Combining Grounded Theory Strategy with Soft Systems Methodology in Knowledge Management Research: An Approach

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Abstract
Knowledge management (KM) is currently an emerging discipline in higher education and its effective implementation is becoming a precondition for success in a globalized knowledge economy. Increasingly, it is being argued that analysis of data and information generated in higher education can be transformed into knowledge that in turn can be used to gain higher educational benefits such as a competitive advantage, minimization of costs, improved quality and responsiveness, or improved service to learners. This paper proposes an interdisciplinary approach to research in KM, particularly in investigating technical ('hard') and organizational ('soft') aspects of KM using grounded theory (GT) strategy combined with soft systems methodology (SSM). Using the explanation that KM research is a human activity system which requires both soft and hard systems methodologies to achieve study goals, a research methodological strategy is proposed for carrying out a study to develop a framework for KM using information and communication technology (ICT) in higher education. It is argued in the paper that this approach is useful to researchers and practitioners alike in carrying out this study as it contributes to a systematic and more effective KM research approach. As well as contributing theoretically to the literature on KM by providing insights into the combination of GT strategy with SSM in carrying out KM research, this paper further seeks to propose a methodological approach that can be used in carrying out research on similar or related KM studies.

Keywords: Knowledge Management, Research strategy, Grounded Theory, Soft Systems Methodology, Integration approach

Introduction

KM is currently a subject of much debate in both the academic and business communities and is increasingly being seen by the two communities as the key to competitive advantage. In the academic world in general and higher education sector in particular, KM has attracted a lot of interest and a lot of researches have been undertaken (Petrides and Nordine, 2003; Steyn, 2004; Omona and van der Weide, 2014). A number of these researches have taken the forms of surveys focusing on success factors and aspects of best practices involving elicitation of general reflections from senior KM practitioners through use of research instruments such as questionnaires and interview methods (Wastell, 2001). Case studies focusing on KM success/failures have also been reported (Storey and Barnett, 2000). Because it is a developing discipline, KM requires definitional studies that focus on basic theory by defining terms and establishing relationships between concepts (Guo and Sheffield, 2008). Studies carried out on KM contain a rich variety of conceptual papers that build theoretical foundations for KM in the disciplinary fields such as information systems, management and organizational behaviors, and systems thinking (Ruggles, 1998; Ponzi, 2002; Jasimuddin, 2012). The problems with these theoretical frameworks (Ruggles, 1998; Ponzi, 2002; Jasimuddin, 2012) are that KM research and the strategies that can be employed to achieve improved KM research results appear to be largely unexplored.

According to Guo and Sheffield (2008), three perspectives on organizational knowledge are discernible that may support theoretical work on KM and how researches in KM can be approached. The first perspective proposes that organization have different types of knowledge, and that identifying and examining these will lead to more effective means for generating, sharing and managing knowledge in organizations. Orlikowski (2002) uses the example of Tsoukas (1996) where a researcher develops classifications of knowledge and then use them to examine the various strategies, routines, and techniques through which knowledge are captured, represented, codified, transferred and exchanged. The second perspective proposes that knowledge is inseparable from knowing how to get things done in complex organizational work and that organization enact a collective capability in organizing. It examines the practices or the situated and ongoing accomplishment that emerge from everyday actions (Orlikowski, 2002). This perspective recognizes the roles and importance of knowledge resources as well as the processes involved in effective KM, but also examines the nature of work practices, and human agency. The third and final perspective proposes that knowing how to accomplish tasks in organizations cannot be separated from politics, that is, how power is attached to knowledge and knowledge is attached to power. Because of these different perspectives of looking at KM, studies in the subject currently show that KM researchers differ in their definitions concerning the concept of knowledge and there is a general lack of conceptual integration to KM research, which has contributed to confusing variety of approaches, theories and frameworks (Alavi and Leidner, 2001).

In today's knowledge driven economy,

higher education managers are faced with the challenge of how to effectively link KM initiatives and processes with the ever-changing needs. The problem arises due to the disconnect between KM and the ever-changing organizational needs which is mainly due to having inappropriate KM framework development and implementation approaches and processes, and adoption of some quick-fix solutions to KM to achieve higher educational goals. If knowledge is to be effectively managed and utilized, KM and KM researches in higher education should be made to link with institutional goals such as enhanced research, innovations and competitiveness.

This paper proposes an approach for combining GT with SSM as the overall strategy that can be adopted to carry out a study to develop a framework for KM using ICT in higher education. The paper starts by examining KM as an interdisciplinary subject; looks at the research paradigms in KM research; examines both GT and SSM and their application in KM research and identify the philosophical position that underpins the research strategy that is being proposed. Finally, a proposal is made on the best research approach that can be adopted to carry out a study to develop a framework for KM using ICT in higher education. As well as contributing theoretically to the literature on KM by providing insights into the application of GT strategy with SSM in carrying out KM research, this paper further seeks to propose a methodological approach that can be used in carrying out research on similar or related KM studies.

