Knowledge management (KM) is an emerging field of specialization in a number of professions, including Information Science (IS). The different professions are contributing to and influencing the developments in KM in their own ways. However, it is argued here that IS is not contributing to the advancement of KM as much as it should for a number of apparent reasons. The main purpose of the paper is to call on the members of the IS profession to take a more proactive and visible role in advancing KM by showing that KM is a natural and long-awaited development in IS and that a number of circumstances have made KM to be an area of emphasis in IS whose time has come. The paper also aims at contributing towards achieving a consensus among IS professionals on conceptualization, goals, and scope of KM in IS. The recommendations of the paper focus on how the profession could proactively be involved in advancing KM.

1. Background and problem statement

Knowledge management (KM) is one of the emerging topics of academic and professional discourse in many fields of knowledge, including cognitive sciences, sociology, management science, information science (IS), knowledge engineering, artificial intelligence, and economics (Dalkir, 2005; Martin, 2008; Sinotte, 2004; Rowley, 2007; Wild & Griggs, 2008). Professional journals dedicated to KM, special issues on KM, regular scholarly articles on KM, reports on different aspects of KM, and national and international conferences on KM have all become common beginning the early 1990s (Ajiferuke, 2003; Blair, 2002; Chua, 2009; Jakubik, 2007). Professional associations that promote the interests of KM professionals are also emerging (such as the Knowledge Management Professionals Society (KMPro) and Knowledge Management Society of Malaysia). Academic programs offering degrees of various levels and short courses are also expanding all over the world (Ajiferuke, 2003; Dalkir, 2005). As will be discussed later in this paper, the importance of managing knowledge is also getting more attention in all types of organizations, including businesses, government bodies, research institutes, Non-Governmental Organizations (NGOs), and international development and financial institutions (Blair, 2002; Chua, 2009).

Evidently, there is a tendency by the different professions interested in KM to present and interpret what constitutes KM from their own perspective as well as define the future direction of KM as it fits the traditions and perspectives of their own profession (Dalkir, 2005; Ekbia & Hara, 2007; Hlupic, Pouloudi, & Rzevski, 2002; Jashapara, 2005; Liao, He, & Tang, 2004; McInerney, 2002; Sarrafzadeh, Martin, & Hazeri, 2006; Widén-Wulff et al., 2005). Consequently, developments in KM are influenced by the different professions interested in knowledge (Dalkir, 2005; Jashapara, 2005; Martin, 2008; Rowley, 2007; Sarrafzadeh et al., 2006; Sinotte, 2004). This has resulted in, among others, lack of universal consensus on some of the key issues of KM, including conceptualizations, processes, goals and scope of KM (Bouthillier & Shearer, 2002; Bouthillier & Shearer, 2005; Corrall, 1999; Hlupic et al., 2002; Maceviciute & Wilson, 2005; Martin, 2008; Morrow, 2001; Ponelis & Fairer-Wessels, 1998; Sinotte, 2004; Wilson, 2002; Widén-Wulff et al., 2005). While this seems to be the case with most of the other professions interested in KM, IS is not playing as much influential role as it should be (Ajiferuke, 2003; Corrall, 1999; Jashapara, 2005; Martin, 2008; Orzano, McInerney, Scharf, Tallia, & Crabtree, 2008; Sarrafzadeh et al., 2006; Summers, Oppenheim, Meadows, Mcknight, & Kinnell, 1999) for a number of apparent reasons, including the following:

First, there is an ongoing debate among the members of the profession on whether KM is a legitimate and distinct field of specialization of IS (Blair, 2002; Bouthillier & Shearer, 2002; Davenport & Cronin, 2000; Gorman, 2004; Maceviciute & Wilson, 2005; Martin, 2008; Sarrafzadeh et al., 2006; Widén-Wulff et al., 2005; Wilson, 2002). This group considers KM as another term for what they have been doing all along. Members of the profession who reject KM as a distinct field of specialization within IS obviously avoid purposeful engagement in advancing KM.

Second, many members of the profession also consider KM as akin to Information Management (IM) that they are currently prac-
Third, some members of the profession believe that they need a new and different skill set, new mindset, and a new professional culture in order for them to move to emphasizing KM. Professionals in this group perceive the management of particularly tacit knowledge as something beyond their current professional preparation and consider acquiring the new set of skills as a pre-requisite for their participation in KM.

Fourth, some members of the profession lack adequate exposure and knowledge of the essence of KM and thus find it difficult to actively contribute in any meaningful way to the ongoing debate as well as to the advancement of KM. They acknowledge having difficulty understanding the key concepts and the distinct dimensions of KM. These members by and large lack the necessary expertise to engage in exploring and practicing KM.

Fifth, some members of the profession are also inhibited from engaging in research for lack of readily usable techniques, frameworks and tools developed or promoted by their profession and that are in tune with existing tradition, philosophy and theoretical frameworks of IS. Although they have the appreciation and acceptance of KM as a legitimate development in their profession, this group finds itself ill prepared to actively participate in KM research and practice.

