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Evaluating KM Journal Content: An Assessment of Trends (2000-2005)

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EVALUATING KM JOURNAL CONTENT: AN ASSESSMENT OF TRENDS (2000 – 2005)

THESIS

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Abstract

Knowledge management (KM) has been receiving ever increasing attention from researchers and practitioners, especially over the last five years. Consequently, some researchers and practitioners now believe that KM should be its own discipline and have established KM-specific journals in an effort to further this idea. Many of these journal founders believe that KM has emerged as a mixture of many disciplines and have written the goal of being interdisciplinary into their charters.

This research reviews the KM literature published in KM-specific journals from 2000 to 2005. Specifically, using a content analysis methodology, this research reviews and analyzes the body of KM literature in KM-specific journals to determine what the body of literature "looks like." The results of this analysis are also used to compare the body of literature for KM-specific journals to that of the leading information systems (IS) journals for the same time period. Lastly, this approach is used to ascertain whether KM-specific journals are meeting their interdisciplinary goal.

The results from this research indicate that, although the coverage of KM focus topics within KM-specific journals is fairly evenly distributed, the KM focus topic of *knowledge transfer* has been receiving the greatest amount of attention by researchers and practitioners contributing to these journals. Additionally, the comparison of the two bodies of literature (KM and IS) shows that they are similar in their coverage of the KM focus topics spectrum. Lastly, the significant number of disciplines found contributing to KM-specific journals indicates that these journals are, indeed, interdisciplinary.

To my loving wife

Acknowledgments

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To my wife, I send my deepest thanks and love, for without her undying support I definitely could not have accomplished the things I have thus far. To my Mother and late Father, I wish to also send my deepest and most heartfelt thanks and love. They have always supported me and my decisions, and for that I am truly grateful.

Donnie O. Harp

Table of Contents

Page

List of Figures

Page

List of Tables

Page

EVALUATING KM JOURNAL CONTENT:

AN ASSESSMENT OF TRENDS (2000 – 2005)

I. Introduction

Background

Knowledge management (KM) was first observed in industries and functions that were basically selling knowledge (e.g., professional services, pharmaceuticals, and research and development) (Davenport and Grover, 2001). Since then it has quickly moved into other industries and now is expected to be adopted in virtually every business unit and function (Davenport and Grover, 2001). Evidence depicting how this rapid growth has found its way into the research of knowledge management was submitted by Peachey et al. in their 2005 study of KM in the leading information systems (IS) journals. Peachey et al. (2005) found that over 2,000 articles were written on the subject between the years 2000 and 2004. Within this large selection of articles, one can find researchers from many diverse disciplines that have written about and advocate the need to establish KM as its own discipline (Jennex and Croasdell, 2005). However, because KM is an emerging discipline (Rubenstein-Montano et al., 2001), research on the subject has yet to identify a generally accepted framework for assessing KM in organizations (Rubenstein-Montano et al., 2001). Rubenstein-Montano et al. (2001) identified 26 KM frameworks which covered many diverse KM focus topics. Although several KM focus topics did overlap between frameworks, the researchers did not find significant commonality

between them (Rubenstein-Montano et al., 2001). This lack of a common framework for assessing KM in organizations, according to the researchers, was causing a variety of KM approaches to be implemented across organizations (Rubenstein-Montano et al., 2001). Furthermore, Rubenstein-Montano et al. stated that "these approaches [did] not adequately fulfill the knowledge management needs of organizations" (2001, p. 5). Although Rubenstein-Montano et al. (2001) did not identify a common framework for assessing KM in organizations, it did not stop researchers from making KM frameworks and theoretical models the most written about subjects in published KM-specific and intellectual capital journals (McKeen et al., 2006).

Rubenstein-Montano et al. stated that "knowledge management might possess more *staying power* as a discipline if discipline-wide, unifying theories and principles [could] be integrated with knowledge management processes, methodologies, tools, and techniques" (2001, p. 6). To accomplish this task, Rubenstein-Montano et al. (2001) suggested a complete systems thinking framework approach for assessing KM in organizations. They also stated that a KM systems thinking framework could "enhance knowledge management through its ability to depict complex, dynamic processes and thus enhance understanding and the ability of knowledge management initiatives to respond to the needs of the organization" (Rubenstein-Montano et al., 2001, p. 6). Unfortunately, Rubenstein-Montano et al. (2001) did not, in their study, develop a KM systems thinking framework for future researchers to use. Since that study, however, some researchers have tried to define what KM focus topics form the body of knowledge in the leading IS journals (Peachey et al., 2005). Peachey et al. proposed that

"understanding the future direction of research in KM requires that we first know what constructs in KM have received the most attention from researchers and where there currently are gaps in the published research" (2005, p. 56). To conduct their study, Peachey et al. (2005) developed a hybrid framework by combining the KM focus topics of *knowledge creation*, *storage/retrieval*, *transfer*, and *application* from Alavi and Leidner (2001) with the KM focus topics of *knowledge generation*, *codification* and *coordination*, *transfer*, and *roles/skills* from Davenport and Prusak (1998) (see Figure 1).

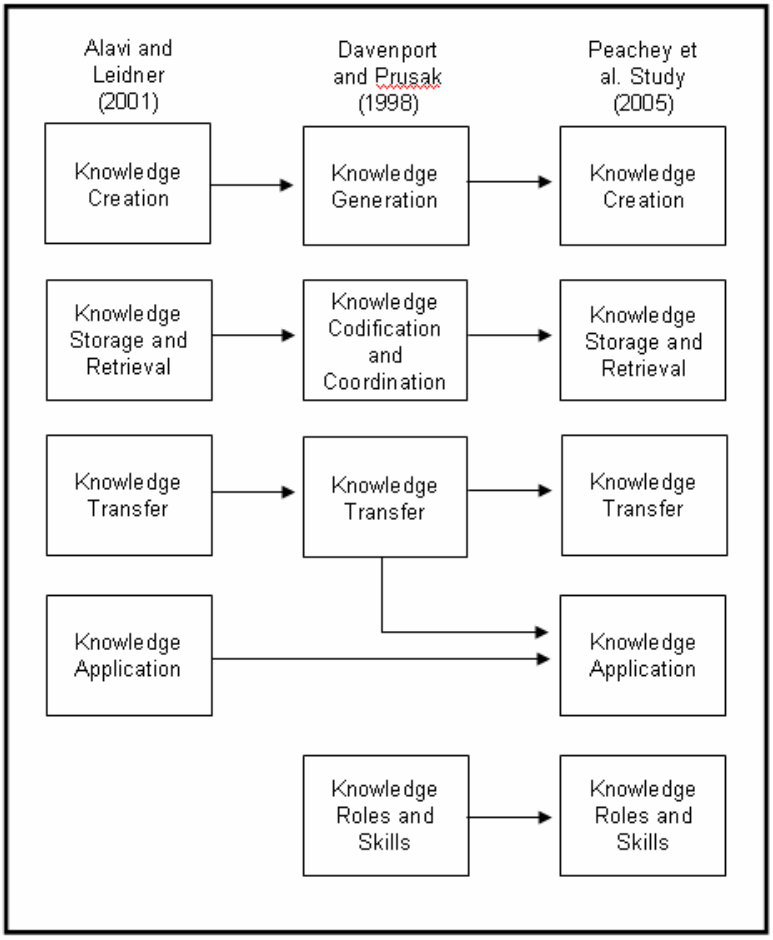

Figure 1. Five Construct Categorization Framework (Peachey et al., 2005)

This hybrid KM framework, consisting of the KM focus topics of *knowledge creation*, *storage/retrieval*, *transfer*, *application*, and *roles/skills* was used by the authors because "both…frameworks [were] parsimonious in their structure and relevant to academics and practitioners alike" (Peachey et al., 2005, p. 57). Given the research goals profiled by Peachey et al. (2005), this hybrid KM framework provided a sound foundation from which to conduct their research. By using the hybrid KM framework as a guide to categorize articles into one or more KM focus topics, Peachey et al. (2005) found that the KM focus topic of *knowledge transfer* was being researched and written about more (approximately 42% of the time) than any of the other four KM focus topics (Peachey et al., 2005). Peachey et al. (2005) suggested that concentrating research on just one or two KM focus topics could cause an imbalance in KM research as a whole. Furthermore, they stated, "for practitioners to deploy effective KM systems, the other [KM focus topics] must be more fully developed" (Peachey et al., 2005, p. 68).

Issues Regarding KM in KM-specific Journals

Although some researchers are attempting to find a common ground for KM research and practice so that it might progress towards being recognized as a standalone discipline (Jennex and Croasdell, 2005), others are questioning whether KM should be its own discipline or just part of the greater IS discipline (Spiegler, 2000). Spiegler has even taken this debate one step farther by labeling KM as a "separate branch of inquiry within information systems" (2000, p. 20). Spiegler states the following about KM's importance to the IS discipline:

> Our IS field and its deficiency of theoretical and philosophical roots may have at last found a safe harbor in the sea of knowledge. Knowledge may be the right

> concept to help establish not only KM as a new endeavor but also put the entire IS discipline on firmer foundations (2000, p. 20).

Spiegler's (2000) view of KM's role as a subfield of IS research is not endorsed by everyone within the IS community (Schwartz, 2005). Schwartz states, "KM is not an important area of IS research, rather IS research is an interestingly important part of the discipline of knowledge management" (2005, p. 2). Regardless of the debate's outcome, it continues to exist while, at the same time, the IS community struggles to establish *itself* as a legitimate discipline (Schwartz, 2005). Schwartz states that even "after 40 years of information systems research, there remains great divergence and diversity in how to accurately define this important discipline" (2005, p. 1).

Schwartz in his recent publication, *The Encyclopedia of Knowledge Management*, identifies 18 journal outlets, which he claims, have "major aspects of KM as a primary focus (see Table 1) (2006, p. xxiv). These outlets cover a plethora of different disciplines, all of which seem to see KM as an important enough subject for inclusion in their journals. Although some researchers are content with publishing their articles in these journals, some have gone beyond this traditional path and created KM-specific journals of their own; focused only on publishing high quality articles on KM research and practice (Jennex and Croasdell, 2005). Journals such as the *Electronic Journal of Knowledge Management*, *Journal of Knowledge Management*, and *Knowledge Management Research & Practice* have appeared over the last five to ten years, and the list continues to grow with the new addition of the *International Journal of Knowledge Management* in 2005 and the *International Journal of Knowledge Management Studies* this year (McKeen et al., 2006; Schwartz, 2006).

Table 1. Journals Publishing KM-specific Articles

Data and Knowledge Engineering	Data Mining and Knowledge Discovery	IEEE Transactions on Knowledge and Data Engineering
International Journal of Intellectual Property Management	International Journal of Knowledge and Learning	International Journal of Knowledge Management
International Journal of Knowledge Management Studies	International Journal of Learning and Intellectual Capital	International Journal of Software Engineering and Knowledge Engineering
Journal of Information and Knowledge Management	Journal of Intellectual Capital	Journal of Knowledge Acquisition
Journal of Knowledge Management	Knowledge and Information Systems	Knowledge, Technology, and Policy
Knowledge-based Systems	Organizational Learning	The Knowledge Engineering Review

(adopted from Schwartz, 2006)

These journals have been developed by researchers and practitioners from a broad range of communities (e.g., IS, economics, management, etc.), but they all seem to share the common goal of growing the KM community and its theoretical base through the publication of literature on and about KM.

Another goal the KM journal founders have in common is their desire to be interdisciplinary. Dr. Murray Jennex is one such founder who embraces this goal, and whose journal's charter states the following:

> The primary objective of the *International Journal of Knowledge Management* (*IJKM*) is to provide a comprehensive cross discipline forum for advancing the understanding of the organizational, technical, human, and cognitive issues associated with the creation, capture, transfer, and use of knowledge in organizations (*IJKM* Charter, 2005, para. 1).

Another example of a journal embracing this goal can be found in the charter for *Knowledge Management Research & Practice* (*KMRP*). The journal's charter states the following:

> *KMRP* will fill the need for a journal specifically concentrating on knowledge management that maintains the highest standards of rigor, and publishes articles that reflect greater multidisciplinary work and/or conceptual integration than those currently published in existing outlets (*KMRP* Charter, 2005, para. 6).

This embracing of KM as interdisciplinary by different journal publication goals was further reiterated by Jennex and Croasdell in their spring 2005 editorial in which they portrayed KM as "a fusion of many disciplines" (2005, p. i).

Schwartz (2005) provided validity to Jennex's and Croasdell's (2005) portrayal of the interdisciplinary nature of KM when he identified researchers and practitioners from 29 unique disciplines that responded to his call for KM papers when developing the *Encyclopedia of Knowledge Management*. Originally, Schwartz (2005) initiated a call for KM papers under the perspective that the main contributors to the encyclopedia would be from the IS field. Although the preponderance of papers submitted *were* from those authors affiliated with the IS discipline (nearly 45%), the fact that almost 18% of the respondents were from non-traditional IS or management disciplines was revealing (Schwartz, 2005). Schwartz states the following about his reaction to this finding:

> As stated in the introduction, I began this process from an information systems perspective. It is the depth and breadth of non-IS contributions that I have found most enlightening (2005, p. 6).

Although Schwartz's finding does shed light on the multitude of disciplines claiming interest in KM, it does not address whether KM journals are recognizing contributions from these other disciplines.

Research Questions

The discussion above has identified three issues where research can add to the body of knowledge for KM. The research questions corresponding to these three issues are presented below.

The first issue addressed by this research concerns the body of KM literature itself. Currently, no known assessment of what the body of KM literature in KM-specific journals looks like exists. To address this issue, research question (RQ)1 is proposed:

RQ1: *How can the body of KM literature in KM journals be described?*

The second issue addressed by this research concerns the current lack of comparison information between the KM focus topics of KM-specific journals and those KM focus topics of the leading IS journals. As mentioned earlier, studies have been conducted on the leading IS journals to determine what KM focus topics are getting the most attention within those publications (Peachey et al., 2005). However, to date no known similar study has been conducted on KM-specific journals. Therefore, to address this issue, research question (RQ)2 is proposed:

RQ2: *How does the KM literature in IS journals compare to that being published in KM-specific journals?*

The last issue addressed by this research relates specifically to the "interdisciplinary" nature of KM-specific journals. As mentioned above, KM journal charters purport to recognize the importance of an interdisciplinary approach to KM

literature. However, no known study has been conducted to determine if KM-specific journals are indeed meeting their interdisciplinary goal. In an effort to resolve this issue, research question (RQ)3 is proposed:

RQ3: *How "interdisciplinary" are the KM-specific journals?*

Methodology

For this study, a content analysis methodology is the appropriate tool to use for answering the research questions outlined above. Use of a content analysis tool allows the researcher to utilize a step-by-step approach for assigning literature (in this case, KM) to a predetermined set of categories. Furthermore, to ensure full coverage of the body of literature within KM-specific journals, a KM systems thinking framework, as highlighted by Rubenstein-Montano et al. (2001) is used to answer questions RQ1 and RQ2. This KM systems thinking framework provides the KM focus topics needed to categorize the focus topics identified in each KM-specific journal article. By using the predetermined KM focus topics, the primary researcher and coders can assess what KM focus topics exist in each KM-specific journal article and annotate those identified KM focus topics on a researcher-developed code form.

To answer RQ3, a KM framework derived from Schwartz's (2005) findings is applied. By using the 29 different disciplines as a guide, the KM discipline affiliation framework allows the primary researcher and coders to review the author(s) information provided in each article and assign a number from 1-29, effectively placing the author(s) into a specific KM discipline affiliation. Once the KM discipline affiliation is identified,

the primary researcher and coders can annotate the identified number on a researcher-developed code form.

Additionally, a selection of articles from five KM-specific journals meeting certain stated criteria (outlined in Chapter III) are deemed to be an appropriate population of interest for this research. Every article within these KM-specific journals is subject to coding, however, some have been eliminated from the study due to their non-applicability to the research questions above. Therefore, of the 469 articles included in these journals, only 317 specifically discuss KM and KM-specific issues relating to the KM focus topics identified in the KM systems thinking framework. To ensure each article is coded by at least two coders, each article is coded by a designated coder and the primary researcher. Also, a code book and code form is used to ensure consistent coding of each article included in the study.

