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# 1

## Knowledge Management Research Using Grounded Theory Strategy: Applicability, Limitations and Ways Forward

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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 an increasingly globalized economy. Because it is interdisciplinary in nature, carrying out a research in KM requires that one uses appropriate research strategies that should be used to enable objectives of a study to be undertaken to be achieved. Based on review and analysis of available literatures, this paper looks at the paradigms in KM research and examines in details the applicability and limitations of grounded theory strategy in carrying out KM research. 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 research to develop a framework for KM using ICT in*

*higher education in Uganda as part of an on-going study.*

*As well as contributing theoretically to the literatures on KM by providing insights into the applicability and limitations of grounded theory strategy in carrying out KM research, this paper further seeks to propose a methodological strategy that can be used in carrying out similar or related studies.*

*Keywords: Knowledge Management; Research Strategy; Grounded Theory; Applicability; Limitations*

## **1. INTRODUCTION**

Knowledge management (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. 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 successes/failures have also been reported [[Storey and Barnett 2000](#); [Shani et al. 2000](#)]. However, these studies often lacked critical depth and/or methodological clarity. Typically, the results often appear as lists of factors, with no clear links to underlying data in terms of explicit methods of theory generation and cited evidences [Wastell 2001]. Because it is a developing discipline, KM requires definitional papers that focus on basic theory by defining terms and establishing relationships between concepts [Croasdell et al. 2003; [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. The problems with these theoretical frameworks are that interconnections that may exist among them in term of KM research and the strategies that can be employed to achieve improved KM results appear to be largely unexplored.

According to Guo and Sheffield [2008], three perspectives on organizational knowledge are discernable that may support such an exploration and how researches in KM can be approached. The first perspective proposes that organizations 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] characterizing such a perspective as “taxonomic”, with researchers developing classifications of knowledge and then using these to examine the various strategies, routines, and techniques through which different types of knowledge are captured, represented, codified, transferred and exchanged [Nonaka 1994; Nonaka and Takeuchi 1995]. 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. Pozzebon and Pinsonneault [2006] expound on this perspective by describing the conflicting views of clients and consultants in customizing complex software artifacts such as Enterprise Resource Planning (ERP) systems. The authors use this example to describe initial configuration of client-consultant relationships, and the way this arrangement evolves through mediation, in terms of power relations.

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 a confusing variety of approaches, theories and frameworks [Alavi and Leidner 2001]. For example, Earl [2001] summarizes seven different approaches to KM research, including systems, cartographic, engineering, commercial, organizational, spatial, and strategic, with each having its own philosophical underpinnings, research focus, and aims. This makes KM eclectic rather than grounded on a specific ideology, resulting in a variety of knowledge definitions and classification schemes [Amidon 1998; Bushko & Raynor 1998; Nonaka & Takeuchi 1995], as well as methods, models, and approaches [Earl 1994; Nonaka & Takeuchi 1995; Martiny 1998]. Giaglis [2003] points out that the interdisciplinary nature of KM renders its detailed epistemological study more difficult, albeit at the same time also more important.

This paper examines KM research and the applicability and limitations of grounded theory strategy in carrying out KM study, with a view to proposing the best research strategy that will be adopted to carry out a study to develop a framework for KM using ICT in higher education. Firstly, the paper starts by examining KM as an interdisciplinary subject; secondly, it looks at the research paradigms in KM; thirdly,

it examines the relationships between grounded theory and KM research. This is followed by examination of the applicability and limitations of grounded theory in carrying out a study involving KM framework development. Finally, a proposal is made on the best research strategy that will be adopted to carry out our study. As well as contributing theoretically to the literature on KM by providing insights into the applicability and limitations of grounded theory strategy in KM research, the paper also seeks to propose a methodological strategy that will be adopted to carry out a study to develop a framework for KM using ICT in higher education in Uganda as part of an on-going study.

## 2. **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 exists 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. According to Pierce [1999] and Klein [1996], KM is interdisciplinary because it involves the exportation and integration of theories or methods to other disciplines; and in the case of KM, 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 information technologies, but the greater aspect, is to a degree, about organizational culture and practices”. According to Ponzi [2002], a contextual view of Ruggles’ definition demonstrates the popular perception of the claim that KM is interdisciplinary in nature. It also suggest 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. For examples, 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”. KM as a subject should therefore be seen and understood as a confluence of several sciences and disciplines, each contributing to the understanding of the concept of KM.