Finally, many members of the profession are not also getting as much opportunity to actively participate in KM initiatives of their respective organizations for various reasons. The primary preoccupation of these members is to prove their value to their organizations, rather than focusing on and advancing KM. Due to these and similar reasons, there is little reported evidence supporting that IS is one of the main professions contributing to the emergence and further evolution of KM in terms of research findings, conferences, publications, and so on (Jashapara, 2005; Orzano et al., 2008; Sarrafzadeh et al., 2006). There is also little evidence of the involvement of the members of the profession in KM programs of organizations (Ajiferuke, 2003; Chen, 2005; Corrall, 1999; Sarrafzadeh et al., 2006).

The failure to play the influential role could have detrimental effect on IS profession in a number of ways. First, in the absence of significant contribution from IS, other professions are influencing developments in KM in the direction that is in line with their traditions and perspectives. Second, IS is affecting its own development by not fully embracing KM which is supposed to be one of the next logical stages of development in the profession. As a result of this, many IS professionals interested in KM research, for example, are left with little choice but to use frameworks and tools developed by the other professions interested in KM even when the frameworks and tools are not as suitable for the work at hand. Third, by showing reluctance to take the lead in advancing KM, IS has created the situation for some of the other professions to unfairly claim the contributions of IS to the development of KM as if they are their own. It is not uncommon to come across claims by some of the other disciplines interested in KM of concepts and techniques that have originated in IS without acknowledging the original contributions by IS (for example, knowledge audit and knowledge taxonomies have their roots in the works of IS researchers). It is not also uncommon to see some of the other professions interested in KM not acknowledging the contributions that IS has made towards the emergence and evolution of KM as a field of study and practice (Maier, 2007; Widén-Wulff et al., 2005). Finally, it will not be overemphasizing if one mentions, as a consequence of IS’s lack of attention to KM, that KM is also being denied the contributions that could have come from years of the accumulated knowledge in data and information management by IS.

The primary purpose of this paper is to contribute towards achieving a consensus on the true place of KM in IS among the IS professionals by establishing that KM is a natural and long-awaited development in IS and that a number of circumstances have contributed to make KM an area of emphasis in IS whose time has come. The paper also aims at contributing towards achieving consensus among IS professionals on key issues related to KM (namely, conceptualization, goals, and scope of KM) because such consensus help define the boundaries and the direction that KM should take in IS. To this end, the paper is organized under four sections. The first section provides background and the purposes of the paper. Section two presents factors and circumstances that are contributing to the emergence and evolution of KM in IS by way of providing supporting evidence that KM is a logical and long-awaited development in IS. Section three highlights the distinguishing features of KM in IS when understood as a logical and natural progression in emphasis by IS. Section four presents some concluding remarks and gives recommendations.

2. Factors leading to emergence and developments of KM in IS

2.1. Knowledge as the highest order manifestation of the object of study of IS

KM has emerged in IS primarily in response to the need for emphasizing the management of knowledge as the highest form of manifestations of the object of study of IS. Information is the object of study of IS (Bates, 1999; Bates, 2005; Bawden, 2007; Belkin, 1978; Ingwersen, 1995; Robinson, 2009; Vakkari, 1994; Vickery, 1997), and it is generally understood as manifesting itself on a continuum that runs from data, to information, to knowledge. This continuum is commonly referred to in the literature as information hierarchy, knowledge spectrum, knowledge pyramid, knowledge hierarchy or similar others. The knowledge hierarchy is the widely accepted conceptualization of the object of interest of IS and is widely used to define and reveal relationships of the foundational concepts of IS—data, information and knowledge (Bates, 2005; Fricke, 2009; Martin, 2008; Meadow & Yuan, 1997; Rowley, 2007; Zins, 2007b). The different authors have described the place of data, information and knowledge in IS as “one of the fundamental, widely recognized, and taken for granted models in information and knowledge literatures” (Rowley, 2007); the fundamental concepts and basic building blocks of the field (Zins, 2007b), “the canon of information science” and “part of the common currency of information science” (Fricke, 2009).

The primary implications of the relationships revealed by the knowledge hierarchy are that knowledge is the highest form that information would take, making knowledge and its management the ultimate target towards which developments in the field have logically been progressing. According to the hierarchical representation of the manifestations of information, the following dimensions that show that knowledge is the highest form of manifestation of the object of study of IS are revealed:

- The manifestation of information is in the form of continuum running from data to information to knowledge, where each is followed by the other (Morrow, 2001; Ponelis & Fairer-Wessels, 1998).
- The interrelationships among data, information and knowledge are hierarchical where data represents the elementary and crude form of existence of information; information represents data endowed with meaning; and knowledge represents information with experience, insight, and expertise (Broadbent, 1998; Zins, 2007a).
• The creation of the three manifestations of information is to be logically incremental whereby data is consolidated to become information, and information is further consolidated with human insight, experience, and context to become knowledge (Meadow & Yuan, 1997; Morrow, 2001; Rowley, 2007; Zins, 2006; Zins, 2007a). In this sequential order, data and information serve as inputs to the creation of knowledge (Rowley, 2007; Zins, 2007a; Zins, 2007b).
• The higher level manifestation includes the manifestation below it (Ilkka, 2000; Rowley, 2007), making knowledge to be inclusive of data and information.
• Finally, data, information depend on knowledge for their proper interpretation and understanding. In other words, knowledge is the highest form of manifestation that is required to understand and interpret data and information (Martin, 2008; Meadow & Yuan, 1997; Ponelis & Fairer-Wessels, 1998; Zins, 2007b).