KM as an interdisciplinary subject

KM efforts have a long history to include on-the-job discussions, formal apprenticeship, discussion forums, corporate libraries, professional training and mentoring programs. More recently and with increased use of computers, specific adaptations of technologies such as knowledge bases, expert systems, knowledge repositories, group decision support systems, and computer supported cooperative work have been introduced to further enhance such efforts. A broad range of thoughts on the KM discipline exist with no unanimous agreement; and approaches to KM research vary by authors and schools. For example, Ponelis and Fair-Wessels (1998) assert that KM is a new dimension of strategic information management. Davenport and Prusak (1998) view KM as the process of capturing, distributing, and effectively using knowledge. Skyrme (1997) suggests that KM is the explicit and systematic management of vital knowledge along with its associated processes of creating, gathering, organizing, diffusing, using, and exploiting that knowledge. Pierce (1999) argues that KM is interdisciplinary because it involves the exportation and integration of theories or methods to other disciplines, and to the development of the emerging field of KM.

The variations in the definition of KM by the different researchers point to the interdisciplinary breadth of the subject and one of the most comprehensive definitions has been proposed by Ruggles (1998). In his definition, Ruggles defines KM as a newly emerging, interdisciplinary business model dealing with all aspects of knowledge within the context of the firm, including knowledge creation, codification, sharing, learning, and innovation. Some aspects of this process are facilitated with ICT, but the greater aspect, is to a

degree, about organizational culture and practices. Ponzi's (2002) contextual view of Ruggles' definition further demonstrates the interdisciplinary nature of KM through suggestion of a definitive set of disciplines that KM is developing from; namely, management science, library and information science, management information science, organization psychology, computer science, and sociology. Ponzi (2002) for examples, points out that in the definition of KM given by Ruggles (1998), 'business model' represent '*management science*', 'codification' represents '*information science*', 'information technology' represents '*management information systems/computer science*', and 'organization culture' represents '*organizational psychology and sociology*', thus implying that KM is a confluence of several sciences and disciplines, each contributing to the understanding of the concept of KM.

Research paradigms in KM

A research paradigm refers to a broad framework of perception, understanding, and belief within which theories and practices operate and consist of a network of coherent ideas about the nature of the world and the functions of researchers which, if adhered to by a researcher or group of researchers, conditions their thinking and underpins their research actions (Bassey, 1990). There are many and diverse theoretical perspectives that have historically influenced the direction, structure, and process of research in the social sciences. However, two research paradigms are most dominant in the literature and have provided the basis for various methodologies. These paradigms are positivism and interpretivism (Sarantakos, 1993; Bryman, 2001). The underlying assumptions of the positivism paradigm are that r*eality is* objective, perceived uniformly through the senses, governed by universal laws, and well integrated for the good of all; that human beings are rational and obey external laws with no free will; that science is based on strict rules and procedures, deductive, nomothetic, and based on sense impressions and value free; and that the purpose of research is to explain facts, causes and effects, to predict, and to emphasize facts and prediction. Interpretivism paradigm on the other hand is based on the assumptions that reality is subjective, created, not found and interpreted; that human beings are creators of the world, assign meanings to the world, not restricted by external laws and create systems of meaning; that science is based on common sense, inductive, ideographic, based on interpretations and value driven; and that the purpose of research is to interpret the world, to understand social life, and to emphasise meanings and understandings (Sarantakos, 1993).

KM is an inherently interdisciplinary research field in as much as its implementation depends on technological systems and its application depends on user acceptance and embracement by both management and employee alike. This implies, according to Giaglis (2003) that research within the field of KM can generally fall under two broad categories depending on the departing point of research questions. On the one hand, one research stream based on hard systems approach draws predominantly on the findings from the fields of computer science and information systems, and sees KM as an application area that extends the

traditional realm of databases and information management into so-called knowledge bases and KM systems. In other words, this sub-area of KM is mostly concerned with investigating ways in which technological capabilities can be exploited by organizations in their pursuit of knowledge driven competitiveness. On the other hand, the second stream based on SSM attempts to tackle the managerial, organizational, and human issues surrounding the successful introduction of KM within organizations. Research under this sub-area of KM is mostly concerned with investigating ways in which the process of knowledge creation, assimilation, communication, and enactment can be managed by organizations.

GT strategy

GT was developed by Glaser and Strauss (1967) as a research methodology for extracting meaning from qualitative data collected in the field, and is used to generate a theory that explains a process, or processes, about something at an abstract conceptual level in a specific context or setting. The GT strategy, particularly the way Glaser and Strauss (1967) developed it, consists of a set of 7 steps as shown in figure 1 below whose careful execution is thought to guarantee a good theory as the final outcome and is an inductive rather than a deductive methodology for carrying out research.

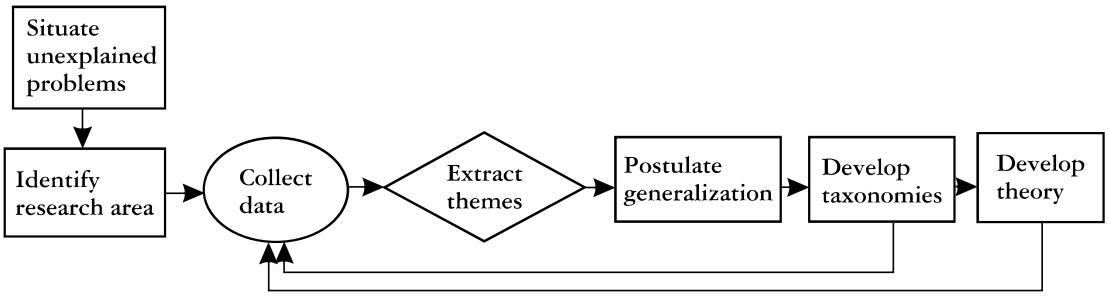

Figure 1: Steps in GT Research (Glaser, 1992)