Limitations

There are five identified limitations to this research. First, due to the rather short time period that KM has been written about (only about 15 years) (McKeen et al., 2006), and the even shorter time that KM-specific journals have existed, there is not a wide array of journals to choose from to conduct a study of this type. Second, due to the constraints placed on coder selection, only four coders could be obtained for this research. This small number of coders means that each article is reviewed by only two coders; however, reliability can still be maintained by using just two coders (Neuendorf, 2002). Third, only the primary researcher determines which articles from the KM-specific journals are included in the study. Since the primary researcher has not worked in the KM field being

studied and has only taken a few courses on KM and KM related issues, this single-person oversight may introduce some element of bias to journal article selection (based on the primary researchers knowledge of the topic being researched) and cause some relevant articles to be eliminated from the population of interest. Fourth, because authors of the selected articles were not surveyed to identify what discipline they were affiliated with, the coders have to review the information (biographies primarily) provided about the authors within the articles reviewed. Since some of the information about the authors is rather sparse or non-existent, proper determination of discipline affiliations is difficult to make thus leading to possible mis-categorization of some or all of the discipline affiliations. Additionally, since no specific delineation of disciplines was able to be produced by the primary researcher, intercoder disagreement on KM discipline affiliations is highly possible. Lastly, the use of a content analysis methodology to conduct this research imposes its own limitation. Because content analysis, especially when using human coders, involves "human inquiry [and thus] is inherently subjective" (Neuendorf, 2002, p. 11) the possibility exists that an incorrect assessment may be made by the coders. This limitation, then, must be recognized when interpreting the results yielded from the use of a content analysis methodology.

Benefits/Implications

There are three main benefits or implications to this study. First, this study provides an assessment of the body of KM literature within KM-specific journals (e.g., the KM focus topic receiving the most attention). Second, this research provides a detailed comparison of KM literature found in KM-specific journals to that found in the

leading IS journals, according specifically to the Peachey et al. (2005) study. Lastly, it investigates the claim that KM-specific journals are interdisciplinary.

Thesis Overview

This document consists of five chapters. Chapter I introduces the topic and provides the overall scope and direction for the research. Chapter II reviews the literature associated with the topic being researched and provides the necessary theoretical groundwork on which the research is based. Chapter III describes the methodology used for conducting the research and identifies the frameworks and/or models utilized. Chapter IV describes the results of the research to the reader, and Chapter V concludes the thesis with a final discussion of the results, the primary researcher's conclusions, the limitations of the research, and directions for future research.

II. Literature Review

Overview

This chapter provides the theoretical groundwork from which the research conducted was based. It begins by providing definitions for both knowledge and knowledge management. These definitions are necessary to understand before any research into KM can be accomplished. Next, literature assessments of the importance of KM frameworks for research and practice are introduced. Additionally, the different types of KM frameworks employed today are discussed and a KM systems thinking framework is developed for use in the study. The final two areas discussed in this chapter focus on KM-specific journals. The first area identifies the particulars of KM-specific journals (e.g., common focus areas and goals). The second area concentrates on their interdisciplinary nature, with particular emphasis placed on defining what constitutes an academic discipline and what it means to be interdisciplinary. This discussion will produce a KM discipline affiliation framework which will be used later in the study.

Knowledge Defined

Davenport and Prusak state that "most people have an intuitive sense that knowledge is broader, deeper, and richer than data or information" (1998, p. 5). In an effort to "[express] the characteristics that make knowledge valuable…[and] difficult to manage well" (1998, p. 5), Davenport and Prusak define knowledge as the following:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of

> knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms (1998, p. 5).

Nonaka and Takeuchi (1995) separate knowledge into two categories: tacit or explicit. Tacit, or implicit, knowledge is the knowledge that resides in the minds of employees (Nonaka and Takeuchi, 1995). Tacit knowledge is very hard to manage because people often know more than they can communicate which makes capturing the knowledge extremely problematic for KM professionals (Nonaka and Takeuchi, 1995). Explicit knowledge, on the other hand, is knowledge that resides in documents, databases, etc. within an organization that has the potential of being managed more easily if proper knowledge management techniques are in place (Nonaka and Takeuchi, 1995).

Knowledge Management Defined

In attempting to define knowledge management, Alavi and Leidner reference von Krogh's (1998) definition of knowledge management: "Knowledge management refers to identifying and leveraging the collective knowledge in an organization to help the organization compete" (2001, p. 113). Alavi and Leidner further state that "knowledge management is largely regarded as a process involving various activities" (2001, p. 114). These activities or processes are knowledge creation, storage/retrieval, transfer, and application (Alavi and Leidner, 2001). Several researchers have stated that the purpose of KM is to boost an organizations performance to gain a competitive advantage (Bartczak, 2002; Delong and Fahey, 2000; Davenport and Prusak, 1998). Therefore, for organizations to sustain a competitive advantage they must be able to manage both the tacit and explicit elements of knowledge.

Use of Frameworks in KM

Metaxiotis et al. define a framework as "a holistic and concise description of the major elements, concepts, and principles of a particular domain" (2005, p. 11). Furthermore, Metaxiotis et al. state that "the main aim of a framework is to explain the domain and define a standardized schema of its core content as a reference for future design implementations" (2005, p. 11). Therefore, a KM framework describes the major elements of the KM domain (Metaxiotis et al., 2005). An additional component of KM frameworks is that they can be separated into three categories or types: prescriptive, descriptive, or a hybrid of both (Rubenstein-Montano et al., 2001; Holsapple and Joshi, 1998). Rubenstein-Montano et al. define prescriptive and descriptive frameworks as the following:

> Prescriptive frameworks provide direction on the types of knowledge management procedures without providing specific details of how those procedures can/should be accomplished. In essence, they prescribe different ways to engage in knowledge management activities (i.e., suggest a knowledge management methodology). In contrast, descriptive frameworks characterize or describe knowledge management. These frameworks identify attributes of knowledge management important for their influence on the success or failure of knowledge management initiatives (2001, p. 7).

By combining elements from both prescriptive and descriptive frameworks, therefore, a hybrid KM framework can be developed (Holsapple and Joshi, 1998). Rubenstein-Montano et al. (2001), in their study of 26 different KM frameworks, found that the majority of frameworks fell into the prescriptive category. They, however, reject this trend as the necessary way to appropriately capture the KM domain (Rubenstein-Montano et al., 2001). Instead, Rubenstein-Montano et al., referencing Holsapple and Joshi (1998), state that prescriptive only KM frameworks "[tended] to be task-oriented"

(2001, p. 7) and do not cover all of the factors important to knowledge management, although "for initial knowledge management efforts, this [is] a natural direction in which to move because the processes involved in actually implementing knowledge management are task, or knowledge manipulation activities" (2001, p. 7). These other factors, they argue, could be garnered from using the elements within a descriptive KM framework (Rubenstein-Montano et al., 2001). In an attempt to identify a KM framework which would include both the prescriptive and descriptive elements, Rubenstein-Montano et al. (2001) decided to view KM in a systems thinking context. This context, Rubenstein-Montano et al. suggest, in referring to Schlange (1995), would be the best fit to accurately describe the KM domain because "systems thinking can enhance knowledge management through its ability to depict complex, dynamic processes and thus enhance understanding and the ability of knowledge management initiatives to respond to the needs of the organization" (2001, p. 6). Additionally, Rubenstein-Montano et al. state that "a systems thinking approach to knowledge management also addresses the concern raised by Tsoukas (1997) regarding the lack of an *overseeing* framework in organizations to provide a general sense of direction for knowledge management initiatives" (2001, p. 6).

To create a systems thinking framework, Rubenstein-Montano et al. (2001) suggest utilizing a hybrid KM framework consisting of both prescriptive and descriptive elements, but also to incorporate the KM focus topics of single-loop and double-loop learning as defined by Argyris and Schön (1978). Rubenstein-Montano et al. (2001) found that, although some KM frameworks included the KM focus topic of single-loop

learning, most did not contain the KM focus topic of double-loop learning. Rubenstein-Montano et al. contribute this inclusion of one KM focus topic but not the other to an often omission of double-loop learning in most organizations (Rubenstein-Montano et al., 2001; Argyris and Schön, 1978). Rubenstein-Montano et al. advocate including the double-loop learning KM focus topic in any KM systems thinking framework because it is more consistent with systems thinking and "involves the concept of emergent properties of systems where knowledge is learned and/or unlearned" (2001, p. 10). This creation of a KM systems thinking framework for KM is important, argue Rubenstein-Montano et al. "because it facilitates the linkage between knowledge management initiatives and the strategic goals and objectives of an organization" (2001, p. 12).

Creating a KM Systems Thinking Framework

As mentioned in the above section, Rubenstein-Montano et al. (2001) argue that the best KM framework for organizations to use is a KM systems thinking framework. Additionally, Rubenstein-Montano et al. (2001) suggest that a KM systems thinking framework can be created by combining the KM focus topics of both prescriptive and descriptive KM frameworks as well as adding the additional KM focus topics of single-double-loop learning as described by Argyris and Schön (1978). Using Rubenstein-Montano et al.'s (2001) article as a guide, the below sections describe the KM frameworks utilized to create the KM systems thinking framework used for this study.

Prescriptive KM Framework.

The prescriptive KM framework employed for this research to categorize KM focus topics in KM-specific journal articles came from Alavi and Leidner (2001). The

Alavi and Leidner (2001) KM framework was described by Peachey et al. as "[containing] well-defined constructs suitable for categorization" (2005, p. 56). Although Peachey et al. (2001) classified Alavi and Leidner's (2001) KM framework elements as "constructs," the operational variables used in their study were the elements most focused on by the authors writing KM-specific articles for the leading IS journals. Therefore, for purposes of this research, these elements are referred to as KM focus topics.

Jennex and Croasdell (2005) found that the Alavi and Leidner (2001) journal article was the fourth most cited KM article. This high standing among KM articles lends credence to the fact that the Alavi and Leidner (2001) KM framework has established itself within the KM body of literature. The Alavi and Leidner (2001) KM framework, consists of the KM focus topics of *knowledge creation*, *knowledge storage/retrieval*, *knowledge transfer*, and *knowledge application* (see Figure 2). Descriptions of each KM focus topic are provided in the following sections.

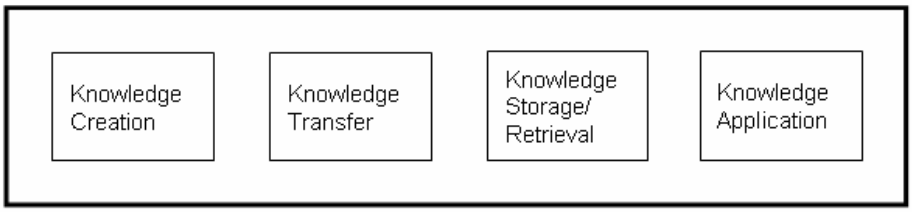

Figure 2. Prescriptive KM Focus Topics
(adapted from Alavi and Leidner Framework, 2001)

Knowledge Creation.

Alavi and Leidner's KM framework depicts *knowledge creation* as the following:

> …involving a continual interplay between the tacit [comprised of both cognitive and technical elements (Nonaka 1994)] and explicit [articulated, codified, and communicated in symbolic form and/or natural language (p. 110)] dimensions of knowledge and a growing spiral flow as knowledge moves through individual, group, and organizational levels (2001, p. 116).

As presented by Alavi and Leidner (2001), *knowledge creation* can, theoretically, occur within any of the other three processes. However, for use within this research, *knowledge creation* is viewed as a process where knowledge is generated and shared in an effort to create new ideas. In order for this process to be clearly visible, any reference to *knowledge creation* needs to involve the four modes identified by Nonaka (1994). These four modes are socialization, externalization, internalization, and combination. The socialization mode "refers to conversion of tacit knowledge to tacit knowledge through social interactions and shared experience among organizational members" (Alavi and Leidner, 2001, p. 116). The combination mode "refers to the creation of new explicit knowledge by merging, categorizing, reclassifying, and synthesizing existing explicit knowledge" (Alavi and Leidner, 2001, p. 116). The other two modes "involve interactions and conversion between tacit and explicit knowledge" (Alavi and Leidner, 2001, p. 116).

Knowledge Storage/Retrieval.

Alavi and Leidner (2001) distinguish *knowledge storage/retrieval* from the other three processes by connecting the process to organizational memory. In referencing Stein and Zwass (1995, p. 85), Alavi and Leidner state that organizational memory is defined

as “the means by which knowledge from the past, experience, and events influence present organizational activities” (2001, p. 118). Therefore, by taking this definition into account, and referring to Tan et al. (1998), Alavi and Leidner view *knowledge storage/retrieval* as the process by which organizational memory is codified in some manner and “includes knowledge residing in various component forms, including written documentation, structured information stored in electronic databases, codified human knowledge stored in expert systems, documented organizational procedures and processes, and tacit knowledge acquired by individuals and networks of individuals” (2001, p. 118). To further distinguish *knowledge storage/retrieval* from the other three processes, Alavi and Leidner (2001) tie this process directly to customer or business-function related activities rather than to organizational learning. This distinction allows for categorization of elements within an organization as *knowledge storage/retrieval* if these elements involve “developing vast repositories of knowledge about customer, projects, competition, and the industries they serve” (Alavi and Leidner, 2001, p. 119).

Knowledge Transfer.

Alavi and Leidner view *knowledge transfer* as “the transfer of an individual’s explicit knowledge to group semantic memory, (which can occur, for instance, when individuals place reports they have prepared on a group server for others to view)” (2001, p. 119) or the “transfer from individual tacit knowledge to group episodic memory” (2001, p. 119). Alavi and Leidner further elaborate that “individuals may likewise learn from the group semantic and episodic memories” (2001, p. 119). In simplest terms, *knowledge transfer* occurs when knowledge is passed from person-to-person, person-to

group, group-to-group, group-to-organization, etc. in an effort to share what is known (Alavi and Leidner, 2001). In most cases, *knowledge transfer* is intended to increase the overall knowledge of the organization through internal or external learning (Alavi and Leidner, 2001).

Knowledge Application.

Alavi and Leidner describe *knowledge application* in terms of Grant's (1996) "three primary mechanisms for the integration of knowledge to create organizational capability: directives, organizational routines, and self contained task teams" (2001, p. 122). In referring to Demsetz (1991), Alavi and Leidner define directives as "the specific set of rules, standards, procedures, and instructions developed through the conversion of specialists' tacit knowledge to explicit and integrated knowledge for efficient communication to non-specialists" (2001, p. 122). Organizational routines refer to "the development of task performance and coordination patterns, interaction protocols, and process specifications that allow individuals to apply and integrate their specialized knowledge without the need to articulate and communicate what they know to others" (Alavi and Leidner, 2001, p. 122). Lastly, task teams are formed for problem solving "in situations where task uncertainty and complexity prevent the specification of directives and organizational routines" (Alavi and Leidner, 2001, p. 122). Generally speaking, when individuals find a way to make knowledge concerning the performance of functions or tasks within an organization explicit in nature, the knowledge becomes routine or part of organizational norms (Alavi and Leidner, 2001). Therefore, for purposes of this research, this action demonstrates *knowledge application*. Workflow automation systems

and expert systems are prime information technology tools for accomplishing *knowledge application* because they serve as a "means of capturing and enforcing well specified organizational procedures" (Alavi and Leidner, 2001, p. 122).

Descriptive KM Framework.

The descriptive KM framework utilized for this study came from the Rubenstein-Montano et al. (2001) study. Rubenstein-Montano et al. identified the Holsapple and Joshi framework as "[presenting] the most comprehensive [hybrid] framework in the existing literature" (1998, p. 10). Although Rubenstein-Montano et al. (2001) classified the Holsapple and Joshi framework as a hybrid framework, Holsapple and Joshi defined it as "descriptive in nature" (1998, p. 2), therefore, for the purpose of this research, it is considered to be descriptive. To lend further credence to the use of this framework, the research conducted by Holsapple and Joshi to produce the framework involved over "30 scholars, researchers, and practitioners" (1998, p. 1). This Delphi-like international panel, Holsapple and Joshi, claim "[yielded] a fairly comprehensive and unifying perspective of KM" (1998, p. 2). The KM framework developed by Holsapple and Joshi (1998) contains the KM focus topics of *managerial influences*, *resource influences*, *environmental influences*, *activities*, and *learning and projection as outcomes* and each is described in the following sections (see Figure 3).

Figure 3. Descriptive KM Focus Topics
(adapted from Holsapple and Joshi Framework, 1998)

Managerial Influences.

Managerial influences are influences to KM that come from those employees within an organization who are in charge of KM functions (Holsapple and Joshi, 1998). In determining if actions by managers are influences KM within an organization, Holsapple and Joshi (1998) recommend looking for the four main factors of *managerial influences*. The four main factors are exhibiting leadership in the conduct of KM, coordinating the conduct of KM, controlling the conduct of KM, and the process of measuring the conduct of KM (Holsapple and Joshi, 1998).

