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Moving KM to the Next Generation: The Contribution of Critical Systems Thinking

Sharon Simatwo, Gillian Ragsdell, Thomas Jackson
Loughborough University, Loughborough, United Kingdom
s.simatwo@lboro.ac.uk
g.ragsdell@lboro.ac.uk
t.w.jackson@lboro.ac.uk

Abstract: Knowledge Management (KM) is multifaceted and grounded in various disciplines including psychology, strategy, organizational behavior, economics, and management. It is therefore not surprising that KM has developed rapidly as a field with a myriad of frameworks designed to address KM needs in organizations. The emphasis of studies tends to be on the application of KM with paucity in the discussion of its theory and underpinning philosophy. As a result, KM is varied in definition and application. The range of KM tools and practices has caused some concern with authors suggesting that there is need for KM to be applied in an integrated manner.

Systems Thinking (ST) is the conceptual framework for problem solving that views situations holistically. Critical Systems Thinking (CST) is the latest movement in ST that was born from the need to appreciate the diversity in approaches so as to identify the most suitable methodology for a problem context. CST is described by the commitments of critical awareness, sociological awareness, pluralism, complementarity and human emancipation. The application of CST is said to have reformed ST through its commitments and brought synthesis through the provision of a rational approach of combining system methodologies.

Activities that create, capture and utilize knowledge are inherent in systems methods thus indicating a similarity between ST and KM. Authors have as such, called for the use of CST to underpin KM theory and practice.

This paper highlights the contribution of CST to the maturity of Systems Thinking as a discipline. Potential use of CST in developing more unified, systemic and holistic approaches to handling KM is put forward. The aim is to spark conversation on the need for a new generation of KM that is grounded theoretically and philosophically, and based on more than practical case studies.

Keywords: Knowledge management, critical systems thinking, systems thinking, underpinning philosophy, theory

1 Introduction

Knowledge Management (KM) as a discipline has been in existence for over two decades and has grown considerably with its application seen across various fields. Though there are debates about its origin, KM as a discipline began to mature around the 90s from studies on the process of knowledge creation to the meaning of knowledge to the firm (Nonaka and Takeuchi, 1995; Wiig, 1997; Davenport and Prusak, 1998). Since then, it has been seen to branch out and be adapted to solve KM issues within varied organizational contexts (Jasimuddin, 2012). The variety of the backgrounds from which researchers and practitioners hail has resulted in a series of debates as to the origins of KM and equally, a plethora of frameworks to manage knowledge (Holsapple and Joshi, 1999; Hazlett *et al*., 2005). Authors have recognized that not only does the multitude of frameworks fail to solve KM issues adequately in organizations, but it also shows a lack of understanding about the fundamentals of KM as a discipline (Rubenstein-Montano *et al.*, 2001; Scholl *et al.*, 2004; Fteimi and Lehner, 2016).

Researchers have attempted to create or make progress towards creating a unified KM framework (Sunassee and Sewry, 2002; Gao *et al*., 2003; Heisig, 2009). Despite the various attempts, to date there is still limited progress towards an agreement across the discipline (Metaxiotis *et al*., 2005; Heisig, 2014; Fteimi and Lehner, 2016). Some suggestions have included revisiting the theory and underpinning philosophies of KM through drawing insights from similar, well established disciplines such as Systems Thinking (van Aken, 2004; Lehaney *et al*., 2004; Paucar-Caceres and Pagano, 2009). Systems Thinking (ST) has been identified by authors to not only have practical significance to KM applications, but also potential to develop the discipline as a whole (Rubenstein-Montano *et al.*, 2001; Lehaney *et al*., 2004; Jackson, 2005; Paucar-Caceres and Pagano, 2009).

Critical Systems Thinking (CST) is the latest movement in ST that has been said to be responsible for its unification and has since been applied extensively (Panagiotidis and Edwards, 2001; Gao *et al*., 2003; Jackson, 2005; Massingham, 2014).

This paper will aim to address some of the concerns that have been brought forward by KM experts regarding the theory and underpinning philosophies of KM. It will introduce CST and its role in progressing ST as a discipline, and display the potential it may have in grounding KM.

2 Current position of knowledge management

Knowledge Management (KM) as a discipline can attribute its roots to work by pioneers in the early 90s. Studies done have been on the definition of knowledge, the process of knowledge creation and its use for competitive advantage in organizations (Drucker, 1993; Nonaka and Takeuchi, 1995; Wiig, 1997; Davenport and Prusak, 1998). More than two decades have passed and the discipline is still of interest to both academics and practitioners. KM has survived despite being accused of being a 'management fad' during phases of its growth (Wiig, 1997; Ibrahim and Reid, 2010; Serenko, 2013).