GT proceeds from the assumption that 'theory is a process' and this process begins with the collection of raw data which is then qualitatively coded as a first step towards developing prospective theory. From the preliminary coding, major variables emerge, instigating further questions. If the answers to the questions are not found in the data, further data collection is indicated. It is this consistent return to the data at each stage of developments that validates the theory. The theory matures as data elements are integrated into the whole and the grounded network of relationships are established – a process called theoretical sampling (collecting, coding, and analysis of data), and includes deciding what data to collect next and where to find them in order to develop an emerging theory, either substantive or formal (Strauss and Corbin, 1998). The research gradually assembles a theory, inductively and iteratively obtained through categoriza-

tion from the body of knowledge. This is done on a case-by-case basis, rather than through subject-based identification of variables. Comparison of cases and labels should then be able to reveal similarities and differences. The casual relationships, similarities and differences then lead the researcher to draw conclusions and formulate theories about the data that have been collected and analyzed. The whole process aims to develop an account of a phenomenon or phenomena which identifies major categories of data, the relationships between the categories, and the context and processes which are occurring (Becker, 1993). A number of Computer-Assisted Qualitative Data Analysis Software (CAQDAS) are currently available to address some of the obvious barriers to GT qualitative analysis by manual methods such as limitations on size, flexibility and complexity of data records and these include among others NUD*IST, ATLAS/ti, Decision explorer, Nvivo and Code-A-Text.

GT strategy and its intellectual assumption in KM research shows that it owes more of its approach to the constructivist philosophy using the positivist paradigm based on its emphasis on multiple realities; that researcher and phenomenon are mutually interactive; that causes and effects cannot be separated; that research is value laden; and that the outcome of a research is socially constructed (Brown, 1995). As a methodology, GT was developed for, and is suited to the study of behaviors, and given this background, it has considerable potential for the study of the broad range of subjects which have a human dimension such as KM. This is because in KM research, the basic generating functions is to be found in the heads of human beings and the outcomes are represented by actions and decisions made by the individual. This paper adopts the evolved Strauss and Corbin (1998) GT approach as the most appropriate variant for carrying out the proposed research based on the strong sociological nature of KM as well as its emphasis on describing phenomena in terms of actions, interactions and outcomes or consequences. Examples of the use of GT strategy in KM research include the work of Wastell (2001); and Wong and Aspinwall (2005).

SSM

SSM is a methodology within the broader action research framework that encompasses a range of research methods. Action research is defined as a cognitive process that depends on social interaction between the observers and those in their surroundings (Baskerville and Wood-Harper, 1998). The essential components of any action research are viewed as a two-stage process: the diagnostic stage that analyses the social situation, and the therapeutic stage where change is introduced and impact or outcomes are examined (Blum, 1955). SSM as an approach under action research explores the notion of purposeful human activity by enhancing our knowledge of the problem and situation and coming up with a useful intervention for such situation. It aims at contributing to both the practical concerns in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework (Checkland, 1981). The philosophical underpinnings of SSM are essentially interpretive (Susman, 1978). Checkland highlights that this is important for the socio-human systems studies, because unlike the other sciences, human beings can always attach different meanings to the same social world (Checkland, 1981).

In its idealized form, SSM refers to a seven-stage process of analysis which uses the concept of human activity as a mean of defining the situation for taking actions (Checkland, 1981). Human activity systems here refer to an assembly of knowledge workers occupying a shared space that serves as a foundation for knowledge creation (Nonaka and Konno, 1998); and consist of both soft and hard systems resources for managing, organizing, learning and reusing of existing knowledge and, more importantly, for creating new knowledge to realize an organization mission and goals (Gao et al., 2003). The seven steps include:

(i) Identification of problem situation by observing the problem symptoms in a situational context.
(ii) Analysis of the symptoms map to identify the real underlining issues and root causes resulting in rich picture of the given situation.
(iii) Analysis of the problem identified in rich picture and developing a root definition for the transformation processes, which addresses the problem.
(iv) Development of the conceptual model.
(v) Comparison of the conceptual model with identified problems.
(vi) Identification of desirable changes or solutions.
(vii) Development of final model that can be implemented.

The seven steps highlighted above can be decomposed into five steps that are used while carrying out a KM research project according to Baskerville and Wood-Harper (1996): (i) Diagnosing; (ii) Action planning; (iii) Action taking; (iv) Evaluating; and (v) Specific learning. Diagnosing relates to the process of knowledge audit which is typical for any KM project. Action planning and action taking requires formulating new organizational strategies for knowledge creation and sharing. Learning and reflection which come as a result of evaluating and specific learning are seen as major outcomes for the participants involved. These last steps and the learning outcome, which often includes creating new knowledge, are the major focus of KM practice.