Therefore, the representation of the three manifestations of information is knowledge hierarchy culminates in knowledge at the top of the continuum. And KM can be considered as the logical framework for a comprehensive management of the object of study of the profession as argued by Zins (2007a).

It is the argument of this paper then that the emergence of KM is a natural and long-awaited development in IS as a part of the logical progression in emphasis given by the profession to the different manifestations of its object of study. The logical progression in emphasis here refers to the emphasis that the profession has been giving at different times to the management of the different manifestations of information, i.e., first to data and information and then to knowledge, with information receiving particularly more emphasis since the early 1980s (Cronin, 1985; Macevicute & Wilson, 2002; Fairer-Wessels, 1997) and knowledge dominating the literature of IS since the early 1990s (Schlögl, 2005) in accordance to the hierarchical positions of the manifestations. Some authors have gone further to argue that KM will follow IM as the highest stage of evolution of IM (Lytle, 1986; Savic, 1992; Trauth, 1989).

2.2. Knowledge as the ultimate concern of IS

KM has also emerged because knowledge has always been the ultimate concern of the profession. The literature of IS shows that the ultimate emphasis of the profession would be knowledge (and hence knowledge management), making the current emphasis on knowledge and knowledge management forthcoming. This has been reflected in major works of the profession since the early days of the field (Brookes, 1980; Ingwersen, 1995; Oluic-Vukovic, 2001; Saracevic, 1999; Zins, 2006, 2007a). In his seminal paper on the fundamental equation of information science, Brookes (1980) states that objective knowledge as recorded in languages, arts, the sciences and the technologies is the concern of IS. Brookes (1980) further suggests that information science needs theory of objective knowledge, since objective knowledge is the underlying object of the field. Saracevic (1999, p. 14) notes that the mission of IS is to address the massive task of making the bewildering store of knowledge more accessible. Oluic-Vukovic (2001, p. 55) is of view that knowledge processing and management is the main concern of IS and comments that "Although information still constitutes the essential part, the ultimate intellectual problem is not the effective means of information provision but production and use (consumption) of knowledge." He also cites the statement by ASIST (1999) as a supporting evidence that the emphasis of the IS profession is shifting towards knowledge:

Our ability to transform data into information, and to transform information into knowledge that can be shared, can change the face of work, education and life. We have increasing capacity to generate or gather, model, represent and retrieve more complex, cross disciplinary and multi format data and ideas from new sources and at varying scales. The transformational power of information can only be capitalized upon through knowledge acquisition, classification, utilization and dissemination research, tools and techniques.

Zins (2006) posits that IS explores the phenomena, objects, and conditions that facilitate access to knowledge. Zins (2007a, p. 339) also defines Information Science as ‘...the study of mediating perspectives of universal human knowledge...The mediating perspectives include cognitive, social, and technological aspects and conditions, which facilitate the dissemination of human knowledge from the originator to the user’. Zins (2007a, p. 335) takes his argument further when he calls for changing the name of the field to knowledge science:

Furthermore, even the name information science is problematic. The three concepts, data, information, and knowledge that are embodied in the concept of information science are interrelated. Data is commonly conceived as the raw material for information, which is commonly conceived as the raw material for knowledge. Knowledge is the highest order construction. If this is the case and information science deals with all three, then it should be called knowledge science, rather than information science. Note that knowledge science can explore knowledge and its building blocks, information and data, whereas information science is hindered from exploring knowledge because it is of a higher order.

A number of leading members of the profession who participated in a panel discussion on the conception of IS, and reported in Zins (2007a), have also reflected in their definitions of IS that knowledge transfer is the ultimate concern of the profession (Hanne Albrechtsen, Maria Teresa Biagetti, Michael Buckland, Henri Jean–Marie Dou, Nicolae Dragulianescu, Michel Menou, and Anna da Soledade Vieira, reported in Zins, 2007a). Emphasizing knowledge and its management has thus been to many the eventual concern of the IS and thus the underlying trust of the development effort of the field.

2.3. Experiences of the profession in understanding and managing data and information

Three categories of relevant developments in and experiences of IS are also contributing factors for the emergence and evolution of KM in IS. The first one relates the insight that IS has accumulated on the inherent qualities of knowledge and superior value of knowledge over data and information. The second relevant experience contributing to the emergence and evolution of KM is the experience and expertise that the field has accumulated in data and information management that has created the impetus for the profession to consider that the time has come to move to the next level of development (i.e., KM). The third area of experience relates to the application of ICTs in IS that in one form or another made it feasible for the profession to embark on KM. Each of these is briefly discussed below.

2.3.1. Deeper understanding of the inherent qualities of knowledge

Better understanding of the inherent qualities of knowledge by IS is also presented here as one of the developments that led the field to realize that it is imperative that the emphasis of the profession should be knowledge and KM. The profession's long years
of focus on the information phenomenon as its object of study has led to the realization that knowledge is the most enriched and useful of the three, and the ultimate source of value to users. This has made knowledge to be the desired form of the three manifestations of information for the profession to emphasize for the benefit of society. Orzano et al. (2008, p. 491) argue that “KM grew out of an understanding of the critical value of knowledge and the clear need to devise ways to support and benefit from them”.