Knowledge is currently regarded as one of the key determinant factors of higher education institutions’ survival and growth in the knowledge age. Unlike Drucker [1993], who considered knowledge as a key resource, it is now widely believed that other factors, such as the business environment or political factors are just as important as knowledge to higher education institutions, firms, industries, and countries, and that the configuration of various factors as a whole determines the performance of these institutions. In systems terms, a “whole” can be greater than, equal to, or perhaps lesser than the sum of its parts. Therefore, KM requires an interdisciplinary study to critically and continuously “sweep in” “new” ideas, approaches, models, and techniques in an informed manner, in both theory and practice, to pursue the notion that a whole is greater than the sum of its parts from the perspective of critical systems thinking [Jackson 2000; Gao et al. 2003]. Although there have been several contribution on KM from different disciplines as well as from different professional experiences, somehow, each of these remained isolated for long, and it is only recently that interdisciplinary approaches to the study of KM have begun to emerge [Ponzi 2002]. This diversity of the contributions from the different discipline and the consequent multiplicity of approaches, theories, tools and technologies lead to the need to decide on the most appropriate research strategy to carry out a study like ours to develop a framework for KM using ICT in higher education.

### **3. RESEARCH PARADIGMS IN KM**

A research paradigm refers to a broad framework of perception, understanding, and belief within which theories and practices operate. It is thus a network of coherent ideas about the nature of the world and the functions of researchers which, if adhered to by a group of researchers, conditions their thinking and underpins their research actions [Bassegy 1990]. There are various categorizations of research paradigms. A four-paradigm scheme consisting of functionalist, interpretive, radical structuralist, and radical humanist, has been proposed for the analysis of social theory and information systems development by Hirschheim and Klein [1989]. The first two paradigms in this scheme (functionalist and interpretive) seek more or less concrete evidence about the existing state of affairs, while the last two (radical structuralist and radical humanist) criticize, and offer radical alternatives to the status quo. This scheme has further been developed into four paradigms for a discourse theory of

organizational inquiry and KM, and these are normative discourse, interpretive discourse, dialogic discourse, and critical discourse [Deetz 1996; Schultze and Leidner 2002]. According to Cavana et al. [2001], positivism, interpretivism, and critical inquiry – aligned with normative discourse, interpretive discourse, and, dialogic and critical discourse respectively – are frequently identified as the main research paradigms for interdisciplinary disciplines such as social sciences, KM and business research.

As has already been pointed out earlier, 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 soft systems methodology approaches KM research from a complementary perspective and 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.

Based on the positivist, interpretivist and critical pluralist paradigms, this study will use the research paradigm proposed by Herbamas [1987] in his ‘theory of knowledge-constructive interest and communicative action’ to recommend the best research strategy that will be adopted to carry out our study. In this paradigm, ‘knowledge interests’ provide the key architectural element for carrying out a study. Knowledge interests according to the paradigm direct the phenomenon studied (research interest) and the guarantor of knowledge gained in a particular research paradigm, and each research interest is associated with a tradition of systems thinking (see Table 1). In the paradigm, knowledge interests are used to frame a typology of actions and such typology can be very useful in guiding actions of KM researchers.

**Table 1: Herbamas Research Paradigms**

<b>Research Interest</b>	<b>Research Paradigms</b>	<b>Traditions of Systems Thinking</b>
Emancipatory	Critical pluralism	Critical
Practical	Interpretivism	Soft
Technical	Positivism	Hard

According to Herbamas [1987], in the critical pluralism paradigm, a researcher’s emancipatory knowledge interest motivates a study of personal reality and is adopted for carrying out KM research in the tradition of critical systems thinking. Here, communicative rationality drives the critically oriented science in their questioning of the legitimacy of the status quo and guides their concern about structured contradictions and/or exploitation, and the main task of inquiry is to examine the legitimacy of the current system and provide a stimulus for emancipatory change. Pozzebon and Pinsonneault [2006] study is an example of a research conducted using this paradigm. The research is concerned with uncovering the surface illusion that power and knowledge are separate issues.

In the interpretivist paradigm, Herbamas [1987] points out that a researcher’s practical knowledge interest motivates a study of social reality and is adopted for carrying out KM research in the tradition of soft systems thinking. Here, strategic rationality drives the hermeneutic-phenomenological sciences and research on phenomena that are emergent and subject to social interpretation. The main task of inquiry here is to understand the potential ambiguity and uncertainty of social meaning, and knowledge is associated with the understanding of participants in social interactions. Orlikowski [2002] is an example of a research conducted using this paradigm and is concerned about the nature of ‘practice’ which is described as situated and an ongoing accomplishment that emerges from people’s everyday actions.

