The Pennsylvania State University

The Graduate School

School of Public Affairs

THE COMPARISON OF KNOWLEDGE MANAGEMENT PRACTICES BETWEEN PUBLIC AND PRIVATE ORGANIZATIONS: AN EXPLORATORY STUDY

A Thesis in

Public Administration

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

May 2007

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ABSTRACT

Knowledge management (KM) is on its way to becoming an integral business function (Grover and Davenport, 2001) and a new aspect of management for many organizations (Ponzi and Koenig, 2002). Although it can be argued that public sector organizations increasingly face similar pressures as the pressures on the private sector, public sector organizations, partly because of their public ownership and limited competition, may not pursue KM as strongly and effectively as private sector organizations. It seems, therefore, reasonable to expect that there will be differences in understanding, best practice, and performance indicators between the two sectors and how they impact drivers for KM activity. There are differences in how to create value from effectively managing knowledge in the private and public sector contexts, and that these differences will be reflected in KM strategy practice.

The purpose of this study is to test empirically the basic KM argument that KM in public organizations differs from that carried out in private organization. In the literature review, the key dimensions of KM are described (chapter 2). This includes arguments about ‘what knowledge is’ (definition, features, types, and perspective of knowledge), and ‘what knowledge management is’ (definition, principles, process, and implementation of knowledge management). Moreover, I explained current situation that KM in public organizations is still underrated even thought KM is so important to public organizations. As needed for the purpose of research, I reviewed general arguments about similarities or differences between public and private organization. Lastly, in the

literature review, I introduced the ‘management in the 1990s research program by MIT’ as one part of the research model.

In Chapter 3, the methodology for this study is presented. Research model and the hypotheses were developed based on Hansen, Nohria, and Tierney’s model (1999) and MIT90s Framework (Scott Morton, 1991). The processes of measurement such as variables operationalization, methods of data collection, units of analysis, and sample are presented.

Chapter 4 covers the analysis and the findings from the survey. In here, first, I analyzed the characteristics of survey respondents according to position, age, gender and education. Second, I tested the hypotheses which were developed to compare KM in both the private and the public sector. Most hypotheses are not supported. Even though the results are contrary to my hypotheses, I found significant differences between public and private organization in some aspects of KM. In knowledge management process, the private organization focuses more on all knowledge processes stages (the storage and retrieval, transfer and sharing, and application of knowledge) than the public organization. Moreover, the result of the test for the degree of codification hypothesis shows that the private organization follows more codification knowledge strategies than personalization knowledge strategies. The means of private organization for the rest of all aspects which are related to codification strategy is significantly higher than those of public organization. Third, factor analysis is applied to identify small number of factors that summarize observed correlations among codification and personalization variables. Fourth, the relationship between the codification and personalization dimension is tested with correlation analysis. The major implication of this is that effective organizations

tend to emphasize to a similar degree both codification and personalization knowledge management strategies.

Chapter 5 presents the conclusions for this study. It is divided into five sections. In first section, an overview of the purpose of the study and the summary of research are presented. The second section covers the suggestions for KM to public organizations. The third section discusses the implication and contributions of this study. The fourth section discusses the possible future research. The final section presents the limitations of this study.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chapter 1

INTRODUCTION

Today's public and private organization environments are characterized by continuous, rapid and often radical change. But the typical 20th century organization did not function well in such rapidly changing environment. In the twenty-first century, new attitudes and approaches within organizations are demanded for success in this volatile environment. A key challenge for any organization is to seek to maintain and improve performance, and how this can be done under conditions of radical changes is not clear.

Harvard Business Review (1997, p.18) posed the question to Peter Drucker and Peter Senge: "What problems or challenges do you see already taking shape for business executives as they move into the next century?" Drucker and Senge identified changes that were not technical or rational in nature as much as cultural: how to lead organizations that create and nurture knowledge, and how to maintain, as individuals and organizations, our ability to learn. De Geus (1997) also points out that "during the past 50 years, the world of business has shifted from one dominated by capital to one dominated by knowledge" (p.16). Additionally, there are volumes of research on the effectiveness of learning organizations-most notably that of Peter Senge (1997)-stating that "organizations can't thrive and achieve sustained growth without adapting their attitudes about the value of collective knowledge within an organization."

By focusing upon identifying, valuing and managing knowledge assets, there are significant opportunities to build more effective organizations and to improve their efficiency by reducing the amount of wasted time, effort and lost opportunity through

better and more integrated use of both tangible and intangible organizational resources. As knowledge becomes a central productive and strategic asset, the success of the organization increasingly depends on its ability to gather, produce, maintain, and disseminate knowledge. That is, developing procedures and routines to optimize the creation, flow, learning, protection, and sharing of knowledge and information in the organizations become a central management responsibility. The process of systemically and actively managing and leveraging the stores of knowledge in an organization is called knowledge management (KM).

KM is not new. “For hundreds of years, owners of family business have passed their commercial wisdom on to their children, master craftsmen have painstakingly taught their trades to apprentices, and workers have exchanged ideas and know-how on the job” (Hansen, Nohria, and Tierney, 1999). However, KM as a concept has been around only since the early 1990s. In organization and management, a great upsurge of interest in knowledge and KM has been brought. The idea was to develop innovative ways to leverage the collective knowledge of vast organizations. The rise of networked computers has made it possible to codify, store, and share certain kinds of knowledge more easily and cheaply than ever before. The KM trend began to pick up some momentum in the mid 1990s, getting coverage in the trade press, at industry conferences, and in business and academic fields (Hansen, Nohria, and Tierney, 1999).

Knowledge management is rooted in many disciplines, including business, philosophy, economics, psychology, strategic management, organization theory and behavior, and information management (Truch, 2001; Award and Ghazir, 2004). Both business and academic communities believe that by leveraging knowledge, an

organization can sustain its long-term competitive advantages. Knowledge management is on its way to becoming an integral business function (Grover and Davenport, 2001) and a new aspect of management for many organizations (Ponzi and Koenig, 2002).

Research and practice KM in the past decade have produced a significant body of knowledge in terms of both practice and theory (Brooking, 1996; Davenport and Prusak, 1998; Stewart, 2002). However, much of the documented KM practice is related to the private sector. The relative newness of the area as a management philosophy has resulted in most research and practical application studies being based in large private sector organizations. That is, how KM contributes to the public sector is, to a large extent, less commonly addressed. It seems that KM practice in the public sector falls behind their private counterparts.

However, like the private sector, public sector organizations need better access to the best internal and/or external information and knowledge for effective decision-making and the ability to innovate and adapt (Martin, 2000). For example, in the education sector, it is reported that US educational institutions are being forced to operate in much more business-like competitive environments, characterized by tighter education funding, increased interest in information sharing practices, greater accountability, and increased information needs of teachers, faculty, staff, and administrators (Petrides and Nodine, 2003). Although it can be argued that public sector organizations increasingly face similar pressures as the pressures on the private sector, public sector organizations, partly because of their public ownership and limited competition, may not pursue KM as strongly and effectively as private sector organizations. It seems, therefore, reasonable to expect that there will be differences in understanding, best practice, and performance

indicators between the two sectors and how they impact drivers for KM activity. There are differences in how to create value from effectively managing knowledge in the private and public sector contexts, and that these differences will be reflected in KM strategy practice.

Nevertheless, “no mention was found in the knowledge management literature that indicated a need for separate treatment in theoretical or empirical research terms of characteristics that are specific to individual private or public sectors” (Truch, 2004: 123). There has been little work that examines KM from public versus private sector perspective (Rubenstein-Montano, 2001). Moreover, little empirical evidence is available. How knowledge is managed in public sector organizations is still largely unknown.

Purpose of Paper

The purpose of this study is to compare KM in both the private and the public sector to enable cross-learning to take place and for suitable KM developments to be advanced in the public sector. In other words, the purpose of this paper is to test empirically the basic KM argument that the KM in public organizations differs from that carried out in private organizations.

Organization of Paper

Chapter 2, the literature review, describes the key dimensions of KM. This includes arguments about ‘what knowledge is’ (definition, features, types, and perspective of knowledge), and ‘what knowledge management is’ (definition, principles,

process, and implementation of knowledge management). I also discuss KM in public organization. This purpose of this research is to compare KM between public and private organization. I review arguments about similarities or differences between public and private organization. Lastly, I introduce the “Management in the 1990s Research Program” of MIT.’

Chapter 3 describes the methodology for this study. The research model and hypotheses will be presented. To test these hypotheses, measurement considerations will be also presented. This includes how variables are operationalized, how data are collected (survey), who are the subjects, and how samples are chosen.

Chapter 4 covers the analysis and the findings from the survey. The final chapter, Chapter 5, summarizes findings and connect them to the purpose of the study, and make recommendations for further developments of KM in pubic organization with some conclusions.

Chapter 2

LITERATURE REVIEW

This section reviews literatures related to the research topic. This chapter is divided with four parts. In the first part, I will focus on the Knowledge Management (KM). It consists of several subjects, like the meaning of knowledge, definition of KM, principles and pitfalls of KM in organizations, KM processes, and strategies. In the second part, various aspects of KM in public organizations are discussed. The intent is to answer such questions as “Why do public organizations need KM?” The third part is related to differences between public and private organizations. In the last part, the “Management in the 1990s Research Program” will be introduced. The MIT90’s framework that emerged from this research will be my research model.

Knowledge Management

Prior to the information revolution and the field of KM, human value had primarily been limited to physical products produced. We now are experience a new paradigm of treating our employees as knowledge workers. The advent of management information systems, the Internet, networks, e-mail, and instant sharing of information make us to realize that knowledge (and its sharing) is a fundamental element of an organization’s activities.

What is 'Knowledge'?

What is knowledge? The study of knowledge dates back to Plato and Aristotle. However, considering the management of knowledge throughout a corporation first gained visibility by a philosopher named Michael Polanyi in 1958. He introduced knowledge as something that can have intrinsic value placed on it and outlined two types of knowledge-tacit and explicit. Nonaka (1991) reconfirmed Polanyi's two knowledge level concepts. After that, there has been much discussion of the term 'knowledge.' This is one of the more confusing aspects of KM (Cong and Pandya, 2003). With the following definitions of knowledge, I begin to answer my first question: "What is knowledge?"

Definitions

Definitions of knowledge range from the practical to the conceptual and philosophical, and from narrow to broad in scope (Beckman, 1999). The practical definitions focus on the functions of knowledge as in problem-solving and decision-making. Woolf (1990) defined knowledge as "an organized information applicable to problem solving." Broadly, Turban (1992) said that "knowledge is information that has been organized and analyzed to make it understandable and applicable to problem solving or decision making." And Beckman (1997) said that knowledge is reasoning about information and data to actively enable performance, problem solving, decision making, learning, and teaching.

Meanwhile, some scholars define ‘knowledge’ conceptually. For instance, Clarke (1998) defines knowledge as “an understating of why and how something works.” And Davenport, DeLong and Beer (1998) said that “knowledge is simply stated as information combined with experience, context, interpretation, and reflection.”

As for philosophical definitions, there are a few. Wiig (1993) believed that “knowledge consists of truths and beliefs, perspectives and concepts, judgments and expectation methodologies, and know-how.” Sowa (1984) said that “knowledge encompasses the implicit and explicit restrictions placed upon objects (entities), operations, and relationships along with general and specific heuristics and inference procedures involved in the situation being modeled.” Van der Spek and Spijkervet (1997) define ‘knowledge’ as “the whole set of insights, experiences, and procedures that are considered correct and true and that therefore guide the thoughts, behaviors, and communications of people.”

This insightful analogy creates a logical link between knowledge and organizations and begins a paradigm shift in the need to pay attention to the collective thoughts of the people within the organization as knowledge contributors. This kind of knowledge is called ‘organizational knowledge.’ Brooking (1996) defined the organizational knowledge as “the collective sum of human centered assets, intellectual property assets, infrastructure assets, and market assets.” Myers (1996) thought that “organizational knowledge is processed information embedded in routines and processes that enable action. It is also knowledge captured by the organization’s system, processes, products, rules, and culture.”

Features of Knowledge

There are many dimensions in which knowledge is featured. Three features of knowledge will be examined in detail: storage media, accessibility, and hierarchy. There are several media in which knowledge can reside – human mind, organization, document, and computer. Knowledge in the human mind is often difficult to access; organizational knowledge is often diffuse and distributed; document knowledge can range from free text to well-structured charts and tables; computer knowledge is formalized, shareable, and often well-structured and well-organized but fragmented across multiple systems of databases.

Another feature is knowledge accessibility. Nonaka and Takeuchi (1995) have divided accessibility into two categories – tacit and explicit just as Polanyi described knowledge itself. In Liebowitz and Beckman's (1998) view, there may be three stages of accessibility: tacit, implicit, and explicit. Accessibility can be mapped to storage media. Knowledge gains in value as it becomes more accessible and formal:

1. Tacit (human mind, organization): accessible indirectly only with difficulty through knowledge elicitation and observation of behavior
2. Implicit (human mind, organization): accessible through querying and discussion, but informal knowledge must first be located and then communicated
3. Explicit (document, organization): readily accessible, as well as documented into formal knowledge sources that are often well-organized.

A further dimension considers the premise that knowledge can be organized into a hierarchy. Several authors (Alter, 1996; Bhatt, 2001) draw distinctions between data, information, and knowledge. Data, information and knowledge are three related but not

interchangeable concepts. Defining data, information, and knowledge is difficult. Only through external means or from a user's perspectives, can one distinguish between data, information, and knowledge. Data are a set of discrete, objective facts about events (facts, images, or sounds). Information is organized data presented in context. Data becomes information when their creator adds meanings or value (formatted, filtered, and summarized data). Similarly, knowledge derives from information as information derives from data. Knowledge can be viewed as information in context, together with an understanding of how to use it (instincts, ideas, rules, and procedures that guide actions and decisions). In general, data are considered as raw facts, information is regarded as an organized set of data, and knowledge is perceived as meaningful information.

Knowledge is an organized combination of data, assimilated with a set of rules, procedures, and operations learned through experience and practice. In a sense, knowledge is the ‘meaning’ made by the mind (Marakas, 1999, p. 264). Without meaning, there is only is information or data. It is only through meaning, that information finds life and becomes knowledge (Bhatt, 2000). Thus, the distinction between information and knowledge depends on users’ perspectives. Knowledge is context dependent, since ‘meanings’ are interpreted in reference to a particular paradigm (Marakas, 1999, p. 264).

Types of Knowledge

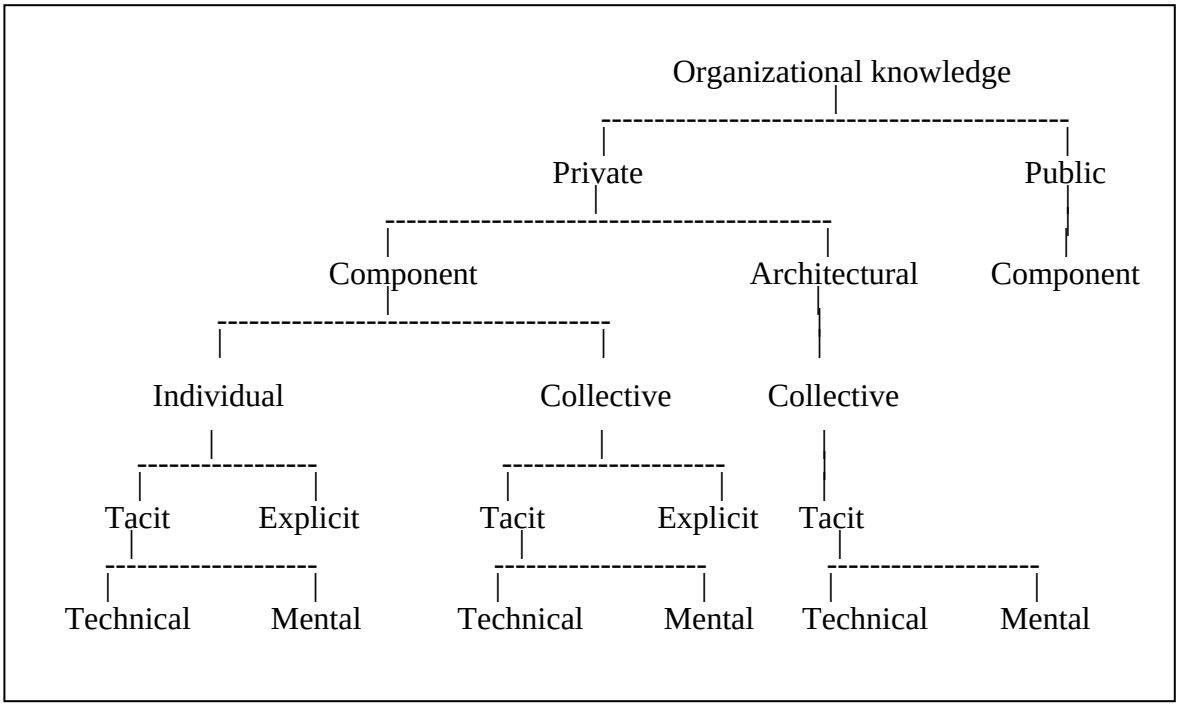
An understanding of the classification of knowledge is an important step towards knowledge management. Typologies of knowledge are defined, categorized, and described in terms of knowledge type-conversion, including structural features,

elementary properties, purpose and use, and conceptual levels (Beckman, 1999). Nonaka and Takeuchi (1995) suggested the 'Tacit Knowledge' and 'Explicit Knowledge' as the types of knowledge. Also, they developed a matrix for knowledge conversion based on accessibility. Collins (1997) also relates knowledge types to their accessibility: 'symbol type knowledge' (explicit), 'embodied knowledge' (implicit), 'embrained knowledge' (implicit/tacit), and 'encultured knowledge' (tacit). Van der Spek and Spijkervet (1997) discuss the structural features of knowledge for classification: availability (form, time, location), and content (structure, application). Parsaye and Chignell (1988) describe five elementary properties of knowledge that can be used to define and represent objects and their interactions: 1) Naming (proper nouns), 2) Describing (adjectives), 3) Organizing (categorization and possession), 4) Relating (transitive verbs and relationship nouns), and 5) Constraining (conditions).

Based on purpose of use of knowledge, Quinne, Anderson, and Finkelstein (1996) suggests the following typology: 1) Know-what, 2) Know-how, 3) Know-where, 4) Know –why, and 5) Care-why. According to Brooking (1996), there are four conceptual levels of knowledge: 1) Goal-setting or idealistic knowledge, 2) Systematic knowledge, 3) Pragmatic knowledge, and 4) Automatic knowledge. Demarest (1997: 377) categorizes shared knowledge in four groups: 1) Imperatives, which are those directives that are unchallenged because they derive from the firm's dogma, 2) Patterns, described as predictive models that have 'a certain longevity, durability and level of universality [and that] describe the likely shape of scenes that call for particular kinds of knowledge,' 3) Rules, which include algorithms and heuristic, and 4) Scripts, or prescriptions for performance, which are therefore more than rules.

According to Chua (2002), knowledge can be classified along many dimensions, such as private-public, component-architectural, individual-collective and explicit-tacit. Figure 1 shows how such schemes of classification can be integrated to produce a comprehensive taxonomy of knowledge.

Figure 1: Taxonomy of Knowledge



Source: Chua (2002). Taxonomy of Organizational Knowledge. Singapore Management Review, Vol. 2 (2), p. 69.

Private Knowledge versus Public Knowledge: One dimension to classify organizational knowledge is to dichotomize it into private and public knowledge (Matusik and Hill, 1998). Private knowledge refers to the knowledge uniquely possessed by the organization. It represents a resource that is valuable, rare, and imperfectly imitable (Barney, 1991). Examples of private knowledge include the organization's

unique practices, processes, documentation, or business strategies. Public knowledge consists of knowledge not proprietary to any particular organization. It resides in the public domain. This knowledge includes industry and occupational best practices.

Component Knowledge versus Architectural Knowledge: Private knowledge can be further classified along the component-architecture dimension (Matusik and Hill, 1998). Component knowledge is knowledge that relates to a subroutine or discrete aspect of an organization's operation. The components found in an organization are the resources, knowledge, skills, and technical systems (Amit & Schoemaker, 1993; Henderson & Cockburn, 1994). Architectural knowledge differs from component knowledge in that it relates to organization-wide routines and schema for coordinating the various components of the organization (Henderson and Clark, 1990). Matusik and Hill (1998) found that there is often no one individual who is in a position to see, comprehend, and articulate the totality of architectural knowledge. Due to its unique nature and development, no two organizations share the same architectural knowledge.

Individual Knowledge versus Collective Knowledge: Component knowledge as mentioned above, can be classified into individual knowledge and collective knowledge (Matusik and Hill, 1998). Individual knowledge refers to the knowledge harbored by an individual in an organization. If this knowledge is not shared with other members of the organization, the organization can neither multiply nor leverage on the value of this expertise (Davenport and Prusak, 1998). However, if individual knowledge is shared, it becomes collective knowledge. Collective knowledge is therefore the knowledge held commonly by a group of organization members. This includes organizing principles, routines, practices, and relative organizational consensus on past experiences, goals and

missions (Zander and Kogut, 1995). Hence, by definition, architectural knowledge is one form of collective knowledge, but not individual knowledge. Collective knowledge is more secure and has more strategic significance than individual knowledge (Spender, 1996). By comparison, collective knowledge is less volatile and less easily affected by staff turnover. Hence, the transformation of individual knowledge into collective knowledge has attracted much research interest among knowledge scholars (for example, Fahey and Prusak, 1998).