Resource Influences.

According to Holsapple and Joshi (1998), *resource influences* include the elements of knowledge resources, human resources, and material resources. In simpler terms, many types of resources have impacts on how KM is conducted in an organization. These resources, if lacking, can hinder the conduct of KM and thus, affect the company's bottom-line and competitiveness.

Environmental Influences.

Factors external to an organization that have a direct effect on how KM is conducted within the organization are referred to as *environmental influences* (Holsapple

and Joshi, 1998). These *environmental influences* can affect the types of knowledge manipulation skills that are available to an organization (Holsapple and Joshi, 1998). The six main factors usually associated with environmental factors are competition, fashion, markets, technology, time and the GEPSE (governmental, economic, political, social, and educational) climate (Holsapple and Joshi, 1998).

Activities.

Much like Alavi and Leidner's (2001) view of KM activities, Holsapple and Joshi (1998) view the KM focus topic of *activities* as processes that people employ in the conduct of KM within an organization. In describing their particular view of the KM focus topic of *activities*, Holsapple and Joshi state the following:

> In the conduct of KM, participants use their knowledge handling skills to perform knowledge manipulation activities on knowledge resources. That is, knowledge manipulation activities are an expression of participants' knowledge manipulation skills" (1998, p. 9).

The four major *activities* which Holsapple and Joshi (1998) attribute to participants' skills are acquiring knowledge, selecting knowledge, internalizing knowledge, and using knowledge (which includes the sub-activities of externalizing and generating knowledge) (see Figure 4). Additionally, Holsapple and Joshi (1998) view these activities as occurring within, and creating, a knowledge flow inside an organization. Each of Holsapple's and Joshi's four major activities is described below:

- Acquiring Knowledge: "refers to the activity of identifying knowledge in the organization's environment and transforming it into a representation that can be *internalized*, and/or *used* within an organization" (1998, p. 12)
- Selecting Knowledge: "refers to the activity of identifying needed knowledge within an organization's existing *knowledge resources* and providing it in an

appropriate representation to an activity that needs it (i.e., to an *acquiring*, *using*, or *internalizing* activity)" (1998, p. 12)

- Internalizing Knowledge: "an activity that alters an organization's knowledge resources based on *acquired*, *selected*, or *generated* knowledge" (1998, p. 13)
- Using Knowledge: "the activity of applying existing knowledge to *generate* new knowledge and/or produce an *externalization* of knowledge" (1998, p. 14)

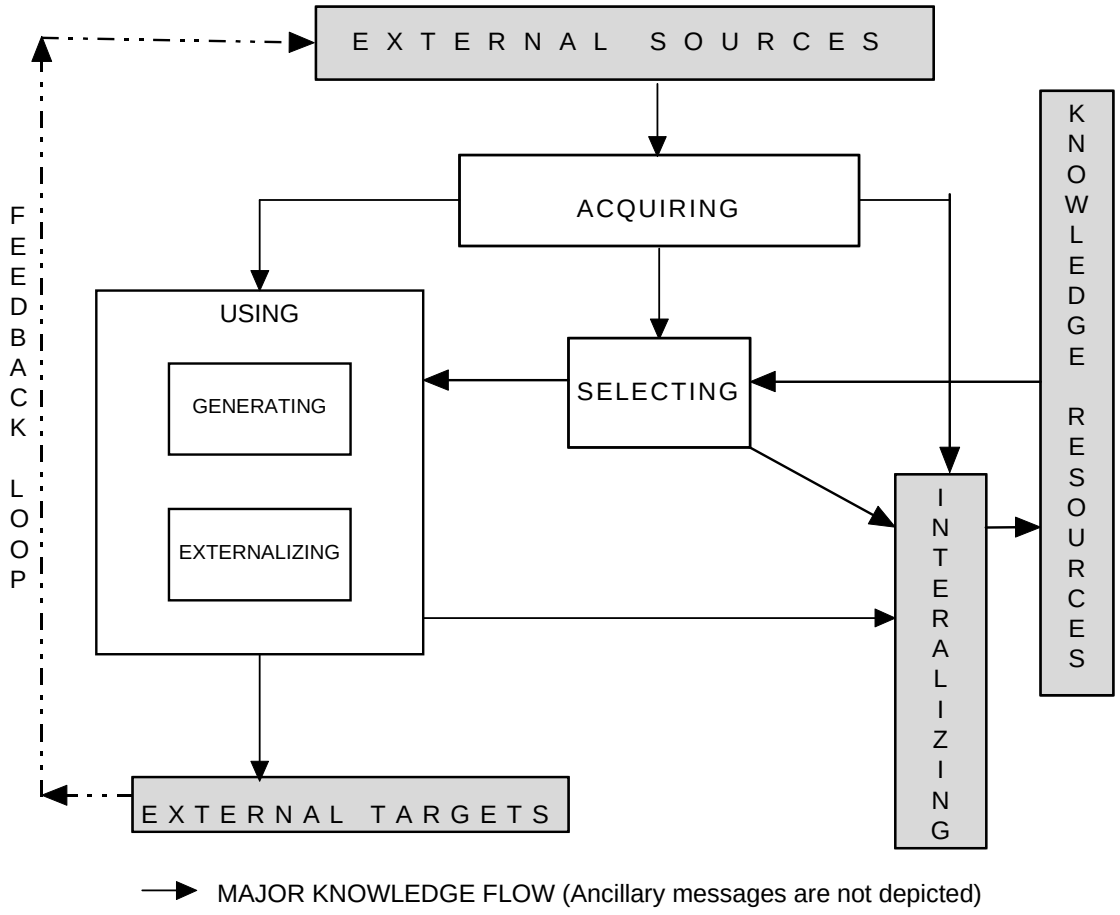

Figure 4. Major Knowledge Manipulation Activities (Holsapple and Joshi, 1998)

Learning and Projection as Outcomes.

When a company attempts to modify its human knowledge resources it is considered to be engaging in learning activities (Holsapple and Joshi, 1998). Examples of these efforts include those oriented toward problem solving, experimentation, simulation, scenario analysis, opportunity identification, data mining, or decision making (Holsapple and Joshi, 1998).

Projection is concerned with enhancing an organization's standing within its environment (e.g., its reputation and its competencies in the market) (Holsapple and Joshi, 1998). Therefore, when an organization releases its organizational resources into the market it is considered to be engaging in a projection activity (Holsapple and Joshi, 1998).

Although these two terms may not seem related, they are combined together here because learning and projection are two dimensions of organizational performance that are direct results of knowledge management conduct (Holsapple and Joshi, 1998). Learning concerns an organization's internal competencies, and projection concerns an organization's external competencies (Holsapple and Joshi, 1998).

The Single- and Double-Loop Learning KM Focus Topics.

The KM focus topics of *single-* and *double-loop learning* were born out of the academic research and theorizing of Argyris and Schön (1974, 1978; 1996) and Argyris (1994) on individual and organizational learning (Smith, 2001). Argyris and Schön (1978) describe the KM focus topics of *single-* and *double-loop learning* as occurring within, or as a result, of an individual's or organization's learning cycle. Within this

learning cycle, an individual or organization has a set of governing variables which drive actions/strategy, and yields certain outcomes or consequences (Argyris and Schön, 1978). To be considered effective, all three elements must work in sync with each other (Argyris and Schön, 1978). When the three elements do not work in sync with each other, then a mismatch is detected and some form of change, representing individual or organizational learning, must occur (Argyris and Schön, 1978). If an individual or organization decides to change the actions/strategies *only* in order to yield the expected consequences, then that individual or organization is seen as engaging in *single-loop learning* (Argyris and Schön, 1978). When an individual or organization decides to start from the beginning and change the governing variables which he, she, or they operate under in order to yield expected consequences, then that individual or organization is seen as engaging in *double-loop learning* (Argyris and Schön, 1978). A depiction of these actions can be seen in Figure 5.

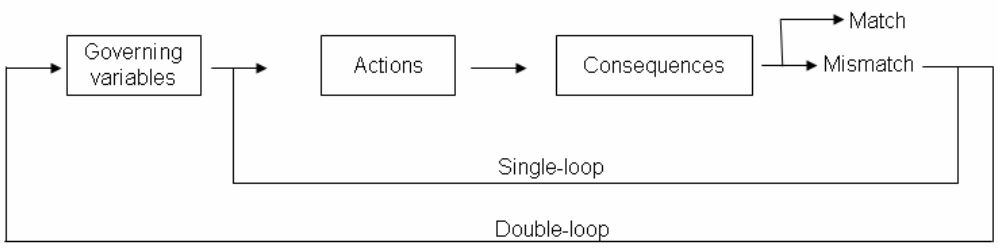

Figure 5. Single- and Double-loop Learning (adopted from Argyris, 1994)

Additional Consideration for a KM Systems Thinking Framework.

As mentioned earlier, Rubenstein-Montano et al. (2001) believe that to properly assess KM in an organization, conductors of KM must use a KM systems thinking

framework. However, as also mentioned, Rubenstein-Montano et al. (2001) did not create a KM systems thinking framework for researchers or practitioners to use. Therefore, without a complete guide on what a KM systems thinking framework should look like, researchers and practitioners have to decide what KM focus topics constitute a true KM systems thinking framework. Although the KM focus topics discussed previously capture the intent of Rubenstein-Montano et al.'s (2001) vision of a KM systems thinking framework, there is still a possibility that new KM focus topics have emerged since their study (conducted over five years ago). Therefore, for purposes of this research, it was decided to include one new KM focus topic which has the potential of capturing any new KM focus topic(s) that have emerged since Rubenstein-Montano et al.'s study. This KM focus topic is generically labeled *emerging KM focus topic* and is used as a place holder for any new KM focus topic(s) which does not conform to the KM focus topics already captured by the KM systems thinking framework.

The KM Systems Thinking Framework.

Given that a set of prescriptive and descriptive KM focus topics has been identified, the final step is to combine those KM focus topics into a KM systems thinking framework; adding, modifying, or removing any KM focus topics that may be needed (e.g., *emerging KM focus topic*), redundant or unnecessary. In reviewing the prescriptive and descriptive KM focus topics outlined earlier, it is determined that the only KM focus topicss that are redundant are the prescriptive KM focus topics of *knowledge creation*, *knowledge storage/retrieval*, *knowledge transfer*, and *knowledge application* from the Alavi and Leidner (2001) KM framework and the *activities* KM focus topic from the

Holsapple and Joshi (1998) KM framework. Therefore, since the Alavi's and Leidner's descriptions of their KM focus topics provide a better categorization capability, (Peachey et al., 2005) the *activities* KM focus topic is eliminated from the final KM systems thinking framework.

Additionally, although it was the initial intent within this research to add *single-* and *double-loop learning* into the KM systems thinking framework as standalone KM focus topic, as prescribed by Rubenstein-Montano et al. (2001), after reviewing the thoroughness of Holsapple's and Joshi's (1998) KM framework, it was decided that a different approach should be taken. Since the Holsapple and Joshi (1998) KM framework already included a component of *single-loop learning* (although not specifically stated in the framework) within the *learning and projection as outcomes* KM focus topic, modifying the *learning and projection as outcomes* KM focus topic to include *double-loop learning* would conform to Rubenstein-Montano et al.'s intent and eliminate the need to add *single-* and *double-loop learning* as two separate and distinct KM focus topics. Additionally, this action helps to facilitate the categorization of KM focus topics within KM-specific journal articles by not creating situations in which a coder may be forced to decide if an article discussing organizational learning is focusing primarily on learning in general or *single/double-loop learning* in particular. Therefore, modifying *learning and projection* as *outcomes* vice creating a two total new KM focus topics specifically for *single-* and *double-loop learning* eliminates this double or miscoding situation but still allows for *single-* and *double-loop learning* to be assessed

within KM-specific journal articles. This action, as well as the other actions described above, is graphically represented in Figure 6 below.

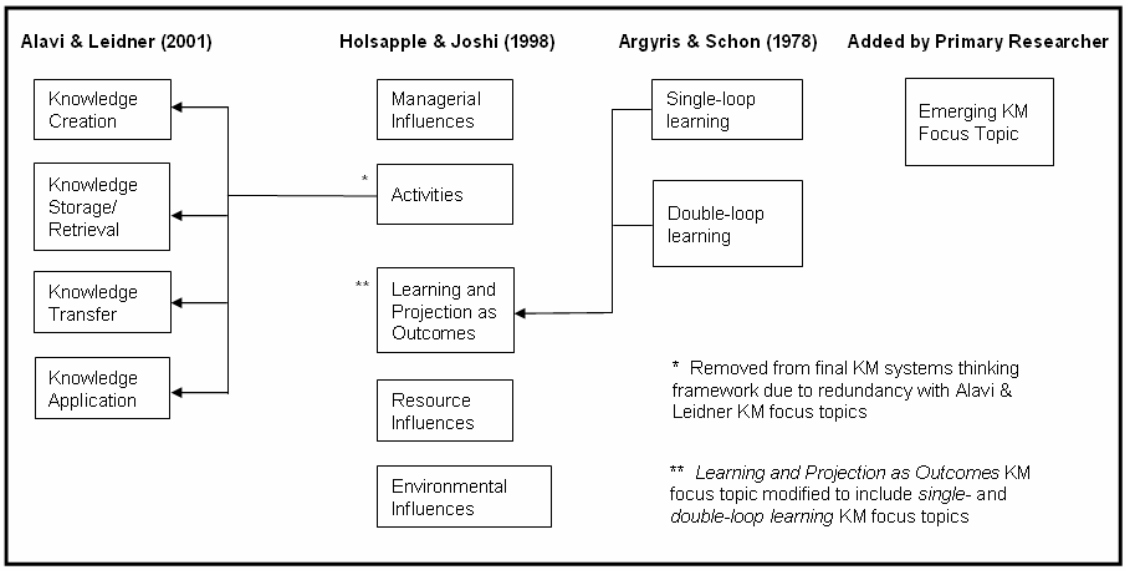

Figure 6. Combining KM Frameworks into a KM Systems Thinking Framework

After combining the KM focus topics from both the prescriptive and descriptive KM frameworks developed by Alavi and Leidner (2001) and Holsapple and Joshi (1998) respectively, adding the *emerging KM focus topic* KM focus topic, and incorporating the Argyris and Schön (1978) KM focus topics of single- and double-loop learning into the Holsapple and Joshi (1998) *learning and projection as outcomes* KM focus topic, the final KM systems thinking framework is developed (see Figure 7). This newly developed KM systems thinking framework is used throughout the study to identify KM focus topics discussed within KM-specific journal articles. Specifically, the KM focus topics contained within the KM systems thinking framework are used by the primary researcher

and coders of KM-specific journal articles to categorize the content discussed by the various authors of those articles. This categorization can then be used to assess the body of literature within KM-specific journals and answer research questions 1 and 2 as detailed in the Chapter I.

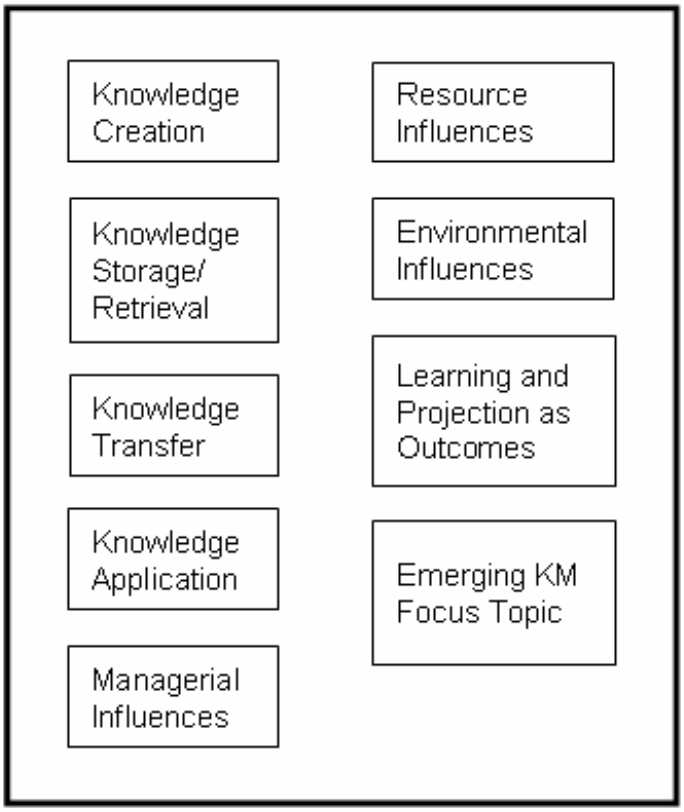

Figure 7. KM Systems Thinking Framework

What is a KM-specific Journal?