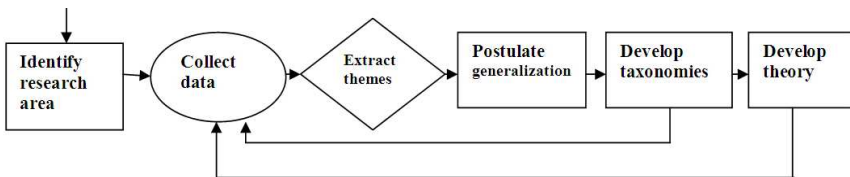
In the positivist paradigm, Herbamas [1987] points out that a researcher’s technical knowledge interest, motivates a study of objective reality and is adopted in the tradition of hard systems thinking. Here, instrumental rationality drives the

empirical-analytic sciences and research designs centered on measurement, causal relationships, prediction as well as the imposition of control, and knowledge is associated with hard data, mathematics and models. The paradigm is concerned with the discovery of universal laws that can be used to predict human activity, and the physical and technological world. Holsapple and Joshi [2004] is an example of a research conducted using this paradigm and is concerned with enquiries for categories of operations required to manage different types of knowledge.

### 3. GROUNDED THEORY STRATEGY

Grounded theory 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 grounded theory strategy, particularly the way Glaser and Strauss [1967] developed it, consists of a set of 7 steps 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. The steps include situating unexplained problems, identification of a research area, collecting data, extracting themes, postulating generalization, developing taxonomies, and developing theories (see Figure 1). The whole process aims to develop an account of a phenomenon or phenomena, which identifies its major categories, the relationships between the categories, and the context and processes which are occurring [Becker 1993]. The result is a middle order theory, as opposed to grand theory or a hypothesis, which explains the phenomenon [Alston and Bowles 2003]. Emergence is a key assumption in grounded theory, and because data, information and knowledge are emergent phenomena that are actively constructed, they can only have meaning when positioned in time, space and culture, and are only relevant in an experiential world [Goulding 1999].

**Figure 1: Steps in Grounded Theory Research**



Curry [2003] points out that the purpose of grounded theory is to provide a framework by which theory can be scientifically and methodically generated. Whereas many other researches are concerned with verifying deductive theory,

grounded theory is concerned with insuring that the theory, which is being verified, was methodologically-driven, carefully developed, and purposefully grounded in the trenchant data. In other words, anomalous states of knowledge are explored and scrutinized. Covalesky & Dirsmith [1990] place grounded theory in the category of the symbolic analysis approach to social science research. This approach views “reality as a realm of symbolic discourse, where humans are seen as actors and symbol users; and where information as a network of symbols, does not represent reality but is reality itself. The essential character of grounded theory lies in the generation of theory from data by constant comparative qualitative analysis. It aims at the emergence of theory from the data, rather than exploring the data to confirm existing theory.

Grounded theory 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. Theoretical sampling is the process of collecting, coding, and analyzing 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 categorization 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 what is happening. Every cycle will see the researcher test the emerging theory against new cases and categories, and compare that theory against those in the literature to try and explain or reinforce it. With discovery of further labels, the theory may be refined or abandoned.

### **3.1 Grounded Theory Strategy Applicability in KM Research**

As has already been pointed out, an analysis of the grounded theory strategy and its intellectual assumption shows that it owes more of its approach to the hard systems/interpretivist 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, grounded theory was developed for, and is suited

to the study of behavior, 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, and on whatever level of abstraction we use the concept of knowledge, the outcome is rooted in the individual.

As a methodology that is used for extracting meaning from qualitative data that are collected from the fields, grounded theory assists in generating a theory that explains a process, or processes, about something at an abstract conceptual level in a specific context or setting [Glasser and Strauss 1967]. The fundamental aspect of this methodology that must be adhered to while carrying out a KM research is therefore to ensure that the theory derived is grounded in the data. The theory that is generated may be an abstraction or generalization of the causal relationships found in the study, and can emerge from logical assumptions or is generated from observations [Glasser and Strauss 1967]. The theory can also be developed from research that is either data driven or theory driven [Dick 2000]. Examples of the use of grounded theory strategy in KM research include the work of Ford and Angermeier [2004]; Smith [2004]; Wastell [2001]; and Wong and Aspinwall [2005].