Some researchers (Gowler and Legge, 1982) questioned whether there is any real difference between collective knowledge and the aggregation of individual knowledge. Simon and Davies (1996) maintained that the organization per se does not hold any knowledge; only its members do. Hence, collective knowledge is actually the aggregate of the individuals' knowledge in an organization. Meanwhile, Nelson and Winter (1982) asserted that 'collective knowledge is an attribute of the organization just like its modus operandi and culture.' Collective knowledge is therefore not reducible to what any single individual knows, or even to any simple, aggregation of the various competencies and capabilities of all the individuals. Weick and Roberts (1993) provide evidence to demonstrate that collective knowledge resides at the organizational level. Their analysis acknowledges the reasoning that collective knowledge is conceived to be socially and contextually embedded in an organization and not a simple aggregation of knowledge held by a set of individuals.

***Explicit Knowledge versus Tacit Knowledge*:** The most fundamental and common classification of organizational knowledge is along the explicit-tacit dimension (Nonaka and Takeuchi, 1995). In this classification, explicit knowledge is considered to

be objective and can be expressed unambiguously in words, numbers and specifications. Anne Brooking (1999) defined ‘explicit knowledge’ as “knowledge which a person is able to make available to another for inspection. This may mean it can be explained verbally, but it is generally preferable to codify it, that is, write it down” (p. 50). That is, it can be transferred via formal and systematic methods in the form of official statements, rules and procedures (Nonaka and Takeuchi, 1995; Polanyi, 1966).

Unlike explicit knowledge, tacit knowledge is subjective, situational and intimately tied to the knower's experience (Kidd, 1998). It involves human understanding and individual knowledge. Tacit knowledge resides in the heads of people and is gained mainly through experience. Thus, it cannot be formalized, documented or communicated easily to others. Insights, intuition, beliefs, personal skills and craft, and using rule-of-thumb to solve a complex problem are examples of tacit knowledge. There are two components to tacit knowledge (Nonaka and Konno, 1998). First is the technical component, which encompasses the kind of informal personal skills or crafts often referred to as ‘know-how.’ Second is the mental component. It consists of beliefs, ideals, values, schemata, and mental models that are deeply ingrained in us, and often taken for granted. It is this mental component of tacit knowledge that shapes the way we perceive the world.

Spender (1996) suggested that a relationship can be established between the individual-collective dimension of knowledge and its explicit-tacit dimension to create a matrix comprising four types of organizational knowledge as shown in Figure 2.

Figure 2: Spender's four types of organizational knowledge

	Individual	Social
Explicit	***Conscious***	***Objectified***
Implicit	***Automatic***	***Collective***

Source: Spender J. C. (1996). Making Knowledge the Basis of a Dynamic Theory of the Firm. Strategic Management Journal, Vol. 17 (Winter special issue), p. 52.

The first type is individual explicit knowledge (*Conscious knowledge*) which represents the expertise and knowledge available to the individual in forms that can be easily taught or written down. The second type is individual implicit knowledge (*Automatic knowledge*) which is knowledge held by the individual in forms of individual schemas, skills, habits, and abstract knowledge and cannot be easily articulated (Lyles and Schwenk, 1992). The third type is social explicit knowledge (*Objectified knowledge*) which is knowledge embedded in an organization in forms that can be easily taught or written down. This type of knowledge manifests itself in standard operating procedures, documentation, information systems, and rules (Brown and Duguid, 1991). Finally, the fourth type is social implicit knowledge (*Collective knowledge*) residing in organizational routines, culture and corporate mindset (Spender, 1996). Such knowledge usually remains relatively obscure from individual members but is accessible and sustained through their interaction (Spender, 1994).

Several researchers (Nahapiet and Ghoshal, 1998; Weick and Roberts, 1993) discovered that high-performing organizations are better in creating and managing the collective tacit knowledge (*Collective knowledge*) than mediocre ones. They attributed the strategic importance of collective tacit knowledge to the fact that it represents the

extent of knowledge being distributed and leveraged among organization members and cannot be easily replicated by rival organizations.

Perspectives for Knowledge

Just like the variety in defining knowledge, there are several different ways of "seeing" knowledge. In here, I review three perspectives for "seeing" knowledge: 1) Economic view, 2) Knowledge as the resources to competitive advantage, and 3) Knowledge as an important asset.

Economic View of Knowledge: Spender (1996) distinguishes knowledge from the traditional factors of production, labor, land and capital. Knowledge, it seems, has become the most important or 'strategic' factor of production, so managers must now focus on its production, acquisition, movement, retention and application.

Spender also argues that (1) different types of knowledge lead to different types of economic rents and that firms' strategies, as the pursuit of these economic rents, will also differ; and (2) that the firm's knowledge mix or profile may change over time, being dominated by one type of knowledge at on time and by another type at another time.

Spender concludes that knowledge based theories of the firm can yield insights beyond the production-function and resource-based theories of the firm. They are platforms for a new view of the firm as a dynamic, evolving, quasi-autonomous system of knowledge production and application. The proposed solution is a synthesis of socio-technical systems theory and self-regulating biological systems. Spender identifies four heuristics which managers might use to help them define the firm as a knowledge-based

activity system, and to understand their relationship to it. The heuristics require that organizational knowledge is not defined in a positivist way as a corporate asset. Rather it is a qualitative aspect of the activity system they shape as managers. The four heuristics are (1) interpretive flexibility, (2) boundary management, (3) identification of institutional influences, and (4) the distinction between systemic and component features.

Knowledge and Competitive Advantage: Organizations possess numerous resources, but it is those resources which are unique, inimitable and valuable that form the key to competitive advantage (Prahalad and Hamel, 1990). An organization's knowledge base is one such resource (Matusik and Hill, 1998). Firms increasingly rely on building and creating knowledge as a necessary condition to survive in their respective competitive marketplaces (Nonaka, 1991). Quickly changing environmental demands and rapid imitation by competitors make it necessary for even leading firms to continually build new knowledge. Not only must firms be able to create knowledge within their boundaries, but they must also expose themselves to a bombardment of new ideas from outside in order to prevent rigidity, to encourage inventive serendipity, and to check their technological development against those of competitors (Leonard-Barton, 1992).

Bontis (1996) comments on the emergence of the chief knowledge officer (CKO), a job title that is beginning to appear in companies' annual reports. These ground-breaking individuals have been assigned the task of channeling their organizations' intellectual capital in order to develop an essential source of competitive advantage. He states that competitive success will be based less on the level of strategy applied to allocating physical and financial resources, and more on the extent to which intellectual capital is strategically managed- from capturing, coding and disseminating information,

to acquiring new competencies through training and development, to re-engineering business processes.

Knowledge Seen as an Important Asset: According to a study of large US corporations carried out by Wiig (1997a), CEOs agreed that "knowledge is our most important asset." They also agreed that knowledge-based assets will be the foundation of their success in the 21st century. Wiig states that progressive mangers have recognized that the enterprise's viability depends directly on (1) the competitive quality of its knowledge-based intellectual capital and assets; and (2) the successful application of these assets to its operational activities in order to realize their potential to fulfill the enterprise's objective.

What is 'Knowledge Management?'

An early recognition of the concept of harnessing knowledge in the workplace is attributed to the distinguished management guru Peter Drucker who, in the 1960s, introduced the concept of the knowledge worker. In his book, *The Post-Capitalist Society*, he referred to knowledge as displacing capital, natural resources and labor as a basic economic resource. As such, this represents a break from the past. Also, Karl Wiig, management consultant and artificial intelligence (AI) practitioner, is one of the field's most prominent advocates as well as its likely founder. He coined the term at a 1986 Swiss conference sponsored by the United Nations – International Labor Organization (1997).

In action, knowledge management (KM) is a conscious decision on the part of an organization to bring its staff together to help transform well-structured information into

an intellectual asset. It is not the technical economy or the information age. It is about harnessing people's intellectual capability. It could even help to bring together the aspirations of education, business and government (Goldsmith, Morgan, and Ogg, 2004).

Definitions of Knowledge Management

Within the growing reference material in the area of KM, the definitions offered seem as diverse as the potential applications of this emerging discipline. This is likely because knowledge itself is defined in many different ways and approaches from many different angles and levels of analysis. Some definitions emphasize the process of knowledge management. Others focus on the object of knowledge management. Here are some definitions of KM.

Hibbard (1997) defined KM as "the process KM is the process of capturing a company's collective expertise wherever it resides – in databases, on paper, or in people's heads – and distributing it to wherever it can help produce the biggest payoff." O'Dell and Grayson (1998) said that "KM applies systematic approaches to find, understand, and use knowledge to create value."

Meanwhile, Van de Spek (1997) described KM as "the explicit control of management knowledge within an organization aimed at achieving the company's objectives." Macintosh (1996) said that "KM involves the identification and analysis of available and required knowledge, and the subsequent planning and control of actions to develop knowledge assets so as to fulfill organization objectives." Petrash (1996) believed that "KM is getting the right knowledge to the right people at the right time so they can make the best decision." And, Beckman (1997) defined KM as "the

formalization of an access to experiences, knowledge, and expertise that creates new capabilities, enables superior performance, encourages innovation, and enhances customer value."

Rastogi (2000) provides a definition that seems to embrace the prism of KM. He states "knowledge management may be defined as a systematic and integrative process of coordinating organization-wide activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups in pursuit of major organizational goals." Similarly, Wiig (1997b) said that "KM is the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge assets."

Principles for Knowledge Management

The several definitions of what KM is can be summarized convincingly into the schemes developed by Davenport (1996). He has developed ten general principles of KM. These can be categorized to three levels: financial, strategic planning, and organization culture.

- ***Financial level***: knowledge management is expensive. So financial decisions need to be made.
- ***Strategic planning level***: effective knowledge management requires the involvement of people and technology; knowledge management requires knowledge managers; knowledge management benefits more from maps than models and is market driven; knowledge management is intended to improve knowledge work processes; access to knowledge is only the beginning; knowledge management never ends.

- ***Organization culture***: knowledge management is highly political; sharing and using knowledge are unnatural acts; knowledge management requires a knowledge contract.

Similarly, Allee's (1997) proposed a set of principles include recognizing that knowledge is messy, is self-organizing, seeks community, travels by language, is difficult to pin down, is always changing, is a social process, does not grow forever, and is difficult to impose rules on.

Moreover, Wheatley (2001) provides six principles that facilitate KM. The following list by Wheatley (2001) touches upon some of the basic human elements of KM.

1. Knowledge is created by human beings. To be successful we must do away with the traditional Western philosophy of people as machines in the process of labor.
2. It is natural for people to create and share knowledge.
3. Everybody is a knowledge worker. If every person is viewed as a contributor to the creation of knowledge, everyone will be equally targeted as having value-added.
4. People choose to share their knowledge. Some may not willingly share what they know. This desire to share knowledge is facilitated if the employee feels supported by the company.
5. Knowledge management is not about technology. Knowledge resides in the heads of employees and it is important to understand the human involvement.
6. Knowledge is born in chaotic processes that take time (33-35).

The Process of Knowledge Management

There are many ways to see knowledge management. One of them is the 'process perspective' - "considering the process(es) involved in knowledge management and the activities that go to make up knowledge management" (Edwards, Collier, and Shaw, 2003). That is, knowledge management focuses on understanding how knowledge is created, validated, presented, distributed, and applied within an organization. Many researchers have proposed models for the knowledge management process. Wiig (1993), Van der Spek and Spijkervet (1997), Holsapple and Joshi (1997), and Beckman (1997) are best known. Each of them presents a slightly different focus within the process perspective. Their various viewpoints contain several different descriptions of the processes and activities, and hence none of them has seemed to gain common acceptance.

Wiig (1993) proposes a four step processes that focuses on knowledge itself: 1) Creation and sourcing, 2) Compilation and transformation, 3) Dissemination, and 4) Application and value realization. Van de Spek and Spijkervet (1997) also suggest four different activities. However, they specifically focus on managing knowledge: 1) Creating (developing) new knowledge, 2) Securing new and existing knowledge, 3) Distributing knowledge, and 4) Combining available knowledge. Holsapple and Joshi (1997) present six steps with supporting sub-activities. Their focus is on what the individual person does with or to knowledge: 1) Acquiring knowledge (extracting, interpreting, and transferring), 2) Selecting knowledge (locating, retrieving, and transferring), 3) Internalizing knowledge (assessing, targeting, and depositing), 4) Using knowledge, 5) Generating knowledge (monitoring, evaluating, producing, and transferring), and 6) Externalizing knowledge (targeting, producing, and transferring).

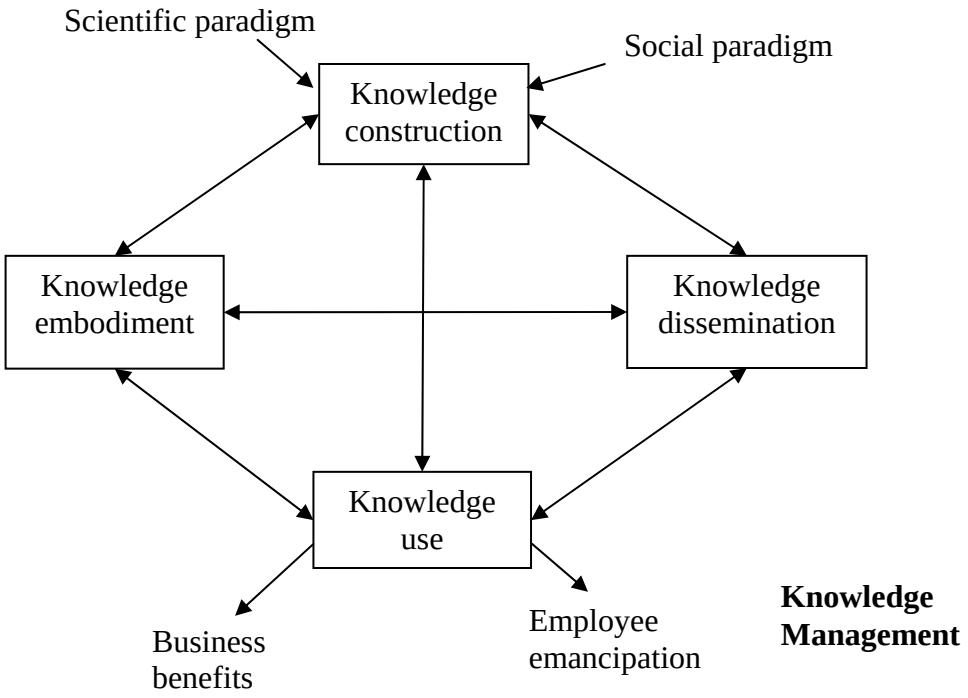
Beckman (1997) proposes a similar eight stage process for KM: 1) Identify (determine core competencies, sourcing strategy, and knowledge domains, 2) Capture (formalize existing knowledge), 3) Select (assess knowledge relevance, value, and accuracy; resolve conflicting knowledge), 4) Store (represent corporate memory in knowledge repository with various knowledge schema), 5) Share (distribute knowledge automatically to users based on interest and work; collaborate on knowledge work through virtual teams), 6) Apply (retrieve and use knowledge in making decisions, solving problems, automating or supporting work, job aids, and training), 7) Create (discover new knowledge through research, experimenting, and creative thinking), and 8) Sell (develop and market new knowledge based products and services). Truch (2001) presents a practical approach (called *knowledge value-chain*) to map the knowledge assets and knowledge creating mechanisms of an organization. The main stages of the knowledge value chain are as follows: 1) Gather data (includes collecting data to go into the system and contributing to the system), 2) Store data (includes organizing information for ready access), 3) Refine data (includes analysis, synthesis, abstracting, interpretation and also retention and disposal disciplines), 4) Transfer information (transferring information to others via sharing, distribution or self-service mechanisms), and 5) Apply knowledge (putting knowledge to use, for example to perform core tasks, make decisions, set strategy or learn from experience; linking to business processes where knowledge creates value; or sell or license the knowledge asset).

Demarest (1997) introduced the socially-constructed model for the KM process. This model assumes a wide definition of knowledge and represents knowledge as being intrinsically linked to the social and learning processes within the organization. The

model emphasizes four key dimensions of KM: 1) Knowledge construction, 2) Knowledge embodiment, 3) Knowledge dissemination, and 4) Knowledge use. (See figure 3)

The construction of knowledge within organization is not limited to scientific inputs but is seen as including the social construction of knowledge. And then the constructed knowledge is embodied within organization, not just through explicit programs but through a process of social interchange. Following embodiment, there is a process of dissemination of knowledge throughout the organization and its environment. The knowledge is seen as being of economic use in regard to organization outputs.

Figure 3: Demarest's (1997) Knowledge Management Model



Source: Demarest, M. (1997). Understanding knowledge management. Long Range Planning, 30, p. 376.

Based on the previous knowledge management process(es) models, I classify four different processes of knowledge management: 1) Knowledge acquisition and creation, 2) Knowledge storage and retrieval, 3) Knowledge transfer and sharing , and 4) Knowledge application.

Knowledge Acquisition and Creation: Organizations acquire knowledge from both external and internal sources. The ways to acquire information from external source are "1) benchmarking best practices from other organizations, 2) attending conferences, 3) hiring consultants, 4) monitoring economic, social and technological trends, 5) collecting data from customers, competitors, and resources, 6) hiring new staff, 7) collaborating with other organizations, 8) building alliances, 9) forming joint ventures, and 10) establishing knowledge links with business partners" (Morse, 2000). Organizations acquire knowledge internally by tapping into the knowledge of its staff, learning from experience, and implementing continuous process improvement.

Two important points regarding knowledge acquisition; first, information, whether it is acquired from an external or an internal source is subject to perceptual filters (norms, values, and procedures) that influence what information the organization listens to and ultimately accepts. Second, knowledge acquisition systemically is guided by a firm's core competency strategy. Individuals search for information, internally and externally, which enhances performance and adds to existing knowledge bases. For organizations to meet their strategic objectives, knowledge acquired from multiple sources must self-organize around the firm's key business processes and knowledge domains modeled in a firm's value chain (Morse, 2000).

Knowledge creation is an essential part of KM. It refers to the ability of an organization to develop new and useful ideas and solutions (Marakas, 1999: 440). By reconfiguring and recombining foreground and background knowledge through different sets of interactions, an organization can create new realities and meanings. Knowledge creation is an emergent process in which motivation, inspiration, experimentation, and pure chance play an important role (Lynn, Morone, and Paulson, 1996). Critical factors for success in this area are what is recognized in the organization as knowledge and how such knowledge is developed in the organization and its employees.

There are two differing paradigms of knowledge creation. First, there is the scientific view of knowledge or 'knowledge is truth' view (Alvesson and Willmott, 1996), where knowledge is considered as a canonical body of facts and rational laws. Second, there is what is referred to as the social paradigm of knowledge construction (Burgoyne and Reynolds, 1997), where knowledge can be socially constructed through employee interchange.

Organizations create new knowledge through numerous activities: 1) action learning (involves working on problems, focusing on the learning acquired, and actually implementing solutions); 2) systematic problem solving (requires a mindset, disciplined in both reductionism and holistic thinking, attentive to details, and willing to push beyond the obvious to assess underlying causes); 3) learning from past experience (reviews a company's successes and failures, assessing them systematically, and transferring and recording the 'lessons learned' in a way that will be of maximum benefit to the organization) (Morse, 2000).

Knowledge Storage and Retrieval: In order to store and later to retrieve knowledge, an organization must first determine what is important to retain and how best to retain it. Knowledge should be structured and stored so the system can find and deliver it quickly and correctly. When structuring knowledge it is important to consider how the information will be retrieved by different groups of people. Functional and effective knowledge storage systems allow categorization around learning needs, work objectives, user expertise, use of the knowledge, and location (where the information is stored). However, knowledge is not always present in its optimal form, is not available when needed, and is not present where the work activity is carried out. Additionally, knowledge content is often not complete, not current, and not uniform.

Knowledge Transfer and Sharing: Knowledge transfer and sharing mean making knowledge more active and relevant for the firm in creating values. In general, knowledge needs to be employed into a company's products, processes, and services. If an organization does not find it easy to locate the right kind of knowledge in the right form, the firm may find it difficult to sustain its competitive advantage. When innovation and creativity are the hallmark of the present competitive arena, an organization should be swift in finding the right kind of knowledge in the right form from the organization.

This process involves the mechanical, electronic, and interpersonal movement of information and knowledge both intentionally and unintentionally. Organizations intentionally transfer knowledge by written communications, training, internal conferences, internal publications, job rotation and job transfer, and mentoring.

Organizations unintentionally transfer knowledge as a function of unplanned human interaction, i.e. job rotation, stories, and myths, task forces, and informal networks.

Knowledge needs to be shared throughout the organization, before it can be exploited at the organizational level. The interactions between organizational technologies, techniques, and people can have direct bearing on knowledge sharing. However, in a survey of 60 Dutch organizations, Van der Spek and Spijkervet (1997) report that hardly any structural attention is paid to knowledge management. That is, organizational structure, based on traditional command and control, minimizes the interactions between technologies, techniques, and people, and thus reduces the opportunities in knowledge sharing. What is often lacking is coordination between various activities and departments.

On the other hand, horizontal organizational structure, empowerment, and open-door policy speed up knowledge flow between different participants and departments. The application of e-mail, intranet, bulletin board, and newsgroup can support the sharing of knowledge throughout the organization and allows organizational members to debate, discuss, and interpret information through multiple perspectives.

Knowledge Application: Knowledge application is related to activities concerned with deploying knowledge in order to produce goods and service. Three different activities can be identified. The first is ‘putting knowledge to use.’ Knowledge can be put for performing core tasks, making decisions, setting strategy or learning from experience. ‘Linking to business process where knowledge creates value’ is other activity of

knowledge application. The last one of knowledge application is ‘selling and licensing the knowledge asset.’