As stated previously, some researchers have moved away from their primary disciplines and have worked to create KM-specific journals of their own in which they publish high quality articles on KM research and practice (Jennex and Croasdell, 2005).

Although no *official* "KM-specific journal" definition exist, a KM-specific journal can be defined as a specialized publication dedicated to KM research and practice (Jennex and Croasdell, 2005). Furthermore, a KM-specific journal's main focus is to advance the discipline of knowledge management by publishing articles only pertaining to KM. One similarity among KM-specific journals is that they have a common goal of being interdisciplinary. Jennex and Croasdell, in their inaugural *IJKM* editorial paper, stated that their goal of an interdisciplinary approach to their journal was due to their belief that "[KM] is a fusion of many disciplines" (2005, p. i).

KM-specific journals have not been around very long and very few are currently in circulation. However, over the last five years, the number of KM-specific journals has begun to grow. Additionally, several other outlets for KM and intellectual capital management literature have emerged as identified by McKeen et al. (2006) (see Table 2). Although McKeen et al. (2006) did not distinguish between these outlets, further analysis of the outlets included in the study show that of the 10 publications identified, two were intellectual capital publications, five were KM-specific journals, two were KM-specific magazines, and one was a KM and process oriented journal. The five KM-specific journals identified by McKeen et al. (2006) were the *Journal of Knowledge Management*, *Journal of Knowledge Management Practice*, *Electronic Journal of Knowledge Management*, *Knowledge Management Research & Practice*, and the *International Journal of Knowledge Management*.

Table 2. Journals Devoted to KM and Intellectual Capital Management

Journal of Knowledge Management	International Journal of Intellectual Capital and Learning	Journal of Knowledge Management Practice
Electronic Journal of Knowledge Management	Knowledge Management Research & Practice	Journal of Intellectual Capital
International Journal of Knowledge Management	Knowledge Management	Knowledge Management Review
Knowledge and Process Management		

(adopted from McKeen et al., 2006)

The Interdisciplinary Nature of KM

To be described as interdisciplinary, an entity (e.g., journal or article) must consist of or reference two or more different disciplines (Lattuca, 2002). The "disciplines" Lattuca (2002) is referring to are academic disciplines. Introna states that "being an academic discipline is a status conferred by institutional practices such as the ability to form departments, appoint chairs, [organize] conferences, edit journals, etc." (2003, p. 236). Introna also states that groups without an academic discipline may become recognized as an academic discipline, if "they succeed to build up a sustainable, 'intellectual' or 'academic' infrastructure of departments, research programmes, conferences, journals, associations, etc." (2003, p. 236).

In addition to Introna's (2003) discussion of becoming recognized as an academic discipline, Benbasat and Zmud (2003), in describing the perceived identity crisis within the IS discipline, list three additional criteria which they believe are essential for an academic discipline. These three criteria, first introduced by Albert and Whetten (1985) in their discussion of organizational identity, are: a claimed central character, a claimed

distinctiveness, and a claimed temporal continuity (Benbasat and Zmud, 2003). In their discussion of the importance of these criteria within the IS academic discipline, Benbasat and Zmud state that "these criteria indicate that a collective's identity is based on a set of important, essential core properties that distinguish the collective from others in its environment" (2003, p. 184).

Although several academic disciplines exist, some groups still struggle to have their field of interest recognized as a legitimate discipline, as demonstrated by the discussions above; besides IS, KM is one such field (Schwartz, 2005). Some KM-specific journal editors have called for KM to be recognized as its own discipline citing their adherence to the criteria outlined by Kuhn (1996) for defining a discipline (Jennex and Croasdell, 2005). To be recognized as a standalone discipline, Jennex and Croasdell state that Kuhn (1996) lists the following criteria:

- Formation of specialized journals
- Foundation of professional societies (or specialized interest groups within societies-SIGs)
- Claim to a special place in academe (and academe's curriculum)
- An accepted body of knowledge for group members to build upon, eliminating having to build their field anew with each paper
- Promulgation of scholarly articles intended for and addressed only to professional colleagues, [those] whose knowledge of a shared paradigm can be assumed and who prove to be the only ones able to read the papers addressed to them, i.e. a specialized ontology

(2005, pp. i-ii)

As mentioned in Chapter II, Schwartz's (2005) call for papers to include in his book *Encyclopedia of Knowledge Management* yielded 29 different disciplines claiming

interest in the field of KM. This abundance of disciplines outside of *his* chosen discipline, IS, prompted Schwartz to make the following observations:

> First, [the result from this call for papers] tells us that we need to look far beyond the castle walls of information systems in our pursuit of knowledge management. Second, it tells us that a discipline of knowledge management or a formal academic program of knowledge management, needs to draw from at least 10, and perhaps as many as 20, contributing disciplines (2005, p. 10).

Schwartz's (2005) observations lead one to believe that for KM to be an academic discipline it should also be interdisciplinary, however Schwartz stops short of stating that in his article. This observation is echoed, however, in every KM-specific journal charter. If therefore, KM-specific journal founders agree with Schwartz that KM should consist of at least 10 or more disciplines (Schwartz, 2005), then their journals must publish articles from a variety of disciplines before they too can be considered interdisciplinary. But, what disciplines have an interest in and write articles about KM? Although it may be difficult to identify every discipline that claims interest in KM, Schwartz (2005) has given us a good starting point. The 29 disciplines identified by Schwartz (2005), therefore, provide a basis for assessing the interdisciplinary nature of KM-specific journals and establishes a baseline for the research framework defined in the next section.

Creating a KM Discipline Affiliation Framework

A KM discipline affiliation framework provides coders of KM-specific journal articles the necessary framework needed to categorize academic disciplines based on the academic discipline of the author(s) of those articles. As mentioned above, Schwartz (2005), by having the contributors to his book self-identify himself or herself, provides the necessary components needed to develop a KM discipline affiliation framework (see

Table 3). Specifically, the KM discipline affiliations contained within the KM discipline affiliation framework are used by the primary researcher and coders of KM-specific journal articles to categorize the disciplines associated with the various authors of those articles. This categorization can then be used to determine the interdisciplinary nature of KM-specific journals and answer research question 3 as detailed in the Chapter I.

Table 3. KM Discipline Affiliations of Contributing Authors

Banking	Finance	Media Management
Business Admin	Human Resource Mgmt	Organizational Science
Cognitive Science	Information & Library Science	Philosophy
Communications	Information Management	Real Estate
Computer Science	Information Systems	Science & Technology
Cultural Studies	Innovation Studies	Social Psychology
Economics	Management	Sociology
Education	Management Science	Statistics
Engineering	Marketing	Technology Mgmt
Engineering Mgmt	Mathematics	

(adapted from Schwartz, 2005)

III. Methodology

Overview

This chapter discusses the methodology used to conduct the research. To be more precise, this chapter explains the particular data collection techniques utilized and provides a complete explanation as to how the data collected will be used to answer the research questions discussed in Chapter I.

Use of a Mixed-Method Approach

Given the research questions identified and the type of data being collected, it was determined that a mixed-method approach to this research would be appropriate. A mixed-method approach allows the researcher to use both qualitative and quantitative tools in the conduct and analysis of data collection.

The rationale for selecting a mixed method approach was based primarily on Leedy's and Ormrod's (2001) methodology selection criteria (see Table 4). Leedy and Ormrod (2001) suggest that by answering five specific questions, the decision to utilize a qualitative or quantitative approach to research can be determined. Therefore, the questions to ask and the responses to those questions are detailed below.

What is the Purpose of the Research?

In answering this question, the researcher must determine whether the research is meant to *confirm and validate* or to *explore and interpret* (Leedy and Ormrod, 2001). In the case of this research, the answer is to *explore and interpret*. The research questions outlined in Chapter I are exploratory in nature and require the researcher to interpret from

the data collected exactly what the findings mean. Therefore, for this question, a qualitative approach is selected.

Table 4. Criteria for Methodology Selection

Question:	*Quantitative:*	*Qualitative:*
What is the purpose of the research?	• To explain and predict • To confirm and validate • To test theory	• To describe and explain • To explore and interpret • To build theory
What is the nature of the research process?	• Focused • Known variables • Established guidelines • Static design • Context-free • Detached view	• Holistic • Unknown variables • Flexible guidelines • Emergent design • Context-bound • Personal view
What are the methods of data collection?	• Representative, large sample • Standardized instruments	• Informative, small sample • Observations, interviews
What is the form of reasoning used in analysis?	• Deductive analysis	• Inductive analysis
How are findings communicated?	• Numbers • Statistics, aggregated data • Formal voice, scientific style	• Words • Narratives, individual quotes • Personal voice, literary style

(adapted from Leedy and Ormrod, 2001)

What is the Nature of the Research Process?

Of the many criteria associated with this question (e.g., *focused* versus *holistic*, *known* versus *unknown variable*, and *static* versus *emergent design*), the most important to this research is *detached* versus *personal view* (Leedy and Ormrod, 2001). Since the research being conducted assumes a lot of interpretation of data and context, a personal view is vital. Therefore, this question definitely points the researcher towards utilizing a qualitative approach.

What are the Methods of Data Collection?

The criteria outlined for this question can lead the researcher to either a quantitative or qualitative approach. First, Leedy and Ormrod (2001) recommend a

quantitative approach for any research which contains a large sample size. Since this research involves the entire population of KM articles from KM-specific journals over the last five years, the population size is rather large; therefore a quantitative approach would seem to be appropriate. However, since the primary researcher and coders are interested in what the nature/focus of the articles in KM literature within KM-specific journals is depicting, a qualitative approach seems to be the approach of choice (Leedy and Ormrod, 2001). Although this dichotomy between a qualitative and quantitative approach to research poses a problem for the researcher when selecting which approach to use, it is determined that the criterion of *observation* outweighs the *population* criterion for this particular research. Therefore, a qualitative approach, once again, is selected.

What is the Form of Reasoning Used in Analysis?

With only one criterion for each category, *deductive analysis* versus *inductive analysis* (Leedy and Ormrod, 2001), this question is fairly easy to answer. This research involves reviewing articles for specific content (e.g., KM focus topic(s) discussed); however this content may not always be easily determined by the coders of the articles. Therefore, because the primary researcher and coders have to interpret what each article author is trying to convey to the reader, an inductive analysis is necessary to properly code the articles. Hence, since *inductive analysis* is the required method, a qualitative approach is selected.

How are findings communicated?

Since the research will use a scientific method to "calculate" percentages of KM focus topics and KM discipline affiliations as well as do a comparative analysis between the collected data and the data collected from previous studies in order to answer the research questions, a quantitative analysis is selected for this research (Leedy and Ormrod, 2001).

The Final Tally.

Taking all of the questions into account, it is determined that a mixed-method approach to this research is appropriate. Additionally, since Leedy and Ormrod's (2001) table depicts a logical progression through a research effort (e.g., determining the purpose, then the nature of the research, etc.) it is determined that a qualitative approach will be used for the collection of the data needed for this research, and a quantitative approach will be used for analyzing and communicating the data collected.

Research Methodology

A content analysis methodology using a model developed by Neuendorf (2002) is chosen to conduct research design, data collection and analysis portions of this research. Neuendorf's (2002) model (discussed in more detail later) provides a step-by-step approach for assigning literature to a set of established categories. Additionally, a content analysis methodology is well suited for a mixed-method approach to research because it allows the researcher to perform qualitative forms of data collection (e.g., interpreting KM focus topics from KM-specific articles), but with the ultimate goal of producing quantitative results. This view is consistent with Neuendorf who states that

"content analysis has as its goal a numerically based summary of a chosen message set" (2002, p. 14).

The rationale for choosing a content analysis methodology comes directly from Neuendorf's (2002) book, *The Content Analysis Guidebook*. According to Neuendorf, "content analysis is (or should be) a research technique that conforms to the rules of science, most closely related to the technique of survey research, it uses messages rather than human beings as its level of analysis" (2002, p. 47). Therefore, since the use of Neuendorf's (2002) model requires the primary researcher and coders to analyze the messages (e.g., KM-specific journal articles) published by KM-specific journals, a content analysis methodology is considered appropriate. Moreover, Neuendorf states that "in a content analysis, an attempt is made to measure all variables as they naturally or normally occur. No manipulation of independent variables is attempted" (2002, p. 49). For this research, the KM focus topics contained in the KM systems thinking framework and the KM discipline affiliations contained in the KM discipline affiliation framework are measured by the primary researcher and coders exactly as they occur in the messages with no manipulation of independent variables. This action, therefore, conforms to Neuendorf's (2002) rationale for a content analysis methodology and provides greater credence to the use of a content analysis methodology for this research. Additionally, due to the close relationship between the goals of this research and the criteria for conducting such research as outlined by Neuendorf, a content analysis methodology is deemed appropriate.

Research Design

As briefly mentioned earlier, the research design for this research comes from a model developed by Neuendorf. In her book, *The Content Analysis Guidebook*, Neuendorf (2002) presents a model, what she refers to as a "flowchart," for conducting research using a content analysis methodology (see Figure 8). This flowchart outlines nine processes for conducting research within a content analysis methodology and allows other researchers to replicate the steps taken during this study in any future research efforts. Although the nine steps outlined by Neuendorf (2002) can be used for any content analysis study, for this research the second step, *conceptualizations*, was deemed unnecessary because this research did not employ the use of hypotheses for theory generation (e.g., no constructs were developed), therefore it was eliminated from the final flowchart used to conduct this study. After this modification, the remaining eight steps were applied to this research. Since steps one through six are associated with the initial research setup and coding execution involved in the study, only these steps are detailed below, however steps seven and eight, which involve analysis and reporting of findings, are discussed in Chapter IV.

Theory and Rationale.

This first step involves determining "what content will be examined and why" (Neuendorf, 2002, p. 50). To answer the "what" part of this step, a literature review was conducted as outlined in Chapter II. This literature review yielded evidence that KM focus topics had been researched within the leading IS journals, but the same could not be

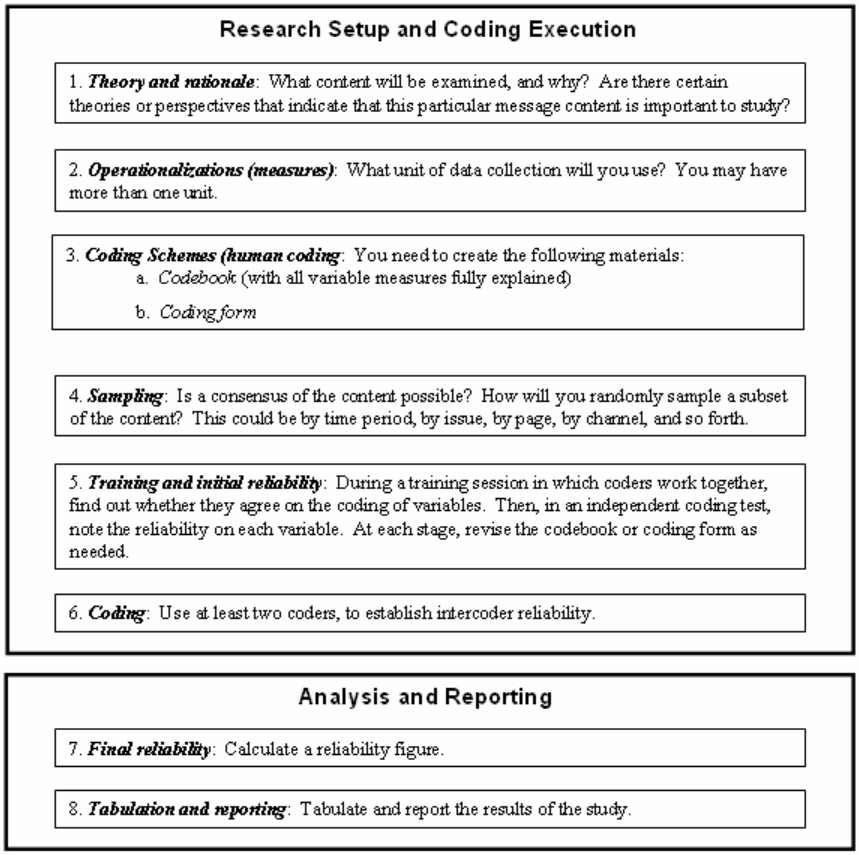

Figure 8. Content Analysis Research Flowchart (adapted from Neuendorf, 2002)

said of KM focus topics within KM-specific journals. Additionally, since no known research existed on KM focus topics within KM-specific journals, no comparison of these focus topics against the ones identified in the leading IS journals had been conducted. Lastly, although the disciplines who expressed interest in contributing to his book on KM had been reported by Schwartz (2005), no known research could be found that determined whether KM-specific journals, that purport to be interdisciplinary, were actually reflecting an interdisciplinary mix of these affiliated disciplines. Therefore, it was determined that research conducted on KM-specific journals would fill this void.