The quality dimensions revealed in the IS literature as we go from data to information and to knowledge include the following:

- **Level of added value**: The relationship among data, information and knowledge is shown as reflecting increasing levels of value added from data to information to knowledge (Liao et al., 2004; Ponelis & Fairer-Wessels, 1998; Donald Hawkins, cited in Zins, 2007b; Gordana.Dodig-Crnkovi cited in Taylor, 1986; Zins, 2007b).
- **Degree of distillation**: The relationships among the three concepts are also described in terms of increasing degree of distillation from data to knowledge, where the distillation is achieved through the value adding processes of summarizing, evaluating, comparing, classifying, and so on (Bates, 2005; Bawden, 2001; Correll, 1999; Liao et al., 2004; Taylor, 1986).
- **Degree of complexity**: The hierarchical relationships of data, information and knowledge are based on the increasing levels of complexity that each shows as we go from data to information and to knowledge (Anna da Soledade Vieira, cited in Allee, 1997; Zins, 2007b).
- **Level of abstraction**: The level of abstraction, i.e., a degree of semantics extraction and which enables actors to retool, restructure and redesign the organization, increases as we go from data to knowledge in the hierarchy (Liao et al., 2004).
- **Degree of integration**: Moving from data to knowledge in the hierarchical presentation is also marked by increased levels of integration, where data is the least integrated and knowledge the most integrated (Allee, 1997).
- **Degree of organization**: The concepts are distinguished in terms of the increasing levels of organization that they possess from data to information to knowledge, where data is shown as disparate entities while knowledge is the result of a complex process of organization of data, information, context, experience, and personal reflections (Donald Hawkins, cited in Zins, 2007b; Gordana.Dodig-Crnkovi, cited in Zins, 2007b).
- **Degree of connectedness**: The hierarchy is understood as representing increasing levels of connectedness of the entities embodied, where data shows unconnected entities and knowledge shows highly connected entities, involving acts, experience, insights and so on that make up the knowledge structure (Bellinger, Castro, & Mills, 2004; Clark, 2000).
- **Degree of value (importance or relevance)**: The hierarchy reveals increasing levels of value of the three manifestations for problem solving and decision making as we go from data to knowledge, showing knowledge as the ultimate source of value (Aldo Barreto, cited in Bouthiller and Shearer, 2002; Zins, 2007b; Controller iCenter, 2002; Donald Kraft, cited in Zins, 2007b; Donald Hawkins, cited in Zins, 2007b; Eriksson-Backa, 2003, cited in Huvila, 2006; Lang, 2001; Liao et al., 2004; McNerney, 2002; Meadow & Yuan, 1997; Morrow, 2001). The relationships between the three concepts also show the importance of knowledge in that it is required to interpret data and information (Martin, 2008).
- **Degree of meaningfulness**: Data, information and knowledge are also distinguished in terms of degree of meaningfulness where data has no meaning and knowledge is the most meaningful of the manifestations (Donald Hawkins, cited in Rowley, 2007; Zins, 2007b, citing Chaffey and Wood, 2005).
- **Level of human input**: The amount of human contribution increases as we go from data to information and to knowledge (Ponelis & Fairer-Wessels, 1998; Rowley, 2007, citing Pearson and Saunders, 2006).
- **Degree of applicability (ready for use)**: In the hierarchy, the move from data to information to knowledge is marked as accompanied by increasing levels of applicability, where knowledge is readily applicable while data is not (Bates, 2005; Bouthiller & Shearer, 2002; Rowley, 2007; Sinotte, 2004).
- **Degree of contextualization**: The move from data to information and from information to knowledge is marked by increased level of contextualization, rendering knowledge the most meaningful and applicable (Clark, 2000; Donald Kraft, cited in Zins, 2007b).
- **Degree of learning**: There is an increased learning (increased clarity, deeper understanding) as we go from data (unfiltered) to information (patterns), to knowledge (predictability) (OTEC, 2007).
- **Degree of understanding**: Moving from data to knowledge is also marked by increased understanding reflected in each (Clark, 2000).

Thus, according to the knowledge hierarchy, the three manifestations of information are understood and presented as logically related whereby data evolves to information and information to knowledge as a natural progression towards becoming more valuable, useful, meaningful, and comprehensive. That knowledge is all-inclusive and the most useful form has also made knowledge to be the desired form towards which emphasis should be directed. The different dimensions and relationships among the three concepts further show that the concern of the profession would ultimately be knowledge and its management.

### 2.3.2. Experiences in managing data and information

The profession has accumulated years of expertise and experience on the management of data and information in the past decades. This expertise and experience is argued here to have conditioned members of the profession to be drawn to addressing knowledge related issues as a way forward in the management of the object of study of their profession.