Philosophical position

When working with social phenomena like KM, it is important for researchers to consider their underlying philosophy when planning research and how this influences the research they conduct and the results they achieve. Influential philosophies all have their own concepts of what constitutes theory, evidence, knowledge, and how we understand the world, as well as what our values as researchers should or should not be. In this paper, the philosophical position that was adopted to guide the development of the proposed research approach is positioned in the social constructivist tradition based on the systems thinking school of thoughts. The position suggests that through social activity, individuals in the social setting constantly re-create knowledge in new forms (Berger and Luckmann, 1966), and that improvement in KM is intrinsically linked within purposeful human activity systems. Knowledge is suggested here to be an emergent property of purposeful action as a result of interactions taking place in a community of practices or network of information units; it is disseminated through conversational acts; and it is applied in purposeful human activity where groups construct knowledge for one another and collaboratively create a small

culture of shared artifacts with shared meanings. The social constructivist school of thoughts is based on specific assumptions about reality, knowledge, and learning:

- that reality is constructed through human activity where members of a society together invent the properties of the world (Kukla, 2000). For the social constructivist, reality cannot be discovered: it does not exist prior to its social invention.
- that knowledge is also a human product, and is socially and culturally constructed (Prawat and Floden, 1994). Individuals create meaning through their interactions with each other and with the environment they live in.
- that learning should be viewed as a social process. It does not take place only within an individual, nor is it a passive development of behaviors that are shaped by external forces (McMahon, 1997). Meaningful learning is said to occur here when individuals are engaged in social activities.

Systems theory which forms the basis of the social constructivist school of thoughts focus on the relationships between parts and the properties of a whole, rather than reducing a whole to its parts and studying their individual properties (Senge, 1990). Systems theory has been applied to a wide variety of organizational and management issues (Shen *et al.,* 2009) and recent studies have suggested that the business sector in general and KM research in particular could benefit from leveraging a systems perspective (Atwater *et al.,* 2008). Systems' thinking, derived from systems theory is the basis for the learning organization such as higher education (Senge, 1990) where knowledge are thought of as being complex wholes of material and immaterial things, with the component entities being hierarchical, but of themselves being able to be treated as wholes (Hitchin, 1992).

Based on the systems perspectives, this paper adopts the approach proposed by Habermas (1987) in his 'theory of knowledge-constructive interest and communicative action' to propose the best research strategy that can be used to carry out a study to develop a framework for KM using ICT in higher education. In this approach, 'knowledge interests' provide the key architectural element for carrying out a study and direct the phenomenon studied (research interest). It is also the guarantor of knowledge gained in a particular research paradigm, and each research interest is associated with a perspective of systems thinking (see Table 1). In the approach, knowledge interests are used to frame a typology of actions and such typology can be very useful in guiding the actions of a KM researchers.

Table 1: Perspectives on KM (Habermas, 1987)

Research Interests	Research Paradigms	Systems Perspective
Technical	Positivism	Hard
Practical	Interpretivism	Soft

Proposed research approach

As highlighted in table 1, research on KM can be viewed through two main paradigms, namely the technological or computational paradigm (positivism), and the socio-organizational or practical paradigm (interpretivism) (Hazlett *et al.,* 2005). The former is placed in the domain of Information Systems (IS) research based on predefined assumptions and models, and characterized by heuristics and mathematical models developed to deal with hardware and software issues. In this sense, it represents a '"hard-wiring" approach to KM that is typified by the institutionalization of "best practices" (Hazlett *et al.,* 2005). The socio-organizational paradigm (practical) on the other hand, without rejecting the role of technology, places emphasis on people and organizational-related issues within the wider KM field. It seeks to understand the role of behavioral aspects of knowledge work, employees' social networks, work structures and practices, and organizational culture in knowledge processes and outcomes (Hazlett *et al.,* 2005). Empirical studies examining socio-relational aspects of knowledge transfer and sharing within the socio-organizational paradigm have employed either quantitative methods (e.g., Hansen, 1999; Levin and Cross, 2004), or qualitative methods (e.g., Andrews and Delahaye, 2000) or a combination of both (e.g., Cross and Sproull, 2004).

The approach being proposed in this study aims at developing a framework for KM using ICT in higher education with a view to improving KM for enhanced education outcomes, research, competitiveness and innovations. To come out with the best strategy, the scope of the intended study is defined to include carrying out reviews and analysis of available literatures to explore and understand the key concepts, theories and models of KM using ICT in higher education; proposing of a conceptual framework to guide the study; carrying out fieldworks using a case study; and finally carrying out testing and verification of the usefulness of the proposed framework for continued improvement. In line with Guo and Sheffield (2008) proposal that a combination of positivism and interpretivism are the paradigms most frequently employed in KM research because they capture much of the fluidity and interconnectedness of knowledge, it is proposed to use inductive-hypothetical research strategy as overall research approach to achieve the research objectives. The approach has been used previously by other researchers to solve 'messy', 'complex' or 'ill-structured' problems (Churchman, 1971; Sol, 1982; de Vreede *et al.,* 1998). The strategy will employ a combination of GT (positivist paradigm) methodology together with a quantitative approach using SSM (interpretivist paradigm) to carry out the proposed study.