The source and application of knowledge assets falls into three main categories: 1) generated internally and used internally – economic rent, 2) generated externally and used internally – licenses, data and expertise bought in or outsourced, and 3) generated internally and used externally – sold or licensed. In the case of licensing, such as software, there might be an ongoing commitment to renew the asset and this may constitute a potential asset or liability to the organization (Truch, 2004).

That is, knowledge application means making knowledge more active and relevant for the organization in creating values. In general, organizational knowledge needs to be employed into an organization’s products, processes, and services. If an organization does not find it easy to locate the right kind of knowledge in the right form, the organization may find it difficult to sustain its competitive advantage.

Myers (1996) said that “knowledge management focuses on understanding how knowledge is acquired, created, stored and utilized within an organization. Successful companies are able to acquire, codify and transfer knowledge more effectively and with greater speed than the competition.” Organizations provide employees with an environment to learn and share knowledge using technology with the goal of enhancing their productivity.

Implementation of KM

Implementing KM is no easy task. It requires an organization to develop an analytical process to see what role KM can and should play in its operations. KM needs a facilitator to direct change management and to continually assess the value KM plays in the organization. Moreover, the organization must establish some strategic priorities and vision for implementing KM. Since this effort involves a significant strategic change in most firms, it is important to look at several factors that may be considered as the foundation for successful KM implementation.

Success or Failure Factors for Implementation of KM: First of all, Beckman (1999) has suggested four prerequisites to consider to enhance the change of success during the implementation KM: 1) Executive leadership and commitment, 2) Healthy culture, 3) Expertise, and 4) IT infrastructure[1]. Especially, he proposes using business reengineering to guide the implementation of KM projects that are larger and more complex.

Davenport and Prusak (1998) recognized nine success factors for knowledge projects that include Beckman's prerequisites for implementing KM: 1) A knowledge-oriented culture, 2) Technical and organizational infrastructure, 3) Senior management support, 4) A link to economics or industry value, 5) A modicum of process orientation,

[1] As the IT infrastructure implementation, he (1997) proposes a four stage model for implementation the innovative IT needed to support and enable KM: **Stage 1**: Establish an IS and IT infrastructure, **Stage 2**: Create knowledge repositories, **Stage 3**: Develop expert system applications, and **Stage 4**: Develop IPSS and KDD capability

6) Clarity of vision and language, 7) Nontrivial motivational aids, 8) Some level of knowledge structure, and 9) Multiple channels for knowledge transfer.

Similarly, facilitating factors for organizational learning are identified by DiBella and Nevis (1998). There are some common factors with those of Davenport and Prusak (1998). They are 1) Scanning imperative, 2) Performance gap, 3) Concern for measurement, 4) Organizational curiosity, 5) Climate of openness, 7) Continuous education, 8) Operational variety, 9) Multiple advocate, 10) Involved leadership, and 11) Systems perspective.

According to Wilson (1999**)**, there are seven key elements for successful KM.

1) Knowledge Orientation has to do with the extent that the firm gives priority to overt or deliberate efforts to manage knowledge as an asset in the fulfillment of its mission.
2) Climate refers to the extent to which the organization's people are receptive to change.
3) Culture is the extent to which the organization's vision, mission, business strategies, policies, and procedures support change.
4) Daily Operation refers to the extent to which the practical aspects of managing the daily operations of the organization actually support change.
5) Information Architecture is the extent to which the systems, policies, and procedures that affect the flow and availability of information throughout the organization support change.
6) Leadership is the extent to which the persons in leadership positions support change.
7) Magnitude of Proposed Change is the number of people in the organization who will be affected by the proposed change and the extent to which they will need to shift paradigms in order to accommodate the change.

Every element must be assessed and scored to determine readiness to proceed. If the areas are sufficiently advanced, the implementation efforts may proceed. If all are not, then it is appropriate to take action to improve the low scoring areas. In other word, the goal of assessing and scoring is to find what obstacles to KM are. So, action may be taken to eliminate or minimize the risks associated with the issues.

According to Klein's (1998) research, KM can fail in four areas: 1) business objectives, 2) program architecture, 3) strategic priorities, and 4) sponsorship. The KM business objectives must be clear and specific for the organization and allow the organization to measure itself against milestones provide for self-correction. The program architecture spells out the tools and methods for KM. If the architecture is incomplete or not compatible with the organization, KM will likely fail. Setting the organization's strategic priorities is the first step in KM. If the organization members believe top management is not concerned with KM, they will feel that KM is unimportant to the organization's survival. Sponsorship problems will affect the organization's ability to change and adapt to KM.

Beckman (1999) sees several challenges in implementing KM in the typical organization. First, knowledge is often hoarded, rather than shared. Second, valuable knowledge developed by others is often ignored, rather than applied in daily work situation. Third, knowledge and expertise are often not valued by the corporate culture, by failing to measure intellectual assets. Fourth, employees who share knowledge and expertise are considered naïve, rather than being rewarded for their valuable organizational behavior.

Zand (1997) also lists potential obstacles to success: 1) Success breeds complacency, 2) Lack of familiarity blocks action, 3) Corporate culture sets the tone, and 4) Fear of technology can block innovation.

Krogh, Ichijo, & Nonaka (2000) also identify KM in its present form as a "constricting paradigm" that has three pitfalls: 1) knowledge management relies upon easily detectable, quantifiable information, 2) knowledge management is devoted to the manufacture of tools, and 3) knowledge management depends on a knowledge officer (26-28).

The process of knowledge (just like, storage, retrieval, managing, and distribution of knowledge) would be limited to explicit knowledge and not applicable for tacit knowledge. It should be noted, however, that as organizations create processes to facilitate the conversion from tacit to explicit knowledge, applicability increases. In the eyes of the Japanese, like Nonaka, tacit knowledge represents the fundamental element to enable knowledge. He has showed the belief that to facilitate true "learning organizations," tacit knowledge must be the 'cornerstone of future investigation.' Although explicit KM is important, it only operates on the margins towards exponential corporate growth and significant individual contribution towards becoming a learning organization. Krogh, Ichijo, & Nonaka (2000) provide five knowledge enablers that begin to provide a vehicle to unleash the power of tacit knowledge. They include, 1) Instill a knowledge vision, 2) Manage conversations, 3) Mobilize knowledge activists, 4) Create the right context, and 5) Globalize local knowledge (p. 5). The authors assert that sharing

of knowledge can occur through these ‘knowledge enablers’ and true organizational improvement will result.

Technology and Culture for KM Implementation: There are two big factors in success or failure of KM implementation: technology and culture. Here, I review more some researchers’ discussions about them.

Although Wheatley (2001) states **“**knowledge management is not about technology**”** in her fifth of six elements, it can be argued that the most effective means of storage, retrieval, mapping, managing, and distributing knowledge is accomplished through technological advancements. Zack (1999) discusses the management of codified (explicit) knowledge and the use of four primary resources to manage knowledge. They include, “1) repositories of explicit knowledge, 2) refineries for accumulating, refining, managing and distributing knowledge, 3) organization roles to execute and manage the refining process, and 4) information technologies to support the repositories and processes” (47). Augier and Vendele (1999) state “technologies manifest themselves as representers of knowledge” (253). Huang, Lee, and Wang (2001) offer “technology and systems, however, are used as facilitators in the production, storage, and use of organizational knowledge” (4).

One of the key factors of KM is its dependence on a culture that will support KM activities. Some of the activities that are extremely culture dependent are the sharing and acceptance of knowledge between individuals and organizations. A culture that is rich in human interaction is much different than on where people only talk with each other when a meeting is scheduled, in other words by appointment. A culture where there is a lot of

face-to-face communication is very different from one where most communication is via phone or e-mail. This information will make a significant different in the approach that is used to implement KM in the organization. Again, having a healthy corporate culture is imperative for success in KM. Zand (1997) believes that bureaucratic cultures suffer from a lack of trust and a failure to reward and promote cooperation and collaboration. Without a trusting and properly motivated workforce, knowledge is rarely shared or applied; innovation and risk-taking case; and organizational cooperation and alignment are nonexistent. No wonder that most bureaucratic organizations suffer under marginal performance, and are incapable of agile, innovative behaviors leading to future success. That is, according to Buchwalter (2000), the general lack of a culture, which supports knowledge management, is the primary obstacle for (government) organizations. The characteristics of sharing and openness are very few and far between in government organizations. Also, even where claims of open-door policies are made, the management body disdains any activities that do not follow the hierarchical structure.

Hansen, Nohria and Tierney (1999) provide numerous examples of companies that have changed their business strategies to incorporate knowledge management activities through changes in their culture.

According to the socio-technological perspective of the organization (Emery, 1959, 1967; Trist, 1981; Trist and Bamforth, 1951), technologies and social systems are equally important in knowledge management. The conversion between data and information is efficiently handled through information technologies, but IT is a poor substitute for converting information into knowledge. The conversion between information and knowledge is best accomplished through social actors, but social actors are slow in

converting data to information. So, knowledge management is best carried out through the optimization of technological and social subsystems.

Knowledge Management Strategies: Wiig (1997) has observed in varied work situations that many organizations pursue different knowledge management strategies in an attempt to match their culture, priorities and capabilities. He found that enterprises tend to pursue one of five basic knowledge-centered strategies:

1) **Knowledge strategy as business strategy -** emphasizes knowledge creation, capture, organization, renewal, sharing and use in all plans, operations and detailed activities to provide the best possible knowledge available at each point of action.
2) **Intellectual asset management strategy -** emphasizes enterprise level management of specific intellectual assets such as patents, technologies, operational and management practices, customer relations, organizational arrangements and other structural knowledge assets. Management's task is to renew, organize, evaluate, protect and increase availability and marketing of these assets.
3) **Personal knowledge strategy** – emphasize personal responsibility for knowledge-related investments, innovations, and competitiveness, renewal, effective use and availability to others of knowledge assets within each employee's area of accountability. The objectives are to build knowledge continually and to apply the most competitive knowledge to the enterprise's work.
4) **Knowledge creation strategy** – emphasizes organizational learning, basic and applied research and development, and the motivation of employees to innovate and capture lessons learned in order to acquire new and better knowledge as a way of increasing competitiveness.
5) **Knowledge transfer strategy** – emphasizes systematic approaches to transfer (i.e. obtain, organize, restructure, warehouse or memorize, repackage for deployment and distribute) knowledge to points of action where it will be used to

perform work. This strategy includes knowledge sharing and adopting best practices.

To pursue these strategies, organizations undertake specific programs and activities, provide supporting infrastructure capabilities, and sometimes create incentives to motivate individual employees, teams and even departments and business units to cooperate with the new objectives.

Personalization and Codification Knowledge Strategies: In a study of management consultancies, Hansen, Nohria, and Tierney (1999) found that they do not take a uniform approach to managing knowledge. They employ two very different knowledge management strategies: a ‘codification strategy’ and a ‘personalization strategy.’ (see Table 1)

In some companies the strategy centers on the computer. Knowledge is carefully codified and stored in databases, where it can be assessed and used easily by anyone in the company. They call this ‘codification strategy.’ In other companies, knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contact. The chief purpose of computers is to help people communicate knowledge, not to store it. Hansen, Nohria, and Tierney (1999) call this ‘personalization strategy.’

A company’s choice of strategy depends on the way the company serves its clients, the economics of its business, and the people it hires. Emphasizing the wrong strategy or trying to pursue both at the time can, as some consulting firms have found, quickly undermine the business. They found that these two strategies are not unique to

consulting firms, and analyzed computer companies and health care providers and found the same two categories at work. They believe that the choice between codification and personalization is the central one facing virtually all companies in the areas of knowledge management. Knowledge codification uses a people-do-documents approach (it is

Table 1: Codification versus Personalization Knowledge Strategies

How consulting Firms Manage their Knowledge		
	Codification	**Personalization**
Competitive Strategy	Provide high-quality, reliable and fast information systems implementation by re-using codified knowledge	Provide creative, analytically rigorous advice on high level strategic problems by channeling individual expertise
Economic Model	REUSE ECONOMICS: - Invest once in a knowledge asset; reuse it many times - Use large teams with a high ratio of associates to partners - Focus on generating large overall revenues	EXPERT ECONOMICS: - Charge high fees for highly customized solutions to unique problems - Use small teams with a low ratio of associates to partners - Focus on maintaining high profit margins
Knowledge Management Strategy	PEOPLE-TO-DOCUMENTS Develop an electronic document system that codifies, stores, disseminates and allows reuse of knowledge	PERSON-TO-PERSON Develop networks for linking people so that tacit knowledge can be shared
Information Technology	Invest heavily in IT; the goal is to connect people with reusable codified knowledge	Invest moderately in IT; the goal is to facilitate conversations and the exchange of tacit knowledge
Human Resource	- Hire new college graduates who are well suited to the reuse of knowledge and the implementation of solutions - Train people in groups and through computer-based distance learning - Reward people for using and contributing to document databases	- Hire MBAs who like problem solving and can tolerate ambiguity - Train people through one-to-one mentoring - Reward people for directly sharing knowledge with others

Source: Hansen, Nohria, and Tierney (1999)

extracted from the person who developed it, made independent of the person, and reused for various purpose). They found that strategy-consulting firms emphasize a personalization strategy, i.e. people-to-people. They focus on dialogue between individuals, not knowledge objects in a database. Knowledge that has not been codified – and probably could not be – is transferred in brainstorming sessions and one-in-one conversations. Consultants collectively arrive at deeper insights by going back and forth over problems they need to solve. Firms following personalization strategies tend to invest heavily in building networks of people. Knowledge is shared not only face-to-face but also over the telephone, by e-mail and via video conferences.

Wiig (1997) observes that the systematic and explicit knowledge management covers four areas of emphasis: (1) top-down monitoring and facilitation of knowledge-related activities, (2) creation and maintenance of knowledge infrastructure, (3) renewing, organizing and transforming knowledge assets, and (4) leveraging (using) knowledge assets to realize their value.

Knowledge Management in the Public Sector

Research and practice into KM and IC (intellectual capital) in the past decade have produced a significant body of knowledge in terms of both practice and theory (Brooking, 1996; Davenport and Prusak, 1998; Stewart, 2002). However, much of the documented KM practice is related to the private sector. How KM contributes to the public sector is, to a large extent, less commonly addressed. It seems that KM practice in

the public sector lags behind the private sector. Moreover, there has been little work that examines KM from public versus private sector perspective (Rubenstein-Montano, 2001). However, like private firms, public sector organizations need better access to the best internal and/or external information and knowledge, effective decision making and the ability to innovate and adapt (Martin, 2000).

Why is KM so important to public sector organizations?

Public agencies have a particularly high percentage of professionals and special staff who command important domains of knowledge-based activities, especially in administrative departments, in the judiciary, and in regulatory agencies. Many public organizations are chiefly “intelligence organizations” and officials can be considered as knowledge workers par excellence. Complex decisions are particularly knowledge demanding. Decision making is a public official’s daily bread. For any agency, its specific domain knowledge is an asset of key importance. Here, one aspect comes in that is of utmost importance: acting and decision-making in the public sector are not a prerogative of management. Complex decisions are made at the operational level, and this is precisely where most knowledge demands originate.

The prospective loss of employees due to an aging workforce is an example. A recent GAO report indicated that a substantial portion of the federal workforce would become eligible to retire or will retire over the next five to 10 years, and that workforce planning is critical to ensure that agencies have sufficient and appropriate staff to account for these retirements. A problem these retirements pose is that the senior employees who retire will be taking a great deal of knowledge experience with them. Knowledge

management can mitigate the impending shortage by capturing the expertise of employees before they leave the government so that their expertise can be reused in the future.

In addition, high staff turnover, lack of adequate training, and a tendency to maintain the status quo, further impact and impede the success of knowledge retention and growth. Oftentimes, when people leave an organization, they take a wealth of knowledge about their jobs with them. Knowledge management attempts to secure and replenish the learning experiences, as well as the work products, of the individuals who comprise an organization.

Knowledge management is still underrated in public organizations

For all levels of government, knowledge management is of prime concern. In general, scarcity of knowledge is the driver for introducing knowledge management. Knowledge management aims at managing knowledge distributed within and outside an organization with the purpose to establish an organizational memory. This is done in a systematic way according to a lifecycle of knowledge production, integration and validation. In practice, the development process is an ongoing and adaptive interaction with the instrument of a knowledge base. Moreover, an organized transfer of know-how, skills and expertise has to be arranged in a proactive way; a learning organization is the goal which one has in mind. The technical means for achieving a learning organization status is KMS (Knowledge Management Systems) which will integrate diverse concepts

and tools. For more on Knowledge Management and KMS we refer to the literature (Borghoff and Pareschi, 1998).

Turning to the public sector as application domain for KM, one has to say that public administrators are not yet mentally prepared to that development. Crucial as it is – knowledge management is underrated in this field. It starts with most administrators not being conscious that, in their agencies, extensive “riches” of knowledge – a real bounty of worth and benefit - is hoarded. Gloomy as it may appear, administrators do not conceive themselves as knowledge workers and so they have little concern for knowledge as an asset. There are several reasons that dealing with knowledge finds little regard: not many administrators will evaluate ‘their knowledge’ in financial terms; others see themselves not responsible for that issue.

Riley (2003) points out that “the challenge now for organizations is to determine and develop principles and guidelines on how knowledge can be created, harnessed, shared and distributed among government agencies and to the public.” To address the challenge, three important issues have emerged in KM research and practice for the public sector. These include:

1) How do public sector organizations measure up against KM critical success factors?
2) How do public sector organizations compare with private sector organizations in KM and IC practice?
3) Are the differences because of cultural factors or simply because public sector organizations are not as far advanced in KM and IC practice?

Answers to these questions would help advance our understanding of how knowledge is and should be managed in the public sector.

Public and Private Organizations
(The Distinction between Public and Private Organizations)

It is very difficult for scholars to say that the public organization and the private organization are either the same or different. The distinction between public and private administration is a very important topic for students, scholars, and policy makers. In order to effectively manage public organizations, a deep understanding about the importance and meaning of the distinction is necessary. Research results about this distinction are varied according to how researchers approach this topic. For example, Michael Murray (1975), who takes generic approach, believes that all organizations should be observed and emphasizes that there are many similarities and same limitations between public and private organizations. In contrast, Rainey, Backoff, and Levine (1976) take a "binary approach," comprehensively and synthetically showing distinctions between public and private organizations.

Wallace Sayre's ironic aphorism that public and private management are fundamentally alike in all unimportant respects neatly summarizes a long standing and highly contentious issues in public administration. Assuming that Sayre is correct, then differences in modes of managing obviously imply differences in the kinds of organizations that are managed. By extension, if public and private organizations differ from one another in significant ways, then questions naturally arise about how theorizing might, both descriptively and normatively, take due account of those differences (Harmon and Mayer, 1986).

We can find the similarity between public organizations and private organizations

in some research. Studies of variables such as size, task and technology in government agencies show that those variables may influence government organizations more than anything related to their governmental auspices. These findings agree with the commonsense observation that an organization becomes bureaucratic not because it is in government or business but because of its large size. Some of the prominent efforts (Hass, Hall, and Johnson, 1966) to develop a taxonomy of organizations based on empirical measures of organizational characteristics have failed to show any value in a public-private distinction. The result shows that the task and functions have much more influence on their characteristics than public or private auspices. Moreover, in classifying a sample of some fifty-eight organizations, Pugh, Hickson, and Hinings (1969) had predicted that the government organizations would show more bureaucratic features, such as more rules and procedures, but they found no difference. They interpret the results as inconclusive as to whether government agencies differ from private organizations in terms of structural characteristics.

Many people and organizations in the public and private sectors perform virtually the same functions. In addition, through contracts, grants, vouchers, subsidies and franchises, governments arrange for numerous services by private organizations and private business and non-profit organizations become parts of the service delivery process for government programs. Some people point out that the public and private sectors are overlap and interrelate.

Bower (1977) believes effective public administration is not the same as effective business management. He argues that “business people should operate under no illusions about there being similarities between their work and the tasks of public administration.”

Allison (1983) has also contributed to the argument that “the differences are more important than the similarities.”

Rosenbloom (1993) say that public administration differs from private administration in significant ways. Although there are several aspects of management that are generic, that is, they are similar in both public and private settings, on balance public administration is largely a separate endeavor. He explains the reasons of differences between public administration and private administration in several ways: Constitutions, the public interest, the market and sovereignty.

Constitutional concerns favoring the separation of powers and federalism create a very complex environment for contemporary public administration in the United States. This complexity of fragmented authority is generally not matched in the private sector. Legal restrictions and requirements affect private management, but they do not fragment authority over it in the same way or to the same extent.

Constitutional concerns are important in another way as well. They establish values in the public sector that frequently run counter to the values embodied in private management. We will have much more to say about this when we discuss the values inherent in the political and legal approaches to public administration. For now, however, it should be noted that efficiency in government is often subordinated to political principles such as representativeness or to legalistic considerations like due process.

Frederick Mosher assures that public administrators represent the interests of the citizenry. Otherwise, there can be no guarantee that democracy will prevail. Private firms are thought to best serve the general interest by vigorously pursuing their own economic interests. One way of summarizing this different perspective on the public interest is to

think in terms of externalities - or aspects of the productive or service operations of organizations that do not enter into the agreement between buyer and seller. Pollution is a classic example of an externality.

A closely related distinction between public and private administration concerns the market. It is generally true that public agencies do not face free, competitive markets in which their services or products are sold. The remoteness of market forces from most public administrative operations has profound consequences. First, it enables government to provide services and products that could not profitably be offered by private firms, which is another way of saying would not be provided by private enterprise at all. Some of these services and products are referred to as public goods or collective goods. The remoteness of market forces in the public sector also makes it difficult to assess or evaluate the worth and efficiency of public administrative operations.