The expertise and the experience accumulated have particularly helped the profession to realize the limitations of emphasizing only data and information management in fully meeting its goal of facilitating information and knowledge to enable society make informed decisions at the right time. This has led the profession to see beyond data and information management to KM, a focus that the profession has known to offer a lot more. Blair (2002) notes that the experience, both successful and failed experiences, in data/information management have contributed to the emergence of KM in the field: “The emergence of Knowledge Management is, in some sense, the consequence of, first, the realization that there is “something more” to be extracted from current information/data systems than what is actually stored on them, and, second, the poor record of DSSs and ESs in supporting, capturing or utilizing this additional information.” (p. 1024). Sinotte (2004) contends that failure of most computer based information systems to help manage information has led the profession to look beyond IM and specifically to KM. In a similar way, Jashapara (2005) argues that KM has emerged because IM has failed to deliver tangible results in organizations. Orzano et al. (2008) observe that “KM both attempts to translate lessons learned from information/data management as well as to make aware its diminishing returns” (p. 493). Thus the knowledge accumulated in understanding and managing data and information and the challenges faced by the profession in meeting societal goals are argued here to have paved the way for the profession to consider focusing more on the essence, distinguishing features, importance, tools and management of knowledge.
2.3.3. Experience in applications of ICTs

Developments in the capacities and ubiquity of ICT and their subsequent successful applications in data and information management have triggered and facilitated the move to emphasizing KM in IS. It is widely observed that developments in ICT capacity, particularly of those that are more relevant to managing knowledge in its different forms, have made it possible for the profession to move to focusing on KM (Blair, 2002; Chong & Choi, 2005; Doodeward, 2006; Makani, 2008; Oluic-Vukovic, 2001). Oluic-Vukovic (2001, p. 55) observes that technological developments are among the factors for the current interest in KM by the profession: “the initial impetus or stimulus [for the current needs for knowledge production] is supposed to come about through the rapid development of information technology (i.e., through its incentive as well as enabling effects).” Oluic-Vukovic (2001, p. 57) concludes that “The current shift towards knowledge processing is driven by a mix of daunting practical needs set by the society, and the recent technological advances that make the concept of generating useful knowledge from a huge amount of data more feasible.”

A wider application of ICT in data and information management has also led the profession to discover their increased potential for representing and capturing knowledge, prompting the profession to embark on KM (Blair, 2002) argues that the emergence of KM is highly influenced by the growth and application of computer technology particularly to data and information management, with the earlier applications of the technology being data management. Many also contend that the technology has been part and parcel of developments of KM (Becerra-Fernandez & Sabherwal, 2006; Dalkir, 2005; Doodeward, 2006; Cannon-Leary & Fontainha, 2007; Hsu, Lawson, & Liang, 2007; Lang, 2001; Pang, Pablos-Mendez, & Jsselmaiden, 2004; Wild & Griggs, 2008). Becerra-Fernandez and Sabherwal (2006, p. 230), for example, state that:

Rapid changes in the field of knowledge management (KM) have to a great extent resulted from the dramatic progress we have witnessed in the field of information and communications technology. ICT allows the movement of information at increasing speeds and efficiencies, and thus facilitates sharing as well as accelerated growth of knowledge. Thus, ICT has provided a major impetus for enabling the implementation of KM applications.

Thus, ICT amenable to KM activities have enabled the profession to take up the challenges of managing the highest form of manifestation of their object of study.

2.4. The Emergence of knowledge society

Finally it is argued here that the profession has to embark on emphasizing knowledge and KM in response to the emergence of the knowledge society, a society that puts knowledge production and use at the heart of its activities, and due to the fact that the inherent qualities of knowledge are receiving increasing appreciation globally (Drucker, 1993 cited in Kabakadse, Kouzmin, & Kakabadse, 2001; Morrow, 2001; Nath, 2000; Oluic-Vukovic, 2001; Passerini, 2007; UNCTAD, 2007; UNDP, 2003; The World Bank, 1999). The development calls for means and tools of the management of knowledge to which the profession is already committed and has relatively richer experience and expertise in. The emergence of knowledge-based society has also brought with it a new sense of urgency to look into issues surrounding knowledge with earnest. According to Oluic-Vukovic (2001, p. 57) one of the reasons for the current needs to intensify the activities to the discovery of knowledge is “the emergence of knowledge-based societies, paralleled by replacement of capital and labor-intensive organizations with knowledge-intensive organizations, where the quality and availability of intellectual capital become critical success factors, allowing business to make proactive, knowledge-driven decision . . .”. Due to this, the IS profession has found itself in the best possible position to live up to its goal of serving societal needs which is an important impetus for the profession to give emphasis to KM. Many agree that development of the knowledge-based society has indeed fueled the shift of emphasis from information to knowledge, and hence to KM in IS (Al-Hawamdeh, 2002; Chong & Choi, 2005; Jashapara, 2005; Lang, 2001; Sinotte, 2004; Oluic-Vukovic, 2001; Ondari-Okenwa, 2006; Passerini, 2007).

3. Implications of the IS perspective on KM

The perspective that KM is a logical progression of emphasis by the IS profession would guide how the profession conceptualizes and practices KM. Accordingly, KM in IS would have the following formulations of its key concepts, goal, and scope.

3.1. Conceptualization of knowledge and KM

The conceptualization of knowledge and KM has to be in line with the perspective that KM is a natural development in IS that follows data and information management.

3.1.1. The concept of knowledge

In line with the perspective that KM is a logical progression in emphasis given by the profession, knowledge should be understood as the highest order manifestation of information that includes both data and information. It is information combined with personal experience, insights, expertise, hunches and logical reasoning formed in the minds of human beings. A number of writers in the profession have already put forward definitions of knowledge in line with this conceptualization of knowledge and some of these definitions are given in Appendix A of this paper.