Inductive-hypothetical research strategy combines theory and practice and adopts existing problems by emphasizing problem specification from a multidisciplinary point of view (Sol, 1982). By combining GT under the hard systems perspective together with SSM under the soft systems perspectives, the inductive-hypothetical approach in our study will focus on literature review, conceptual framework development, and testing and evaluation of the proposed KM framework and generation of alternatives solutions for continuous improvement. In this study,

theory and conceptual framework development will be formulated based on abstraction from an inductive case study as well as from existing theory using the GT strategy, followed by application and evaluation of the proposed framework in real life situation using SSM for continuous improvement. The overall study process will be as outlined in figure 2 below:

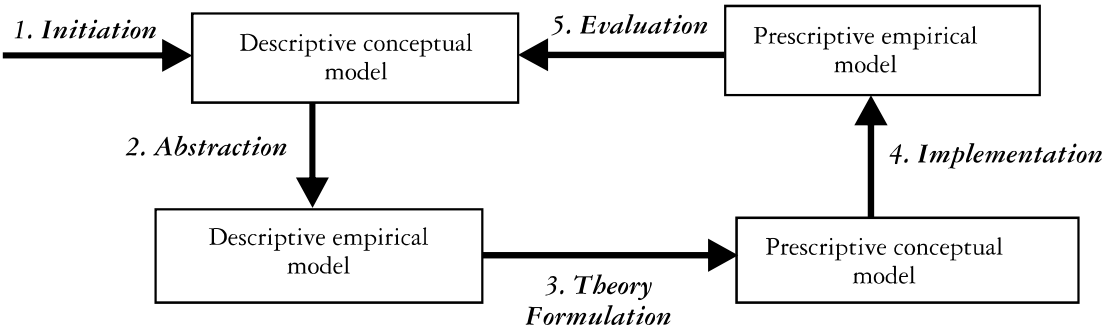

Figure 2: The inductive-hypothetical research strategy (Sol, 1982)

As shown in figure 2, the inductive-hypothetical research strategy starts with reviewing of literatures so that the problem domain of KM using ICT in higher education is elicited, a process called initiation *(arrow 1)*. The result here is expected to be a descriptive conceptual model providing the first understanding of the key issues regarding KM framework development using ICT in higher education as well as the parameters that are required for effective implementation of KM. To substantiate the issues identified during initiation, field explorative studies using case studies in higher education will be undertaken to identify KM approaches, processes, strategies and key challenges through a process called abstraction *(arrow 2)*. Through this process, a descriptive empirical model will be derived where a description of the KM framework requirements will be made. Using the results from the conceptual and empirical descriptions, theory will be formulated in which the descriptive conceptual model will be made prescriptive *(arrow 3)* giving rise to a prescriptive conceptual model. The theory formulated should be able to describe what constitute an effective KM implementation framework using ICT in higher education. The prescriptive conceptual model will then be implemented by testing of the usefulness of the proposed framework *(arrow 4)*. Finally, the prescriptive empirical model will be evaluated *(arrow 5)* so that further improvements can be made through comparison of the elicited empirical knowledge *(arrow 1)* with the prescriptive empirical model *(arrow 4)*. In the study therefore, GT strategy will be used for initiation, abstraction, and the theory formulation phases of the study, while SSM will be used in the implementation and evaluation phases.

Discussions

KM and organizational KM process is viewed as a human activity systems which involves real life situations. Human activity systems here refer to an assembly of knowledge workers occupying a shared space that serves as a foundation for knowledge creation (Nonaka and Konno, 1998), and consist of both soft and hard systems resources for managing, organizing, learning and reusing of existing knowledge and, more importantly, for creating new knowledge to realize an organization mission and goals (Gao *et al.,* 2003). The activities of creating, storing, transferring, converting, sharing, using and reusing existing knowledge are the human practical activities. Without these activities, knowledge cannot be created, used, reused and shared. An organizational KM framework is a purposeful human activity system (Checkland, 1999) comprising of three interdependent components: the people who make up the organization, the activities the people perform, and the technologies that enable these activities. Thus any KM research involving framework development needs a combination of GT methodology to address the needs of design of physical solutions to meet the KM framework needs as well as SSM to deals with the analysis of evolving and ill-defined needs. Inductive-hypothetical research strategy attempts to address all these needs and the use of qualitative methods of inquiry through GT can complement, enrich, and extend understanding by gathering information on the role of the KM using ICT in higher education in particular and the wider organizational context within which social relationships and KM activities take place in higher education. The main advantage in applying SSM to KM research at this stage is that it offers a flexible approach where solutions to problems can be tested and re-tested with participants, and ultimately ownership of solutions and their implementation are increased (Fennessy and Burstein, 2000). It can also be useful as a way of using the researcher as "helper" to look at the situation, applying their own expertise and experience, and to immerse them in the process in a constructive way.

KM research using GT in the interpretivist paradigm regards knowledge, technology and organizational practices as socially constructed. Sahay and Robey (1996) highlight the implications of this social construction, namely that conceptual knowledge about a system is heavily intertwined with the social environment and that this environment influences not only the spread of knowledge, but also the adoption and adaptation of ICT. Because the assimilation process can be viewed as one of organizational learning, knowledge transfer and ICT adoption, Sahay and Robey (1996) further suggest that organizational learning should be a theoretical perspective adopted for research on organizational transformation through ICT. On the other hand, SSM which has its foundation in general systems theory is characterized by involvement in a problem situation, learning by doing, trying to see a system from as many perspectives as possible, and seeing a system through the eyes of others rather than the researcher (Checkland, 1981) making it useful to complement GT in our study.