Sovereignty is the concept that somewhere in a political community there is an ultimate repository of supreme political power and authority. In the United States, sovereignty resides in the people, as a whole, who exercise it through a representative government. Public Administration and public employment, in particular, are consequently considered to be a “public trust.” As representatives of the sovereign people, public administrators are also placed in a position that differs considerably from that of managers and employees in the private sector. Public administrators are engaged in the formulation and implementation of policies that allocate resources, values, and status in a fashion that is binding on the society as a whole.

Public administrators’ actions embody the will of the sovereign, which means that the actions of public administrators have the force of law and the coercive power of the

government behind them. Private firms also make policies and are engaged in activities that affect the lives of individuals in the society as a whole, but their actions are not binding in the same sense and they cannot be enforced through legitimate coercive physical power.

Scholars have provided useful insights into the distinction in recent year, and researchers and managers have reported more evidence of distinctive features of public organization. Robert Dahl and Charles Lindblom (1953) analyzed the alternatives available to nations for controlling their political economies. Two of the fundamental alternatives are political hierarchies and economic markets. Polyarchy is a political process which involves a complex array of contending groups and institutions that produces a complex, hydra-headed hierarchy, and such a politically established hierarchy can direct economic activities. Alternatively, the price system in free economic markets can control economic production and allocation decisions. Strength of polyarchy is its inexpensiveness, and its weakness is its confining, clumsy, ineffectiveness, poorly adapted to many local circumstances, and cumbersome to change. The strength of the market is its freedoms, flexibility, providing incentives for efficient use of resources, controlling production in the direction of consumer demands, and avoiding the problems of central planning and rule making inherent in polyarchy are also its strength. Its weakness is a limited capacity to handle certain types of problems such as general benefits for the society, providing sufficient education or information, and externalities.

In their analysis of markets and polyarchies, Dahl and Lindblom treat the public-private distinction as a complex continuum of types of organization, ranging between enterprises and agencies. Enterprises are organization controlled primarily by markets.

Agencies are public or government-owned organizations. Agencies have more trouble integrating cost reduction into their goals and coordinating spending and revenue decisions, since legislatures assign their tasks and funds separately. Moreover, agencies pursue more intangible, diverse objectives, making efficiency harder to measure. Also, agencies have problems of hierarchical control, such as red tape, buck passing, rigidity, and timidity, than do enterprises.

Wamsley and Zald (1973) employ ownership and funding in making a distinction between private and public organization. Organizations can be owned by government or privately owned. They can receive most of their funding from governmental sources, such as budget allocations from legislative bodies, or they can receive most of it from private sources, such as donations or sales on economic markets. Putting these two dichotomies together results in the four categories. This scheme does have limitations; it makes no mention of regulation. Nevertheless, the approach provides a fairly clear way of identifying core categories of public and private organization.

Bozeman (1987) employs the concept of “publicness” to conceive the complex variations across the public-private dimension. He said that all organizations have some degree of political influence and are subject to some level of external governmental control. He used two subdimensions, political authority and economic authority as continua. The publicness of an organization depends on the joint level of these two dimensions.

In spite of the difficulties of finding the distinction, the stream of assertions and research continues. During the 1970s and 1980s, various reviews complied the most frequent arguments and evidence about the distinction. Conclusively, Rainey (1997)

summarizes the common assertions about the distinctive nature of public organization and management in five domains. First, most public organizations do not sell their outputs on economic markets. Second, differences arise from the distinct nature of transactions with the external environment. Government is more monopolistic, coercive, and unavoidable than private organization. Government organization is subject to unique public expectations for fairness, openness, accountability, and honesty. Third, the constraints and diffuse objectives in public organization allow managers less decision-making autonomy and flexibility than their private counterparts. Fourth, public employees' personality traits, values, needs, and work-related attitudes differ from those of private employees. Fifth, government organizations operate less efficiently and effectively than do private organizations.

The distinction between the public and private administration is a very important topic for students, scholars, and policy makers. In order to effectively manage public organizations, a deep understanding about importance and meaning of the distinction is necessary. The research results about distinction are varied according to approaches in history of public administration. For example, Michael Murray (1975), who takes the generic approach, believes that all organization should be observed and emphasizes that there are many similarities and same limitations between public and private organizations. On the contrary, Rainey, Backoff, and Levine (1976), who take binary approach, comprehensively and synthetically show the distinction of public-private organizations.

Do public organizations really differ from private organizations? To answer this question, it is meaningful to review some results of research about the similarities and distinctions.

Similarities

Some researchers and scholars have insisted that public and private organizations are very similar. In classifying some fifty-eight organizations, Pugh, Hickson, and Hinings (1969) found no difference although they had predicted that the government organizations would show more bureaucratic features, such as more rules and procedures. The result made them interpret that the difference between private and public organizations in terms of structural characteristics is unsettled. Moreover, the efforts (Hass, Hall and Johnson: 1966) to develop taxonomy of organizations based on empirical measures of organizational characteristics have failed to show the differences.

The public and private sectors overlap and interrelate in many ways. Through contracts, grants, vouchers, subsidies and franchises, governments arrange for numerous services by private business and non-profit organizations and these become parts of the service delivery process for government programs. Many people and organizations in the public and private sectors perform actually the same functions. That is, general managers, computer programmers, auditors, personnel officers, and many other specialists perform similar tasks in public and private organizations.

Distinction

Bower (1977) believes that effective public administration is not same as effective business management. He argues that “business people should operate under no illusions about there being similarities between their work and the task of public administration.”

Allison (1983) has also contributed to the argument that “the differences are more important than the similarities.”

Rosenbloom (1993) says “public administration differs from private administration in significant ways. Although there are several aspects of public management that are generic, that is, they are similar in both public and private settings, on balance public administration is largely a separate endeavor.” He explains the reasons of differences between public administration and private administration in several ways: constitutions, the public interest, the market, and sovereignty.

Constitutional concerns favoring the separation of powers and federalism create a very complex environment for contemporary public administration in the United Sates. They establish values in the public sector that frequently run counter to the values in private management.

Public administrators represent the interests of the citizenry. Otherwise private firms are thought to best serve the general interest by pursuing their own economic interests. Thinking in terms of externalities gives the one way of summarizing this different perspective on public interest.

A closely related distinction between public and private administration concerns the market. It is generally true that public agencies do not face free, competitive markets in which their services or products are sold. The remoteness of market forces in the public sector also makes it difficult to assess or evaluate the worth and efficiency of public administrative operations.

Sovereignty is the concept that somewhere in a political community there is an ultimate repository of supreme political power and authority. As representatives of the

sovereign people, public administrators are also placed in a position that differs considerably form that of managers and employees in the private sector.

Some researchers present concepts to show the distinction between public and private organizations. Wamsley and Zald (1973) use concepts of ownership and funding to make a distinction between private and public organization. They say that organizations can be owned by governmental or private entities. Also, organization can receive most of their funding from governmental sources, such as budget allocations from legislative bodies, or they can receive most of it from private sources, such as donations or sales in economic markets. They make four categories by putting these two dichotomies together (see figure 4). This scheme does have limitations; it makes no mention of regulation (Rainey, 1997). Nevertheless, the approach provides a fairly clear way of identifying core categories of public and private organization.

Figure 4: Political and Economic Differences between Public and Private Organizations

		Ownership
	Public	**Private**
Public (taxation, government contracts)	Defense Department Arsenals Judicial system Social Security Administration	Aerospace firms Rand Corporation Oak Ridge National Laboratories Space Technology Laboratories
Private (Sales rates regulated and now regulated)	Post Office Publicly owned utilities Comsat	Food stores YMCA Community Service Conuncils

Source: Wamsley, G. L. and Zald, M. N. (1973). The Political Economy of Public Organizations. Lexington, Mass.: Heath, p.10.

Bozeman (1987) presents the concept of “publicness” to understand the complex variations across the public-private dimension. He says that all organizations have some degree of political influence and are subject to some level of external governmental control. He used two subdimensions, political authority and economic authority as continua. The publicness of an organization depends on the joint level of these two dimensions.

Rainey (1997) summarizes five common assertions about the distinctive nature of public organization and management. First, “most public organizations do not sell their outputs on economic markets.” Second, “differences arise from the distinct nature of transactions with the external environment.” Public organizations are more monopolistic, coercive, and unavoidable than private organizations. Moreover, the more values such as fairness, openness, accountability and honesty have to be considered in public organizations. Third, “the constraints and diffuse objectives in public organization allow managers less decision-making autonomy and flexibility than their private.” Fourth, “public employees’ personality traits, values, needs, and work-related attitudes differ from those of private employees.” Fifth, “government organizations operate less efficiently and effectively than do private organizations.”

These various analyses point out that it is very difficult to say how public organizations differ from private organization. But, in spite of difficulties of finding the distinctions, the stream of assertions and researches continues because understanding the distinctions is a basic step to effectively managing public organizations.

Wallace Sayre’s ironic aphorism that public and private management is

fundamentally alike in all unimportant respects neatly summarizes long standing and highly contentious issues in public administration. Assuming that Sayre is correct, then differences in modes of managing obviously imply differences in the organizations that are being managed. By extension, if public and private organizations differ from one another in significant ways, then questions naturally arise about how theorizing might, both descriptively and normatively, take due account of those differences (1986).

Management in the 1990s Research Program

'The Management in the 1990s Research Program' was created in 1984 to examine the impacts of information technology (IT) on organizations of all kinds by a group of faculty at the MIT Sloan School of Management (Scott Morton, 1991). This program began with two basic premises: 1) The business environment is and will remain turbulent and 2) IT will continue its rapid evolution over at least the next decade.

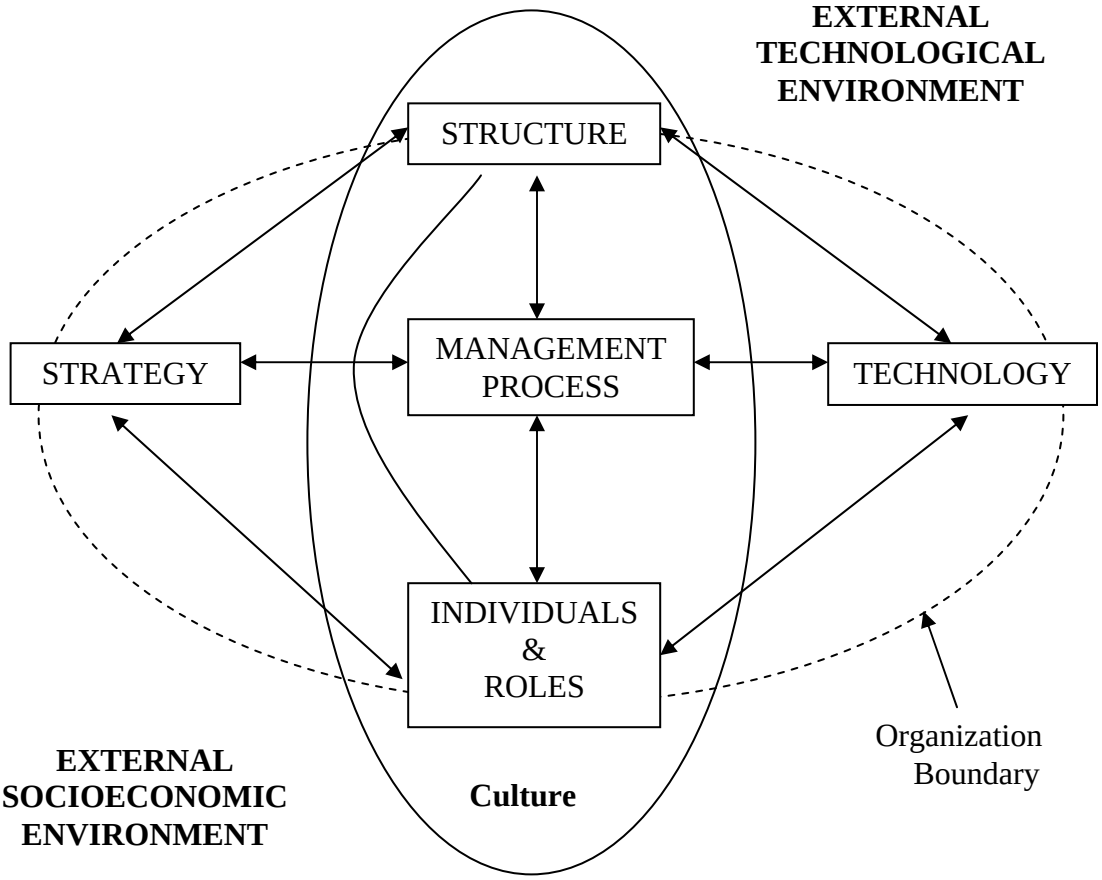
Soctt Morton (1991) said that "turbulence in the business environment puts pressure on organizations to be sure they can effectively meet the fundamental changes that are occurring." The research program identified the four kinds of changes with which organizations must contend: social change, political change, technical change, and economic change.

The research program expected that in the 1990's organizations would experience the effects of the continuing integration and evolution of a set of elements collectively termed information technology. Six elements were considered: Hardware, Software, Networks, Workstations, Robotics, and Smart chips.

One model emerged from the MIT90s research – Scott Morton's MIT90's

framework (Scott Morton, 1991). This framework demonstrates that organizations are complex systems of people, structures, technology, culture, processes and management operating in an environment which is itself complex and constantly changing (see *Figure 5*).

Figure 5: The MIT90s Framework



Source: Scott Morton, M. S. (ed.) (1991). The Corporation of the 1990's. p. 20.

The MIT90's framework includes a hypothesis that a change in any one of these

elements can have repercussions elsewhere, and the unintended consequences of even minor changes can, in the worst case, destabilize the whole change effort (Scott Morton, 1991). The management of change is a complex undertaking; the complexity arises from the systematic or 'holistic' nature of organizational change. As soon as the organization moves beyond very simple changes, it needs to take account of a variety of inter-related factors which can make the management of change a complex requirement.

The MIT90s framework illustrates this complexity. This framework represents the complexity as a set of five forces in dynamic equilibrium perpetually striving for stability (Morton, 1991). These forces are:

Strategy: general modes of doing business in pursuit of organizational goals**.** Given that competing organizations will also exploit IT, strategy innovation is needed to generate competitive advantage.

Structure: the way that the organization is partitioned and the way the partitions interrelate. The organizational structure will be changed and new organizational structures will reflect the adoption of new IT and IT-enabled processes and practices.

Management processes: the standardized sequences of activities that organizations adopt in order to undertake the tasks they perform regularly. Their character reflects the power and control distribution within an organization, the structure, the people and their assigned roles, and the enabling technology.

Individuals and roles: concerned with people within the organization, tasks they undertake, and the education and training they require to perform their functions. This force recognizes that there will be a blurring of job categories and tasks.

Technology: the IT that can be applied to facilitate business processes. Scott Morton points out that improvements in IT will lead to increasing shrinkage of time and distance effects, greater interconnectedness, better

organizational memory and greater capture of organizational rules.

An important element of the MIT90s research program was the development of a model of ‘strategic alignment’ that serves as a framework, not only to conceptualize the interdependence of the elements, but also to identify attractive and appropriate courses of action to achieve the organization’s goals. According to MacDonald (1991), business success does not depend simply on the harmonization of business strategy and information systems. Rather, it depends on a more complex co-alignment of strategy, organization and management processes, IT strategy and information systems architecture.

This framework also identifies the influences that an organization is subjected to from its external environment and to which it must respond. Both the internal forces in the organization and the external environment change through time and the changes in any one area will have implications for the other areas (Scott Morton, 1991). The complexity and interrelatedness of these areas highlight the need for dedicated management of the change process: if nobody is responsible for ensuring that an intended change takes place, the change effort will not reach fulfillment. The model is displayed in Figure 5.

In this chapter, current theories and models relating to the main elements of the research topic have been identified and outlined. As the basic concepts of this research, I reviewed several subjects related to ‘knowledge management’: the meaning of knowledge, definition of KM, principles and pitfall of KM in organizations, KM processes and strategies. Also, I discussed the KM in public organizations with several

aspects. Especially, this shows the need of KM in public organization. In addition, I reviewed the literature on whether and how public organizations differ from private ones.

The purpose of this paper is to test empirically the basic KM argument that KM in public organizations differs from that carried out in private organizations. While there has been substantial argument about this, there is little work that examines KM from public versus private sector perspective. This study will fill this gap in research about KM. The MIT90's framework that introduced above will be used as the foundations for building a model for comparing KM between public and private organizations.

The research topic for this paper refers to knowledge management strategy. Hansen, Nohria, and Tierney (1999) found that business employs two very different knowledge management strategies; one is 'codification strategy' (knowledge is carefully codified and stored in database, where it can be accessed and used easily by anyone in the organization) and the other one is 'personalization strategy' (knowledge is closely tied to the person who develop it and is shred mainly through direct people-to-people contact). They believe that the choice between the two different knowledge management strategies is the central one facing virtually all organizations in the areas of knowledge management. That is, the proper choice of strategy of KM brings better performance to organizations.

There are a lot of assertions about the similarities and distinctions between public and private organizations. It is difficult to say that public organizations differ fundamentally from private organizations. But in spite of difficulties, many researches have focused on this topic because understanding the distinction is a basic step to effectively managing public organizations.

I found an association between the description by Hansen, Nohria, and Tierney (1999) of codification and personalization knowledge management strategies and the description by the assertions and researches of the characteristics of the public and private organizations. Public organizations and codification strategy share the following common characteristics: a focus on cost-effectiveness than high margins, a high degree of reuse of resources such as knowledge, and the employment of people who are suited to standardized work. One the other hand, private organizations, which are continually searching for market opportunities and are more innovative, are close in many respects to a personalization knowledge strategy. They bear following common characteristics: creativity, focus on maintaining high margins, employment of people who are flexible and can handle high degree of ambiguity and a greater focus on tacit rather than explicit knowledge. The purpose of this study is to test whether or not there actually are such differences between public and private organizations.

Chapter 3

RESEARCH METHODOLOGY

The subject of this study concerns possible differences in KM between public and private organizations. In the literature review, I describe theories, models and perspectives that relate to this topic. This chapter presents the research methodology to explore possible differences in five parts. The first part describes the research model which will be tested in this study. The second part describes research hypotheses which will be classified by the five forces of The MIT90s framework. The third part describes how measurements used in this research are operationalized. The fourth part describes the population and sample. The fifth part describes how data will be collected.

Research Model

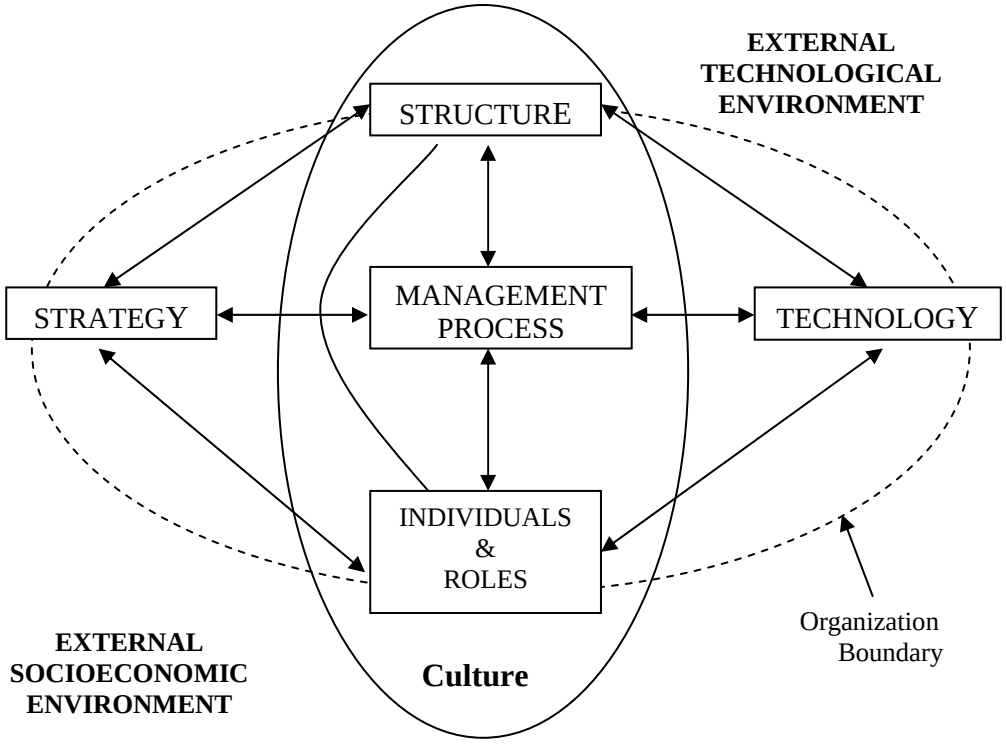
The basic premise of this research is that the proper choice of strategy of KM brings better performance to organizations. And for better performance, different strategies of knowledge management are needed for public and private organizations.

Hansen, Nohria, and Tierney (1999) found that business employs two very different knowledge management strategies. In some companies, the strategy centers on IT. Knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the organization. They called this a *codification strategy*. In other companies, knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts. The chief purpose of IT in such organization is to help people communicate knowledge, not to store it. They call this a

personalization strategy. According to Hansen, et al., a choice of strategy is far from arbitrary; it depends on the way the firm services its clients, the economics of the business, its culture and the people it hires. Emphasizing the wrong strategy or trying to pursuing both at the same time can quickly undermine a business. They believe that the choice between codification and personalization is the central issue facing virtually all companies in regards to KM.

According to the Scott Morton's MIT90's framework (see Figure 6 below), an organization can be thought of as comprised of five sets of forces (strategy, structure, management process, individuals and roles, and technology) in dynamic equilibrium among themselves even as the organization is subjected to influences from an external environment.

Figure 6: The MIT90s Framework



Source: Scott Morton, M. S. (ed.) (1991). The Corporation of the 1990's. p. 20.