The "why" then is self-evident. With this void existing in the research literature, research of this type is beneficial in order to determine what the current body of KM literature in KM-specific journals looks like, how that body compares to the body of KM-literature in the leading IS journals, and whether KM-specific journals are, indeed, interdisciplinary.

Operationalizations (Measures).

As recounted in the Chapter II, Metaxiotis et al. state that "the main aim of a framework is to explain the domain and define a standardized schema of its core content as a reference for future design implementations" (2005, p. 11). The use of frameworks to facilitate this research was deemed pertinent in order to ensure that all of the operational variables associated with the research questions are described.

In order to answer questions RQ1 and RQ2, this research employed the KM systems thinking framework developed in Chapter II (see Figure 7). Each KM focus topic contained in the KM systems thinking framework (e.g., *knowledge creation*, *knowledge storage/retrieval*, *knowledge transfer*, *knowledge application*, *managerial influences*, *resource influences*, *environmental influences*, *learning and projection as outcomes*, and *emerging KM focus topic*) was considered to be an independent operational variable or measure. To answer RQ3, it was determined that the KM discipline affiliation framework developed in Chapter II (see Table 3) was required. Each distinct KM discipline affiliation identified by Schwartz (2005) (29 total) was considered to be an independent operational variable or measure.

Coding Schemes – Human Coding.

The use of technology to extract KM focus topics from KM-specific journal articles was deemed impractical given the research criteria of interpreting the KM focus topics from a content analysis of each article. Therefore, in using human coders to conduct the research, Neuendorf (2002) recommends creating a code book and code form. In explaining the importance of a code book and code form, Neuendorf states the following:

> All measures for human content analysis coding need to be fully explicated in a document called a code book. The code book corresponds to a coding form, which provides spaces appropriate for recording the codes for all variables measured. Together, the code book and coding form should stand alone as a protocol for content analyzing messages (2002, p. 132).

Before a code book or code form could be created, the units of analysis had to be determined. Therefore, the description of the units of analysis used in this research and the components of the code book and code form are detailed below.

Units of Analysis.

The units of analysis used for this research were the articles from the KM-specific journals selected by the primary researcher. These units of analysis were used by the researcher to collect the data needed in order to answer the research questions outlined in Chapter I.

Code Book.

The code book (see Appendix B) was created by the primary researcher. In creating the code book, the primary researcher provided descriptions of each KM focus

topic utilized to answer questions RQ1 and RQ2. To illustrate how the primary researcher developed these descriptions, the following scenario is provided:

> In developing the description for the operational variable, *knowledge transfer*, the primary researcher reviewed the Alavi and Leidner article, *Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues*, published in 2001. Within the Alavi and Leidner literature, the authors defined *knowledge transfer* as "the transfer of an individual's explicit knowledge to group semantic memory, (which can occur, for instance, when individuals place reports they have prepared on a group server for others to view)" (2001, p. 119) or the "transfer from individual tacit knowledge to group episodic memory" (2001, p. 119). Since the primary researcher viewed these definitions as being too formal for coding purposes, the primary researcher reworded the definition of *knowledge transfer* to read "a term primarily used when knowledge is shared or transferred from person-to-person, person-to-group, group-to-group, group-to-organization, etc. in an effort to communicate what is known." In addition to the revised definition, the primary researcher also provided certain keywords or phrases that could be easily identified by a coder within a KM-specific journal. For instance, communities of practice and expert/protégé relationships are just some of the many keywords or phrases that may allude to the existence of the *knowledge transfer* KM focus topic use in KM-specific journal articles.

Since no specific criteria for delineation of KM discipline affiliations could be found, only the instructions (techniques) for coding the KM discipline affiliations were included in the code book. Specifically, the primary researcher informed each coder to review the biography of each author or authors and, from those biographies, make a determination as to the discipline of that author or authors.

Code Form.

The code form (see Appendix C) was also created by the primary researcher and resembled a spreadsheet. Because the code book contained the majority of information concerning the coding technique and delineations of operational variables, the code form was kept to a minimum of complexity. The code form consisted of 11 columns with the first column reserved for the number of the article being reviewed, the second column being reserved for the number corresponding to the discipline of the author or authors, and columns 3 – 11 being reserved for coding of the KM focus topics found within each article. By columnizing the operational variables used in this study, the primary researcher and coders were able to document their findings by locating the matching article number of the article currently being reviewed on the code form and annotating the KM discipline affiliation and KM focus topic or topics identified in the columns provided.

Sampling.

Before any sampling could take place, a population of interest had to be determined. Based on a specific set of criteria, this determination was made by the primary researcher and yielded five KM-specific journals. A discussion of how the

population of interest and the final total of articles represented in the research were determined is presented below.

Population of Interest.

Due to the research questions being asked in this research, the use of KM-specific journal articles to form the population of interest was paramount. To determine what publications could be considered KM-specific journals and which of those journals should be used for the research, the primary researcher established four distinct criteria, with the first three specifically focusing on the journals themselves. Criterion one stated that the journal must currently be in distribution. However, this criterion did not preclude electronic journals from being used in the research. Electronic journals were deemed in circulation as long as their respective websites were being maintained and kept current. The second criterion stated that KM-specific journals had to be peer-reviewed. This means that any journals selected for the research had to be governed by an editorial board of some type. The third criterion stated that the journals must specify KM as their primary focus area. The last criterion was established in order to keep the population of interest at a manageable level. This criterion stated that the only journal articles included in the research were those which had been published within the last five years, covering the period from January 1, 2000 to September 30, 2005 (last quarter of 2005 eliminated to allow for coding of articles from October 1, 2005 to December 31, 2005). Although this criterion may by viewed by some as skewing the population base and possibly limiting the generalizability of this study to only the last five years, as stated earlier, Peachey et al. (2005) only included IS journal articles from 2000 to 2004, therefore, this

limitation had to be established to provide for a comparative analysis of the two journal types.

By adhering to the criteria established for KM-specific journal inclusion, the primary researcher was able to identify five KM-specific journals meeting all four criteria. These five journals were the *Electronic Journal of Knowledge Management*, *Journal of Knowledge Management*, *Knowledge Management Research & Practice*, *Journal of Knowledge Management Practice* and *International Journal of Knowledge Management.*

Final Sampling Population.

Due to the small number of KM-specific journals found meeting the criteria established above, the primary researcher determined a census could be taken vice sampling the population. Neuendorf states that in cases where a small population exits "there may be no need to draw a smaller, representative sample of the population" (2002, p. 74). She further goes on to say that in cases where "all units in the population [are] included in the study, [the population] would then be called a census" (2002, p. 74). After a review of the KM-specific journal articles present within the five KM-specific journals selected, the researcher determined that some of the articles did not pertain to the research being conducted. The subjects/focuses of the eliminated articles ranged from literature reviews (much like this research), to editorials, to articles whose abstracts or body never specifically discussed KM. Most of the articles eliminated due to their lack of KM focus concentrated on intellectual capital (IC), which, although very similar in nature to knowledge management, entails much more than just the managing of

knowledge within an organization. An example of the difference between these two areas is provided by Zhou and Fink (2003). Zhou and Fink state that "KM is concerned with knowledge generation, transfer, and application processes and the organizational environment to facilitate these processes, while IC focuses on the value perspective from harnessing a firm's intellectual capacity" (2003, p. 86). Therefore, since a difference between KM and IC exists, articles focusing only on IC were eliminated from the final population, along with the other article types discussed above, reducing the final number of articles available for this research from 469 to 317.

Training and Initial Reliability.

Neuendorf states that "three words describe good coder training: train, train, train" (2002, p. 132). To adhere to the full intent of Neuendorf's statement, every attempt was made to ensure the thorough training of each coder. In selecting the coders for this research, the primary researcher was cautious to limit coder selection to only those individuals who were familiar with KM concepts. To facilitate this criterion, all coders selected were required to have taken at least one graduate-level KM class and to have participated in coder training. To aid in the training effort, three of the four coders selected were involved in initial coder training in which they coded a similar coding scheme for a class project. The fourth coder resided outside of the state in which the training took place; therefore he was not able to attend the training. However, he was offered the opportunity to review the code book for thoroughness and was afforded time, before the research began, to provide comments to the primary researcher. Additionally,

since this coder had performed similar research on this topic in the past, coder training was not seen as essential to overall coder reliability.

To facilitate the coder training of the other three coders, however, the primary researcher created a code book for a class project in which over half of the operational variables used in this study was used for the project research. Each coder in the training was afforded the opportunity to use the code book during the coding process and provided feedback, as necessary, to the primary researcher for items within the code book which were ambiguous. This feedback was used by the primary researcher to gain consensus regarding the overall effectiveness of the code book during the coding process. This method of coding against a code book and providing feedback is consistent with Neuendorf's (2002) recommendation for pilot training. Additionally, this training of coders allowed for "pilot" coding to take place (Neuendorf, 2002). Neuendorf states that "practice coding, called pilot coding, can inform the researchers as to the reliability and overall validity of the coding scheme" (2002, p. 133). Pilot coding takes place when, during the training process, revisions are made to the code book based on coders' suggestions (Neuendorf, 2002). By conducting pilot coding on the code book, the primary researcher was able to correct any areas in the code book which caused miscoding and confusion among coders. This correction ability, hence, allowed the primary researcher to develop a standardized code book which facilitated consistent coding of KM-specific journal articles throughout this research.

Coding.

Coding of the 317 KM-specific journal articles included in the research was conducted by the primary researcher and four coders. Each article included in the study was coded by the primary researcher and one of the four coders ensuring a minimum of two coders per article for reliability purposes (Neuendorf, 2002). To facilitate ease of identifying each two-coder pair, the primary researcher assigned a label to each pair, with the first pair labeled Coder *A*, the second pair labeled Coder *B*, the third pair labeled Coder *C*, and the last pair labeled Coder *D*. It must be stated, however, that the term two-coder pair was only used for intercoder reliability purposes only. Neither the primary researcher, nor any of the four coders, knew how the other coders were coding his articles; ensuring that each article received an independent review by each coder coding the article, and eliminating the possibility of coders seeking consensus on operational variable(s) findings. This technique is consistent with Neuendorf's (2002) guidance for final coding. Neuendorf states that "final coding is to be done by each coder individually; at this stage, it is not a consensus-building process" (2002, p. 133).

Although the number of articles available for this study was small by some accounts, the limited number of coders available for the research forced the primary researcher to randomly divide the articles amongst the four pairs of coders for coding. Because the primary researcher was a member of each coder pair, the primary researcher, in essence, coded each and every article while the four additional coders coded only those articles specifically assigned to them. Three of the coders and the primary researcher received the articles in hard copy form, while the fourth coder (due to his remote status)

elected to receive the articles in soft copy form (e.g., a compact disc). This medium format coincides with Neuendorf's (2002) "tips" for coding. Neuendorf states that "human text coding seems to work better with hard copy (Frank, 2000), especially when some measures are helped by the coders being able to mark up the pages" (2002, p. 135). For the three coders who received their articles in hard copy, Neuendorf's tip was seen as successful. The fourth coder, having had experience in using soft copy forms to code articles, relayed that the soft copy version was better for his coding approach.

To perform the actual coding of the articles, each coder was instructed to perform the following six operations. First, every article was to be read for content. In particular, each coder was instructed to look for what the author or authors were trying to convey to the audience. Second, each coder was instructed to (on the row within the code form corresponding to the specific article being reviewed) annotate the KM focus topic(s) discussed in the article. To properly mark the code form, coders were instructed to place the number "1" in the specific column representing the KM focus topic discussed. In instances where more than one KM focus topic was discussed in an article, coders were instructed to place a "1" in each and every column associated with the KM focus topics observed. For instance, if a coder found that the KM focus topics of *knowledge creation*, *managerial influences*, and *resource influences* were discussed in a KM-specific journal article, the coder would first locate the row corresponding to the article being coded on the code form, then the coder would place the number "1" in the *knowledge creation* column, then the coder would place the number "1" in the *managerial influences* column, and lastly, the coder would place the number "1" in the *resource influences* column.

The third step of the coding process was placed in the code book to capture any emerging KM focus topic(s). If, during the coding process, coders identified a KM focus topic not represented by the KM focus topics outlined by Alavi and Leidner (2001) or Holsapple and Joshi (1998), the coders were instructed to annotate that new KM focus topic in the *emerging KM focus topics* column by writing/typing the KM focus topic in the column. Fourth, after each article had been coded appropriately for KM focus topics, each coder was instructed to read the biography or biographies of each author or authors of the article under review. Fifth, each coder was instructed to (using the KM discipline affiliation framework provided) try and discern which academic discipline most closely matched the discipline of the primary author or authors of the article. Lastly, each coder was instructed to annotate the corresponding number of the discipline determined on the code form in the discipline column for that specific article. Once all of the above steps were completed, coding for that specific article was considered to be completed.

Analysis and Reporting.

As mentioned earlier, the final two steps (final reliability and tabulation/reporting) in Neuendorf's flowchart will be discussed in detail in Chapter IV. However, at this time it is important to briefly discuss how the final two steps will be conducted.

Final Reliability.

Neuendorf states that "the final reliability assessment should be done on another randomly selected subsample during the full data collection, to fairly represent coders' performance throughout the study. These final reliability figures are the ones to be reported with the study's results" (2002, p. 146). In keeping with Neuendorf's guidance

for final reliability, this research employs the use of what Neuendorf states is "the most popular coefficients in business and the social and behavioral sciences…raw percent agreement" (2002, p. 148). Additionally, since the number of units to be coded by each two-coder pair is so small, all units that are coded by the primary researcher and each coder are used in calculating intercoder reliability vice selecting a subsample.

In calculating raw percent agreement, Neuendorf states that "the intercoder reliability coefficients do not assess internal consistency among a variety of measures…rather, they are concerned with the assessment, one measure at a time, of one or more of the following criteria: agreement, agreement beyond chance, and covariation" (2002, pp. 148-149). In reviewing Neuendorf's definition of each criterion, it was determined that the criterion of *agreement* was most applicable to this research because simple agreements could be assessed based on whether the coders agreed or disagreed on the existence of a KM focus topic or KM discipline affiliation with a given article. This decision to focus on the criterion of agreement conforms to Neuendorf's rationale because, as she states, "this is particularly appropriate to measures that are categorical (i.e., nominal), wherein each pair of coded measures is either a hit or miss" (2002, p. 149). Therefore, to calculate intercoder reliability using the agreement criterion, Neuendorf suggests using the formula $\mathbf{PA_o = A/}\boldsymbol{n}$ "where $\mathbf{PA_o}$ stands for 'proportion agreement, observed,' **A** is the number of agreements between two coders, and ***n*** is the total number of units the two coders have coded for the test (also, the maximum agreement they could achieve)" (2002, p. 149). When this calculation is complete, it will yield a value between .00 and 1.00 indicating the percent of agreement (.00 meaning no

agreement and 1.00 meaning perfect agreement) (Neuendorf, 2002). Since this research involves the primary researcher and four coders (i.e., two-coder pairs, Coder *A* – *D*), four separate sets of $\mathbf{PA_o}$s will be calculated corresponding to the four sets of two-coder pairs. Additionally, overall $\mathbf{PA_o}$s will be calculated for each measure depicting the overall intercoder reliability between the primary researcher and all four coders combined. This calculation will involve taking the overall number of agreements between the primary researcher and all four coders for a particular measure (e.g., *knowledge transfer*) and dividing that number by 317 (the total number of units in the study).

