Andriani, 2003). The three mechanisms not only appear to comprehensively reflect extant theories, but they are also more balanced as they incorporate all three levels of analysis.

4.3 Step 3 –Theorising KM practice system

There are three important elements in a theory; the constructs, the relationship between the constructs, and context, which may modify the nature of the relationship (Rousseau & Fried, 2001; R. Weber, 2003; Whetten, 1989) (Figure 4 illustrates the KM practice system theoretical model). There are also boundary conditions that KM practice system must consider. Internal 'functional practices' such as information management/ business intelligence (Schultze & Leidner, 2002), learning and development (Thomas, Sussman, & Henderson, 2001), and research and development (Smith, 2000), can overlap with KM practice system. The demarcation between information and knowledge is not always clear, and this is more so with the emergence of social media and other communicative technologies, e.g. crowdsourcing, that increases interaction between an organisation and its stakeholders, in particular customers i.e. when internal and external 'information' coalesces to become 'knowledge' (Saldanha, Mithas, & Krishnan, 2017). The fluidity and organic-nature of knowledge is also mirrored in learning and development, especially when learning and development uses and builds upon existing knowledge to create new knowledge. Finally, research and development is dependent on prevailing knowledge to build and generate new applied knowledge in supporting the development of new products/ services. Issues regarding boundary conditions are also present in practices that involve developing and/or maintaining strategic enterprise-level capabilities, such as organisational ambidexterity (Filippini, Guttel, & Nosella, 2012), resilience (Hatch & Dyer, 2004) and change (Adair, 2004). These capabilities inherently involve generating knowledge, socialising and diffusing knowledge, and applying it for performance.

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insert Figure A4 about here

The second construct of the framework is performance. As posited, what makes KM strategic (and some may even argue warrant the use of the term KM) in organisations is not just the ubiquitous and coherent application of KM practice system, but the intent to make KM a driver of organisational performance. For example, Kiessling, Richey, Meng, and Dabic (2009), report that KM positively influences Eastern European firms' performances. The orientation of KM towards performance is what sets apart strategic KM organisations from those that just dabble in it. However, 'what is' organisational performance must be defined by the firm.

There is a positive relationship between KM and performance. A key principle derived from the themes of performance-led and sustainably-supported, is value traceability. This principle epitomises the need to ensure that KM practice system not only provides value, but that there is also evidence to show that high performance can be attributed to KM practice system (Bogner & Bansal, 2007). Value traceability is ensuring that KM practice system has specific outputs e.g. linked to specific performance indicators, and envisaged outcomes; linked to specific contextual aspects of an organisation such as enhancing external networking and collaboration.

Organisations must consider their context when determining which KM practice system is 'right' for them. From a theoretical perspective, the importance of context has long been recognised (Rousseau & Fried, 2001). Tsui (2004) posits there are three main types of theories; context-free, context-specific and context-bound (Tsui, 2004). Context-free theories are almost law-like and are difficult to falsify (Popper, 1963). Context-bound theories commence with existing models followed by incorporating contextual factors in understanding how context may modify or extend the predictive utility of a theory. Context-specific theories, on the other hand, are instigated by local phenomena supported by extant literature.

KM practice system theory is context-bound because, even though there are elements in the construct that are widely applicable, how KM is put into practice may differ depending on the organisation's sector, strategy and other significant factors. Contexts commonly observed as modifiers to the relationship between the independent (i.e. KM practices) and dependent (i.e. performance) variables include, for example, national culture and sector. However, context may also modify the 'measures' of the constructs. For example, performance in private firms may be in terms of profitability; but for public agencies may be efficiency in service provision.