In this view, a central task of general management is to ensure that the organization, that is, all five forces, move together through time to accomplish the organization's objectives.

As an elaborations of the research model, I made an association between the descriptions of codification and personalization knowledge strategies, and MIT90's framework with types of organization - public and private organization (See *Table 2*).

Developing Hypotheses

The hypotheses presented in the following sections are postulated to describe relationships between knowledge management (KM strategies) and types of organizations (public and private organizations). They are based on the MIT90's framework:

1. Knowledge strategy: codification and personalization
2. Structure: vertical and horizontal structure, and coordination
3. Knowledge processes: acquisition and creation, storage and retrieval, transfer and sharing, application
4. Human resources: recruitment, reward systems, training
5. Information and communications technology

Table 2: Research Model

	Public Organization	Private Organization
Strategy	People-to-documents: focus on developing an electronic document system that codifies, stores, disseminates and allows reuse of knowledge (codification knowledge strategy)	Person-to-person: develop networks for linking people so that tacit knowledge can be shared (personalization knowledge strategy)
Structure	- More centralized and formalized rules in the organization - Functional organizational structure (need the control systems to be centralized)	Use of fact to face and virtual teams operating both horizontally and diagonally across the organizations
Management Process (KM)	- The organization has dedicated staff members (part or full time) who have responsibility for codifying and storing documents in electronic repositories - People can search for and retrieve codified information without having to contact the person who originally developed it - Focus on developing an electronic document system that codifies, stores, disseminates and allows reuse of knowledge	- Fostering of networks by transfer of people between offices - Supports a culture in which people are expected to respond rapidly to requests for information from colleagues - Knowledge is shared mainly through direct person-to-person contacts - Directories – comprehensive yellow pages to locate experts and people with common interests - Emphasis on capturing people's tacit knowledge when they change roles or leave
Individual And Roles	Recruitment: the organization hires people who are well suited to the reuse of knowledge and the implementation of solutions	Recruitment: the organization tends to hire people who like problem solving and can tolerate ambiguity
	Remuneration: performance related pay system rewards employees for using and contributing to document databases	Remuneration: performance related pay system is geared to encouraging sharing of tacit knowledge and rewards employees for directly sharing their knowledge
	Training: is focused on efficiency, tends to be in groups, and where possible uses automated systems such as computer-based distance learning	Training: focuses on conveying tacit knowledge and makes a lot of use of one-to-one mentoring
Technology (IT Systems)	- IT systems are primarily aimed at connecting people with reusable codified knowledge - The KM systems ensure that documents can be tracked down from anywhere within the organization with speed - Focus on providing organization wide easy access to information which is stored in electronic repositories	- IT systems are aimed at facilitating conversations and the exchange of tacit knowledge; and supports people finding other people - Provision of systems and infrastructure for linking people so that tacit knowledge can be shared - A large proportion of the organization's knowledge is tacit and as such is tied to the person who developed it - Linkage between innovation and knowledge management

Strategy

Management practices are always the critical factor for any new implementations in an organization. However, a government organization differs from private industry where the boss is the boss. In a government organization there are many bosses. The executive branch of government delineates processes for most agencies – for example, OMB. The legislative branch of government (i.e. Congress) makes laws that government agencies must follow. Therefore, there are other factors, which can be used to effectuate or encourage a government agency to follow a specific strategy (Buchwalter, 2000).

Hansen, Nohria, and Tierney (1999: 107) say that "the choice between codification and personalization is the central one facing virtually all companies in the area of knowledge management." In particular, they found that effective firms excel by focusing on one of the strategies (codification or personalization) and using the other in a supporting role. They do not try to use both approaches to an equal degree.

Private organizations place more reliance on people capabilities, whereas public organizations rely more heavily on routines and standardized systems. It therefore appears that public organization is associated with the codification knowledge strategy and private organization with the personalization strategy. This leads to the following hypotheses:

H1: Public organizations follow more codification knowledge strategies than private organizations.

H2: Private organizations follow more personalization knowledge strategies than public organizations.

Structure

Government heavily emphasizes control and accountability. The pressure for accountability creates a large numbers of rules, regulations, and reporting requirements. “Public management typically involves great information intensity and information traffic. The tasks that public organizations carry out, of course, tend to be service-oriented and information-intensive” (Rainey, 1997). Bretschneider’s (1990) studies shows that public organizations involve greater information intensity, with private service organizations such as banks and insurance companies coming close to resembling them but actually falling in an intermediate range between industrial firms and public agencies.

Moreover, the system of government has become an elaborate array of “centrifugal and centripetal” forces (Warwick, 1975) and “inevitable bureaucracy” (Lynn, 1996). Based on the result of several different researches, Rainey (1997) concluded that public organizations “often have more centralized, formalized rules for functions such as personnel and procurement.” On the other hand, organizations following personalization knowledge strategies make greater use of virtual teams operating horizontally across the organization (Hansen, Nohria, and Tierney, 1999). Therefore, the following hypotheses seem apt:

H3: Most knowledge flows vertically from subordinate to superior and vice-versa to a greater extent in public organizations than in private organizations.

H4: Knowledge in the organizations flows horizontally across the organization at all levels to a greater extent in private organizations than in public organizations.

Relatedly, the characteristics of a functional organizational structure require the control system to be centralized. So, top level executives have the necessary information and the proper vantage point to control operations that span several organizational subunits (Miles and Snow, 1978).

H5: Knowledge management is coordinated centrally from the top to a greater extent in public organizations than in private organizations.

Knowledge Management Processes

Grant (1996) said that "the primary role of the firm is the application of existing knowledge to the production of goods and services." The knowledge-based organizations which are organized around specialized processes for creating and applying knowledge can lead to important dynamic efficiencies in the products (Sanchez and Mahoney, 1996). Here, as I mentioned in the literature review, I use the four different knowledge processes: 1) acquisition and creation, 2) storage and retrieval, 3) transfer and sharing, and 4) application.

Private organizations are competition based, while public organizations are dependent more on factors such as service delivery, information provision, and knowledge identification, sharing, and utilization. Due to the survival issue, private organizations are constantly vigilant to gain competitive advantage against environmental change by adopting new management tools, techniques, and philosophies such as KM. However, different threats face public organizations. In the core public service,

organizational change has not traditionally been motivated by product competitiveness. However, traditional public service monopolies, to some extent, are increasingly challenged with the globalization of information and the increased people and capital. Even so, the public organization should focus more on identification, sharing and utilization.

H6: In knowledge management processes, public organizations focus more on the storage and retrieval, transfer and sharing, and application of knowledge than private organizations.

H7: In knowledge management processes, private organizations focus more on knowledge acquisition and creation than public organizations.

Acquisition and Creation

Public organizations do not sell their outputs in economic markets. Therefore, the information and incentives provided by economic markets are weaker or absent in public organizations. Some scholars theorize that this reduces incentives for cost reduction, operating efficiency, and effective performance (Rainey, 1997). That is, because of lower efficiency in allocating resources, public organizations have weaker reflection of consumer preferences and less matching of supply to demand. So,

Sub. H1: Detailed knowledge of customers is treated as a priority and is continuously updated to a greater extent in private organizations than in public organizations.

Organizations adopting codification knowledge strategies tend to have dedicated staff members who have responsibility for codifying and storing documents in electronic repositories (Hansen, Nohria, and Tierney, 1999). So,

Sub. H2: Public organizations have dedicated staff for capturing and storing knowledge around the organization in readily accessible documents and databases more than private organizations have.

Organizations need to determine how important it is for them to learn rapidly and apply new knowledge. In general, private organizations want to maximize learning speed so they can utilize first-in advantage.

Sub. H3: The knowledge that an organization relies on requires rapid and continuous update to a greater extent in private organizations than in public organizations.

Sub. H4: Private organizations are more effective than public organizations at creating or acquiring new knowledge assets.

Organizations that follow codification knowledge strategies put more emphasis on transferring knowledge from people to documents and storing it in electronic databases (Hansen, Nohria, and Tierney, 1999). With the hypothesis that “public organizations follow codification knowledge strategies to a greater extent than personalization knowledge strategies (H1), we can say that

Sub. H5: Management places emphasis on capturing knowledge in documents and storing them in electronic databases for later reuse to a greater extent in public organizations than in private organizations.

Storage and Retrieval

Hansen, Nohria, and Tierney (1999) point out the distinction between those organizations where people rely on explicit knowledge and those organization where people rely on tacit knowledge to solve problems. When employees rely on explicit knowledge to do their work, the people-to-documents approach makes the most sense.

By contrast, when people use tacit knowledge most often to solve problems, the person-to-person approach works best, because tacit knowledge is difficult to articulate in writing and is acquired through personal experience. It includes scientific expertise, operational know-how, insights, judgment, and technological expertise.

Sub. H6: A high proportion of the knowledge in private organizations resides within individuals to a greater extent than in public organizations.

Sub. H7: Private organizations have more comprehensive and up-to-date shared guidance of experts who provide information about their experience and current work than public organizations have.

Organizations that follow codification strategies focus on developing an electronic documents system that codifies, stores, disseminates and allow reuse of knowledge (Hansen, Nohria, and Tierney, 1999). This approach permits many people to search for and retrieve codified information without having to contact the person who originally developed it. Moreover, people are able to find documents much faster and can track down that documents from anywhere within the organization.

Sub. H8: People can generally access the information that they need without having to refer to the person who created it to a greater extent in public organizations than in private organizations.

Sub. H9: People can quickly find the documents that they need with a simple search in electronic databases to a greater extent in public organizations than in private organizations.

Sub. H10: Information systems provide access to documents generated anywhere in the organizations to a greater extent in public organizations than in private organizations.

Transfer and Sharing

A personalization strategy (associated with private organizations) focuses on dialogue between individuals, not knowledge objects in a database or documents (Hansen, Nohria, and Tierney, 1999). Knowledge that has not been codified is transferred in brainstorming sessions and one-to-one conversations. This applies where a large proportion of an organization's internal knowledge is tacit and as such is tied to the person who developed it. On the contrary, in the codification strategy (associated with public organization), knowledge is shared through documents and databases.

Sub. H11: A high proportion of internal knowledge sharing is achieved through direct people-to-people contact to a greater extent in private organizations than in public organizations.

Sub. H12: A high proportion of internal knowledge sharing is achieved through documents and databases to a greater extent in public organizations than in private organizations.

Hansen, Nohria, and Tierney (1999) point out that, in a personalization strategy (associated with private organizations), knowledge sharing is often achieved by fostering networks through transfer of people between offices. So,

Sub. H13: Transfer of people between offices (for example, dispatch to and from the departments) is used to foster people networks to a greater extent in private organizations than in public organizations.

Application

As Hansen, Nohria and Tierney (1999) said, an element of a codification strategy (associated with public organization) is 'reuse economics' – the policy of investing once in a knowledge assets and reusing it many times. Such a strategy fits organizations that are creating standardized products/services. In contrast, for organizations that are selling customized products and have customer needs that vary considerably, a personalization strategy (associated with private organizations) is more appropriate.

Sub. H14: Once new knowledge is developed, it is reused as many times as possible in the organization's products/services to a greater extent in public organizations than in private organizations.

Sub. H15: The products and/or services that are provided involve bringing together experts with relevant knowledge and experience to a greater extent in private organizations than in public organizations.

Individuals and Roles

Getting an organization's culture (including values and behaviors) 'right' for KM is typically the most important and yet often the most difficult challenge. KM is first and foremost a people issue. The success of KM initiatives depends upon people's motivation, their willingness, and their ability to share knowledge and use the knowledge of others.

People do share knowledge for some reasons such as reciprocity, reputation, and prestige, or sometimes just for altruistic reasons. This suggests that knowledge sharing is not a natural act in organizations. So, establishing a new and formal human resource system is needed for KM. Employees must be recognized not only for sharing their knowledge with others, but also for being willing to use other's knowledge. This can be done by hiring people with an ability to share knowledge, rewarding people for knowledge sharing, and by training.

Recruitment

According to Hansen, Nohria, and Tierney (1999), organizations that follow codification strategies tend to hire people who are well suited to the reuse of knowledge and the implementation of standard solutions. On the other hand, organizations with personalization strategies hire people who like problem solving and can tolerate ambiguity.

Public organizations develop a high degree of formalization and codification for job descriptions and operating procedures which specify appropriate behaviors for

organization members. There are numerous assertions that public organizations and employees are cautious and not innovative (Rainey, 1997).

H8: People joining an organization are well suited to following procedures and implementing standard solutions to a greater extent in public organizations than in private organizations.

H9: People joining an organization are good at problem solving to a greater extent in private organizations than public organizations.

Reward Systems

Hansen, Nohria, and Tierney (1999) say that people need incentives to participate in the knowledge sharing process. The two different knowledge strategies call for different incentive systems. In the codification strategy, managers develop a system that encourages people to write down what they know and to get those documents (into the electronic repository). In contrast, incentives to stimulate knowledge sharing are very different in organizations that are following the personalization strategy. Managers tend to reward people for sharing knowledge directly with other people.

H10: Pay systems encourage using and contributing to document databases to a greater extent in public organizations than in private organizations.

H11: Pay systems encourage direct sharing of knowledge with others to a greater extent in private organizations than in public organizations.

Training

In organizations following a codification strategy, training is focused on efficiency, tends to be done in groups, and where possible uses automated systems such as computer-based distance learning (Hansen, Nohria, and Tierney, 1999). However, in organizations following personalization strategy, training focuses on conveying tacit knowledge and offers a great deal of one-to-one mentoring.

H12: Training relies on documentation and manuals to a greater extent in public organizations than in private organizations.

H13: Training relies on knowledge transfer through coaching or mentoring to a greater extent in private organizations than in public organizations.

Information and Communication Technology

Technology is employed in all the processes of KM and various technological solutions are readily available in the market. The problem is actually a matter of selecting an appropriate technology. However, one must keep in mind that technology is just an enabler. It can help connect people with information, and people with each other.

Hansen, Nohria, and Tierney (1999) state that the level of IT support an organization needs depends on its choice of knowledge management strategy. The codification model calls for a substantial investment in large, sophisticated electronic repository systems; for personalization model, expenditures are much less. Moreover, the two different knowledge management strategies require different IT infrastructures. In

the codification model, managers need to implement a system that is much like a traditional library – it must contains a large cache of documents and include search engines that allow people to find and use the documents they need. In the personalization model, it is most important to have a system that allows people to find other people.

H14: Information and communications technologies (ICT) to access documents and data are used more in public organizations than in private organizations.

H15: Information and communications technologies (ICT) to contact people and to exchange knowledge are used more in private organizations than in public organizations.

Research Design

Operationalization

In order to empirically test hypotheses, all variables need to be operationalized. Basically, the existing measures that Truch (2004) develops in his research about knowledge orientation will be used. Through three meetings, email and telephone with focus groups of twelve business practitioners, he developed measurements of forty-nine knowledge orientation items in a survey questionnaire. I will use some of them. They mostly use five point Likert scales with a range from strongly disagree (1) to strongly agree (5). I summarize the variables of hypotheses, item measures, and measurement on table 3.

Table 3: Operationalization of Hypotheses

	Hyp. No.	Variables	Item Measure	Measurement
Strategy	H1	**Degree of codification**		Average of SubH2, SubH5, SubH8, SubH9, SubH10, SubH12, SubH14, H8, H10, H12, H14
	H2	**Degree of personalization**		Average of SubH6, SubH7, SubH11, SubH13, SubH15, H9, H11, H13, H15
Structure	H3	Degree to which information flows are **vertical** within the organizations	Most knowledge in our organization flows vertically from subordinate to superior and vice verse	Likert scaling 1: strongly disagree 5: strongly agree
	H4	Degree to which information flows are **horizontally** across the organizations	Most knowledge in our organization flows horizontally across the organization at all levels	,,
	H5	**Centralization**: direction of setting coordination KM	Knowledge management in our organization is coordinated centrally from the top	,,
Knowledge Management Process	H6	Degree to the **knowledge storage and retrieval, transfer and sharing, and application**	1. My organization supports knowledge sharing 2. People are willing to share their knowledge with others in our organization 3. Information technologies are used effectively in our organization to facilitate knowledge storage, sharing, and use	,,
	H7	Degree to the **knowledge acquisition and creation**	1. My organization supports knowledge creation 2. Information technologies are used effectively in our organization to facilitate knowledge creation	Use the results of Sub. H3 and Sub. H4
	Sub. H1	**Acquisition and Creation:** Customer knowledge	Detailed knowledge of our customer is treated as a priority and is continuously updated	Likert scaling 1: strongly disagree 5: strongly agree
	Sub. H2 (C)	**Acquisition and Creation:** Deployment: degree of dedication on staff member who have responsibility for codifying and storing documents in electronic repositories	We have dedicated staff for capturing knowledge around the organization and storing it in readily accessible documents and databases	,,
	Sub. H3	**Acquisition and Creation:** Speed of knowledge refreshment	The knowledge that our organization relies on requires rapid and continuous updating	,,
	Sub. H4	**Acquisition and Creation:** Degree of effectiveness at creating or acquiring knowledge assets	We are effective at acquiring and/or creating new knowledge	,,
	Sub. H5 (C)	**Acquisition and Creation:** People-to-document: development of an electronic document system	Our management emphasizes capturing knowledge in documents and storing them in electronic databases for later reuse	,,

	Sub. H6 (P)	**Storage and Retrieval:** Proposition of the knowledge on individuals	A high proposition of the knowledge in our organization resides within individuals	‘’
	Sub. H7 (P)	**Storage and Retrieval:** The comprehensive and up-to-date shared guidance of experts	We have comprehensive and up-to-date shared guidance of experts who provide information about their experience and current work	‘’
	Sub. H8 (C)	**Storage and Retrieval:** Degree to which people can search for and retrieve codified information	We can generally access the information that we need without having to refer to the person who created it	‘’
	Sub. H9 (C)	**Storage and Retrieval:** Speed to of tracking documents	We can quickly find the documents that we need with a simple search in our electronic database	‘’
	Sub. H10 (C)	**Storage and Retrieval:** Access: easiness of access to information which is stored in electronic repositories	Our information system provide access to documents generated anywhere in the organization	‘’
	Sub. H11 (P)	**Transfer and Sharing:** Degree of internal knowledge sharing through direct people-to-people contact	A high proportion of our internal knowledge sharing is achieved through direct people-to-people contact	‘’
	Sub. H12 (C)	**Transfer and Sharing:** Degree of internal knowledge sharing through documents and database	A high proportion of our internal knowledge sharing is achieved through documents and database	‘’
	Sub. H13 (P)	**Transfer and Sharing:** People network: fostering of networks by transfer of people between offices	Dispatches to and from departments are used to foster people networks	‘’
	Sub. H14 (C)	**Application:** Degree of knowledge reuse (Reuse Economics)	Once we have developed new knowledge, we re-use it as many times as possible in our product/service	‘’
	Sub. H15 (P)	**Application:** Expert Economics	The product/service that we provide always involve bringing together experts with relevant knowledge and experience	‘’
Individuals and Roles	H8 (C)	**Recruitment:** degree of suitability to reuse of knowledge and the implementation solutions	People joining our organization are well suited to effectively implementing standard solutions.	‘’
	H9 (P)	**Recruitment:** organization tends to hire people who like problem solving and can tolerate ambiguity	People joining our organization are good at problem solving in ambiguous situation	‘’
	H10 (C)	**Reward:** relationship between pay system, and employees’ use and contribution to database	Our pay systems encourage using and contributing to document database.	‘’
	H11 (P)	**Reward:** relationship between pay system, and employees’ direct sharing their knowledge	Our pay system encourage direct sharing of knowledge with others	‘’
	H12 (C)	**Training:** degree of training focus on documentation and manuals	Our training relies on documentation and manuals	‘’

	H13 (P)	**Training:** degree of training focus on conveying tacit knowledge and makes a lot of use one-to-one mentoring	Our training relies on knowledge transfer through coaching or mentoring	‘’
ICT	H14 (C)	**Use of ICT** (information and communications technologies) to access to documents and data	We mainly use our information and communications technology (ICT) to access to documents and data	‘’
	H15 (P)	**Use of ICT** (information and communications technologies) to contact people and to exchange knowledge	We mainly use our information and communications technology(ICT) to contact people and to exchange knowledge	‘’

Population and Sample

The main focus of this study is to compare knowledge management practices between public and private organizations. Therefore, the units of analysis are public and private organizations. How do we define the public and private organizations? Wamsley and Zald (1973) distinguish between public organizations and private organizations based on ownership and funding. Public organizations are owned and funded by the government, while private organizations are owned privately and obtain the major part of their funding from private sources (such as market transactions). However, with this distinction, some organizations are in a mixed status. For example, some public corporations operate for profit and are financed largely by user chargers. These organizations would not classify as fully public, but neither are they private. Nevertheless, most large business firms and large government agencies in the United States and the Korea fall clearly within these public and private categories.

This study was conducted in the Republic of Korea (South Korea). Korea is a rugged peninsula lying between China on the west and north and Japan to the east. The peninsula is roughly 1,030 km (612 miles) long and 175 km (105 miles) wide at its

narrowest point, about the size of Utah. South Korea is 99,000 square km -- roughly similar to Oregon -- and its population is close to 50 million (compared to Oregon's 3 million). Mountains and hills make up about 70 percent of the country (http://www.pbs.org/hiddenkorea/geography.htm).

The Korean peninsula is divided just slightly north of the 38th parallel. The democratic Republic of Korea (ROK) in the south and communist Democratic People's Republic of Korea (DPRK) in the north are separated by a demilitarized zone. South Korea is a democratic republic with powers shared between the president, legislature, and judiciary.

The South Korean economy has advanced rapidly since the 1950s and is now the 10th largest economy in the world. South Korea is also one of the world's most technologically advanced and digitally-connected countries. It has the second highest number of broadband internet connections per capita in the world and is a global leader in computer games, digital displays, and mobile phones.