Knowledge should also be treated as existing in a recorded form (explicit or objective form) or unrecorded form (tacit and in the minds of humans). Explicit knowledge is that part of the knowledge captured in some form for others to access (Liyanage, Elhag, Ballal, & Li, 2009; McInerney, 2002; Nordin, Pauleen, & Gorman, 2009; Ponelis & Fairer-Wessels, 1998; Smith, 2001; Yates-Mercer & Bawden, 2002). Although many consider recorded knowledge as equivalent to information, recorded knowledge is argued here to be richer than information as it is a reflection and the result of “many increments of information”, personal experience, insights, reflections, and logical reasoning created in the minds of human beings over a period of time. Information in this context is specific to a situation on which data has been collected and organized to give a meaningful picture about the specific situation. Recorded knowledge is richer than information which is specific to a situation because it includes information that have been accumulated on other similar situations and processed and structured using existing experience, insight, expertise and so on of the knower (Bates, 2005; Bouthiller and Shearer, 2002; Todd, 1999). Bouthiller and Shearer (2002) state that “it is our contention that to consider information as the equivalent of explicit knowledge reveals an inadequate assessment of the qualitative dimensions of the various types of information and knowledge created, used and transferred in organizations”.

Tacit knowledge, on the other hand, is that aspect of human knowledge which cannot be expressed in explicit, objective form (Liyanage et al., 2009; McInerney, 2002; Nordin et al., 2009; Ponelis & Fairer-Wessels, 1998; Smith, 2001; Yates-Mercer & Bawden, 2002). Many argue that tacit knowledge is the basis for competitive advantage, innovation and creativity, making its management the primary raison d’être of KM in many organizations (Yates-Mercer & Bawden, 2002; Kakabadse et al., 2001). May also point
out that Tacit knowledge is the major portion of knowledge that humans possess compared to explicit knowledge (Beijerse, 1999). The management of tacit knowledge is also the main aspect that distinguishes KM from IM, as IM focuses on managing recorded information (Bouthillier & Shearer, 2005).

Knowledge should also be seen as subjective, objective and social. Knowledge is subjective and personal in that its creation, processing and development occur in the minds of the individual (Buckland, 1991; Dalkir, 2005; Morrow, 2001; Ponelis & Fairer-Wessels, 1998; Schlögl, 2005; Wilson, 2002). Knowledge is also external or objective in that, although it is created and resides in the mind of the individual in its entirety, some aspects of it also can take a physical form (Anna da Soledade Vieira, cited in Zins, 2007b; Anthony Debons, 2007b; Davenport and Prusak, 1998; Todd, 1999, citing Brookes, 1974; Zins, 2007b). Knowledge is also social (socially constructed) in that what individuals adopt as perspective and model of the world is a result of social interaction, including acculturation and education which are usually associated with a given discipline or socio-cultural views of a community to which individuals belong (Al-Hawamdeh, 2002; Kirk, 1999; Lang, 2001).

3.1.2. The concept of KM

Broadly, KM is a purposeful and systematic management of knowledge and the associated processes and tools with the aim of realizing fully the potential of knowledge in making effective decisions, solving problems, facilitating innovations and creativity, and achieving competitive advantage at all levels (personal, group, organization, country and so on). Definitions of KM that are consistent with the perspective of this paper and that could provide insights as to the essence of KM are given in Appendix B.

The main added dimension of KM, over and above IM, is its focus on managing tacit knowledge that exists in the form of experience, know-how, insight, expertise, competence and so on (Bouthillier & Shearer, 2002; Bouthillier & Shearer, 2005; Ponelis & Fairer-Wessels, 1998; Sinotte, 2004). Due to its focus on tacit knowledge, KM also uses cultural means such as “face-to-face meetings, socializations and mentoring” as a tool for managing knowledge (Martin, 2008; Sinotte, 2004; Wilson, 2002; Yates-Mercer & Bawden, 2002). KM therefore includes a range of aspects of IM.

KM being with an added dimension over IM means that KM and IM overlap, although some refer to the overlap in tools, terminology, and techniques between KM and IM as a point of argument that KM is IM in disguise. Specifically, IM provides a foundation for KM (Al-Hawamdeh, 2002; Hoven, 2001; Kakabadse et al., 2001; Martin, 2008; Ponelis & Fairer-Wessels, 1998; Sarrafzadeh et al., 2006; Sinotte, 2004). Kakabadse et al. (2001, p. 140) note that “Information and data management are important pillars of knowledge management. However, knowledge management encompasses broader issues and, in particular, creation of processes and behaviours that allow people to transform information into the organization and create and share knowledge”. Hoven (2001) also argues that successful IM is a pre-requisite for KM. Ponelis and Fairer-Wessels (1998) also argue that KM does not replace IM. For Blair (2002) IM is a component of KM: “Although Knowledge Management is not the same as data or information management, data and information retrieval can be important components of it.” (p. 1026). Some also acknowledge that even before they started receiving emphasis, KM related activities have also been practiced under IM programs (Bouthillier & Shearer, 2002). The overlaps include tools in use (databases, internets collaborative tools and so on) and concepts (information audit vs knowledge audit, information mapping vs knowledge mapping and so on).