### **3.2 Limitation of Grounded Theory Strategy**

With regards to the limitation of grounded theory in KM research, the key issue is that the end result of any research carried out using grounded theory strategy is theory. Glaser [1992] emphasized that the theory generation should be through systematic data collection and analysis, arguing that theory verification and testing should be left to others. The methodological thrust of grounded theory is, therefore, towards the development of theory, without any particular commitment to specific kinds of data, lines of research, or theoretical testing. Rather it is a style of doing qualitative analysis that includes a number of distinct features such as theoretical sampling, and certain methodological guidelines such as the making of constant comparison, and the use of a coding paradigm to ensure conceptual development and density [Strauss 1987]. The aim is to develop representative concept and ultimately build a theoretical explanation by specifying phenomena in terms of the conditions that give rise to them, how they are expressed through action/interaction, and the consequences that result as well as the variation [Strauss and Corbin 1990]. The problem with the strategy as far as KM research is concerned, is that the use of knowledge, based on the process of learning, is not simply a subsumption of cases based on theories only; it is a process of contrasting and discovering the extent to which new situations can be understood and improved through theory building, testing and re-testing of KM systems/frameworks for continuous improvement of knowledge service deliveries.

#### 4. PROPOSED RESEARCH STRATEGY

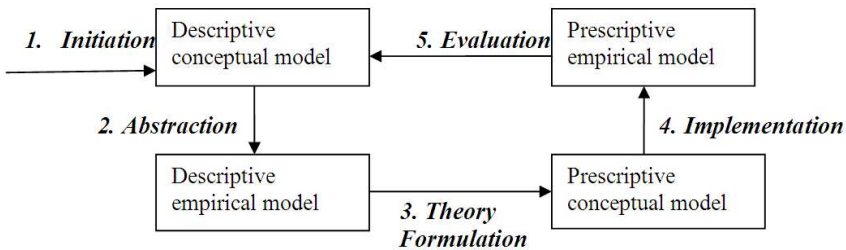
The nature of knowledge, and how we use it, is a complex human activity which cannot be reduced to a formulaic and quantifiable process. Thus, any research strategy in KM must adopt an interpretivist and positivist research approach if it is to yield deep insight and provide solutions to address the challenges involved in the development and implementation of KM activities using ICT in higher education in a real world situation [Guo and Sheffield 2008]. This is because the level of success in the development and implementation of KM framework using ICT in higher education is significantly dependent on the right balance of intervention and reflection on the current practices of KM. Positivist method focus on the intensive study of a real world instance of a phenomenon through observation and case-studies [Yin 1994], while the interpretivist method aims through action research to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science (KM) by joint collaboration within a mutually acceptable framework [Rapport 1970].

The goal of our study is to develop a framework for KM using ICT in higher education, with a view to improving KM for enhanced education outcomes, research, competitiveness and innovations. To achieve this, the scope of the study will 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 case studies, and finally carrying out testing and verification of the proposed framework through action research 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, we proposed to use inductive-hypothetical research strategy as our overall research approach to achieve our research objectives. The approach has been used previously by other researchers to solve “messy”, “complex” or “ill-structured” problems [Sol 1982; Churchman 1971; van Meel 1994; [de Vreede et al. 1998](#)]. The strategy will employ a combination of grounded theory (interpretivist/hard systems) methodology using case studies, with soft systems methodology (positivist) using action research to achieve the objectives of the 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]. Using hard systems as well as soft systems methodologies, the inductive-hypothetical approach in our study will focus on theory formulation,

testing and evaluation of the proposed KM framework and generation of alternatives solutions for continuous improvement. In this research, theory will be formulated based on abstraction from an inductive case study as well as from existing theory using grounded theory strategy. The use of grounded theory strategy will involve using the seven steps processes of situating unexplained problems, identification of a research area, collecting data, extracting themes, postulating generalization, developing taxonomies, and generating theories (figure 1). This will be followed by implementation through testing and evaluation of the proposed framework for continuous improvement. The overall study process which will include generating of theories as well as testing and evaluation of the proposed framework will be undertaken following the steps used in the inductive-hypothetical research strategy as outlined in figure 2 below:

**Figure 2: The Inductive-Hypothetical Research Strategy**



As shown above, 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 for effective KM using ICT in higher education 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 constitutes an effective KM implementation framework and this will be used to guide the development of a framework for KM using ICT in higher education. The prescriptive conceptual model will then be implemented by testing 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 our study therefore, grounded theory strategy will be used for initiation, abstraction, and the theory formulation phases of the study, while soft systems methodology will be used in the implementation and evaluation phases.