The national language is Korean and Koreans use the alphabet named Hangul. About 46% of South Korean citizens profess to follow no particular religion. Of the remainder, Christians account for 27.3% of the population and Buddhists 25.3%. There is also a small percentage of the Islamic faith (http://en.wikipedia.org/wiki/South_Korea).

Due to opportunity, I chose 'The Office for Government Policy Coordination' in the South Korean government as the public organization, and the Samsung Corporation (especially, Samsung Engineering Co., Ltd.) as the private organization in Korea as the organizations to study.

The Office for Government Policy Coordination was organized on January 30, 1993 with vice-ministerial status, and then was raised to a Cabinet ministerial status in February 28, 1998 (Law on Government Organization, article 20, and Regulation on the office for Government Policy Coordination, article 2). The Office for Government Policy Coordination assists the Prime Minister in supervising, commanding and directing each administrative department. It is in charge of managing each administrative and affiliated department under the command of the Prime Minister, maintaining unity within state affairs and coordinating policies, carrying out pending issues regarding the state of affairs, evaluating government operations and managing the state of affairs, carrying out continuous regulatory reforms, and undertaking other orders issued by the Prime Minister (http://opm.go.kr/warp/webapp/content/view?meta_id=english&id=10).

Samsung Engineering Co. Ltd. was established in 1970 as the first domestic engineering company in South Korea. This company has been successfully conducting over 1,700 projects both in Korea and abroad for the past three decades. It was the first Korean engineering company to go public, and has evolved into a leader in the Korean engineering industry. Using business principles to provide services in an economical and optimized manner within the fastest possible time, they focus on building an effective knowledge management system, improving corporate efficiencies through continued cost reduction and overall improvement efforts, and building a global standard management basis to become a customer-oriented, total solution provider (http://www.samsungengineering.com).

Through contact with managers of each organization, I explained the goal, importance, and processes of this study. Both of these organizations agreed to participate in the study. The subject of this study will be the employees of these two organizations – one public and the other private. The number of employees in public organization (The Office for Government Policy Coordination) is 556. All of these employees were chosen as the study's subjects for public organization. They were mainly working in the office. Meanwhile, in the private organization (Samsung Engineering Co., Ltd), 1240 peoples are working. Among them, 352 employees who were working in the office were chosen as the subjects of research for private organization. So, a total of 908 employees from both organizations were questioned.

Data Collection Method

The study used a survey to collect data. Based on operationalization of hypotheses, I developed a survey questionnaire. First, this was developed in English (see Appendix C). For actual survey research, this was then translated into Korean (see Appendix D). To achieve the accuracy of translation, two master degree students who are also the employees of Korea government reviewed the questionnaires in the English version and the Korean version. Also, one manager of Samsung Corporation reviewed this survey questionnaire in both languages. Changes in question wordings that they suggested were incorporated it the survey where appropriate.

At the beginning of questionnaire, the researcher thanks the participants for their cooperation and briefly introduces the purpose and significance of the research. Furthermore, the introduction emphasizes that participation in the survey is completely voluntary and advises the subjects that all responses would be kept confidential. Finally, participants were instructed that there were no right or wrong answers and they need only to record their first perceptions after reading each question. Questions consist of two parts: the 29 questions about knowledge management, and the 6 questions about demographic information.

For collecting data, I used the 'internet' FormMail function. I put the questionnaire on the web (my personal internet space). The first page of web site is the informed consent form for the research which asks for participation in the survey. Beginning on the second page, which can be reached with clicking the button of participation agreement, I begin asking what participants think about Knowledge Management in their organization in terms of the questions in the questionnaire. Additionally, demographic information (job title, gender, education, age and etc.) is asked of participants. At the end of questionnaire, I requested the participants to click the 'commit button' if they finished answering. Clicking 'commit button' makes the site change into the 'thank note site' and the answers are then sent to the researcher through e-mail (FormMail function).

In order to distinguish the answers from the public organization and those from the private organization, I developed separate pages, one for each organization. The only difference is the email subject that indicates where the answers come from.

After developing the web site for the survey, I made initial contact with the subjects of the research by e-mail. The e-mail included some comments about the study and the web address of the survey site for each organization.

I sent e-mail to a total of 908 research subjects; 556 for public organization, and 352 for private organization. In order to increase the rate of participation, I sent same e-mail to them after two weeks from the initial survey day. During four weeks, I got a total of 313 answers from participants (34.5% of total); 165 answers (29.7%) from the public organization, and 148 answers (42.0%) from the private organization.

Of the 313 answers, 18 were eliminated because the participants did not complete the survey. This makes the total number of usable answers 295 (32.2%), of which 161 (54.6%) were from the public organization, and 134 (45.4%) were from the private organization.

Data Screening and Reliability Analysis

To verify that the data are accurately coded and ensure that the responses are valid, I took some steps to maximize the reliability of the data. First, the returned surveys were checked. The answers of 18 participants were dropped from the data set because they answered repeatedly or a only few. All acceptable surveys were assigned a sequential identification number.

Second, the data were coded, and entered into a computer data file and checked for entry errors. In case where errors were found, the data were compared to the original surveys and mistakes were corrected.

Third, after checking for errors and cleaning the data, the reliability of variables was checked. Out of the thirty variables in this study, eleven variables are associated with a codification strategy (dedicated staff, people-to-document, without reference to author, searching in database, access to document, documents and database sharing, reuse economics, recruitment for codification, reward for codification, training for codification, and IT for codification), and nine variables are associated with a personalization strategy (tacit knowledge, expert directories, people-to-people sharing, dispatches for people work, expert economics, recruitment for personalization, reward for personalization, training for personalization, and IT for personalization). The degree of codification was computed with scale variables, which were calculated by taking the mean (average) of the items. The same procedure has used to calculate the degree of personalization variable.

So, were these codification and personalization scores reliable? Which variables more associated with each strategy score? To answer these questions, I used reliability analysis. The reliability analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale.

The reliability of a measure refers to its internal consistency. That is, reliability refers to the property of a measurement instrument that causes it to give similar inputs. There are three ways of estimating reliability – 1) test-retest reliability, which is the degree to which a test yields similar results on several administrations or with parallel tests, 2) inter-rater reliability, which is the degree to which multiple raters assign the same scores, and 3) internal consistency (or scale) reliability, which is the degree to which items on the same test measure the same underlying construct. Internal consistency

reliability can be assessed by comparing the scores on any item with the total score on all the items. If one item does not correlate well with the total score, it is eliminated in order to increase the homogeneity of items.

'Cronbach's alpha' is the most common form of internal consistency reliability coefficient (Norusis, 2003). The widely-accepted social science cut-off is that alpha should be .70 or higher for a set of items to be considered a scale, but some use .75 or .80 while others are as lenient as .50 or .60. That .70 is as low as one may wish to go is reflected in the fact that when alpha is .70, the standard error of measurement will be over half (0.55) a standard deviation. Cronbach's alpha values are presented in Table 4.

Table 4: Cronbach's alpha by organizations and strategies

	Codification	Personalization
Both organization	0.85	0.54
Public organization	0.87	0.53
Private organization	0.77	0.57

For codification scale, the reliability values in all organizations are good. However, the reliability values for personalization in all organizations scale are very low. Therefore, conclusions about personalization must be taken as very tentative.

When each of the items is deleted from the scale, we can determine how much alpha changes. The values of 'Cronbach's Alpha if Item Deleted' in reliability analysis show the degree of change. Items that are not related to the rest cause Cronbach's alpha

to increase in value if the item is deleted. If elimination of an item substantially increase Cronbach's alpha, we should consider removing that item from our scale. In contrast, a decrease in the Cronbach's alpha score when an item is deleted means that item is related to the rest.

In table 5, the variables which related to codification are listed by the value of Cronbach's alpha with the variable removed. The data are ranked by the largest to the smallest impacts of removing an item from the lowest to the highest. In all organizations, the variables of 'training for codification' and 'recruitment for codification' could be considered to be eliminated for both organizations. Meanwhile, the variables of 'reuse economics' and 'searching in database' are most associated with the codification score. Especially, the variable of 'without reference to author' in public organization is more associated with codification than in private organization. The variables of 'access to document' and 'reward for codification' in private organization are more associated with codification than in public organization.

In table 6, the variables which related to personalization are listed by the value of Cronbach's alpha from the lowest to the highest. In all organizations, the variables of 'dispatches for people work,' 'expert directories' and 'expert economics' are most associated with personalization score. Especially, the variables of 'dispatches for people work,' and 'IT for personalization' are more associated with personalization than in private organization. The variables of 'reward for personalization,' and 'people-to-people sharing' in private organization are more associated with personalization than in public organization. Meanwhile, the variables of 'tacit knowledge' and 'people-to-people

Table 5: List of variables related to codification (order by Cronbach's alpha)

Both organizations (Cronbach's alpha = 0.85)	**Public organization** (Cronbach's alpha = 0.87)	**Private organization** (Cronbach's alpha = 0.77)
People-to-document (0.83)	Searching in database (0.85)	Access to document (0.73)
Reuse economics (0.830)	Without refer. to author (0.85)	Reuse economics (0.73)
Searching in database (0.83)	People-to-document (0.85)	Searching in database (0.73)
Without refer. to author (0.83)	Reuse economics (0.85)	IT for codification (0.74)
IT for codification (0.83)	IT for codification (0.85)	Reward for codification (0.75)
Access to document (0.84)	Access to document (0.86)	People-to-document (0.75)
Document and DB sharing(0.84)	Document and DB sharing(0.86)	Without refer. to author (0.75)
Dedicated staff (0.85)	Dedicated staff (0.86)	Dedicated staff (0.76)
Reward for codification (0.85)	Recruitment for codification (0.87)	Training for codification (0.76)
*Training for codification (0.85)**	*Reward for codification (0.87)**	Document and DB sharing(0.76)
*Recruitment for codification (0.85)**	*Training for codification (0.88)**	*Recruitment for codification (0.78)**

* The value of Cronbach's alpha is increased if the italic variable is deleted.

Table 6: List of variables related to personalization (order by Cronbach's alpha)

Both organizations (Cronbach's alpha = 0.54)	**Public organization** (Cronbach's alpha = 0.53)	**Private organization** (Cronbach's alpha = 0.57)
Dispatches (0.48)	Dispatches (0.44)	Reward for personalization (0.51)
Expert directories (0.48)	Expert directories (0.46)	Expert economics (0.53)
Expert economics (0.49)	Recruitment for personalization (0.46)	Expert directories (0.53)
Reward for personalization (0.50)	IT for personalization (0.47)	Dispatches (0.53)
Recruitment for personalization (0.51)	Expert economics (0.47)	People-to-people sharing (0.55)
IT for personalization (0.52)	Reward for personalization (0.49)	Tacit knowledge (0.55)
Training for personalization (0.53)	Training for personalization (0.52)	Recruitment for personalization (0.56)
Tacit knowledge (0.54)	*Tacit knowledge (0.55)*	Training for personalization (0.57)
People-to-people sharing (0.57)	*People-to-people sharing (0.60)*	*IT for personalization (0.58)*

* The value of Cronbach's alpha is increased if the italic variable is deleted.

sharing' could be considered to remove for public organization. For private organization, the variable of 'IT for personalization' could be considered to remove.

General Plan for Data Analysis

This study used three different techniques for analyzing data. First, the study used descriptive statistics to show the demographic profile of respondents. Second, to test the research hypotheses (*H1* to *H15* and *Sub. H1* to *Sub. H15*), an independent-samples *t* test (two-sample *t* test) was applied for each hypothesis. Third, the factor analysis was used to identify a relatively small number of factors that explain observed correlations among variables that are related to knowledge management strategy (codification and personalization).

Chapter 4

RESEARCH FINDINGS

This chapter includes statistical analysis of the survey data, interpretation of the results and some comments which are made in the context of prior researches and theories. Thus, the first analysis, the demographic data, provides a profile of respondents. Second, hypotheses are tested with *t*-tests to identify public-private differences. Third, factor analysis is applied to identify a relatively small number of factors that summarize observed correlations among codification and personalization variables. Fourth, I test the relationship between the codification and personalization dimension with correlation analysis.

Respondent Characteristics

This part presents the first step in the data analysis, the descriptive statistics for the study's samples. Table 7, 8, 9, and 10 present a profile of the survey respondents with regard position, age, gender, and education. The characteristics for both public and private organizations are discussed for each category.

Position

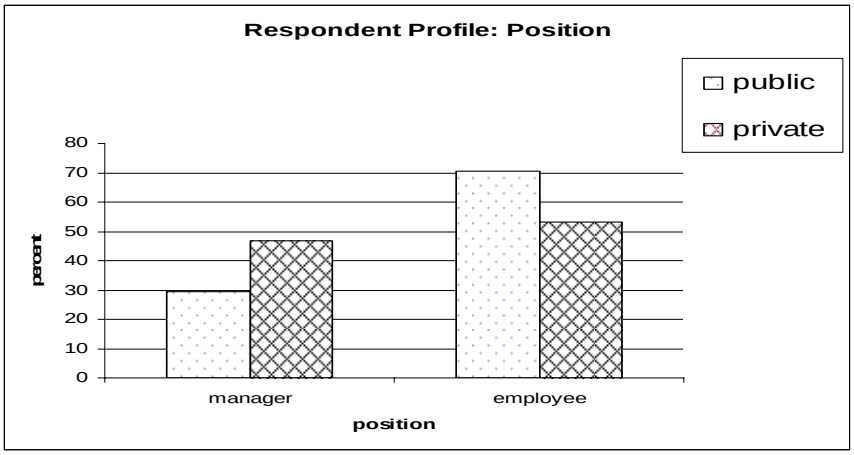
In total number of respondents, the proportion of the managers (37.9%) to the employees (62.1%) is around one to two. However, there is different distribution by the

type of organization. Only 29.6% of the respondents from public organization were managers while 46.9% from private organization were managers. For private organization, the proportion of the managers to the employees is almost equal.

Table 7: Analysis of Respondents by Position

		Type of Organization		Total
		Public	Private	
Class of Position	Manager	42 (29.6%)	61 (46.9%)	103 (37.9%)
	Employee	100 (70.4%)	69 (53.1%)	169 (62.1%)
Total		142 (100%)	130 (100%)	272 (100%)

Figure 7: Respondent Profile (Position)



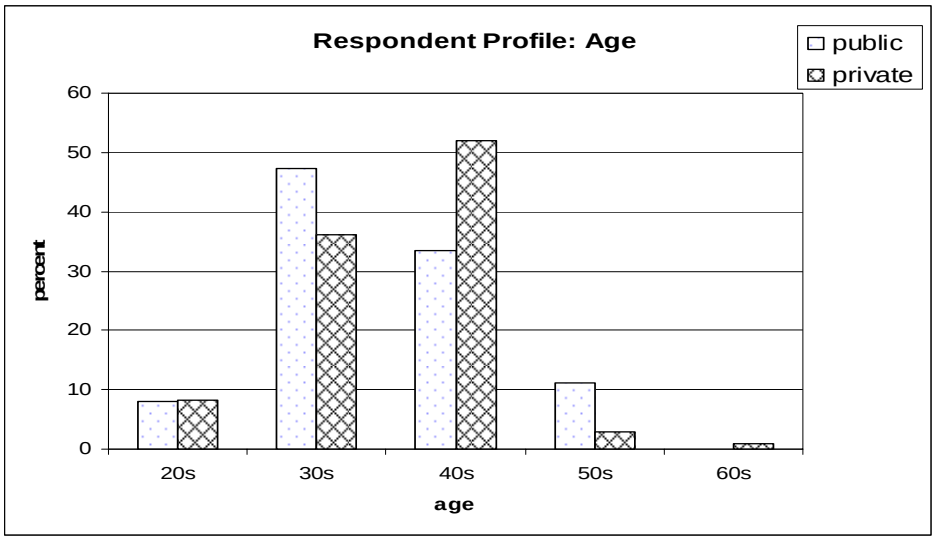
Age

Most of the respondents (84%) were 30-49 years old. 81% of the respondents from public organization were between the ages of 30-49 years while 88% of those from private organization were in this age range. Almost half of the respondents from the private organization were the ages of 40s (40-49 years old). Respondents from private organization were a little older that those in the public organization. However, in the 50s (50-59 years old), the percent of public organization respondents (11%) was higher than that of private organization respondents (3%).

Table 8: Analysis of Respondents by Age

		Type of Organization		Total
		Public	Private	
Class of Age	20s	13 (8.1%)	11 (8.3%)	24 (8.2%)
	30s	76 (47.2%)	48 (36.1%)	124 (42.2%)
	40s	54 (33.5%)	69 (51.9%)	123 (41.8%)
	50s	18 (11.2%)	4 (3.0%)	22 (7.5%)
	60s	0 (0.0%)	1 (0.8%)	1 (0.3%)
Total		161 (100%)	133 (100%)	294 (100%)

Figure 8: Respondent Profile (Age)



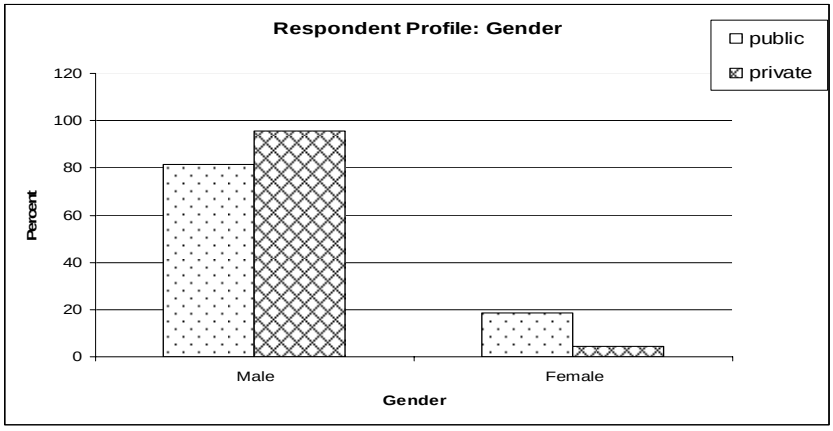
Gender

Over three quarters (87.8%) of total respondents were male. Most of the respondents from the private organization were male (95.5%).

Table 9: Analysis of Respondents by Gender

		Type of Organization		Total
		Public	Private	
Class of Gender	Male	131 (81.4%)	127 (95.5%)	258 (87.8%)
	Female	30 (18.6%)	6 (4.5%)	169 (12.2%)
Total		161 (100%)	133 (100%)	294 (100%)

Figure 9: Respondent Profile (Gender)



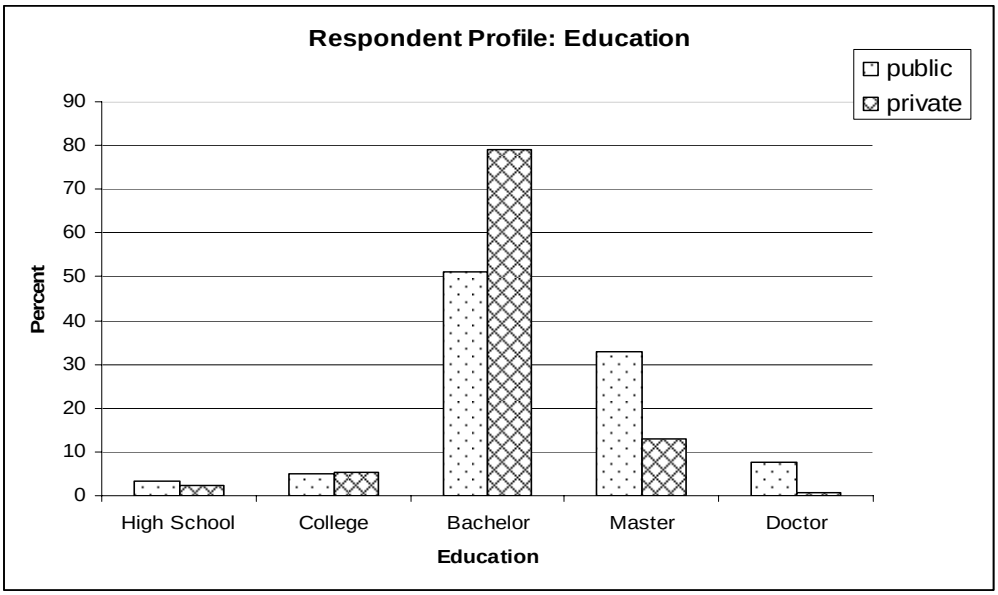
Education

For both organizations, most of the respondents had a bachelor's degree or higher (total: 92.1%, public organization: 91.7%, and private organization: 92.4%). Specifically, 78.9% of the respondents of the private organization had a bachelor's degree, while the half of those (51.3%) of public organization had the same education level. For master or doctor degree, the respondents of public organization (40.5%) had higher rates than those of private organization (13.6%).

Table 10: Analysis of Respondents by Education

		Type of Organization		Total
		Public	Private	
Class of Education	High School	5 (3.2%)	3 (2.3%)	8 (2.7%)
	College	8 (5.1%)	7 (5.3%)	15 (5.2%)
	Bachelor	81 (51.3%)	105 (78.9%)	186 (63.9%)
	Master	52 (32.9%)	17 (12.8%)	69 (23.7%)
	Doctor	12 (7.6%)	1 (0.8%)	13 (4.5%)
Total		161 (100%)	133 (100%)	294 (100%)

Figure 10: Respondent Profile (Education)



Roughly speaking, most of the respondents were male and between the ages of 30-49 years. In position, the participation of managers from private organization is higher than that of managers from public organization. For education, most of the respondents had a bachelor degree or higher. However, in master or doctor education level, the respondents of public organization had higher rates than those of private organization.