Being in a continuum where “each is followed by the other”, (and where information occurs before knowledge), also implies that the concepts, tools, techniques and processes needed for their management are bound to overlap (Al-Hawamdeh, 2002; Bouthillier & Shearer, 2002; Martin, 2008). Al-Hawamdeh (2002), for example, states that:

It is important to note that information management tools are a subset of knowledge management tools. Information management tools allow organizations to generate, access, store, and analyze data, usually in the form of facts and figures. Information management tools enable the manipulation of information but do not capture the complexity of context and the richness of knowledge. While knowledge management systems may include tools that also handle data and information, data and information management tools are not robust enough to truly facilitate knowledge management.

Some aspects of IM are in fact identified as critical for successful KM. For example, knowledge creation requires supply of information, which should be properly managed to help achieve knowledge creation. Todd (1999) observes that IM is a part of KM because one of the ways that knowledge is created and nurtured is through continued exposure to information. That the three manifestations are in a continuum, the higher one involving the lower level manifestation as we go from data to information to knowledge, can thus explain the overlap we see among the aspects of the management of data, information, and knowledge.

3.2. The goals of KM in IS

The goal of KM in IS is basically to help facilitate human access to information and knowledge for effective decision making and problem solving in work situation as well as every day life. This has always been the goal of IS under IM as well as data management and continues to be so under KM (Brookes, 1980; Fairer-Wessels, 1997; Oluic-Vukovic, 2001; Saracevic, 1999; Zins, 2007a). The goal of KM in IS is broader than the goals of KM in other disciplines interested in KM because facilitating access to knowledge by IS is not limited to serving specific contexts and environments such as gaining sustainable competitive advantages or market positions in management sciences or improving organizational learning in organizational sciences. The goal of KM is facilitating access to information and knowledge in organizations, groups, communities, business, research, and so on whenever it is needed.

3.3. The scope of KM in IS

The scope of KM should also be broader than the narrowly defined focus of KM in most of the other disciplines interested in KM, such as the management of organizational knowledge as defined by organizational science and management science. The scope of KM in IS is broader because the scope of KM in the other professions generally targets a narrowly defined environment or context, such as organizational knowledge by organizational science and the cognitive and behavioural processes of learning and knowing by cognitive science (Martin, 2008; Orzano et al., 2008). In line with the scope of the profession itself, the management interest of KM in IS should not discriminate among knowledge sources (implicit and/or explicit) and processes found in different contexts such individual, household, group, organizational, and country levels. It should not also limit its implementation only in certain context if it has to live to its expectations of facilitating human access to knowledge. The theoretical and conceptual frameworks of KM in IS should also be broader than that of the KM in the other disciplines, such as resource based (knowledge based) theory of the firm in organizational science, theory of learning in cognitive science, and the social creation of knowledge in social sciences (Martin, 2008; Orzano et al., 2008). The guiding principle and practice of KM in IS would be ensuring end users’ access to knowledge irrespective of their position in society. Interpreting,
advancing, and implementing KM should also be guided by the traditions, philosophies, and theoretical and conceptual frameworks of IS as these will ensure the continuity that has been evolving from data and information management towards achieving the highest stage of management of the object of study of the profession. This broader scope of KM in IS will also allow it to take advantage of developments in most of the other disciplines interested in KM as they can be viewed as, by virtue of their narrower focus, subsidiary to the KM in IS.

In line with the conceptualization of knowledge above, the knowledge to be managed includes data, information, recorded (or explicit) knowledge, and personal (or tacit) knowledge (Hoven, 2001; Jashapara, 2005; Ponelis & Fairer-Wessels, 1998; Sinotte, 2004). The knowledge processes to be managed also include creating, gathering, nurturing, storing, organizing, sharing and utilizing knowledge. KM also covers the management of KM tools (such as knowledge repositories, e-learning tools) and other KM enablers (such as organizational culture).

4. Conclusions and recommendations

4.1. Conclusion

The shift in emphasis on knowledge, and hence KM, is a logical progression within the knowledge hierarchy framework that the profession has adopted. It can be argued that the foundation for the current shift in focus on knowledge has been laid since the early days of the IS profession, and the profession has been positioning itself and worked to bring about this shift, although largely without having a clearly defined time table for achieving this. The progression is best described as evolutionary and a number of factors have contributed at different times and in different guises to help meet the underlying pre-requisites for or to accelerate the progression to take place at this point in time. The progression is viewed here as logical because understandings and management practices accumulated from the earlier stages have been the basis for this highest stage. As such there is an unavoidable overlap in the conceptualizations, tools and management practices of the three (data–information–knowledge) since the understanding and the management practices of the higher stages are built on the foundations of the earlier stages. What the profession has been doing is primarily recognizing the occurrences and characteristics of the progression and embracing it as instances of development in the field. The acceptance of the progression has never been universal as a good number of IS professionals have argued that there are no differences between KM and IM. This could be due to the fact that KM is at an early stage of development. It could also be due to the logical overlap among the concepts and tools involved in the management of the three manifestations of information.