Surveys are periodically conducted to investigate the positioning of KM as a discipline and to identify themes and areas for future study. Recent ones show that there is still a strong interest in KM and the variety of topics it embraces. This is perhaps no surprise as knowledge is still considered to be an asset that can be leveraged for competitive advantage (*OECD*, 2014). The concerns of KM being a management fad have been dispelled with recent studies indicating that it shows signs of scientific maturity (Serenko and Dumay, 2015). Themes and areas still being studied are on knowledge as a process, competitive advantage, organizational culture, communities of practice, knowledge innovation, KM strategy and problem solving (Dwivedi *et al.*, 2011; Ribière and Walter, 2013; Serenko and Dumay, 2015; Asrar-ul-haq and Anwar, 2016; Fteimi and Lehner, 2016).

Over time, there has been a recognition of the difficulty in gaining a common understanding in KM, whether in theory or in practice (Ibrahim and Reid, 2010). The term knowledge itself has a vast set of definitions depending on its meaning to individuals and the context it is placed in. Knowledge in philosophy has various strands such as knowledge as "belief" as far as Plato, Descartes, Aristotle, Kant and other Western philosophers are concerned; or personal knowledge that can be either tacit or explicit (Kelly, 1963). There is also knowledge as described in social theory which is seen from how it is formed and interpreted as it is transmitted to others; and knowledge as a higher level of information management (Gao *et al*., 2003). The differences in the perception of what knowledge is to researchers and practitioners are not the only cause of demur, but also the nature of the discipline. KM as a discipline is spread across several areas such as IT, strategic management, human resources, economics accounting and operational management (Bollinger and Smith, 2006; Ibrahim and Reid, 2010).

Apart from the difficulty in achieving a common definition of knowledge, KM lacks solid theoretical and philosophical underpinnings. The discipline became popular in management with consultants mainly conducting KM initiatives in their organizations based on their observations. Ibrahim (2010) referred to this as the "bandwagon effect" where the organizations tend to react to the KM needs of the business without reflection on the meaning and implications of these undertakings. As such, there has been a lack of consensus in what constitutes KM (Ibrahim and Reid, 2010). Rubenstein-Montano *et al*., (2001) argue that the field has been slow in working towards a commonly accepted framework. This appears to be true with subsequent studies indicating that there is still a lack of unanimity in background and the thoroughness in which its concepts have been studied (Heisig, 2014; Tzortzaki and Athanassios, 2014).

Attempts have been made in the matter of providing solid grounding for KM theory by, for example, Lehaney *et al.*, (2004) and Nonaka and Peltokorpi (2006). However, there are still calls for more theoretical work in KM to ensure common understanding (Heisig, 2014). There is a general awareness and appreciation of the need for a unified KM approach from theory to practice and efforts are still being made to remedy the situation to date. One such attempt is Shongwe's (2016) KM lifecycle framework that is intended for practice. His lifecycle framework is based on processes common in prominent KM frameworks. While this is a significant step in developing more synthesized approaches, there is little mention of the reasoning behind his approach. KM does not need any more definitions and frameworks, but deeper exploration of the theory

in order to best understand the way forward in developing better methods (Tsoukas and Vladimirou, 2001; Hazlett *et al*., 2005).

The theory of a discipline can be explored from a reference discipline with which there are similarities (Moody *et al*., 2010). KM researchers who have called for the unification of KM have attempted this through making references to the more established discipline that is Systems Thinking (Gao *et al*., 2003; Lehaney *et al*., 2004; Paucar-Caceres and Pagano, 2009). ST is presented to have great similarity with KM and a potential to develop it both in theory and practice (Rubenstein-Montano *et al.*, 2001; Jackson, 2005).

3 Systems thinking

Systems thinking (ST) is a framework for problem solving that views issues in their entirety (Checkland, 2000; Rubenstein-Montano *et al.*, 2001). Initially, the problem solving methods were based on identifying a goal before an analysis is conducted. These were known as the "hard systems" methodologies which were widely used in operational research, systems analysis and systems engineering. These hard systems thinkers were later criticized for developing methodologies that addressed issues on a "meta-level", and "without reflection" (Flood, 1990). The result of this was a discipline that was showing signs of fragmentation (Flood, 1990; Jackson, 1993) .

The work of "soft systems" thinkers through the development of Soft System Methodologies (SSM) challenged the hard systems thinkers. SSM was derived from the critiques of the systems thinkers whose theories assumed that problems could be reduced to and solved by empirical methods (Churchman, 1971; Ackoff and Emery, 1972). Soft system thinkers were opposed to the positivist and functionalist view of the systems methods and provided the argument that real world problems are complex and cannot be defined by clear goals and objectives (Flood, 1990; Jackson, 1991).