To obtain the values corresponding to the variables listed above, the primary researcher determines the number of agreements between he and each coder and divides that number by the total number of units coded by the primary researcher and the coder (i.e., 78 for Coder *A*, 80 for Coder *B*, 79 for Coder *C*, and 80 for Coder *D*). For instance, if this first two-coder pair, Coder *A* (consisting of the primary researcher and one of the four additional coders), coded the same 78 units, the primary researcher would pick one of the measures coded (e.g., *knowledge creation*), total the number of agreements between the two coders on that measure, and divide that number by 78 (total units coded). This calculation would yield a value between .00 and 1.00 and indicate the percent of agreement of these two coders for that specific measure. After this calculation is complete, the primary researcher would pick the next measure (e.g., *managerial influences*) and perform the same calculation for him and the same coder. These calculations would be continued until all measures coded by all coders had been completed. For purposes of this research, KM discipline affiliation is regarded as being

only one nominal (categorical) measure with 29 distinct categories corresponding to Table 3 (see Chapter II). For example, if the primary researcher coded the KM discipline affiliation for article #101 as being written by an author from the information management discipline (coded with a 14) and the second coder of the two-coder pair, Coder *B*, coded the same article as also being written from an author representing the information management discipline, then the KM discipline affiliation measure would be tabulated as an agreement between the two coders.

Tabulation and Reporting.

For purposes of this research, simple descriptive frequency calculations are employed (Neuendorf, 2002). These descriptive frequencies are then used to answer the three research questions discussed in Chapter I. An introduction to how the data collected is used to answer each question is discussed below.

Research question 1 is answered by tabulating the number of units (e.g., KM-specific journal articles) that contain each measure (e.g., KM focus topic). These tabulated numbers are then divided by the total units included in the study. The resulting percentages are then used to answer RQ1 by showing the distribution of KM focus topics across the KM-specific journal articles. This distribution, then, depicts what the body of KM-specific journal literature looks likes.

Research question RQ2 is answered by comparing the distributions calculated for RQ1 against the distributions identified by Peachey et al. (2005) for the leading IS journals. Since this study includes more KM focus topics than the Peachey et al. (2005) study, only the similar categories (i.e., *knowledge creation*, *knowledge storage/retrieval*,

knowledge transfer, and *knowledge application*) will be compared. Additionally, since this research uses a simple descriptive frequency calculation method vice the proportional calculation method used in the Peachey et al. (2005) study, the data collected from RQ1 must be recalculated using the proportional calculation method to ensure proper comparison. After performing the recalculations the researcher can then compare the four KM focus topics side-by-side and determine whether the bodies of KM-specific journals' and the leading IS journals' literature are similar or dissimilar.

Research question 3 is answered in a similar fashion to RQ1. However, for this research question, since each KM-specific journal article has at least one primary author, instead of calculating whether an article contains a measure, this research question is answered by tabulating the number of times a KM discipline affiliation appears in the total units studied (e.g., 20 of the 317 total articles reviewed may be found to have been written by an author from the engineering discipline). The number calculated for that specific discipline affiliation is then divided by the total number of units included in the study, and the yielded percentage is used in depicting final distributions of KM discipline affiliations contributing to KM-specific journals. This final distribution is then used to determine how interdisciplinary KM-specific journals truly are, therefore answering RQ3.

IV. Analysis and Results

Overview

This chapter presents the results of the research. In particular, this chapter first establishes the final reliability for the research by presenting the results of the intercoder reliability calculations performed for the primary researcher and the coders involved in the study. The chapter then concludes by presenting the answers or results for each research question discussed in Chapter I.

Final Reliability

As discussed in Chapter III, Neuendorf states that "the final reliability assessment should be done on another randomly selected subsample during the full data collection, to fairly represent coders' performance throughout the study. These final reliability figures are the ones to be reported with the study's results" (2002, p. 146). In keeping with Neuendorf's guidance, this action was taken by the primary researcher, however, as also stated in Chapter III, since the number of units coded by each two-coder pair was so small, all units coded by the primary researcher and each coder were used in calculating intercoder reliability vice selecting a subsample. In addition to this action, the primary researcher also adhered to Neuendorf's (2002) guidance on calculating raw percent agreement. To facilitate this action, the primary researcher ensured intercoder reliabilities were calculated for each measure (e.g., *knowledge creation*, *managerial influences*, and *resource influences*) on the criterion of *agreement*. The *agreement* criterion, as outlined by Neuendorf, involves the use of the formula $\mathbf{PA_o = A/}\boldsymbol{n}$ to calculate intercoder reliabilities "where $\mathbf{PA_o}$ stands for 'proportion agreement, observed,'

A is the number of agreements between two coders, and ***n*** is the total number of units the two coders have coded for the test (also, the maximum agreement they could achieve)" (2002, p. 149). As a result of performing this calculation for each measure, the primary researcher was able to yield $\mathbf{PA_o}$ values indicating the percent of agreement between himself and the four coders (separately) for each measure included in the study (Neuendorf, 2002). In addition to these four separate sets of $\mathbf{PA_o}$ values, the primary researcher also calculated overall $\mathbf{PA_o}$ values for each measure included in the study indicating overall intercoder reliability between him and the four coders (collectively). Since the KM focus topics and KM discipline affiliations are separate measurement areas, each measurement area has been given its own distinct reporting table (see Tables 5 and 6).

Final Reliabilities for KM Focus Topics.

To calculate final reliabilities for the KM focus topics, the primary researcher used the calculation guidelines discussed above. As a result of the calculations performed, the primary researcher was able to determine whether the calculated $\mathbf{PA_o}$s conformed to Neuendorf's recommendations for *acceptable* levels of intercoder reliability. It must be noted at this point, however, that due to the variability of the *emerging KM focus topics* measure, no agreements could be found between or amongst coders, therefore, the $\mathbf{PA_o}$s for this measure are not included in the following discussion. Additionally, to facilitate ease of reading, any reference to specific $\mathbf{PA_o}$s for a particular coder actually refers to the $\mathbf{PA_o}$s calculated for the primary researcher and that specific coder. For example, a

reference to Coder *A*, refers to the calculation of **PA_o**s for the two-coder pair of the primary researcher and Coder *A*.

Table 5. Two-coder Pair Reliabilities for KM Focus Topics

KM Focus Topic	Coder *A*	Coder *B*	Coder *C*	Coder *D*	Overall
Knowledge Creation	.86	.85	.87	.85	.86
Knowledge Storage/ Retrieval	.78	.94	.85	.81	.85
Knowledge Transfer	.67	.81	.82	.76	.77
Knowledge Application	.95	.84	.90	.98	.91
Managerial Influences	.95	.93	.84	.88	.90
Learning/ Projection as Outcomes	.87	.76	.84	.91	.85
Environmental Influences	1.00	.80	.97	.98	.94
Resource Influences	.82	.94	.73	.83	.83

Additionally, to facilitate ease of reading Table 5 above, any reference to specific **PA_o**s for a particular coder actually refers to the **PA_o**s calculated for the primary researcher and that specific coder. For example, a reference to Coder *A*, refers to the calculation of **PA_o**s for the two-coder pair of the primary researcher and Coder *A*.

Although Table 5 depicts all of the **PA_o**s calculated for each measure against each two-coder pair, the following discussion is presented in order to synthesis the final reliability results. For Coder *A*, the **PA_o**s calculated ranged from .67 for the *knowledge transfer* measure to 1.00 for the *environmental influences* measure. For Coder *B*, the **PA_o**s calculated ranged from .76 for the *learning and projection as outcomes* measure to

.94 for both the *knowledge storage/retrieval* and *resource influences* measures. Coder *C*'s **PA_o**s ranged from .73 for the *resource influences* measure to .97 for the *environmental influences* measure. Lastly, Coder *D*'s **PA_o**s ranged from .76 for the *knowledge transfer* measure to .98 for both the *knowledge application* and *environmental influences* measures. Additionally, the overall **PA_o**s calculated for the primary researcher and the collective of coders ranged from .77 for the *knowledge transfer* measure to .94 for the *environmental influences* measure.

In her discussion of *acceptable* levels of intercoder reliabilities, Neuendorf states that "what constitutes an acceptable level of intercoder reliability for each variable is open to debate" (2002, p. 143). Additionally, Neuendorf states that "common standards are not in place" (2002, p. 143) and commences to provide five examples of the varying standards applied today. After a brief discussion of each standard, Neuendorf concludes by stating that "it's clear from a review of the work on reliability that reliability coefficients of .90 or greater would be acceptable to all, .80 or greater would be acceptable in most situations, and below that, there exists great disagreement" (2002, p. 143). Therefore, since the majority of **PA_o**s calculated for this research are above .80, it is logical to conclude that these intercoder reliabilities would be acceptable to outside scrutiny (Neuendorf, 2002). The only measure not conforming completely to this standard is the *knowledge transfer* measure in which the **PA_o**s calculated range from a low of .67 to a high of .82. However, with the overall **PA_o** being calculated at .77, it is logical to conclude that this measure would still be acceptable in most situations as well. This conclusion is based on the fact that three of the five references used by Neuendorf to

determine *acceptable* levels of intercoder reliabilities conclude that reliabilities above .70 are considered reliable (Neuendorf, 2002).

Final Reliabilities for KM Discipline Affiliations.

Once again, to calculate final reliabilities for the KM discipline affiliations, the primary researcher used the calculation guidelines discussed above. As a result of the calculations performed, the primary researcher was able to determine whether the calculated $\mathbf{PA_o}$s conformed to Neuendorf's recommendations for *acceptable* levels of intercoder reliability. Additionally, to facilitate ease of reading, any reference to specific $\mathbf{PA_o}$s for a particular coder actually refers to the $\mathbf{PA_o}$s calculated for the primary researcher and that specific coder. For example, a reference to Coder *A*, refers to the calculation of $\mathbf{PA_o}$s for the two-coder pair of the primary researcher and one of the four additional coders. Although Table 6 below depicts all of the $\mathbf{PA_o}$s calculated for the KM discipline affiliation measure against each two-coder pair, the following discussion is presented in order to synthesize the final reliability results. For Coder *A*, the $\mathbf{PA_o}$ calculated was .36. For Coder *B*, the $\mathbf{PA_o}$ calculated was .64. Coder *C*'s $\mathbf{PA_o}$ was .47, and Coder *D*'s $\mathbf{PA_o}$ was .44. Additionally, the overall $\mathbf{PA_o}$ calculated for the primary researcher and the collective of coders was .48.

Taking into account Neuendorf's (2002) recommendations for *acceptable* levels of intercoder reliability, the $\mathbf{PA_o}$s calculated for the KM discipline affiliation measure seem to be below any recognized acceptable levels. Although the $\mathbf{PA_o}$ calculated for Coder *B* (.64) was close to an acceptable level of intercoder reliability, the overall $\mathbf{PA_o}$ of .48 reduces the reliability of this finding. However, it should be stated that although the

simple agreement calculation method yielded unacceptably low intercoder reliability results, other calculation methods may demonstrate higher intercoder reliability results, thus proving these results to be within acceptable levels (Neuendorf, 2002).

Table 6. Two-coder Pair Agreements for KM Discipline Affiliation Measure

Two-Coder Pairing	KM Discipline Affiliation
Coder *A*	.36
Coder *B*	.64
Coder *C*	.47
Coder *D*	.44
Overall	.48

Findings

As discussed earlier, the final population for this research consisted of 317 articles from five KM-specific journals. Therefore, the findings discussed in this section are based primarily off of these 317 articles only. Before the specific results are presented below, it is appropriate at this point to briefly identify the distribution of the final population of KM-specific journal articles. In particular, of the 317 articles included in this study, 7 came from *IJKM*, 30 came from *KMRP*, 35 came from *EJKM*, 52 came from *JKMP*, and the remaining 193 came for *JKM* (see Table 7). This uneven distribution can be attributed partially to the number of years *JKMP* and *JKM* have been in existence (five to six years longer than the other KM-specific journals); however, the large disparity between *JKMP* and *JKM* can only be explained by the difference in the number of

articles produced annually by each KM-specific journal. For instance, between January 1, 2005 and September 30, 2005, *JKM* published a total of 43 articles while *JKMP* only produced 20 articles.

Table 7. KM-specific Journal Article Distributions

KM-specific Journal	Year Started	Number of Articles Included in Study
IJKM	2005	7
KMRP	2003	30
EJKM	2003	35
JKMP	1998	52
JKM	1997	193

In answering the research questions first identified in Chapter I, the primary researcher had to use the analysis techniques outlined in Chapter III. In particular, the primary researcher utilized Neuendorf's (2002) recommendations for tabulating and reporting as indicated in step eight of her flowchart (see Figure 8 in Chapter III). The specific actions taken within this step and the results yielded for each research question are addressed below.

Research Question RQ1.

As outlined in Chapter III, research question 1 was answered by tabulating the number of units (e.g., KM-specific journal articles) that contained each measure (e.g., KM focus topic). These tabulated numbers were then divided by the total units included in the study. The resulting percentages were then used to answer RQ1 by showing the distribution of KM focus topics across the KM-specific journal articles (see Table 8).

In reviewing the results of this research for RQ1, the following observations can be made. First, in determining what the body of literature for KM-specific journals looks like, the results show that the body of literature does contain all of the KM focus topics identified in the KM systems thinking framework. Secondly, the body of literature for KM-specific journals reflects a wide dispersion of KM focus topics ranging from a low percentage of coverage for the *environmental influences* and *knowledge application* KM focus topics (11% and 17% respectively) to a high percentage of coverage for the *knowledge transfer* KM focus topic (68% coverage). Lastly, there was one new "emerging" KM focus topic discovered during analysis. The emerging KM focus topic of knowledge mapping was found to be discussed in six percent (6%) of the articles reviewed. In the articles which covered knowledge mapping, many focused on how knowledge mapping can help identify *what* and *where* knowledge exists in an organization. For example, Iske and Boersma state that "a knowledge map illustrates or 'maps' how knowledge flows throughout an organization, [and that] in almost all KM projects the creation of a so-called knowledge map is one of the key activities" (2002, p. 129). Since this specific discussion did not seem to fall within the boundaries of the other eight KM focus topics already included in the KM systems thinking framework, it was deemed by the primary researcher as meeting the criterion of being a new or emerging KM focus topic and is being identified as such in this study. However, it should be noted that this observation was made only by the primary researcher and not by the four additional coders involved in the study, thus bringing the reliability of the finding into question.

Table 8. KM Focus Topic Coverage in KM-specific Journals

KM Focus Topic	# Articles Where Topic Observed	% of Population
Knowledge Creation	102	32
Knowledge Storage/Retrieval	113	36
Knowledge Transfer	217	68
Knowledge Application	55	17
Managerial Influences	90	28
Learning/Projection as Outcomes	92	29
Environmental Influences	36	11
Resource Influences	151	48
Emerging KM Focus Topic of Knowledge Mapping	20	6

Research Question RQ2.

Research question 2 was answered by using a recalculated subset of the data collected from RQ1 to compare to the distributions identified by Peachey et al. (2005) for the leading IS journals. Since this study includes more KM focus topics than the Peachey et al. study, only the similar categories (i.e., *knowledge creation*, *knowledge storage/retrieval*, *knowledge transfer*, and *knowledge application*) were compared (see Figure 9 and Table 9). It should be noted, however, that by eliminating the KM focus topic of *knowledge roles and skills* from the Peachey et al. study results, the percentages for the leading IS journals do not add up to 100% (*knowledge roles and skills* accounted for 9.85% of the total KM focus topic coverage). Additionally, since the Peachey et al.

(2005) study used a different calculation method (see Chapter III), the subset was recalculated using the Peachey et al. calculation method. Once the recalculations were complete, each KM focus topic within the subset of the KM-specific journals was compared against the KM focus topic identified in the Peachey et al. (2005) study to ascertain whether the two distributions were similar or dissimilar.