Due to this logical progression, KM is going to be here with us, with a far reaching impact on the profession’s core values, processes, tools, technologies and research issues. Ensuring that KM matures fully for everyone to see that it is the highest stage of development in the IS profession is in the hands of the profession itself. Consequently the profession has to fully embrace it, nurture it, develop it and exploit it to meet its professional contributions.

4.2. Recommendations

The following key recommendations will help the profession to respond better to the progression in line with the arguments and conclusions of this paper.

4.2.1. Embrace it

The profession should fully embrace the emergence of KM as a natural progression in emphasis of its object of study. The literature shows that the emergence of KM has been inevitable and the process has been unfolding under the auspices of IS. This makes IS the main field to take the lead in recognizing and making KM its own as it should be.

4.2.2. Establish it

Similarly, the profession has to develop consensus as to the place of KM in IS, as KM has not yet been accepted as a logical progression as well as a legitimate specialization of the field by all its members. The first step then should be to resolve the differences and establish KM as the primary focus of the field. The current paper hopefully contributes in that regard by showing that the profession by and large has been involved in KM in one form or another and that KM is the logical progression that may not be reversed.

4.2.3. Develop it

With embracing the emergence of KM, the profession should embark on professional and academic activities to help develop and sustain the development in KM, to promote and establish KM as a professional and academic endeavor among its members, to make it the main identity of the profession, and to assume the responsibility of advancing the field. In this connection training and research are the key areas of activities that the profession should focus on:

• Training: As the highest stage of emphasis of the object of study of the profession, the primary training thrust of IS should emphasize KM at different levels. This should include expanding degree programs (BSc, PGD, MSc, Mphil, and PhD) at higher learning institutions, including KM courses in other areas of specializations within IS as compulsory, and conduct short courses as professional development interventions.

• Research: Similarly, the profession should take the lead to put KM on the top of the research agenda of the profession to advance the field and sustain the advancement. The research focus should include the applications of KM tools, frameworks, techniques and technologies to addressing the every day issues of human beings. With knowledge-based development receiving attention among development and economics experts, KM on development should also be one of the areas of research and development of KM. The controversial issues in KM should also be addressed as a matter of priority in order to bring together and build consensus among members of the professions. Research particularly to develop an integrative framework that would allow KM in IS to define its priorities and directions as well as filter developments in other disciplines interested in KM for possible absorption into its corpus of knowledge and practice is also imperative.

Appendix A. Illustrative definitions of knowledge for KM in IS

• Data is a series of facts and figures resulting from observation or measurement process and that has not been processed for use. Here “unprocessed” might be understood in a sense that no specific effort has been made to interpret or understand the data. Information is data given context, and endowed with meaning and significance. Knowledge is information that is transformed through reasoning and reflection into beliefs, concepts, and mental models. (Gordana.Dodig-Crnkovi cited in Zins, 2007b, p. 482).


• Knowledge is information that has been given meaning and taken to a higher level. Knowledge emerges from analysis, reflection
upon, and synthesis of information. (Donald Hawkins cited in Zins, 2007b, p. 483).

- Knowledge is the accumulation and integration of information received and processed by a recipient (Meadow & Yuan, 1997, p. 701).
- Knowledge is information given meaning and integrated with other contents of understanding (Bates, 2005).
- Knowledge is a collective entity, a summation, integration and transformation of many bits of information organized in a coherent way. It exists privately in the minds of people, and it can be made external and public through being recorded in some way (Todd, 1999, p. 862).
- Knowledge is the combination of data and information, to which is added expert opinion, skills, and experience, to result in a valuable asset which can be used to aid decision making (Rowley, 2007, p. 172, citing Chaffey and Wood, 2005).
- Knowledge is data and/or information that have been organized and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current problem or activity (Rowley, 2007, p. 172, citing Turban et al., 2005).
- Knowledge is the combination of information, context, and experience. Context is an individual’s framework for viewing life. This includes influences like social values, religion, cultural heritage, and gender. Experience is previously acquired knowledge (Ponelis & Fairer-Wessels, 1998, p. 2).
- Knowledge is created in the minds of humans through “accretion and integration of many increments of information over different exposures to information at different times” (Todd, 1999, p. 859, citing Brookes, 1974).

Appendix B: Illustrative definitions of KM consistent with the argument of this paper

- Successful knowledge management is an integrated approach that combines the information stored in an enterprise’s information systems with unstructured information that holds the experiences and insights of the enterprise (Hovén, 2001, p. 82).
- Knowledge management is an added dimension, intensifying the need for the integration and management of all three (data–information–knowledge) within an organization (Ponelis & Fairer-Wessels, 1998, p. 5).
- Knowledge management brings a new dimension, the need to manage tacit knowledge by focusing on people and enhance their capability by improving communication, information transfer and collaboration (Al-Hawamdeh, 2002).
- Knowledge Management is Information or data management with the additional practice of capturing the tacit experience of the individual to be shared, used and built upon by the organization leading to increased productivity (http://www.gdrc.org/kmgmt/what-is-km.html citing Source: KMTool Community).
- Knowledge management is the creation and subsequent management of an environment which encourages knowledge to be created, shared, learnt, enhanced, and organized for the benefit of the organization and its customers (Sarrafzadeh et al., 2006, p. 624).

References