SSM has since been widely used in various disciplines to solve problems and complement existing methods, even in KM (Maqsood *et al*., 2001; Hasliza Md Saad *et al*., 2006; Shankar *et al*., 2009; Avalos-Villarreal, 2010; Jackson, 2010). Debates emerged that were a result of the fundamental differences in the worldview of systems thinkers in general (Jackson, 1991). This sparked the need for a critical view that would enable discussions that were above these differences. Critical Systems Thinking (CST) was then born to reconstitute systems thinking rather than let the debates put a divide on the discipline as a whole (Jackson, 2001).

4 Critical systems thinking

Critical systems thinking (CST) is the latest movement in ST that was born from the appreciation for the need of pluralism in ST. The reason for a "critical" approach is to ensure that there is integration of theory into practice in a manner that is consistent with the views of the nature of social reality. The emergence of CST enabled ST to mature as a discipline through the provision of a rational approach of combining the various systems approaches to solve complex problems (Flood, 1990; Jackson, 2010).

CST was based on the commitments of critical awareness, sociological awareness, complementarism and human emancipation (Flood and Jackson, 1991; Jackson, 1991; Gao *et al*., 2003). The logic of the commitments is summarized as follows:

- *Critical awareness:* This calls for an understanding the strengths and weaknesses of the methods. Following the complexity of systems, a requirement of conscious observation and thought needed to be taken at both theoretical and practical levels.
- *Sociological awareness:* This is an extension of critical awareness that accounts for understanding and recognizing the organization and society pressures that affect the choice of method as well as the consequences of the same.
- *Complementarism:* Complementarism at both the theoretical and methodological level were the innate parts of CST. Later advocated as pluralism, it encourages the appreciation of the diversity of methodologies that are expressed from different rationalities. This notwithstanding, caution is given that complementarism is opposed to a 'pick and mix' strategy but rather interventions be undertaken in a sensible manner.
- *Human emancipation:* Drawn from of the cognitive interests in Habermasian theory, emancipation was included to embrace the dedication human improvement. In so doing, CST

ensures that concerns about the ethical and moral aspect are put into consideration in problem contexts.

Once the philosophical underpinnings were set, Flood and Jackson (1991) developed their operationalized toolkit, Total Systems Intervention (TSI). TSI encompassed three phases of creativity, choice and implementation that were embedded by seven principles. Each of the phases of TSI was described by the task, the tools and the expected outcome highlighted in Table 1.

Table 1: The Three Phase TSI methodology (Adapted from Flood and Jackson, 1991, p.54)

Creativity	
Task	To highlight aims, concerns and problems
Tools	Systems metaphors
Outcome	'dominant' and 'dependent' metaphors highlighting major issues
Choice	
Task	To choose an appropriate systems-based intervention methodology (methodologies)
Tools	The 'system of system methodologies', the relationship between metaphors and methodologies
Outcome	'dominant' and 'dependent' methodologies chosen for use
Implementation	
Task	To arrive at and implement specific change proposals
Tools	System methodologies employed according to the logic of TSI
Outcome	Highly relevant and coordinated intervention

TSI solves problems through the combination of metaphors, system of systems methodologies and knowledge of the individual system approaches. The examples of system methods selected in their toolkit were: system dynamics, viable system diagnostics, strategic assumption surfacing and testing, interactive planning, soft systems methodology and critical systems heuristics. For each, Flood and Jackson (1991) put into consideration the philosophy, principles and methodology.

Not only did CST reform ST as a discipline, but its ideals were thought to have potential to be applied in various management areas such as in evaluation research, logistics, information systems, operational research and knowledge management (Jackson, 2010).

5 CST for KM

It has been said that finding a common ground for KM still remains a challenging task despite the discipline being present for over two decades (Fteimi and Lehner, 2016). Authors have called for the application of CST as a path towards more unified and holistic methods to KM (Ghalib, 2004; Avalos-Villarreal, 2010). The argument for this use of CST for KM is mainly rooted in the similarity between the two disciplines.

"What is most remarkable is the compatibility of the traditions of KM and CST. They share enough in common to make productive debate easy but differ in ways that allows each to benefit from the other." (Jackson, 2005, p.195). This statement gives a clear indication of the potential of CST for KM as it is suggested by one of the main instigators of the CST movement. The observation was also made by other authors familiar with the concepts of ST and KM. This is seen in their use of insights from ST to complement KM in their work whether in theory or practice (Panagiotidis and Edwards, 2001; Rubenstein-Montano *et al.*, 2001; Achterbergh and Vriens, 2002; Gao, *et al*., 2003; Lehaney *et al.*, 2004; Jackson, 2005; Paucar-Caceres and Pagano, 2009).