In order to transform knowledge into a valuable organizational asset, knowledge, experience and expertise must be formalized, distributed, shared, and applied. KM and organizational dynamic process knowledge is viewed as a human activity systems which involves real life situations. Real life here involves ill-formulated and ill-structured problems and conditions: real life problems have context, depth, complexity, and duration; involve cooperative situations and shared consequences; and are worth solving and can provide benefits when solved [Fitzsimons 2001]. Human activity systems 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 capturing, coding, abstracting, storing, transferring, converting, sharing, using and reusing existing knowledge and creating new knowledge are the human practical activities. Without these, knowledge cannot be created, used, reused and shared. An organizational KM system/framework is a purposeful human activity systems [Checkland 1999] comprising three interdependent components: the people who make up the organization, the activities the people perform, and the technologies that enable activities. Thus any KM research involving systems/framework development needs a combination of soft systems methodology that deals with the analysis of evolving and ill-defined needs as well as hard systems approach to address the needs of design of physical solutions to meet those needs. Inductive-hypothetical research strategy attempts to address all these issues highlighted. KM research using grounded theory 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, soft systems methodology which has its foundation in action research and 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 grounded theory in our study.

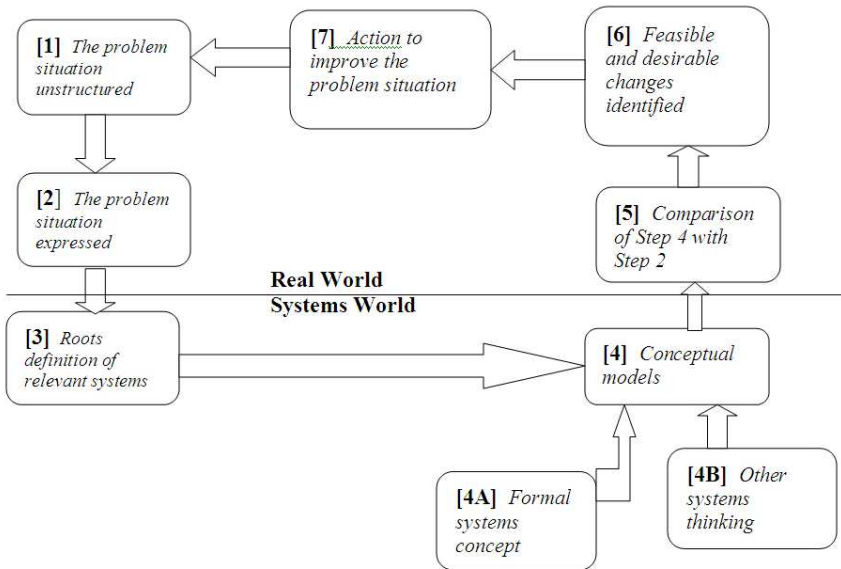
The widespread use of ICT in KM embodies social complexity, and the continuous changes in technology within organizations requires a continuing evolution from advancement of ICT tools and applications to cognitive level usually involving messy human problems within the social context in a particular environment. In addition, the level of success in the implementation of KM initiatives in higher education is significantly dependent on the right balance of intervention and reflection on the current practices of the organizations. Using soft systems methodology combined with grounded theory is an attempt to try and address this limitation. Checkland's [1981] soft systems methodology lies firmly within the tradition of action research and aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework [Rapport 1970]. Organizations with entrenched traditional structures such as higher institutions of learning are under particular pressure to review their working practices in KM. In this context, Elliman and Orange [2000] recommend soft systems methodology as an approach to facilitate effective change and to improve work practices.

Checkland's soft systems methodology is concerned with human activity systems which he defines as a notional purposive system which expresses some purposeful human activity; activity which in principle could be found in the real world. Such systems are notional in the sense that they are not descriptions of actual real-world activity (which is an exceptionally complex phenomenon) but are intellectual constructs; they are ideal types for use in debate about possible changes which might be introduced into a real-world problem situation [Checkland 1999]. According to Durant-Law [2005], human activity systems by their nature are complex. They are considered to be holistic, subjective, process-oriented, in a state of constant flux, and often non-rational. In addition, they act based on interpretation of the world, but there are always several world views because individuals interpret the world differently and there is no single correct answer to a problem situation.

In its idealized form, soft systems methodology refers to a seven-stage process of analysis as shown in figure 3, which uses the concept of human activity as a means of defining the situation for taking actions [Checkland 1981], and these 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 underlying 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; and
- (vii) Development of final model that can be implemented.