Hypotheses Tests for Knowledge Management

This part represents the second section in the data analysis that is testing hypotheses about the means of the KM variables between the public and the private organizations.

To test the hypotheses (*H1* to *H15* and *Sub. H1* to *Sub. H15*), independent-samples *t* tests (two-sample *t* test) were applied to compare the means of variables. The results are in Table 11, the F statistic for *Levene test* is obtained by computing a one-way analysis of variance on the absolute deviations of each case from its group mean. It is used for testing if the variances of two organizations (public and private) differ. The null hypothesis is that two population variances (not the means) are equal. If the observed significance level for this test is low (less than 0.05), we should use the separate-variance *t* test for means. That is, the F statistic for variable with a less than 0.05 significance level indicates that the hypothesis of equal variances is rejected. Thus, it is not appropriate to use the pooled (Equal variances assumed) test for comparing means.

Two tests are computed for comparing group means. The first, labeled 'Equal variances assumed,' is called the 'pooled-variance *t* test.' It assumes that the population variances for the two organizations are equal – that is, the distributions generally have the same shape.

Table 11: The Results of an t test: KM and Type of Organization

	Hyp. No.	Variables	Public (mean)	Private (mean)	*t*-value
Strate -gy	H1	Degree of codification	3.19	3.54	-5.95*
	H2	Degree of personalization	3.21	3.17	0.82
Structure	H3	Degree to which information flows are vertical within the organizations	3.20	2.73	4.62*
	H4	Degree to which information flows are horizontally across the organizations	2.99	3.16	-1.76
	H5	Centralization: direction of setting coordination KM	2.94	2.72	1.95
Knowledge Management Process	H6	Degree to the knowledge storage and retrieval, transfer and sharing, and application	3.34	3.65	-4.25*
	H7	Degree to the knowledge acquisition and creation	3.42	3.77	-5.14*
	Sub.H1	**Acquisition and Creation:** Customer knowledge	3.45	4.01	-5.69*
	Sub.H2 (C)	**Acquisition and Creation:** Deployment: degree of dedication on staff member who have responsibility for codifying and storing documents in electronic repositories	3.07	3.36	-2.43*
	Sub.H3	**Acquisition and Creation:** Speed of knowledge refreshment	3.71	3.83	-1.24
	Sub.H4	**Acquisition and Creation:** Degree of effectiveness at creating or acquiring knowledge assets	3.47	3.83	-3.86*
	Sub.H5 (C)	**Acquisition and Creation:** People-to-document: development of an electronic document system	3.42	3.83	-5.16*
	Sub.H6 (P)	**Storage and Retrieval:** Proposition of the knowledge on individuals	3.37	3.36	0.17
	Sub.H7 (P)	**Storage and Retrieval:** The comprehensive and up-to-date shared guidance of experts	3.12	3.30	-1.88
	Sub.H8 (C)	**Storage and Retrieval:** Degree to which people can search for and retrieve codified information	2.92	3.52	-6.20*
	Sub.H9 (C)	**Storage and Retrieval:** Speed to of tracking documents	3.23	3.40	-1.91
	Sub.H10 (C)	**Storage and Retrieval:** Access: easiness of access to information which is stored in electronic repositories	3.03	3.69	-6.01*
	Sub.H11 (P)	**Transfer and Sharing:** Degree of internal knowledge sharing through direct people-to-people contact	3.25	3.14	0.99
	Sub.H12 (C)	**Transfer and Sharing:** Degree of internal knowledge sharing through documents and database	3.57	3.87	-3.67*
	Sub.H13 (P)	**Transfer and Sharing:** People network: fostering of networks by transfer of people between offices	3.23	2.74	4.44*
	Sub.H14(C)	**Application:** Degree of knowledge reuse (Reuse Economics)	3.26	3.65	-4.41*
	Sub.H15(P)	**Application:** Expert Economics	3.70	3.80	-1.10
Individuals and Roles	H8 (C)	**Recruitment:** degree of suitability to reuse of knowledge and the implementation solutions	3.21	3.28	-0.77
	H9 (P)	**Recruitment:** organization tends to hire people who like problem solving and can tolerate ambiguity	3.31	3.33	-0.29
	H10 (C)	**Reward:** relationship between pay system, and employees' use and contribution to database	2.73	2.96	-2.06*
	H11 (P)	**Reward:** relationship between pay system, and employees' direct sharing their knowledge	2.59	2.70	-0.96
	H12 (C)	**Training:** degree of training focus on documentation & manuals	3.28	3.71	-4.96*
	H13 (P)	**Training:** degree of training focus on conveying tacit knowledge and makes a lot of use one-to-one mentoring	3.06	2.87	1.90
ICT	H14 (C)	Use of ICT (information and communications technologies) to access to documents and data	3.42	3.66	-2.98*
	H15 (P)	Use of ICT (information and communications technologies) to contact people and to exchange knowledge	3.28	3.35	-0.76

*: $p < 0.05$ or lower

The second test, as its label ‘Equal variances not assumed’ indicates, does not require equal variances and is called the ‘separate-variance *t* test.’ In here, according to F values from Levene test, I chose the *t* values for comparing means (If the significance of F-value is less than 0.05, I picked the *t* value of the ‘separate-variance t test.’ If not, the t value of the ‘pooled-variance t test’). Thus, the t-values in Table 11 are appropriate for the variances of the data.

If *t*-value is a negative number, it means that the mean of private organization for each variable is larger than that of public organization. Conversely, a positive *t*-value means that the means of public organization for each variable is larger than that of private organization. In order to determine whether the difference of means for each variable is significant or not, the *t*-value, degree of freedom (*df*) and the *p* value (significance (2-tailed)) are used. That is, with significance which is less than 0.05, we can decide whether the means of two organizations for each variable are significantly different.

Strategy

H1: Public organizations follow more codification knowledge strategies than private organizations.

Public mean = 3.19; Private mean = 3.54; *t*-value = -5.95 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. Therefore, the alternative research hypothesis H1 that public organization follows a more codification strategy is not supported. However, there are significant differences. The mean of private

organization is significantly higher than that of public organization. This result is opposite of what was hypothesized.

H2: Private organizations follow more personalization knowledge strategies than public organizations.

Public mean = 3.21; Private mean = 3.17; *t*-value = 0.82 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H2 that private organization follows more personalization strategy is not supported.

For the degree of codification, there is a significant difference between public and private organizations even though the hypothesis H1 is rejected. That is, the mean of codification strategy for private organization is significantly higher than that for public organization. For hypothesis H2, the result of research shows no significant difference on the degree of personalization between public and private organizations, even though the mean of personalization for public is a little bit higher than that for private organization.

According to the OECD (2003) report, KM strategies have often not been well disseminated in public organizations. In addition, difficulties of implementation of KM strategies have arisen from staff resistance (and in particular middle management in many organizations), from the difficulty in capturing employees' undocumented knowledge, and from the organizational focus on information and communication technologies (ICTs).

For the implementation of a good knowledge management strategy, organizations need the class requirement of successful change management (OECD, 2001). First, organizations should prepare a knowledge management strategy defining the user or customer value of knowledge for the organization, as well as the needs of the knowledge worker. Second, strong commitment from the top, board-level or agency head of the public sector responsibility for overseeing implementation of knowledge management, raising awareness of mid-level managers (developing incentives for managers to promote knowledge- sharing within their teams) are needed. Third, organizations should focus implementation on the three fields of knowledge management: i) improving human capital, ii) adapting organizational capital, and iii) building stakeholder capital. Lastly, organizations should do the regular assessments of the implementation of the knowledge management strategy.

Structure

H3: Most knowledge flows vertically from subordinate to superior and vice-versa to a greater extent in public organizations than in private organizations.

Public mean = 3.20; Private mean = 2.73; *t*-value = 4.62 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. Therefore, the alternative research hypothesis H3 that there are differences is supported.

H4: Knowledge in the organizations flows horizontally across the organization at all levels to a greater extent in private organizations than in public organizations.

Public mean = 2.99; Private mean = 3.16; *t*-value = -1.76 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H4 about horizontal flows is rejected.

H5: Knowledge management is coordinated centrally from the top to a greater extent in public organizations than in private organizations.

Public mean = 2.94; Private mean = 2.72; *t*-value = 1.95 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H5 of coordination from the top is rejected.

The structure part of the survey assesses three aspects of organization and management: vertical knowledge flows, horizontal knowledge flows, and centralization of the coordination (Hypotheses 3 – 5). In terms of knowledge flows across organization, the study finds that knowledge flows vertically from subordinate to superior and vice versa to a greater extent in public organization than in private organization. However, for horizontal knowledge flows and for centralization of the coordination, there is no significant difference between public and private organizations. Both organizations reported a moderate degree of horizontal knowledge flows and centralization of the coordination.

Buchwalter (2000: 467) said that “knowledge management is not just a technology project. KM relies on organizational structures and cultures to meet its goals.” Public sector organizations tend to have a hierarchical and bureaucratic organizational structure, and knowledge flows inside the organization are mainly vertical (Zhou, 2004).

"In terms of internal management, central public organisations traditionally function with a more vertical hierarchy and fewer incentives for innovation and team work. Outcomes are less clear and less measurable in public organisations, as well as less commonly understood by their staff" (OECD 2003).

Knowledge management involves adapting classic management tools systematically to promote knowledge-sharing (Buchwalter, 2000). One of the ways is the improving human and social capital by flattening rigid pyramidal hierarchies and opening up bureaucratic divisions to promote horizontal knowledge-sharing. Moreover, the pressure of competitiveness and the incentives to lower costs have been increased. So, public organizations have started to change. According to OECD survey for KM (2003), approximately 75 percent of organizations surveyed say that they have taken initiatives in the past five years to decentralize and delegate authority to lower hierarchical levels and create internal networks to share information. Two-thirds of organizations have opened up their bureaucratic divisions in the past five years.

Knowledge Management Processes

H6: In knowledge management processes, public organizations focus more on the storage and retrieval, transfer and sharing, and application of knowledge than private organizations.

Public mean = 3.34; Private mean = 3.65; *t*-value = -4.25 with significance < 0.05 (see Table 8). The null hypothesis of equal means is rejected. However, the mean of

private organization is higher than that of public organizations. Therefore, the alternative research hypothesis H6 of storage and retrieval differences is opposite to the hypothesis.

H7: In knowledge management processes, private organizations focus more on knowledge acquisition and creation than public organizations.

Public mean = 3.42; Private mean = 3.77; *t*-value = -5.14 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. Therefore, the alternative research hypothesis H7 about differences in knowledge acquisition and creation is supported.

Through testing theses hypotheses, I examine whether the private organization focuses on all knowledge management processes (storage and retrieval, transfer and sharing, and application of knowledge as well as acquisition and creation of knowledge) more than public organization. Both organizations show high scores for all knowledge management practices, but the private organization has higher scores than the public.

The result is in accord with Zhou's remark (2004, 220) that "public sector organizations, in comparison with private sector organizations, lack the ability to utilize IT, organizational culture and organizational structure in the processes of knowledge creation and sharing," although here the differences are not very great.

Further findings about the four different knowledge management processes (acquisition and creation, storage and retrieval, transfer and sharing, and application) are presented below.

Acquisition and Creation

Sub. H1: Detailed knowledge of customers is treated as a priority and is continuously updated to a greater extent in private organizations than in public organizations.

Public mean = 3.45; Private mean = 4.01; *t*-value = -5.69 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. Therefore, the alternative research hypothesis Sub. H1 about detailed knowledge of customer is supported.

Sub. H2: Public organizations have dedicated staff for capturing and storing knowledge around the organization in readily accessible documents and databases more than private organizations have.

Public mean = 3.07; Private mean = 3.36; *t*-value = -2.43 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of the private organization is higher than that of public organization. Therefore, the alternative research hypothesis Sub. H2 about having dedicated staff for capturing and storing knowledge is accepted; however, the pattern is opposite of what has expected.

Sub. H3: The knowledge that an organization relies on requires rapid and continuous update to a greater extent in private organizations than in public organizations.

Public mean = 3.71; Private mean = 3.83; *t*-value = -1.24 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H3 about rapid and continuous knowledge update is

not supported. Both types of organizations appear to strive to keep their knowledge current.

Sub. H4: Private organizations are more effective than public organizations at creating or acquiring new knowledge assets.

Public mean = 3.47; Private mean = 3.83; *t*-value = -3.86 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. Therefore, the alternative research hypothesis Sub. H4 that privates are more effective is supported.

Sub. H5: Management places emphasis on capturing knowledge in documents and storing them in electronic databases for later reuse to a greater extent in public organizations than in private organizations.

Public mean = 3.42; Private mean = 3.83; *t*-value = -5.16 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of public organization is less than that of private organization. Therefore, the alternative research hypothesis Sub. H5 is opposite to the hypothesis.

Five aspects of knowledge acquisition and creation were measured by the survey: 1) customer *(Sub. H1)*, 2) dedicated staff *(Sub. H2)*, 3) refresh *(Sub. H3)*, 4) acquiring/creating *(Sub. H4)*, and 5) people-to-documentation *(Sub. H5)*. In all aspects (except refresh aspect - *Sub. H3*), private organization scored significantly higher than public organization. Both public and private organizations returned high scores on most knowledge acquisition and creation aspects, but the private has higher scores. Especially, the two organizations strongly agree that the knowledge that an organization relies on

requires rapid and continuous update (the means of refresh: public = 3.83, and private = 3.71).

Even though the hypothesis is not supported, the public manager's task in knowledge creation phase is "to have in place a process that will lead to the certification or recognition of the newness of the knowledge with respect to the organization as a whole – even if the knowledge is old knowledge to some departments. The U.S. government's patent search process provides a model for certifying knowledge creation at the level of national technology..... The public manager's role in capturing knowledge is to identify the necessary and desirable information to be gathered and to specify the gathering process and the data entry format for the information" (O'Looney, 2002: 106).

Storage and Retrieval

Sub. H6: A high proportion of the knowledge in private organizations resides within individuals to a greater extent than in public organizations.

Public mean = 3.37; Private mean = 3.36; *t*-value = 0.17 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H6 about differences in tacit knowledge is not supported.

Sub. H7: Private organizations have more comprehensive and up-to-date shared guidance of experts who provide information about their experience and current work than public organizations have.

Public mean = 3.12; Private mean = 3.30; *t*-value = -1.88 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H7 about expert directories is not supported.

Sub. H8: People can generally access the information that they need without having to refer to the person who created it to a greater extent in public organizations than in private organizations.

Public mean = 2.92; Private mean = 3.52; *t*-value = -6.20 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of public organization is less than that of private organization. Therefore, the alternative research hypothesis Sub. H8 in so far as the pattern is opposite for what was hypothesized.

Sub. H9: People can quickly find the documents that they need with a simple search in electronic databases to a greater extent in public organizations than in private organizations.

Public mean = 3.23; Private mean = 3.40; *t*-value = -1.91 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H9 about searching in database is not supported.

Sub. H10: Information systems provide access to documents generated anywhere in the organizations to a greater extent in public organizations than in private organizations.

Public mean = 3.03; Private mean = 3.69; *t*-value = -6.01 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of

private organization is higher than that of public organization. Therefore, the alternative research hypothesis Sub. H10 is not supported in terms of directionality.

Five aspects of knowledge storage and retrieval were measured by the survey: 1) tacit knowledge *(Sub. H6),* 2) expert directories *(Sub. H7),* 3) without reference to author *(Sub. H8),* 4) searching in database *(Sub. H9),* and 5) access to document *(Sub. H10).*

In aspects of reference to author *(Sub. H8)* and access to document *(Sub. H10),* there are significant differences between public and private organizations. That is, the people in the private organization can access the information that they need without having to refer to the person who created it more easily than those in public organization. Moreover, information system of private organization provides faster and more comprehensive documents retrieval than that of public organization.

In the other aspects, there are no significant differences between two organizations. However, they reported a moderate high score on those aspects. Particularly, both organizations agree that a high proportion of the knowledge in their organizations resides within individuals (tacit - *Sub. H6)*. This finding (the means of public = 3.36, and private = 3.37) is consistent with Tovstiga and Korot (1998) who estimate that tacit knowledge constitutes more than 70 percent of an organization's knowledge. However, this is contrary to Hansen, Nohria, and Tierney's (1999) model which suggests that the proportion of tacit knowledge in organizations following codification strategies is no more than 20 percent.

Especially, non-technical public managers are likely to need more assistance in this storage and retrieval stage because of the technical nature of some of the decision.

"Managers should get the advice of persons with experience in large-scale (or enterprise-level) systems and in date warehousing. In particular, managers should ask a series of questions regarding the scalability of the choice of storage and processing systems" (O'Looney, 2002: 107).

Transfer and Sharing

Sub. H11: A high proportion of internal knowledge sharing achieved through direct people-to-people contact occurs to a greater extent in private organizations than in public organizations.

Public mean = 3.25; Private mean = 3.14; *t*-value = 0.99 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H11 about differences in people-to-people sharing is not supported.

Sub. H12: A high proportion of internal knowledge sharing is achieved through documents and databases to a greater extent in public organizations than in private organizations.

Public mean = 3.57; Private mean = 3.87; *t*-value = -3.67 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of private organization is higher that that of public organization. Therefore, the alternative research hypothesis Sub. H12 about differences in document and databases sharing is opposite what was expected.

Sub. H13: Transfer of people between offices (for example, dispatch to and from departments) is used to foster people networks to a greater extent in private organizations than in public organizations.

Public mean = 3.23; Private mean = 2.74; *t*-value = 4.44 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of public organization is significantly higher than that of private organization. Therefore, the alternative research hypothesis Sub. H13 about dispatches for people network is opposite to the hypothesis.

Three aspects of knowledge transfer and sharing were measure by the survey: 1) people-to-people sharing *(Sub. H11)*, 2) documents and database sharing *(Sub. H12)*, and 3) dispatches for people network *(Sub. 13)*.

In terms of people-to-people sharing knowledge, there is no significant difference between organizations. Both organizations moderately agree that a high proportion of internal knowledge sharing is achieved through direct people-to-people contact (public = 3.25 and private = 3.14).

For documents and database sharing aspect, and dispatches for people network aspect, the results of analysis show that there are significantly differences between public and private organizations. In contrast with the hypotheses, the private organization strongly agrees that a high proportion of internal knowledge sharing is achieved through documents and database (codification strategy). And, to a greater extent than the private organization, the public organization strongly agrees that people use transfer of people between offices (for example, dispatch to and from the departments) to foster people

networks (personalization strategy). These results are consistent to Hansen, Nohria and Tierney (1999)'s model which indicates that the organization which emphasizes on codification strategy generally uses documents and databases to share internal knowledge, and the personalization strategy organization usually uses the direct people-to-people contact to share internal knowledge sharing.

To promote knowledge sharing, O'Looney (2002) recommended linking performance pay and promotion to knowledge sharing and building communities of practice (group of practitioners sharing their knowledge in a specific area without working on the same specific project). Moreover, according to an OECD survey (2003), improving transparency and outward sharing of information as well as improving working relations and trust within organisations also rank high among factors motivating the establishment of KM practices.

However, there are side effects of new knowledge and information sharing. First, information and email can be overloaded, and can waste time in consultation and attendance of meetings. Second, staff in organizations can have difficulties in using new information and communications technologies (ICTs). Third, this can bring the dilution of responsibilities (OECD, 2003).

Application

Sub. H14: Once new knowledge is developed, it is reused as many times as possible in the organization's products/services to a greater extent in public organizations than in private organizations.

Public mean = 3.26; Private mean = 3.65; *t*-value = -4.41 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of public organization is less than that of private organization. Therefore, the alternative research hypothesis Sub. H14 about difference in reuse economy is opposite for what was hypothesized.

Sub. H15: The products and/or services that are provided involve bringing together experts with relevant knowledge and experience to a greater extent in private organizations than in public organizations.

Public mean = 3.70; Private mean = 3.80; *t*-value = -1.10 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis Sub. H15 about differences in bringing in experts is not supported.

Two aspects of knowledge application were measured by the survey: 1) reuse economics *(Sub. H14)* and 2) expert economics *(Sub. H15)*. For reuse aspect, there is a significant difference between the public and private organizations. In contrast with the hypothesis, once new knowledge is developed, it is reused as many times as possible in the organization's products/services to a greater extent in private organization than in public organization. Some large consulting companies, such as Andersen Consulting and Ernst & Young, have pursued a codification strategy. They have developed elaborate ways to codify, store, and reuse knowledge (Hansen, Nohria and Tierney, 1999). Knowledge is codified. It is extracted from the person who developed it, made independent of that person, and reused for various purposes. This approach allows many

people to search for and retrieve codified knowledge without having to contact the person who originally developed it. That opens up the possibility of achieving scale in knowledge reuse and thus of growing the business.

Both organizations' mean scores for expert economics (the product and/or services that are provided involve bringing together experts with relevant knowledge and experience) are high (public = 3.70 and private = 3.80). However, there is no significant difference between pubic and private organizations. Hansen, Nohria and Tierney (1999) refer to expert economics as an element of a personalization strategy, whereby a large proportion of revenues are at high margins for highly customized solutions provided by experts to solve unique problems.

For the public sector, the issue of knowledge management should not be considered merely as an internal management and governance challenge for public organizations. Knowledge is in many ways a crucial public good, affecting a country's overall competitiveness and creating new challenges for ensuring equity. The public sector has a unique role in promoting the production, use and transfer of knowledge. For examples, 1) public organizations provide knowledge not traditionally provided by private firms, 2) public organizations ensure education and information for all, 3) public organizations construct 'information super highways,' and public organizations regulate knowledge production, transfer, sharing and use (OECD, 2001).

Public managers need to train and empower public employees to focus on data through the entire KM cycle from creation to use. To do this, however, public managers themselves need to become familiar with the individual features of the KM process (Van Buren, 1999).