Combining GT with SSM

McLucas (2003) points out that real world activities are 'hows' related to a specific 'what', which is usually implicit rather

than explicit. In social situations, the 'whats' can be difficult to define and many problems might be considered to be 'wicked' – that is, they are complex, dynamic, systemic, emergent, difficult to resolve, and confounding to manage; and KM represent such a situation. SSM addresses this complex situation by modeling the real world 'what' as well as alternative 'how' for improvement of the situation and to gain insights into wicked problems. It is also useful in building a road-map to a research project and to show the logical dependencies of the various activities in a multi-disciplinary research project (Hindle *et al.,* 1995), especially where the research process is of itself a purposeful human activity. Indeed, Gao *et al.* (2002) suggest that SSM is a valuable research approach to study KM by offering inspiration on how to learn continuously and effectively. In the same vein, GT is a useful research methodology for collecting and analyzing research data, and can provide deep insight into the real issues associated with a phenomenon like developing a framework for KM using ICT in higher education. Because of the depth of analysis, GT results in deep understanding of phenomena and is therefore, a sound research approach for any behavior that has an interactional element to it (Goulding 2005).

Huber (1991) identifies many weaknesses and gaps in research in organizational learning as a central component of KM in higher education. In particular, Huber (1991) highlights the difficulties in identifying and disseminating organizational knowledge to other people within the organization who have need for that knowledge. Hard systems perspective through the interpretive paradigm using GT methodology has been proposed to support organizational learning as a part of KM (Cavaleri, 1994), as the approach sees ICT as a way of gaining control of organizational learning and KM in higher education through the development of context-based, process-oriented descriptions and explanations of phenomena (Myers, 1997). SSM on the other hand has been proposed to support GT through interpretation and appreciation of social phenomena (Checkland, 1981). A closer look at the two methodologies also shows that they are both seven-step processes with remarkable similarities and complementarities as shown in Table 2:

Table 2: GT and SSM Compared (Durant-Law, 2005)

METHODOLOGY		
Steps	**GT**	**SSM**
1.	An unexplained phenomena or process	The problem situation considered
2.	The phenomena or process identified	The problem situation expressed
3.	Data collection and coding	Root definitions of relevant systems
4.	Theme extraction	Conceptual model construction
5.	Postulate generalizations	Model and problem situation comparison
6.	Develop taxonomies	Feasible and desirable change construction
7.	Theory development	Action to improve the situation

Table 2 shows that there are remarkable similarities as well as complementarities in using the two methodologies to carry out the proposed study. For example, steps 4 and 5 result in similar outcomes, although they are expressed differently. In addition, many of the research methods, tools and techniques can be used in either methodology. For example, the use of questionnaires, interviews and focus group discussions are common in both methodologies. The two methodologies also share the assumption that the model or the phenomena determines the final model or theory. The main difference between the two approaches is that GT develops theory from data interpretation by the researcher while SSM values data from the perspective of participants. Using the two approaches in a complementary manner should therefore provide a more holistic approach in carrying out the intended study (Durant-Law, 2005).

Finally, Rose (1997) emphasizes the importance of using SSM to complement GT strategy in carrying out a study like the proposed one. Firstly, Rose (1997) points out that SSM is a good-fit research tool that is quantitative, activity-based, interpretative, participative, and systems-based which uses methodological tools that are appropriate to a KM framework development study; secondly, that it is a triangulation tool that can be used to confirm, deny, or amplify findings from GT; thirdly, that it is a problem-structuring tool that can serve as a 'front-end' to GT strategy by lending structure to a 'messy' problem; fourthly, that it is a theory testing or generation tool; and fifthly, that it is a coordinative or directive tool which can help in conceptualizing a research process based on human activity systems.

Conclusion

In today's knowledge driven economy, higher education managers are faced with the challenge of how to effectively link KM initiatives and processes with their ever-changing needs. The problem arises due to the disconnect between KM and the ever-changing higher education needs which occur due to having inappropriate KM framework development and implementation approaches and processes, and adoption of some quick-fix solutions to KM to achieve higher educational goals. If knowledge is to be effectively managed and utilized, KM and KM researches in higher education should be made to link with institutional goals such as enhanced research, innovations and competitiveness. This paper proposed the inductive-hypothetical research strategy based on the use of GT methodology, in combination with SSM, as the best research approach that can be adopted to carry out a study to develop a framework for KM using ICT in higher education. The proposed approach attempts to address the missing links between KM initiatives and processes and the ever-changing needs of higher education, and presents a holistic view for formulating KM framework development and implementation using ICT by focusing on both technical (hard) and non-technical (soft) issues including higher education activities, KM processes and human activities within institutions. In this paper, KM is thought of as a complex research area that brings together hard and soft system perspectives: technical issues related to KM enabling tools, organizational issues related to the culture, structure and context within which these enabling tools may be used, and the

organizational learning that may result from their use.

While research in KM and attempts to address the challenges relating to the different facet of KM using ICT in higher education is growing, there is currently little empirical or theoretical work that provides a systematic, integrated, inter-disciplinary perspective to the study of KM. Using inductive-hypothetical research approach based on GT methodology combined with SSM is an attempt to address these challenges. The degree to which these interventions are successful provides useful tests for the theory and may indicate areas where further improvements can be made in the implementation of KM using ICT in higher education. Both GT and SSM have been used to explore and discuss problems relating to KM in complex settings and situations. They offer a flexible approach to a KM research like ours, where solutions to problems can be theorized, tested and re-tested with participants, thus increasing stakeholders' ownership of solutions and participation in the KM framework development and implementation. Although the focus of this paper is in proposing the best research strategy that can be used to carry out a study to develop a framework for KM using ICT in higher education, it may not help much in promoting good research unless it is accompanied by a conscientious, intelligent and self-reflective application when conducting a study. This will ensure that the objectives of a study are achieved as well as contribute to improved research outcomes.