5. Limitations and Further Research

While this sensegiving paper allows for reflective and reflexive accounts of an emerging phenomenon from an insider perspective, it also presents a key limitation as it is a single viewpoint. Nonetheless, to some extent, the same can be said of interpretivist research undertaken by a sole investigator. Another limitation is that the working group outputs could not be presented due to the confidentiality required by ISO, which in part justifies the sensegiving approach adopted. Future research may validate the mechanism and theoretical model using the Delphi-method, consisting of a panel of academics. In addition, in developing a theoretical framework, this paper may be faulted for an overly reductionist approach. Although the approach is justified, as it is guided by established theory-building parameters e.g. Whetten (1989), future research may adopt a more pluralistic method by including other KM panel members as participants to draw from their experience and insight into how the KM practice standard may be 'represented' in the scholarly domain. Finally, while context was emphasised in the KM standard, the type of contexts that are particularly germane to KM practice system has not been specified, which is a gap that future research may focus upon.

6. Contribution and Conclusion

The development of an international KM standard synthesises practices from across the world in conveying what KM practice is about and 'what works'. This paper makes three contributions. Firstly, by taking advantage of a unique sensegiving opportunity on the maiden development of a KM standard, this paper identifies its implications on KM practice system theory. In particular, four themes of context-driven, performance-led, enabler-savvy and sustainable, were identified. Secondly, by adopting the innovative mechanism-based method of theorising, three mechanisms that are essential constituents of KM practice system were identified; learning and knowledge creation culture, organisational knowledge architecture for adaptive and exaptive capacity, and 'business model' for knowledge capitalisation and value capture. The mechanism-based method is consistent with practitioners' pragmatist paradigm and problem-solving approach. The third contribution is the development of a new KM practice system theoretical framework that adds to the scholarly debate concerning the antecedents and predictive utility of KM practice system. The theoretical foundations of KM practice system are robust, being founded upon well-established theories, which demonstrates the strong link between both practice and theory. The new KM practice system theoretical framework contributes to literature in providing a fresh view, in particular of the construct's mechanism-based constituents in setting new trajectories for research. Finally, while this study is aimed at KM scholarship and research, it may also be useful to KM practitioners as it provides précised conceptualisation of the international KM standard, specifically in the form of the four themes *from* the KM standard and the three mechanisms *for* KM practice system.

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Appendices:

Figure A1:

Figure A1: Stages in Sensegiving

Step 1	**Step 2**	**Step 3**
Identify themes from KM standard	Interpret themes; from standard to mechanisms, and validate the mechanisms for theorising	Develop a KM practice systems theoretical framework

The requirements standard

The theory
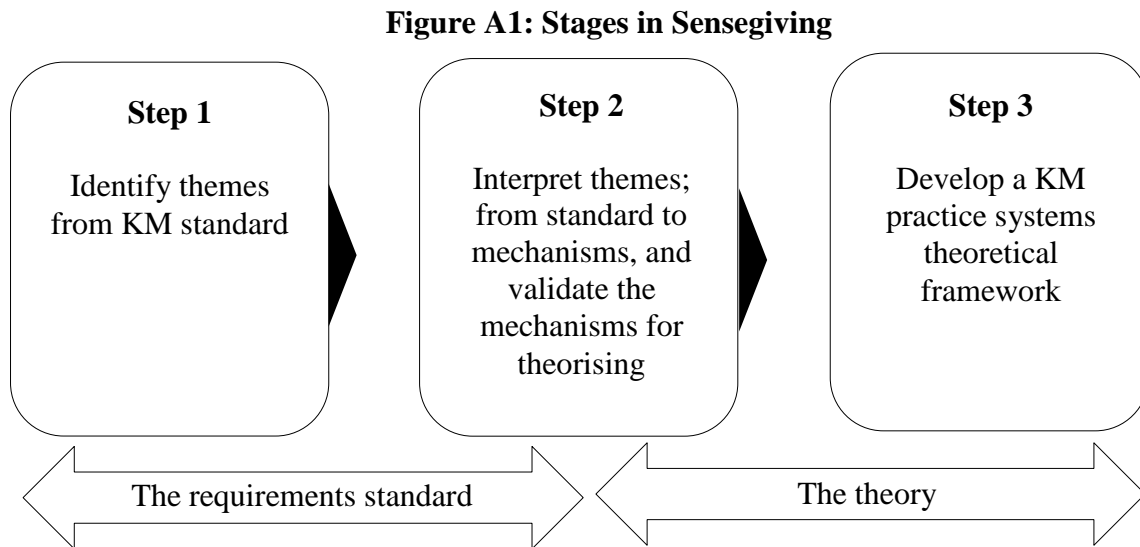
Figure A2:

Figure A2: Four themes from the KM standard[1]

Context-driven	**Performance-led**
Firms to determine what 'type' of knowledge is important and KM practices that are suitable	*KM is performance orientated but interpreted within the context of the firm*
Enabler-savvy	**Sustainably-supported**
Infrastructure and instruments to drive and support KM	*'Backroom' operations of KM practices. Reinforces KM environment*

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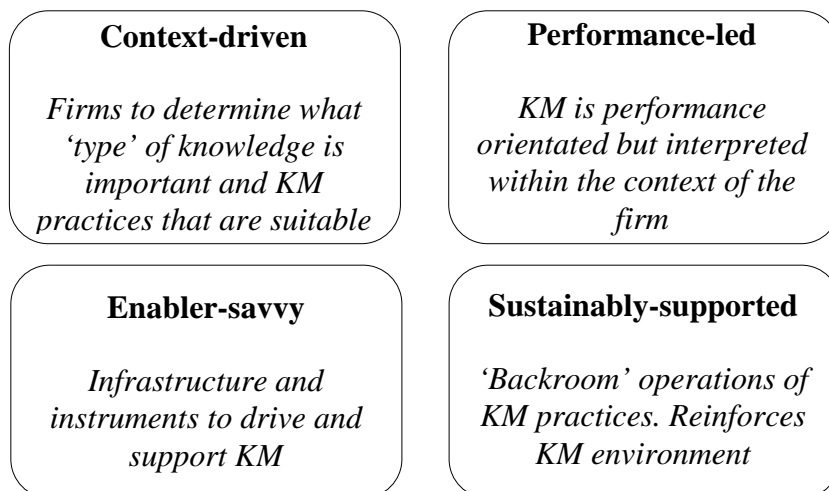
[1] This study leverages upon tables and figures to synthesise the sensegiving process

Table A1:

Table A1: Mechanisms of KM practice system

Themes from the KM standard	Mechanisms		
	Learning and knowledge creation culture	**Organisational knowledge architecture for adaptive and exaptive capacity**	**'Business model' for knowledge capitalisation and value capture**
Context-driven ** Each of the three mechanisms must be relatively robust in various contexts.*	The preferred mode of learning e.g. formal vs informal, may differ amongst organisations.	The architecture appropriately designed to suit the organisation e.g. degree of orientation in the use of information technology.	Determines how new knowledge is embedded in a firm's value proposition.
Performance-led	Individuals value KM for its performative utility. Underpins assumptions and guides behaviour in learning and creating knowledge.	Guides how knowledge architecture is established to transform and use knowledge for performance.	Performance drives the design and implementation of methods to capitalise on knowledge created and to capture value from it.
Enablers-savvy	Rewards values and behaviours that prize learning and knowledge creation, and knowledge transfer from external sources.	Organisational architecture for knowledge appropriation to enhance bundling and implementation of KM practices.	Equal emphasis on infrastructure and instruments used within a 'business model' (as with 'KM operations'). For example, using social media for crowd-sourcing, to gain market intelligence and ultimately sales.
Sustainably-supported	Formalisation of KM-specific roles, operations and processes that reinforces the learning and knowledge creation culture.	KM 'back office' helps to sustain KM practices e.g. meta-knowledge management.	Ensures that KM practice 'pays' for itself in a sustained manner.