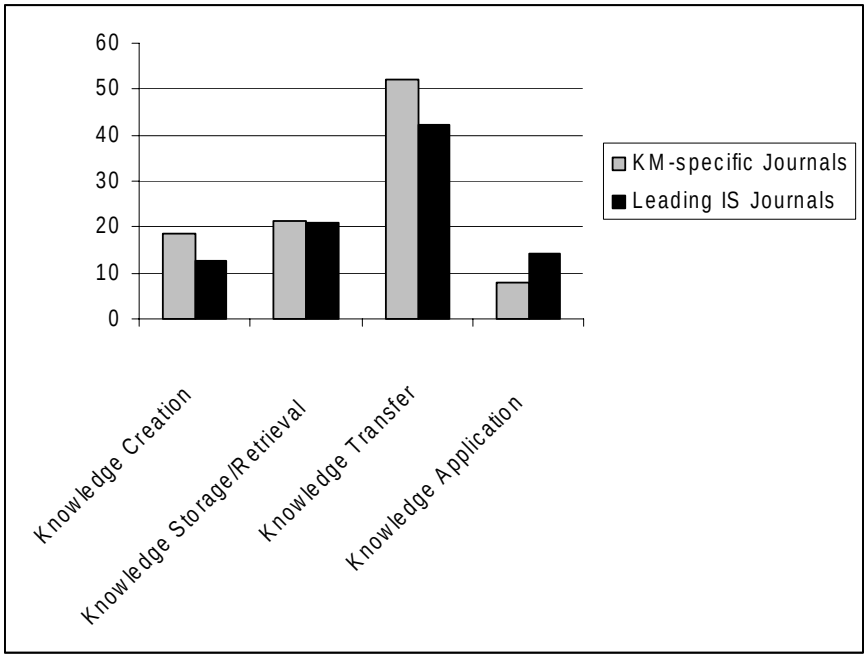

Figure 9. Comparison of KM-specific Journals and the Leading IS Journals

Table 9. Comparison of KM-specific Journals and the Leading IS Journals

KM Focus Topic	KM-specific Journals	Leading IS Journals
Knowledge Creation	18.55	12.75
Knowledge Storage/Retrieval	21.31	21.08
Knowledge Transfer	52.14	42.30
Knowledge Application	7.98	14.02

The results from the comparison of the two distributions indicates that the amount of coverage in both the KM-specific journals and the leading IS journals are similar. Specifically, the comparison confirms that the KM focus topic of *knowledge storage/retrieval* is given the same amount of coverage and the remaining three KM focus topics are given approximately the same amount of coverage with only a seven to ten percent difference detected.

Research Question RQ3.

Research question 3 was answered in a similar fashion to RQ1. However, for this research question, since each KM-specific journal article had at least one primary author, instead of calculating whether an article contained a measure, this research question was answered by tabulating the number of times a KM discipline affiliation appeared in the total units (e.g., KM-specific journal articles) studied. The number calculated for that specific KM discipline affiliation was then divided by the total number of units included in the study, and the yielded percentage was used in depicting final distributions of KM discipline affiliations contributing to KM-specific journals. This final distribution was then used to determine how interdisciplinary KM-specific journals truly are, therefore answering RQ3 (see Table 10).

Although the above table details the distributions of KM discipline affiliations observed during this study, the following discussion is presented in order to synthesize the results. First, of the 29 distinct disciplines outlined by Schwartz (2005), 22 (or 76%) were observed during the coding process, ranging from business administration to technology management. Furthermore, aside from the 22 disciplines found, the health

Table 10. KM Discipline Affiliations Found in KM-specific Journals

KM Discipline Affiliation	# Articles Observed	% of Pop.
Business Administration	35	11.04
Cognitive Science	2	0.64
Communications	4	1.26
Computer Science	11	3.47
Economics	9	2.84
Education	4	1.26
Engineering	14	4.42
Engineering Management	4	1.26
Finance	3	0.95
Health Care	1	0.32
Human Resource Management	13	4.10
Information & Library Science	4	1.26
Information Management	14	4.42
Information Systems	81	25.55
Innovation Studies	4	1.26
Management	59	18.61
Management Science	8	2.52
Marketing	7	2.21
Organizational Science	16	5.05
Science & Technology	5	1.58
Social Psychology	4	1.26
Sociology	4	1.26
Technology Management	11	3.47
Total	371	100

care discipline (not identified in Schwartz's article) was also observed contributing to the body of literature for KM-specific journals. Second, of the 23 disciplines observed during the coding, the least observed discipline came from the aforementioned health care profession (0.32%), while the greatest observed discipline came from the information systems profession (25.55%). The next closest discipline to the information systems discipline came from the management profession (18.61%), followed closely by the business administration discipline (11.04%). The remaining 19 disciplines had

coverage percentages ranging in values from 0.64% for the cognitive science discipline to 5.05% for the organizational science discipline. This abundance of KM discipline affiliations represented in KM-specific journals attests to the strong interdisciplinary nature of these journals.

Summary

This chapter presented the results of the research. In particular, this chapter first established the final reliability for the research by presenting the results of the intercoder reliability calculations performed for the primary researcher and the coders involved in the study. The chapter then concluded by presenting the answers or results for each research question discussed in Chapter I.

In answering research question 1, the researcher observed that the *knowledge transfer* KM focus topic was given the most coverage (68%) in KM-specific journals. Additionally, the emerging KM focus topic of *knowledge mapping* was found to be discussed in 6% of the KM-specific journal articles reviewed. In answering research question 2, the researcher observed, after recalculating KM focus topic percentages, that the coverage of KM focus topics in KM-specific journals is similar to the coverage in the leading IS journals. Lastly, in answering research question 3, the researcher found that 22 of the 29 disciplines identified by Schwartz (2005) had contributed articles to KM-specific journals. Additionally, a new KM discipline affiliation (health care) was found contributing to the body of literature for KM-specific journals. However, it must be reiterated that the findings for RQ3 are questionable, based on the low reliabilities calculated for the KM discipline affiliation measure.

V. Conclusions and Recommendations

Overview

This study focused on three main research areas, of which three research questions were developed and outlined in Chapter I. Chapter II then provided the theoretical groundwork on which the research was based. Chapter III described the methodology used for conducting the research and identified the frameworks and/or models utilized, and Chapter IV presented the research findings. This chapter begins where Chapter IV closed; by presenting the researcher's conclusions based on the results yielded in Chapter IV. Chapter V is then concluded with a final discussion of the significance of the research, its limitations, and recommendations for future research.

Conclusions of Research

The results outlined in Chapter IV have provided the base from which the following conclusions have been reached. To facilitate a thorough discussion of each focus area profiled in this study, the following three sections are provided, corresponding to the three research questions outlined in Chapter I.

How can the body of KM literature in KM journals be described?

In answering research question 1, the researcher tabulated the number of articles in which a particular KM focus topic was discussed and divided that number by the total number of articles included in the study (317). The results from this action illustrated that the KM focus topic of *knowledge transfer* was being written about more often than any other KM focus topic. A possible explanation for this phenomenon may have been posited by Peachey et al. (2005). As stated earlier, Peachey et al.(2005) also found

knowledge transfer as receiving more coverage than any other KM focus topic. This finding caused Peachey et al. to posit that "[knowledge] transfer, as well as [knowledge] storage and retrieval, remain topics of interest in the IS community because of their obvious tie with information technology" (2005, p. 66). If this indeed is true for the leading IS journals, it may also be true for KM-specific journals. Another possibility, however, may be that the research and practitioner communities are just responding to the needs of corporations who are struggling to find ways to transfer the knowledge they have from individual-to-individual, group-to-group, etc. If this is indeed the case, then this phenomenon will likely continue for the foreseeable future. However, as stated by Peachey et al., practitioners may find it hard to properly deploy effective KM systems if "the other [KM focus topics are not] more fully developed" (2005, p. 68). Since this study revealed that researchers and practitioners (who are submitting papers to KM-specific journals) are taking a similar path as those contributing to the leading IS journals, Peachey et al.'s statement would seem to apply to them as well, thus they should be giving as much attention to the other KM focus topics as they have been giving to *knowledge transfer*.

The results from RQ1 also reveal that the body of KM literature in KM-specific journals is an amalgamation of the many KM focus topics reflected in the KM systems thinking framework. In particular, even though the *knowledge transfer* KM focus topic did get significant coverage, discussion of the remaining KM focus topics was rather evenly distributed. A perfect example of this even distribution can be found in the KM focus topics of *knowledge creation, knowledge storage/retrieval, managerial influences,*

learning and projection as outcomes, and *resource influences* with percentages of coverage of 32%, 36%, 28%, 29%, and 48% respectively. This abundance of articles discussing KM focus topics other than or in conjunction with *knowledge transfer* signifies that these KM focus topics are getting coverage despite the overwhelming coverage being given to *knowledge transfer*.

It must be noted, however, that the low percentage of coverage for *environmental influences* (11%) indicates that contributors to KM-specific journals do not see this KM focus topics as important as the other KM focus topics. A possible reason for this lack of interest may be due to the internal focus many researchers and practitioners are applying to KM. A significant amount of coverage in KM-specific journals is related to either the KM activities performed by organizations or the internal influences (e.g., managerial and resource) that relate to KM (89%), thus until researchers and practitioners feel they have addressed all the issues relating to these KM focus topics, they may not turn their attention outward. Moreover, until their focus changes from internal to external influences, the KM focus topic of *environmental influences* may continue to see lackluster coverage in KM-specific journals.

It must also be noted that, during the process of this research, the new KM focus topic of *knowledge mapping* was found to be discussed in six percent of the articles reviewed. This finding, too, is significant because it lends credence to the fact that the KM discipline is still emerging (Rubenstein-Montano et al., 2001). In the case of this research, the KM systems thinking developed by the primary researcher was initially viewed as capturing all of the KM focus topics outlined by Rubenstein-Montano et al.

(2001). However, as was the case, had the primary researcher not accounted for the possibility that the KM systems thinking framework did not capture all of the KM focus topics discussed in KM-specific journals, then the KM focus topic of *knowledge mapping* would not have been found. Although some may conjecture that *knowledge mapping* is not a standalone KM focus topic, the way that the KM focus topic was discussed in the articles coded seems to indicate that it definitely qualifies as one. Specifically, *knowledge mapping*, as depicted in the majority of the articles discussing it, involves the initial identification of where knowledge resides in an organization, whether it be in certain individuals or knowledge repositories, etc. This area of focus seems to transcend the definitions of the other KM focus topics because the other KM focus topics either are concerned with how knowledge is treated once it is identified, how it is generated within an organization, or what types of elements influence its conduct within organizations. This research suggests that some researchers and practitioners are stepping back from this traditional focus and concentrating on how to find the knowledge that may already exist within the organization and, thus define the paths in which individuals within an organization can traverse in order to get to the knowledge.

How does the KM literature in IS journals compare to that being published in KM-specific journals?

In answering research question 2, the primary researcher first recalculated a subset of the KM focus topics included in the KM systems thinking framework (i.e., *knowledge creation*, *knowledge transfer*, *knowledge storage/retrieval*, and *knowledge application*) using the proportional calculation method employed by Peachey et al. (2005). This recalculation ensured the percentages used during the comparison were of

the same nature (apples compared to apples). The comparison of the two KM focus topics distributions showed that the bodies of literature for the leading IS journals and the KM-specific journals are, indeed, similar. This similarity suggests that the leading IS journals are presenting a fair representation of the KM-specific body of literature. Conversely, it also may suggest that the KM-specific journals are presenting a fair representation of the body of KM literature in the leading IS journals. This different view is only offered because of the varying perceptions of the roles between IS and KM; mainly which one is a subset of the other (Schwartz, 2005). Whatever that perception, however, one cannot find enough difference between two bodies of literature to advocate his or her position either way. Instead, an advocate of either discipline can only admit that each body of KM literature is very similar to the other and take the argument of which discipline is a subset of the other in another direction.

The above research finding may not be significant, however, because only the four KM focus topics from the Alavi and Leidner (2001) KM framework were included in the comparison. Additionally, since this research had a slightly different goal than the Peachey et al. study, the manner in which the KM focus topics were coded may have contributed to the different distributions. Only a full comparison study utilizing the same measuring tools can eliminate any speculation of the complete accuracy of this finding.

How "interdisciplinary" are the KM-specific journals?

In answering the last research question, RQ3, the researcher tabulated the number of times a KM discipline affiliation appeared in the total units (e.g., KM-specific journal articles) included in the study and dividing that number by the total units (317) to yield

percentages. The results garnered from this action showed that the IS discipline was contributing the most articles to KM-specific journals (26%). Moreover, the results also indicated that 23 separate disciplines were contributing to KM-specific journals, although in much smaller numbers. This brings us to the crux of the research question 3. As stated in Chapter II, Lattuca (2002) suggests that to be described as interdisciplinary, an entity (e.g., journal or article) must consist of or reference two or more different disciplines. Additionally, another criterion can be used (e.g., an even distribution of disciplines contributing to KM-specific journals) to also determine the interdisciplinary nature of KM-specific journals. Using both of these criteria as a guide to assess KM-specific journals, the findings garnered from the research suggest that KM-specific journals are very interdisciplinary. Not only were there a significant number of KM discipline affiliations found contributing to KM-specific journals (23 total), but the distributions of 20 of the 23 disciplines varied by only five percent either way.

Although the interdisciplinary nature of KM-specific journals may have been answered by this research, one additional finding from this study may need further attention. Specifically, the finding that 3 of the 23 disciplines contributed 60% of the articles, while 20 of the 23 disciplines contributed the remaining 40% suggests that these other disciplines may actually be contributing to KM, but through their own specific journals. For example, authors representing the engineering discipline may be electing to publish their KM articles in journals representing their own discipline. This phenomenon may not pose an immediate threat to the current status of KM-specific journals as interdisciplinary, but if these authors see that contributing research articles to their own

specific journals benefits their particular discipline more than contributing research to KM-specific journals then they may start pulling away from KM-specific journals all together. This exodus then could change the interdisciplinary nature of KM-specific journals in the years to come. But, for now, in answering the question "how 'interdisciplinary' are the KM-specific journals?", this research indicates, very interdisciplinary.

Limitations

During the process of analyzing the data for this research, two research execution limitations came to the forefront which affects the overall conclusions made for this study. The first limitation concerns the comparison of the body of literature for the leading IS journals to that of the KM-specific journals. As mentioned in Chapter III and IV, the researcher had to recalculate the data collected from the research using the calculation method utilized by the Peachey et al. (2005) study. This method calls into question whether the coding manner was the same given the different research goals of each study. Therefore, the final results should be looked upon as a simple comparison between two independent studies and not as an intentionally designed comparison study. This does not mean, however, that the final results should be discounted. Instead, it means that the research should be viewed for its intent, and that the conclusions drawn from the results match that intent only.

The second limitation concerns the final reliability of the KM discipline affiliations. As outlined in Chapter IV, the reliabilities for KM discipline affiliations were extremely low (between 30 – 40 percent). These low percentages indicate that there

was not a close consensus between the primary researcher and the four coders on the KM disciplines affiliations contributing to KM-specific journals. Therefore, since the final results for KM discipline affiliations came from the coding performed by the primary researcher only, the results may not reflect the true nature of KM disciplines affiliations contributing to KM-specific journals and calls into question the final assessment of the interdisciplinary nature of KM-specific journals.

Recommendations for Future Research

The recommendations for future research fall into two categories. The first category proposes future recommendations that could solidify the results and conclusions for this study, while the second category proposes future recommendations which could add to this research and ultimately the body of knowledge for knowledge management; both categories are discussed below.

Recommendations for Research Solidification.

The future recommendations for research solidification are based off of the limitations discussed in the previous section. The first recommendation is proposed to solidify the results of the comparison between the body of literature for the leading IS journals and that of the KM-specific journals. In particular, the results from this study could be solidified by a future study which performs an intentional direct comparison of the two bodies of literature. This study could be designed with the intent of performing a direct comparison of the two bodies of literature in which similar coding and calculation methods are used. The results from this type of study then could provide the necessary component needed to solidify the results from this research.

The second recommendation is proposed to solidify the results yielded from the assessment of the interdisciplinary nature of KM-specific journals. In particular, an independent study which surveys the authors from the 317 articles would yield self-identified KM discipline affiliations. By having the authors self-identify, this new study would eliminate the limitations encountered during this study and should provide for a better assessment of whether KM-specific journals are truly interdisciplinary or not.

Recommendations to Add to the Body of Knowledge for KM.

As mentioned in Chapter I, Schwartz in his recent publication, *The Encyclopedia of Knowledge Management*, identified 18 journal outlets, which he claimed, have "major aspects of KM as a primary focus (see Table 1) (2006, p. xxiv). Schwartz (2006) subsequently stated that these outlets produce over 500 KM articles annum. With this abundance of KM focused outlets being identified, a future study in which the KM systems thinking framework is applied to this body of literature could identify what their bodies of literature look like. Additionally, this new study could identify new "emerging" KM focus topics because the outlets recognized by Schwartz (2006) are diverse in their own right and could bring an even more interdisciplinary flavor to research into KM focus topics.

Summary

This research has added to the body of knowledge of KM by identifying what a subset of this body of knowledge, the body of literature for KM-specific journals looks like. Specifically, this research has shown that the coverage of KM focus topics in KM-specific journals is an amalgamation of the KM focus topics reflected in the KM systems

thinking framework; although the KM focus topic of *knowledge transfer* seems to be receiving the most amount of attention by researchers and practitioners contributing to these journals. Additionally, by comparing KM-specific journals to the leading IS journals, this research has provided a look into how these two bodies of literature compare and indicates that they are very similar in their coverage of specific KM focus topics. Lastly, this research has brought to the forefront the fundamental question of whether KM-specific journals are meeting their purported goals of being interdisciplinary. Although this research may not have fully answered this question, it has at least provided a snapshot of where KM-specific journals look today in regards to their interdisciplinary nature. This snapshot shows that KM-specific journals are, indeed, interdisciplinary.