REFERENCES

Alavi, M. and Leidner, D. 2001. Knowledge management and knowledge management systems: Conceptual foundations and research issues. **MIS Quarterly,** 25(1), 107-136.

Andrews, K.M. and Delahaye, B.L. 2000. Influences on knowledge processes in organizational learning: The psychosocial filter. **Journal of Management Studies,** 37(6), 797-810.

Atwater, J.B., Kannan, V.R. and Stephens, A.A. 2008. Cultivating systemic thinking in the next generation of business leaders. **Academy of Management Learning & Education,** 7(1), 9-25.

Baskerville, R.L. and Wood-Harper, A.T. (1996). A critical perspective on action research as a method for information systems research. **Journal of Information Technology,** 11, 235-236.

Baskerville, R.L. and Wood-Harper, A.T. Diversity in information systems action research methods. **European Journal of Information Systems,** 7, 90-107.

Becker, P. 1993. Common pitfalls in published grounded theory research. **Qualitative Health Research,** 3, 254-260.

Berger, P.L. and Luckmann, T. 1966. **The Social Construction of Reality.** Anchor Books: New York.

Blum, F. (1955). Action research: A scientific approach? **Philosophy of Science,** 22, 1-7.

Brown, A.D. 1995. Managing understandings: Politics, symbolism, niche marketing and the quest for legitimacy in IT implementation. **Organization Studies,** 16(6), 951-969.

Bryman, A. 2001. **Social Research Methods.** Oxford: Oxford University Press.

Cavaleri, S.A. 1994. Soft systems thinking: A precondition for organizational learning. **Human Systems Management,** 13, 259-267.

Checkland, P.B. 1981. **Systems Thinking, Systems Practice.** John Wiley and Sons: Chicester.

Checkland, P.B. 1999. **Systems Thinking, Systems Practice.** Revised Ed. John Wiley and Sons: Chicester.

Churchman, C.W. 1971. **The Design of Inquiring Systems: Basic Concepts of Systems and Organization.** Basic Book: New York, NY.

Cross, R. and Sproull, R. 2004. More than an answer: Information relationships for actionable knowledge. **Organization Science,** 15(4), 446-462.

Davenport, T. and Prusak, L. 1998. **Working Knowledge: How Organizations Manage what they Know.** Harvard Business School Press: Boston, MA.

De Vreede, G.J., Jones, N. and Mgaya, R.J. 1998. Exploring the application and acceptance of group support systems in Africa. **Journal of Management Information Systems,** 15(3), 197-234.

Durant-Law, G. 2005. Soft systems methodology and grounded theory combined: A knowledge management research approach? **actKM Online Journal of KM,** 2(1), 13-23.

Dwivedi, Y., Venkitachalam, K., Sharif, A.M., Al-Karaghouli, W. and Weerakkody, V. (2011), Research trends in knowledge management: Analyzing the past and predicting the future, **Information Systems Management,** 28(1), 43-56.

Fennessy, G. and Burstein, F. (2000), Using soft systems as a methodology for researching knowledge management problems, In: 1st **International Conference on Systems Thinking in Management,** Monash University, Australia, 2000, 180-185.

Giaglis, G. 2003. Directions and trends in knowledge management research: Results from an empirical analysis of European projects. In: **Knowledge and Business Process Management** (Hlupic V. Ed.), pp. 1-15. Idea Group Publishing, Hersey, PA.

Glaser, B. 1992. **Emergence vs Forcing: Basics of Grounded Theory Analysis.** Sociology Press, Mill Valley.

Glaser, B. and Strauss, A.L. 1967. **The Discovery of Grounded Theory: Strategies for Qualitative Research.** Aldine, Chicago, ILL.

Goulding, C. 1999. Consumer research, interpretive paradigms and methodological ambiguities. **European Journal of Information Systems,** 33(9/10), 859-873.

Goulding, C. 2005. Grounded theory, ethnography and phenomenology: A comparative analysis of three qualitative strategies for marketing research. **European Journal of Marketing,** 39(3/4), 294-308.

Guo, Z. and Sheffield, J. 2008. A paradigmatic and methodological examination of knowledge management research: 2000 to 2004. **Decision Support Systems,** 44, 673-688.

Habermas, J. 1987. **The Theory of Communicative Systems, Volume 2: Lifeword and System.** Beacon Press, Boston, MA.

Hansen, M.T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. **Administrative Science Quarterly,** 44, 82-111.

Hazlett, S.A., McAdam, R. and Gallagher, S. 2005. Theory building in knowledge management: In search of paradigms. **Journal of Management Inquiry,** 14(1), 31-42.

Hindle, T., Checkland, P., Mumford, M. and Worthington, D. 1995. Developing methodology for multi-disciplinary research: A case study. **Journal of the Operational Research Society,** 46(4), 453-464.

Hitchin, D. 1992. **Putting Systems to Work.** Wiley, Chicester.