Figure A3:

Figure A3: Example of the virtuous cycle of the KM practice system mechanisms

Profiting from knowledge strengthens belief in the importance and value of KM practice

Learning and knowledge creation culture

'Business model' for knowledge capitalisation and value capture

KM practice culture drives and supports the architecture to ensure that knowledge is shared, diffused and reused

Organisational knowledge architecture for adaptive and exaptive capacity

Knowledge transformation enables firms to identify how it may profit from knowledge

Table A2:

Table A2: Mechanisms of KM practice system and relevant theories

Selected key constructs and theories (seminal sources)	Mechanisms (sources applying constructs and theories in a KM context)		
	Learning and knowledge creation culture	Organisational knowledge architecture for adaptive and exaptive capacity	'Business model' for knowledge capitalisation and value capture
Micro level			
Affective commitment e.g. Meyer and Alien (1991)		E.g. Casimir et al. (2012)	
Affective trust e.g. McAllister (1995)		E.g. Swift and Hwang (2013)	
Behaviourist & cognitivist learning theories e.g. Skinner (1954), Piaget (1972)	E.g. Jain (2013)		
Dyad/ Group level			
Constructivist learning theories e.g. Lave and Wenger (1991)	E.g. Garcia-Penalvo and Conde (2014)		
Network theory e.g. Ahuja (2000)		E.g. Heizmann (2011)	
Social capital theory e.g. Nahapiet and Ghoshal (1998)	E.g. Manning (2010)		
Social exchange theory e.g. Blau (1964)	E.g. Konstantinou and Fincham (2011)		
Meso level			
Absorptive capacity e.g. Cohen and Levinthal (1990)	E.g. Valentim et al. (2016)		
Contingency theory e.g. Chandler Jr (1990)	E.g. Powell and Ambrosini (2012),		E.g. Hsu and Sabherwal (2011)
Dynamic capabilities e.g. Teece and Pisano (1994)		E.g. Cepeda and Vera (2007)	
Innovation e.g. Schumpeter (1947)			E.g. Hall and Andriani (2002)
Intellectual capital theory e.g. Youndt, Subramaniam, and Snell (2004)			E.g. Lonnqvist et al. (2009)
Cultural theory e.g. Douglas (1986) and culture theory e.g. Schein (1990)	E.g. Rai (2011)		
Organisational learning e.g. Argyris (1995)	E.g. Wu and Chen (2014)		
Resource-based view theory e.g. Barney (1991)	E.g. Bogner and Bansal (2007)		

Selected key constructs and theories (seminal sources)	Mechanisms (sources applying constructs and theories in a KM context)		
	Learning and knowledge creation culture	Organisational knowledge architecture for adaptive and exaptive capacity	'Business model' for knowledge capitalisation and value capture
Sociotechnical theory e.g. Cherns (1976)	E.g. Vaast (2007)		
Systems theory e.g. Von Bertalanffy (1950)	E.g. Gao et al. (2002)		
Transformational leadership e.g. Avolio, Bass, and Jung (1999)	E.g. Donate and de Pablo (2015)		

Figure A4:

Figure A4: KM practice system theoretical model

Extant theories related to KM

Mechanisms (cogs-and-wheels)

KM Practice System theory (key constructs, boundary conditions, relationships, context)

Relevant extant theories to all 3 mechanisms:
- *Absorptive capacity*
- *Contingency theory*
- *Resource-based view*
- *Systems theory*

- *Behaviourist & cognitivist learning theories*

- *Constructivist learning theories*
- *Organisational culture*
- *Organisational learning*
- *Social capital theory*
- *Social exchange theory*
- *Sociotechnical theory*
- *Transformational leadership*

- *Affective commitment*
- *Affective trust*
- *Dynamic capabilities*
- *Network theory*

- *Innovation*
- *Intellectual capital theory*

Learning & knowledge creation culture

Organisational knowledge architecture for adaptive & exaptive capacity

'Business model' for knowledge capitalisation & value capture

Boundary conditions:
- Functional practices i.e. information management/ business intelligence, learning and development, and research and development
- Strategic enterprise-level capabilities e.g. organisational ambidexterity, change and resilience

KM Practice System

Positive correlation

Organisational Performance

Context e.g. national culture

Underpinning themes from KM Standard

- *Context-driven*
- *Performance-led*
- *Enabler-savvy*
- *Sustainably-supported*