One of the similarities between ST and KM is seen in the reaction to the business environment through time. This is evidenced by the way in which they both responded to the technological and societal changes that affected the view of organizations. ST progressed from hard systems methodologies, to soft and then eventually CST. KM similarly evolved through its generations. First generation KM was placed within the same time as the evolution of personal computers and the internet (Grant and Grant, 2008). The center of most KM strategies was around technology and information systems (McElroy, 1999). Nonaka's SECI model is

said to have triggered second generation KM by including the social aspect involved in the KM process (Snowden, 2002; Grant and Grant, 2008). The introduction of the social aspect to KM is akin to the view of SSM which emerged from a similar need for the inclusion of the human aspect. Third generation KM is put forward by authors such as Snowden (2002) who argue for an appreciation of complexity and holistic thinking in KM. This third generation calls for acknowledgement of complexity is comparable to the movement that is CST.

It has been mentioned that there are instances of the application of ST in KM by researchers and practitioners. Soft methodologies are applied in 'fuzzy' contexts where the problem is not easily understood (Checkland, 1985). SSM has been reported to have very useful tools in dealing with reasons behind system failures that require the use of a certain type of knowledge (Avalos-Villarreal, 2010). Maqsood, *et al.,* (2001) illustrated the use of SSM in construction project management where KM problems were difficult to identify and effect change. Other examples of the use of SSM in KM are in the realignment of a KM framework to improve the knowledge creation process (Shankar *et al*., 2009); establishing a method for the uptake of KM in organisations (Ferrari *et al*., 2002) and formulating KM strategy (Hasliza Md Saad *et al*., 2006; Avalos-Villarreal, 2010). This wide use of SSM for KM not only shows the similarities between KM and ST, but goes to show that the current KM tools are not sufficient in dealing with the 'messy' context in a systematic way. SSM is in-between a philosophy and a methodology for practice. The underpinning philosophy gives a general direction to deal with 'what' of a scenario while the methodology offers 'how' to deal with the problem (Ferrari *et al*., 2002).

Conceptually, KM and ST have a lot in common. Jackson (2005) identified Nonaka and Takeuchi's development of knowledge creation cycle as one that makes considerable use of systems concepts. As highlighted in the previous section, CST works to uncover different theoretical assumptions of system approaches. KM has been argued to be theoretically impoverished (Jackson, 2010). In order to enhance it, Jackson (2010) presents CST as a potential guide towards avoiding potential intellectual stumbling blocks and enable KM to translate insights into practice more easily. Gao *et al*., (2003) presented an attempt at the use of CST for KM. The authors applied CST as a thinking guide to propose a toolkit for managing knowledge. Links are made as to how the commitments of CST could manage the complexity that is the multifacetedness of KM. Critical and sociological awareness calls for KM managers to think beyond the problem itself. Pluralism requires the appreciation of the various theories, methodologies, models and techniques and to be aware of the strengths and weaknesses in doing so. Human emancipation takes ethics in consideration when handling employees and members of society (Gao *et al*., 2003).

CST will not only provide the underpinning philosophy, but also allow the benefits of ST to be applicable to KM through ensuring the use of appropriate methodologies and tools. Total Systems Intervention (TSI) is the toolkit that was developed through the application of CST. The result was an offering of system methods to solve various problems. There is potential for the same in developing a KM toolkit using other theories and approaches in management science that are already being used in KM. Gao, *et al.,* (2003) developed a basic toolkit for KM through the critical approach. Their call for continued work towards a KM toolkit appears not to have been explored as much. The aspiration of this paper was to highlight the potential of CST and ignite a continuation of work such as the one by Gao, *et al*., (2003) in developing a toolkit with theoretical and philosophical underpinnings.

6 Conclusion

This paper has highlighted some of the key areas of conversation in providing theoretical and philosophical underpinnings for KM. It is likely that KM as a discipline is here to stay and is not a management fad, as research continues decades after its inception. A majority of KM researchers and practitioners still manage to develop effective KM solutions for their organizations, but the issue is the solutions are developed without necessarily reflecting on any theories. The result has been a fragmentation in the discipline as evidenced by the plethora of frameworks present. The situation has been acknowledged with authors calling for more unified thinking in the discipline. CST has been suggested as a method to achieve said unification and holistic thinking in KM. CST has been identified due to the similarities in the ST and KM disciplines. Through its commitments, CST enabled ST to evolve from debates on divided thinking to an appreciation of the different problem solving methodologies and contexts to eventually an operationalized toolkit. KM is also in need of an evolution that will solve the issue of fragmentation in frameworks and approaches. It has been seen that

CST did not necessarily unify ST in a "one method for all" sort of way, but provided the argument for the need to appreciate the diversity of methods. Similarly, KM needs a philosophically grounded framework that will acknowledge the strengths and weaknesses of the various approaches.

To date some similarities between ST and KM have been drawn based on instances found in literature, to make a case for the use of CST for KM in unifying the discipline. The main focus of this paper has been to highlight the issues with KM research, but also to suggest, through taking findings from previous research papers, how the domain might progress to the next generation of KM.

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