Huber, G.P. 1991. Organizational learning: The contributing processes and the literatures. **Organizational Science,** 2(1), 88-115.

Jasimuddin, S.M. (2012). **Knowledge Management: An Interdisciplinary Perspective.** 1st Ed. World Scientific Publishing Company, Singapore.

Kukla, A. 2000. **Social Constructivism and the Philosophy of Science.** Routledge, New York.

Lee, M.R. and Chen, T.T. (2012), Revealing research themes and trends in knowledge

management: From1995 to 2010, **Knowledge-Based Systems,** 28, 47-58.

Levin, D.Z. and Cross, R. 2004. The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. **Management Science,** 50(11), 1477-1490.

McLucas, A.C. 2003. **Decision Making: Risk Management, Systems Thinking and Situational Awareness.** Argos Press, Canberra.

McMahon, M. 1997. Social constructivism and the World Wide Web: A paradigm for learning. In: **Proceedings of the ASCILITE Conference,** Perth, Australia, December 1997.

Mills, J., Bonner, A. and Francis, K. 2006. Adopting a constructivist approach to grounded theory: Implications for research design. **International Journal of Nursing Practice,** 12, 8-13.

Myers, M.D. 1997. Qualitative research in information systems. **MIS Quarterly,** 21(2), 241-242.

Nonaka, I. and Konno, N. 1998. The concept of 'Ba': Building a foundation for knowledge creation. **California Management Review,** 40(3), 40-54.

Omona, W. and van der Weide, T. (2014). Knowledge assets of higher education institutions in Uganda: Proposing a framework for assessing human, structural and relational knowledge assets. **Knowledge Management for Development Journal,** 10(3), 69-87.

Orlikowski, W. 2002. Knowing in practice: Enacting a collective capability in distributed organizing. **Organizational Science,** 13(4), 249-273.

Petrides, A.L. and Nodine, R.T. (2003). **Knowledge Management in Education: Defining the Landscape.** The Institute for the Study of Knowledge Management in Education Press: Harvard Avenue, CA.

Pierce, S. 1999. Boundary crossing in research literature as a means of interdisciplinary information transfer. **Journal of the American Society for Information Science,** 50(3), 271-279.

Ponelis, S. and Fair-Wessels, F. 1998. Knowledge management: A literature overview. **South Africa Journal of Library Information Science,** 66(1), 1-10.

Ponzi, L.J. 2002. The intellectual structure and interdisciplinary breadth of knowledge management: A bibliometric study of its early stage of development. **Scientometrics,** 55(2), 259-272.

Prawat, R.S. and Floden, R.E. 1994. Philosophical perspectives on constructivist views of learning. **Educational Psychologist,** 29(1), 37-48.

Rose, J. 1997. Soft systems methodology as a social science research tool. **Systems Research and Behavioral Science,** 14(4), 249-258.

Ruggles, R. 1998. The state of the notion: Knowledge management in practices. **California Management Review,** 40(3), 80-89.

Sahay, S. and Robey, D. 1996. Organizational context, social interpretation, and the implementation and consequences of GIS. **Accounting, Management and Information Technologies,** 6(4), 255-282.

Sarantakos, S. 1993. **Social Research.** Houndsmill, Basingstoke: Macmillan.

Senge, P. 1990. **The Fifth Discipline: The Art and Practice of the Learning Organization.** Doubleday, New York.

Shen, H., Wang, L., Xu, Q., Li, Y. and Liu, X. 2009. Toward a framework of innovation management in logistics firms: A systems perspectives. **Systems Research and Behavioral Science,** 26, 297-309.

Skryme, D. 1997. Knowledge management: Making sense of an oxymoron. **Management Insight,** No. 22, Retrieved on 24th November 2014 from http://www.skyrme.com/insights/22km.htm.

Sol, H.G. 1982. **Simulation in Information Systems Development.** PhD Thesis, University of Groningen, Groningen, The Netherlands.

Steyn, G.M. (2004). Harnessing the power of knowledge in higher education. **Educational Development,** 124(4), 615-630.

Storey, J. and Barnett, E. 2000. Knowledge management initiatives: Learning from failure. **Journal of Knowledge Management,** 4, 145-156.

Strauss, A. and Corbin, J. 1998. **Basics of Qualitative Research: Techniques and**

Procedures for Developing Grounded Theory (2nd ed.). Sage, Thousand Oaks, CA.

Strauss, A. and Corbin, J. 1994. Grounded theory methodology: An overview, In: **Handbook of Qualitative Research** (Denzin NK and Lincoln YS Eds.). Sage Publications, Thousand Oaks, CA.

Susman, G. and Evered, R. (1978). An assessment of the scientific merits of action research. **Administrative Science Quarterly,** 23, 582-603.

Tsoukas, H. 1996. The firm as a distributed knowledge system. **Strategic Management Journal,** 17, 11-25.

Vygotsky, L.M. 1978. **Mind in Society: The Development of Higher Psychological Processes.** Harvard University Press, Camridge, MA.

Wastell, D.G. 2001. Barriers to effective knowledge management: Action research meets grounded theory, In: **Proceedings of the 9th European Conference on Information Systems,** Bled, Slovenia, June 27-28, 2001.

Wong, K.Y. and Aspinwall, E. 2005. An empirical study of the important factors for KM adoption in the SME sector. **Journal of Knowledge Management Research and Practice,** 2, 67-79.