**Figure 3: Checkland’s Soft Systems Methodology**



## 5. COMBINING GROUNDED THEORY WITH SOFT SYSTEMS METHODOLOGY

Because of the variation in the definition and understanding of the concept of KM, knowledge has been perceived as either (i) a “discrete, objective, largely cognitive entity” [Newell et al. 2002], susceptible of being classified as tacit (unarticulated expertise and experience) and explicit (formalized and expressed knowledge); or (ii) as socially constructed and embedded in practice (knowledge as a process) [Nonaka

& Takeuchi 1995]. These two different, but complementary perspectives are at the root of different approaches to the KM process in organizations [Newell et al. 2002]. An organization embracing the first perspective of knowledge being a discrete entity will use hard systems methodology to develop knowledge stores and will try to capture the organization's knowledge by software. On the other hand, organizations with the latter perspective of knowledge being a process will use soft systems methodology which gives more importance to the process of knowing and knowledge creation and to the context that makes possible this creation to ensure effective KM. Our research looks at the two perspectives of KM as being complementary, hence the need to use inductive-hypothetical research strategy based on combining grounded theory strategy with soft systems methodology to achieve the research goals.

According to McLucas [2003], 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. Soft systems methodology addresses this complex situation by modeling the real world “what” as well as alternative “how” for improvement of the situation and lends itself to developing of a set of structured research questions 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 and therefore is part of human activity system. Indeed, Gao et al. [2002] suggest that soft systems methodology is a valuable research approach to study KM and that some of its value is to offer inspiration on how to learn continuously and effectively. In the same vein, grounded theory 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, grounded theory 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].

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 below:

**Table 2: Grounded Theory and Soft Systems Methodology Compared**

Steps	METHODOLOGY	
	Grounded Theory	Soft Systems Methodology
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

From the table, it can be seen that there are remarkable similarities as well as complementarities in using the two methodologies to carry out a study. For example, steps 4 and 5 result in similar outcomes, although they are expressed differently. In addition, many of the methods, tools and techniques can be 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 grounded theory develops theory from data interpretation by the researcher while soft systems methodology 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 our study. We intend to merge the seven steps of the two methodologies into a five-step process as used in inductive-hypothetical research strategy, that is, initiation, abstraction, theory formulation, implementation, and evaluation.

Finally, Rose [1997] emphasizes the importance of using soft systems methodology to complement grounded theory strategy in carrying out a study like ours due to the roles it can play in achieving the objectives of the study. Firstly, he points out that soft systems methodology is a good-fit research tool that is qualitative, activity-based, interpretative, participative, and systems-based which uses methodological tools that are appropriate to a KM framework study; secondly, that it is a triangulation tool that can be used to confirm, deny, or amplify findings from grounded theory; thirdly, that it is a problem-structuring tool that can serve as a “front-end” to grounded theory 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 even if it is a human activity systems. Models may then be built, which may assist in delineating the various research activities and their logical dependencies.

## 6. CONCLUSION

In today's knowledge driven economy, higher education institutions' managers are faced with the challenge of how to effectively link KM initiatives and processes with the ever-changing needs of higher education. 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 adoption of some quick-fix solutions to KM to achieve higher educational goals. If knowledge is to be effectively managed and utilized, KM research and other initiatives should be made to link with institutional goals such as enhanced research, innovations and competitiveness. This paper examines the applicability and limitations of grounded theory strategy in carrying out KM research, and proposes the use of inductive-hypothetical research strategy based on grounded theory strategy, in combination with soft systems methodology based on action research, as approaches to be adopted to carry out a study to develop a framework for KM using ICT in higher education in Uganda. 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 and non-technical issues including higher education activities, KM processes and human activities within institutions.

Using inductive-hypothetical research strategy based on grounded theory using case studies combined with soft systems methodology using action research provides a systematic basis for developing and verifying theory (the research interest), and in designing and evaluating interventions to serve the interest of KM practitioners in higher education. The degree to which these interventions are successful provides validation for the theory and may indicate areas where further improvements should be made in the implementation of KM using ICT in higher education. Both grounded theory and soft systems methodology 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 KM framework development and implementation. Although the focus of this paper is in proposing the best approach to be used to carry out our study, it does not help much in promoting good research; a good research is not only effected by a strong research methodology alone, but by its conscientious, intelligent and self-reflective application that must be reflected in how the study is conducted. This will ensure that the objectives of a study are achieved as well as contribute to improved research outcomes.

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