Appendix A: Abbreviations

EJKM – Electronic Journal of Knowledge Management

GEPSE – Governmental, Economic, Political, Social, and Educational

IC – Intellectual Capital

IEEE –Institute of Electrical and Electronics Engineers

IJKM – International Journal of Knowledge Management

IS – Information Systems

JKM – Journal of Knowledge Management

JKMP – Journal of Knowledge Management Practice

KM – Knowledge Management

KMRP – Knowledge Management Research & Practice

PA – Proportion Agreement

RQ – Research Question

Appendix B: Code Book

This code book is designed to provide all necessary information needed by a coder of KM focus topics on KM-specific journals. This code book has been separated into two parts for ease of reading and understanding. Part I, Coding Instructions, provides the coder with the specific coding instructions required to facilitate the coding of assigned articles. Part II, Knowledge Management Focus Topics, gives detailed descriptions of each focus topic relevant to this study. Additionally, a code form has been provided to each coder for use in coding all articles assigned. The form is only intended to be used by the coder to annotate his findings, not as a reference document.

Coding Instructions

On or about Oct 28, 2005 each coder will receive a copy of this code book and a code form. Before any coding commences, each coder should carefully read the code book and, if questions arise, forward them immediately to the primary researcher for clarification or correction. If no questions arise, on or about Nov 1, 2005 all coders will be randomly assigned 80 articles to code. Coders should immediately compare the article numbers referenced on his code form with the numbers annotated on each article. Once again, any discrepancies should be immediately forwarded to the primary researcher. After verification is complete, all coders should begin coding each article per the below instructions. If possible, all articles, code books, and code forms should be returned to the primary researcher by 30 Nov 2005, but NLT 15 Dec 2005.

Instructions for completing coding task are as follows:

1. Every article should be completely read for context. Although some focus topic words may be used in an article, coders are advised to look for the context of the article. In particular, look for what the author(s) is trying to convey, not what he/she may be giving cursory attention to.
2. Once an article has been read for context, any KM focus topics discussed in the article should be annotated on the code form. To properly mark the form, coders should match the article number preprinted on the form with the article number annotated on the article. Once the proper row has been located, any focus topic discussed in the article should receive a "1" in its specific column. **NOTE**: multiple focus topics can be annotated per article.
3. Although it is assumed that the KM focus topics identified in this study capture the entire body of KM literature, it is probable that a proper identification cannot be made. In this case, attempt to discern what the focus topic may be and annotate that topic in the Emerging Focus Topic column on the form.
4. After the focus topic(s) has been annotated, each coder should read the biography for the primary researcher of the article being coded.
5. Using the cross-reference sheet on Atch 1 from this code book, each coder should attempt to discern which academic discipline most closely matches the discipline of the primary researcher. **NOTE**: at this time detailed information on what job

titles/etc. are related to what disciplines is not available. The primary researcher is attempting to resolve this problem and will provide additional information as it comes available.

6. Once the discipline has been determined, the coder should once again find the appropriate row on the code form for the article being coded and annotate the number of the discipline in the Discipline # column.
7. Coding for each article is complete once the Discipline # column and at least one KM focus topic column has been annotated.

Knowledge Management Focus Topics

The below information is provided to each coder to assist in identifying KM focus topics within the assigned articles. An additional purpose of this information is to assist the coder in discerning (if needed) between KM focus topics. Coders should not code an article as having one of these KM focus topics unless that focus topic has been given "sufficient coverage" within the article. Sufficient coverage can be considered for a focus topic if the focus topic can be considered part of the overall context of the article. Any cursory references to a particular focus topic should be regarded as not fulfilling the requirement of "sufficient coverage."

Additionally, although some KM focus topics have extensive detailed information, most of the pertinent information for each focus topic can be found within the first one or two paragraphs. The additional paragraphs are only there to assist in instances where easy delineation cannot be properly made. Coders are encouraged to refer to these additional paragraphs as often as needed, however to ensure proper coding of each article is accomplished. **NOTE**: the reference documents for all of the focus topics outlined below can be obtained from the primary researcher if needed.

Knowledge Creation:

Term primarily used when the four modes of knowledge creation are present. Four modes of knowledge creation are: tacit-to-tacit, tacit-to-explicit, explicit-to-explicit, and explicit-to-tacit.

Knowledge creation can, theoretically, occur within any of the other categories of knowledge, but what you want to look for are the articles that detail collaborative tools where the main purpose is to generate new ideas.

Some IT tools to look for which may allude to knowledge creation:

- Data mining tools
- CoPs used for idea generation
- Learning tools which are used to generate new ways of doing something (not just teaching how something is done

Knowledge Storage/Retrieval:

Term primarily used when you take the knowledge you know and codify it somehow for the organization to use.

Knowledge storage/retrieval is customer-related or business-function based, not learning based. Examples include: product information stored somewhere which can be retrieved to assist a customer with a problem; historical sales data used to predict when sales of a product may be higher or lower; stored knowledge about customers, projects, competition, or the industry a company serves.

Some IT tools to look for which may allude to knowledge storage/retrieval:

- Electronic bulletin boards
- Knowledge repositories (data warehouses)
- Databases

Knowledge Transfer:

Term primarily used when knowledge is transferred from person-to-person, person-to-group, group-to-group, group-to-organization, etc. in an effort to share what is known.

An example of knowledge transfer is an expert-protégé relationship--the expert has knowledge on how to perform a task and teaches the protégé (transfers his knowledge). In most cases CoPs can be considered knowledge transfer tools because someone is usually asking a question about how to do something and the person who knows the answer responds.

NOTE: focus on the learning aspect when reviewing articles for knowledge transfer--is the article discussing elements of knowledge which facilitate learning in the organization?

Some IT tools to look for which may allude to knowledge transfer:

- Electronic bulletin boards
- CoPs used for learning (transferring knowledge on how to do something)
- Learning tools which are used to train people on tasks (i.e. CBTs)
- Knowledge directories
- Metadata tools used to search for knowledge on how to do something
- Taxonomies or organizational mapping which help navigate knowledge resources

Knowledge Application:

Term primarily used when what someone/group knows is turned into organizational norms or rules. These norms or rules are meant to take the "guess work" out of how to accomplish a task. A rule based expert system is a good example of an IT tool used for knowledge application--the knowledge of how to solve a problem is made explicit and put into a system which can be used by anyone to solve the same problem the next time it arises.

Specifically, knowledge application helps eliminate the need for training in some cases because the knowledge of how to do something is made routine enough so that anyone (even without training) can do the job by following specific instructions.

Some IT tools to look for which may allude to knowledge application:

- Expert systems
- Workflow systems

Learning and Projection:

The term learning should be self-explanatory. Learning involves those efforts by companies to modify its human knowledge resources. Examples of these efforts include those oriented toward problem solving, experimentation, simulation, scenario analysis, opportunity identification, data mining, or decision making. Coders must be wary to distinguish between article discussions of knowledge activities like the ones above and specific discussions of learning techniques to modify the knowledge resources in an organization. There may be several instances where *learning* and *knowledge transfer*, for instance, overlap. In these instances, if both are discussed in detail, code the article as containing both. Otherwise, attempt to discern where the overall focus of the article is centered. Additionally, coders can expect that *resource influences* and *learning and projection* may also overlap due to the knowledge resource component found in the *learning and projection* focus topic. **NOTE:** single-loop or double-loop learning should be coded under the generic focus topic of *learning and projection*.

The term projection is concerned with enhancing an organization's standing within its environment (e.g. its reputation, its competencies in a market). It is a process whereby organizational resources are released into the market (thereby modifying it).

Although these two terms may not seem related, they are combined together here because learning and projection are two dimensions of organizational performance that are direct results of knowledge management conduct. Learning concerns an organization's internal competencies and projection concerns an organization's external competencies. Coders should look for articles in which both of these terms are used, however, if one of the two are discussed in great detail (as in an "organizational learning" article), coders should code the article as having the focus topic *learning and projection*.

Managerial Influences:

Emanate from those organizational participants responsible for administering the conduct of knowledge management. *Managerial influences* involve four main factors: exhibiting leadership in the conduct of KM, coordinating the conduct of KM, controlling the conduct of KM, and the process of measuring the conduct of KM.

It should be understood that although an article may be assessed as containing the focus topic of *resource influences* because of its abundance of discussion on, for instance, knowledge resources, if the article also discusses, in detail, how to properly coordinate, control, etc. these resources, then the article should also be assessed as having *managerial influences* as a focus topic.

To help better delineate *managerial influences* from other KM focus topics, brief descriptions of the four main factors of *managerial influences* are provided below. Coders should look for these main factors when assessing an article as having *managerial influences* as one of its focus topics.

- Leadership: is characterized by a leader who can create conditions that allow participants to readily exercise and cultivate their knowledge manipulation skills, to contribute their own individual knowledge resources to the organization's pool of participant knowledge, and to have easy access to relevant knowledge resources.

- Coordination: refers to managing dependencies among activities like those described above; it aims to harmonize activities in an organization by ensuring that proper resources are brought to bear at appropriate times and that they adequately relate to each other.

- Control: is concerned with ensuring that needed knowledge resources are available in sufficient quality and quantity, subject to required security. Two critical factors here are protection and quality of knowledge resources. These factors include protecting knowledge resources from loss, obsolescence, unauthorized exposure, unauthorized modifications, and erroneous assimilation. They also include maintaining the quality of knowledge resources through validity and utility. (validity is concerned with accuracy, consistency, and certainty while utility is concerned with clarity, meaning, relevance, and importance).

- Measurement: involves the valuation of knowledge resources. It is also a basis for evaluation of leadership, coordination, and control; for identifying and recognizing value-adding activities and resources; for assessing and comparing the execution of knowledge activities; and for evaluating the impacts of an organization's knowledge management conduct on bottom-line projections.

Resource Influences:

As the focus topic might suggest, *resource influences* includes knowledge resources, human resources, financial resources, and material (computer-based) resources. In simpler terms, many types of resources have impacts on how KM is conducted in an organization. These resources, if lacking, can hinder the conduct of KM and thus affect the company's bottom-line.

Coders are cautioned to thoroughly review any article in which resources are discussed in detail. In these cases, coders may want to code the article as having the *resource influences* focus topic, but may also need to code the article as having one or more of the knowledge management activities (if these activities are discussed, in detail, in concert with the resource).

To help better delineate *resource influences* from other KM focus topics, brief descriptions of the four main resources of *resource influences* are provided below. Coders should look for these main resources when assessing an article as having *resource influences* as one of its focus topics.

- Financial resources: can facilitate or hinder an organization's ability to acquire new knowledge. In the case of financial resources, budget problems or lack of funding for knowledge management efforts are common discussion areas.

- Human resources: are the skills possessed by knowledge workers for performing knowledge management activities. Abundance or lack of these resources can constrain or facilitate a company's knowledge management conduct.

- Material resources: are those computer-based participants involved in knowledge management activities. Material resources include decision support systems, performance support systems, and expert systems. NOTE: it is highly probable that articles in which these types of systems are discussed will also need to be coded as having one or more of the activities focus topics.

- Knowledge resources: can be broken into six categories: culture, infrastructure, purpose, strategy, participants, and artifacts.
    - Participants: have knowledge manipulation skills that allow them to process their own repositories of knowledge. They can be human resources or material resources. Human participant knowledge is knowledge that a person or a collection of persons (e.g. group, team, or other social entity) is willing to manipulate or make available in the execution of the organization's knowledge activities. Material participant knowledge, in contrast, is knowledge stored in a computer system that can perform one or more of the knowledge activities. NOTE: participants' knowledge can be discussed in terms of type (descriptive, procedural, reasoning), mode (tacit, explicit), quality, volatility, age, and so forth.

- Artifacts: an object that conveys or holds usable representations of knowledge; common examples are video training tapes, books, memos, business plans in print, manuals, patent documents, filing cabinet contents, facilities, layouts, and products.
- Culture: an organization's values, principles, norms, unwritten rules, and procedures comprise its cultural knowledge resources; it is comprised of basic assumptions and beliefs that govern participants' activities; it affects what knowledge is acquired and internalized.
- Infrastructure: a formal counterpart to an organization's cultural knowledge resource; it is the knowledge that structures an organization's participants in terms of "the roles that have been defined for participants to fill, the relationships among those roles, and regulations that govern the use of roles and relationships.
- Purpose: the schematic knowledge resource that defines an organization's reason for existence. It indicates an organization's mission, vision, objectives, and goals. It guides strategy formulation, the result of which then drives knowledge activities.
- Strategy: the schematic knowledge resource that defines what to do in order to achieve organizational purpose in an effective manner. It is comprised of plans for using an organization's infrastructure, culture, knowledge artifacts, and participants' knowledge.

Environmental Influences:

Environmental influences are those factors external to an organization that affect an organization's conduct of KM. It influences what knowledge manipulation skills are available to an organization.

It includes six main factors: competition, fashion, markets, technology, time, and the GEPSE (governmental, economic political, social, and educational) climate.

When coding an article as having the *environmental influences* focus topic, look for a detailed discussion of one or more of the above factors. In particular look to code an article as having this focus topic if you see that a lot of the article focuses on how outside influences can affect the conduct of knowledge management for an organization.

Emerging Focus Topic:

An emerging focus topic is a focus topic that is discovered during the coding process that does not match any of the KM focus topics detailed above. Coders should be advised that an emerging focus topic can exist in the same article with one of the above KM focus topics. In these instances, the coder should annotate the column for the pre-identified KM focus topic with a "1" and write in the focus topic of the discovered focus topic in the Emerging Focus Topic column.

Attachment 1

Banking	1
Business Administration	2
Cognitive Science	3
Communications	4
Computer Science	5
Cultural Studies	6
Economics	7
Education	8
Engineering	9
Engineering Management	10
Finance	11
Human Resource Management	12
Information & Library Science	13
Information Management	14
Information Systems	15
Innovation Studies	16
Management	17
Management Science	18
Marketing	19
Mathematics	20
Media Management	21
Organizational Science	22
Philosophy	23
Real Estate	24
Science & Technology	25
Social Psychology	26
Sociology	27
Statistics	28
Technology Management	29

Academic Cross-reference List

Appendix C: Sample Code Form

Article #	Discipline #	Knowledge Creation	Knowledge Storage/ Retrieval	Knowledge Transfer	Knowledge Application	Managerial Influences	Learning & Projection	Environmental Influences	Resource Influences	Emerging Focus Topic
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Vita

Captain Donnie O. Harp entered the Air Force in 1988 as an honor graduate from Edmonson County High School. He served as a computer operator and computer programmer in his enlisted career and reached the rank of Staff Sergeant before entering undergraduate studies at Bellevue University in Bellevue, Nebraska. He graduated with a Bachelor of Science in Management Information Systems in June 2000, and in July 2000, was promoted to the rank of Technical Sergeant. Later that year, in September 2000, he obtained his commission through Officer Training School, Maxwell Air Force Base, Alabama.

His first assignment was as a communications and information officer at Keesler Air Force Base. He was assigned to the 81st Communications Squadron and later became the executive officer to the Commander, 81st Mission Support Group. In August 2004, he entered the Information Resource Management program at the Graduate School of Engineering and Management, Air Force Institute of Technology, Ohio. Upon graduation, he will be assigned to the Air Force Communications Agency, Scott Air Force Base, Illinois.

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14. ABSTRACT

Knowledge management (KM) has been receiving ever increasing attention from researchers and practitioners, especially over the last five years. Consequently, some researchers and practitioners now believe that KM should be its own discipline and have established KM-specific journals in an effort to further this idea. Many of these journal founders believe that KM has emerged as a mixture of many disciplines and have written the goal of being interdisciplinary into their charters.

This research reviews the KM literature published in KM-specific journals from 2000 to 2005. Specifically, using a content analysis methodology, this research reviews and analyzes the body of KM literature in KM-specific journals to determine what the body of literature "looks like." The results of this analysis are also used to compare the body of literature for KM-specific journals to that of the leading information systems (IS) journals for the same time period. Lastly, this approach is used to ascertain whether KM-specific journals are meeting their interdisciplinary goal.

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