Individuals and Roles

Recruitment

H8: People joining an organization are well suited to following procedures and implementing standard solutions to a greater extent in public organizations than in private organizations.

Public mean = 3.21; Private mean = 3.28; *t*-value = -0.77 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H8 about suitability to use of knowledge and the implementation solution is not supported.

H9: People joining an organization are good at problem solving to a greater extent in private organizations than public organizations.

Public mean = 3.31; Private mean = 3.33; *t*-value = -0.29 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H9 about tendency to hire people who are good at problem solving is not supported.

Reward Systems

H10: Pay systems encourage using and contributing to document databases to a greater extent in public organizations than in private organizations.

Public mean = 2.73; Private mean = 2.96; *t*-value = -2.06 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of

public organization is less than that of private organization. Therefore, the alternative research hypothesis H10 about pay system that encourages using and contributing to document databases is opposite to the hypothesis.

H11: Pay systems encourage direct sharing of knowledge with others to a greater extent in private organizations than in public organizations.

Public mean = 2.59; Private mean = 2.70; *t*-value = -0.96 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H11 about pay systems that encourage direct sharing of knowledge is not supported.

Training

H12: Training relies on documentation and manuals to a greater extent in public organizations than in private organizations.

Public mean = 3.28; Private mean = 3.71; *t*-value = -4.96 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of private organization is higher than that of private organization. Therefore, the alternative research hypothesis H12 about the reliance of training on documents and manuals is opposite to the hypothesis.

H13: Training relies on knowledge transfer through coaching or mentoring to a greater extent in private organizations than in public organizations.

Public mean = 3.06; Private mean = 2.87; *t*-value = 1.90 with significance > 0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H13 about using of coaching or mentoring for knowledge transfer is not supported.

The key aspects of human resources in this research were recruitment, reward systems and training. For the recruitment aspect, I asked the degree of suitability to use of knowledge and implementation solutions (codification strategy) and the tendency to hire people who are good at problem solving (personalization strategy). All means of both organizations about recruitment are a little high. However, there are no significant differences between public and private organizations. One aspect of competitiveness that is affected by the knowledge intensive economy concerns recruitment. “First, it is now clear that job seekers increasingly value jobs that continually improve their knowledge, providing them with better future career opportunities. Second, both organizations now have to recruit specialized ‘knowledge worker’, and new staff in general will have to demonstrate their ability to share knowledge” (OECD, 2001).

Pay systems encourage using and contributing to document databases (codification strategy) to a greater extent in the private organization than in the public organization. However, both organizations reported moderately low scores for pay systems encouraging the direct sharing of knowledge with others (personalization strategy). According to OECD (2003) survey, there is a strong correlation between the existence of rewards for knowledge and information sharing and the self-assessed success of the implementation of knowledge and information management practices.

Sixty percent of the public organizations' respondents say that workers are rewarded for knowledge and information sharing. On the contrary, Zhou (2004) states that there were almost no reward and incentive measures in public sector organizations to motivate knowledge contribution and to encourage effective knowledge sharing behavior. In his opinion, this may be a major cause of ineffectiveness of KM in public sector organizations.

There are formal and informal ways to reward employees. The results of OECD survey (2003) show that only slightly more than 20 percent of public organizations' respondents give monetary incentives, prizes, or formal reward and slight more than 30 percent of them link promotion to knowledge and information sharing. As the informal reward, organizations use peer recognition (50 percent of organisations) and informal encouragement for 95 percent of organisations. However, more than 50 percent of those organizations also say that individuals are rewarded through performance reviews, which can be considered as the second step of individual recognition after informal rewards.

In terms of training, two different types were asked based on the type of knowledge management strategy. First, for the reliance of training on documents and manuals, there is an interesting difference between public and private organizations even though the hypothesis is not supported. That is, the reliance of training on documents and manuals (codification strategy) is higher in the private organization than in the public organization. However, both organizations reported moderately high score on training with documents and manuals. For the usage of coaching or mentoring for knowledge transfer (personalization strategy), there is no significant difference between the two organizations. Additionally, the OECD (2003) report says that, in public organizations,

staffs have more formalized opportunities to improve their knowledge through training, meetings and seminars. However, these opportunities remain rather traditional and new types of formalized practices such as mentoring and coaching methods are rare or non-existent in a majority of organizations.

Information and Communication Technology

H14: Information and communications technologies (ICT) to access documents and data are used more in public organizations than in private organizations.

Public mean = 3.42; Private mean = 3.66; *t*-value = -2.98 with significance < 0.05 (see Table 11). The null hypothesis of equal means is rejected. However, the mean of public organization is significantly less than that of private organization. Therefore, the alternative research hypothesis H14 about use of ICT to access documents and data is opposite what was hypothesized.

H15: Information and communications technologies (ICT) to contact people and to exchange knowledge are used more in private organizations than in public organizations.

Public mean = 3.28; Private mean = 3.35; *t*-value = -0.76 with significance >0.05 (see Table 11). The null hypothesis of equal means is not rejected. Therefore, the alternative research hypothesis H15 about use of ICT for contacting people is not supported.

Two aspects of information and communication technology (mainly focused on use of technology) were measured by the survey: 1) accessing documents and data *(H14)*, and 2) contacting people *(H15)*. But contrary to hypothesis *(H14)*, the private organization's score for the use of information and communication technology (ICT) to access documents and data (codification) is significantly higher than that of the public organization. However, in terms of contacting people (personalization), there is no significant difference between two organizations types. Both organizations reported the moderately high score of use of ICT for both 1) accessing documents and data (public = 3.42 and private = 3.66), and 2) contacting people to exchange knowledge (public = 3.28 and private = 3.35).

The public organization respondents to the OECD survey (2003) have largely achieved internal access to basic e-government technologies for the majority of their staff. Intranets are in use in more than 90 percent of organizations, and 75 percent of organizations say that more than 75 percent of their staff have access to the internet and an email address. The other informal tools such as quality groups/communities of practices, and knowledge networks that usually advocated in the KM literature are also increasingly used. "Most public managers are aware of how technologies (such as spreadsheets, databases, optical character recognition and statistical programs) can be used in the phases of knowledge management. However, public managers may be less aware of how some of the emerging technologies can be used to enhance knowledge management at different phases" (O'Looney, 2002: 112).

Hypotheses which were developed based on Hansen, Nohria, and Tierney's model (1999) and MIT90s Framework (Scott Morton, 1991) are tested to compare KM in both

the private and the public sector. Fourteen hypotheses are not supported. In the others (16 hypotheses), I find the significant differences between two organizations. However, the patterns of 12 hypotheses among them are opposite for what were hypothesized. Only from 4 hypotheses (*H3, H7, Sub H1*, and *Sub H4*), do I get the results as hypothesized. Table 12 shows the summary of hypotheses testing results.

Table 12: Summary of Hypotheses Testing Results

	Hyp. No.	Hypothesis	Supported
Strategy	H1	Public organizations follow more codification knowledge strategies than personalization knowledge strategies.	Yes (opposite)
	H2	Private organizations follow more personalization knowledge strategies than codification knowledge strategies.	No
Structure	H3	Most knowledge flows vertically from subordinate to superior and vice-versa to a greater extent in public organizations than in private organizations.	Yes
	H4	Knowledge in the organizations flows horizontally across the organization at all levels to a greater extent in private organizations than in public organizations.	No
	H5	Knowledge management is coordinated centrally from the top to a greater extent in public organizations than in private organizations.	No
Knowledge Management Process	H6	In knowledge management processes, public organizations focus more on the storage and retrieval, transfer and sharing, and application of knowledge than private organizations.	Yes (opposite)
	H7	In knowledge management processes, private organizations focus more on knowledge acquisition and creation than public organizations.	Yes
	Sub. H1	Detailed knowledge of customers is treated as a priority and is continuously updated to a greater extent in private organizations than in public organizations.	Yes
	Sub. H2 (C)	Public organizations have dedicated staff for capturing and storing knowledge around the organization in readily accessible documents and databases more than private organizations have.	Yes (opposite)
	Sub. H3	The knowledge that an organization relies on requires rapid and continuous update to a greater extent in private organizations than in public organizations.	No
	Sub. H4	Private organizations are more effective than public organizations at creating or acquiring new knowledge assets.	Yes
	Sub. H5 (C)	Management places emphasis on capturing knowledge in documents and storing them in electronic databases for later reuse to a greater extent in public organizations than in private organizations.	Yes (opposite)
	Sub. H6 (P)	A high proportion of the knowledge in private organizations resides within individuals to a greater extent than in public organizations.	No
	Sub. H7 (P)	Private organizations have more comprehensive and up-to-date shared guidance of experts who provide information about their experience and current work than public organizations have.	No

	Sub. H8 (C)	People can generally access the information that they need without having to refer to the person who created it to a greater extent in public organizations than in private organizations.	Yes (opposite)
	Sub. H9 (C)	People can quickly find the documents that they need with a simple search in electronic databases to a greater extent in public organizations than in private organizations.	No
	Sub.H10 (C)	Information systems provide access to documents generated anywhere in the organizations to a greater extent in public organizations than in private organizations.	Yes (opposite)
	Sub.H11 (P)	A high proportion of internal knowledge sharing is achieved through direct people-to-people contact to a greater extent in private organizations than in public organizations.	No
	Sub.H12 (C)	A high proportion of internal knowledge sharing is achieved through documents and databases to a greater extent in public organizations than in private organizations.	Yes (opposite)
	Sub.H13 (P)	Transfer of people between offices (for example, dispatch to and from the departments) is used to foster people networks to a greater extent in private organizations than in public organizations.	Yes (opposite)
	Sub.H14 (C)	Once new knowledge is developed, it is reused as many times as possible in the organization's products/services to a greater extent in public organizations than in private organizations.	Yes (opposite)
	Sub.H15 (P)	The products and/or services that are provided involve bringing together experts with relevant knowledge and experience to a greater extent in private organizations than in public organizations.	No
Individuals and Roles	H8 (C)	People joining an organization are well suited to following procedures and implementing standard solutions to a greater extent in public organizations than in private organizations.	No
	H9 (P)	People joining an organization are good at problem solving to a greater extent in private organizations than public organizations.	No
	H10 (C)	Pay systems encourage using and contributing to document databases to a greater extent in public organizations than in private organizations.	Yes (opposite)
	H11 (P)	Pay systems encourage direct sharing of knowledge with others to a greater extent in private organizations than in public organizations.	No
	H12 (C)	Training relies on documentation and manuals to a greater extent in public organizations than in private organizations.	Yes (opposite)
	H13 (P)	Training relies on knowledge transfer through coaching or mentoring to a greater extent in private organizations than in public organizations.	No
ICT	H14 (C)	Information and communications technologies (ICT) to access documents and data are used more in public organizations than in private organizations.	Yes (opposite)
	H15 (P)	Information and communications technologies (ICT) to contact people and to exchange knowledge are used more in private organizations than in public organizations.	No

Factor Analysis

Twenty items of knowledge management strategy (including 11 codification items and 9 personalization items) were subjected to factor analysis. This analysis reveals

the presence of four components with eigenvalues exceeding 1.0, together explaining 54.0 percent of the variance. Using scree plot, it was decided to retain four components for further investigation. Varimax rotation was performed to help in the interpretation of these four components (See Table 13).

Table 13: Factor Analysis of Knowledge Management Strategies Items

	Component			
	1	2	3	4
F1: Information System and Technology				
Acquisition and Creation5 (c)	**.71**	.25	.19	.27
Use of ICT (c)	**.69**	.18	-.03	.19
Storage and Retrieval 5 (c)	**.68**	.07	.31	.08
Storage and Retrieval 4 (c)	**.67**	.20	.25	.21
Storage and Retrieval 3 (c)	**.67**	.08	.21	.26
Application 1 (c)	**.64**	.08	.27	.36
Transfer and Sharing 2 (c)	**.64**	.13	.00	-.01
Training (c)	**.57**	.29	-.36	-.16
F2: Reward and Associated Behavior				
Reward (c)	.17	**.83**	.00	.11
Reward (p)	.10	**.81**	-.11	.06
Storage and Retrieval 2 (p)	.36	**.45**	.27	.42
Acquisition and Creation2 (c)	.33	**.44**	.30	.16
Use of ICT (p)	.29	**.37**	.09	.16
F3: Personal Knowledge				
Storage and Retrieval 1 (p) Recode	.13	.14	**.77**	-.17
Transfer and Sharing 1 (p) Recode	.20	-.15	**.62**	.19
Training (p) Recode	.13	.07	**.55**	-.16
F4: Agility				
Transfer and Sharing 3 (p)	.03	.40	.24	**.65**
Application 2 (p)	.15	.17	-.20	**.62**
Recruitment (p)	.35	-.09	-.17	**.59**
Recruitment (c)	.29	.31	-.32	**.41**

Each of the four components represented variables that had clear conceptual commonality and each was named appropriately as shown in Table 14. Item scores were summed for each factor for creating summary measures. The Cronbach alpha test (reliability) results for the summary scores are also shown in Table 14.

Table 14: Factor Components and Reliability Test

Factor Component	Heading	Reliability (Cronbach alpha)
F1	Information System and Technology (IST)	0.86
F2	Reward and Associated Behavior	0.72
F3	Personal Knowledge	0.60
F4	Agility	0.59

Two factors (F1 and F2) meet the recommended criterion (Hair et al. 1998) of a Cronbach alpha measure greater than 0.6. However, Factor 3 and 4 have marginal alpha score (0.60 and 0.59). According to Pallant (2001), the Cronbach alpha test is quite sensitive to the number of items in the scale. With short scales of less then ten items, it is common to find low alpha values closer to 0.5. However, F4 has two items and the Cronbach alpha value of 0.591. For these reasons, we can retain Factor 3 and 4 within the model.

The item measures included in each component are set out in Table 15.

Table 15: Factor Composition

F1	Information System and Technology (IST)
Acquisition and Creation 5 (c): People-to-document: development of an electronic document system **Use of ICT (c):** (information and communications technologies) to access to documents and data **Storage and Retrieval 5 (c):** Access: easiness of access to information which is stored in electronic repositories **Storage and Retrieval 4 (c):** Speed to of tracking documents **Storage and Retrieval 3 (c):** Degree to which people can search for and retrieve codified information **Application 1 (c):** Degree of knowledge reuse (Reuse Economics) **Transfer and Sharing 2 (c):** Degree of internal knowledge sharing through documents and database **Training (c):** degree of training focus on documentation and manuals	
F2	**Reward and Associated Behavior**
Reward (c): relationship between pay system, and employees' use and contribution to database **Reward (p):** relationship between pay system, and employees' direct sharing their knowledge **Storage and retrieval 2 (p):** the comprehensive and up-to-date shared guidance of experts **Acquisition and Creation 2 (c):** degree of dedication on staff member who have responsibility for codifying and storing documents in electronic repositories **Use of ICT (p):** (information and communications technologies) to contact people and to exchange knowledge	
F3	**Personal Knowledge**
Storage and Retrieval (p): Proposition of the knowledge on individuals **Transfer and Sharing (p):** Degree of internal knowledge sharing through direct people-to-people contact **Training (p):** The degree of training focuses on conveying tacit knowledge and makes a lot of use one-to-one mentoring	
F4	**Agility**
Transfer and Sharing 3 (p): people network-fostering of networks by transfer of people between offices **Application 2 (p):** The product/services that we provide always involve bringing together experts with relevant knowledge and experience **Recruitment (p):** people in our organization are good at problem solving in unclear situations **Recruitment (c):** people in our organization are well suited to reuse of knowledge and the implementation solutions	

Independent *t* tests were conducted (see Table 16) to explore the relationship of each factor component and the organization types (public and private).

Table 16: Independent t test of Factor Components

Ref.	Factor	Public (mean)	Private (mean)	*t*-value
F1	Information System and Technology	3.27	3.67	-6.47*
F2	Reward and Associated Behavior	2.96	3.14	-2.49*
F3	Personal Knowledge	3.23	3.13	1.24
F4	Agility	3.20	3.14	1.13

*: P <0.05

Factor analysis identified four major components among twenty different items about the codification and personalization of knowledge management strategy (Table 13, Table 14, and Table 15). Factor 1, The Information System and Technology measure shows the extent to which information and communications technology (ICT) are applied to acquisition, creation, storage, retrieval, transfer, sharing, and using information (primarily codified knowledge). Both organizations provide a strong response to Factor1 -- development of an electronic document system; accessing to documents and data easily and speedily; searching and retrieving the codified knowledge; and sharing the internal knowledge through documents and database. It is important to note that the private organization does have a significantly higher score than the public (Public mean = 3.27; Private mean = 3.67; *t*-value = -6.47 with significance < 0.05 (see Table 16)).

Factor 2, Reward and Associated Behavior measures the relationship between pay system and employee's creating codified knowledge and direct sharing knowledge, and

the associated behaviors (expert directories, dedicated staff, and use of ICT for contacting people). All public and private organizations report that their pay systems highly encourage using and contributing to document database as well as direct sharing of knowledge with other people. Here, both organizations show moderate scores on expert directories and dedicated staff items. However, they put on little emphasis on using ICT to contact people and to exchange knowledge.

The Reward and the Associated Behavior factor differs significantly between public and private organization, with the private organization's mean significantly higher than that of the public organization (Public mean = 2.96; Private mean = 3.14; *t*-value = -2.49 with significance < 0.05 (see Table 16)). In particular, the private organization shows a significantly higher score than the public organization on the items which relate the pay system to encouraging, using and contributing to document databases, and the degree of dedication of staff member who have responsibility for codifying and storing documents in electronic repositories

Factor 3, Personal Knowledge measures the extent to which the organization's knowledge resides in individuals, how internal knowledge sharing and conveying is through direct people-to-people contact. Both organizations report high scores indicating that a high proportion of the organization's knowledge is tacit and closely linked to the individual. This is consistent with Tovstiga and Korot's (1998) estimate that over 70 percent of organization's knowledge is tacit. However, they both show moderate scores on the sharing and conveying knowledge through people-to-people. On all dimension as well as on the each item of this factor, there is no significant difference between public

and private organization (Public mean = 3.23; Private mean = 3.13; *t*-value = -1.24 with significance > 0.05 (see Table 16)).

Factor 4, Agility measures the extent to which 1) people are able to handle ambiguity, as reflected in new recruits, 2) relevant experts are brought in for creating and providing products and services, 3) new recruits are well suited to reuse of knowledge and implementation solutions, and 4) fostering of networks by transfer of people between offices. Both organizations show the moderately high scores on all items of this factor. For Factor 4 as a whole, there is no significant difference between the public and private organization (Public mean = 3.20; Private mean = 3.14; *t*-value = 1.13 with significance > 0.05 (see Table 16)). However, through the independent t-test of each item, I found one significant difference between public and private organization. The public organization shows the significantly higher score than private organization on item of fostering of networks by transfer of people between offices (Public mean = 3.24; Private mean = 2.74; *t*-value = 4.44 with significance < 0.05).

The Relations between Codification and Personalization Strategies

Relationships between the codification and personalization dimensions also were explored. The results of analysis do not support Hansen, Nohria, and Tierney's (1999) assumptions which better performing organizations concentrate on either on a codification or a personalization strategy to the extent of an 80:20 balance.

Hansen, Nohria, and Tierney (1999) state that emphasizing the wrong strategy or trying to pursue both at a same time can quickly undermine a business (organization).

That is, they would suggest clustering in two groups: 1) high codification and low personalization, and 2) low codification and high personalization.

In figure 11, 12, and 13, the codification score (horizontal axis) is plotted against the personalization score (vertical axis) for both, public and private organizations. The figures do not demonstrate such clusterings as Hansen, Nohria, and Tierney (1999) posit; rather the data show a linear tendency with some correlations between the degrees of codification and personalization.

Figure 11: Scatterplot - Correlation between Codification and Personalization for Both Organizations

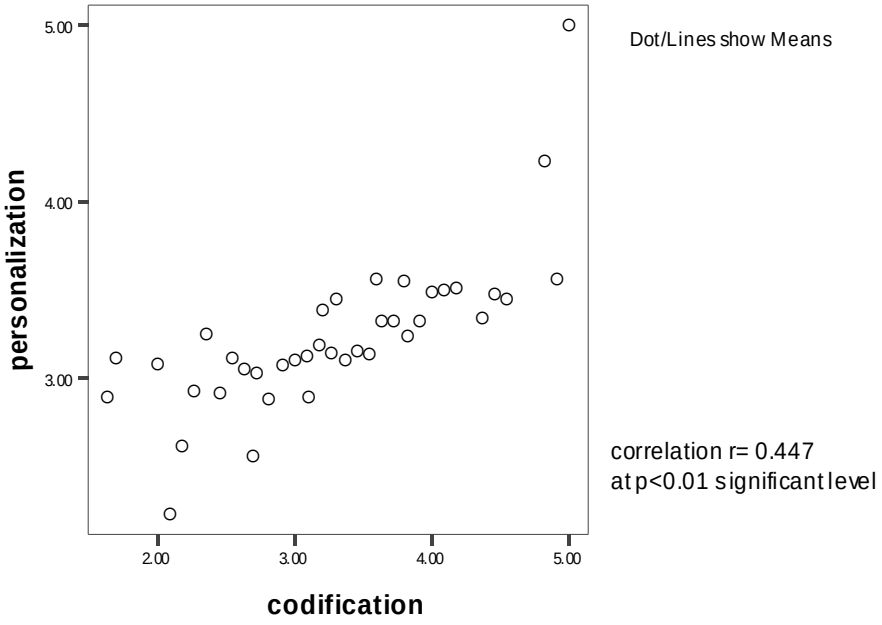


Figure 12: Scatterplot - Correlation between Codification and Personalization for Public Organization

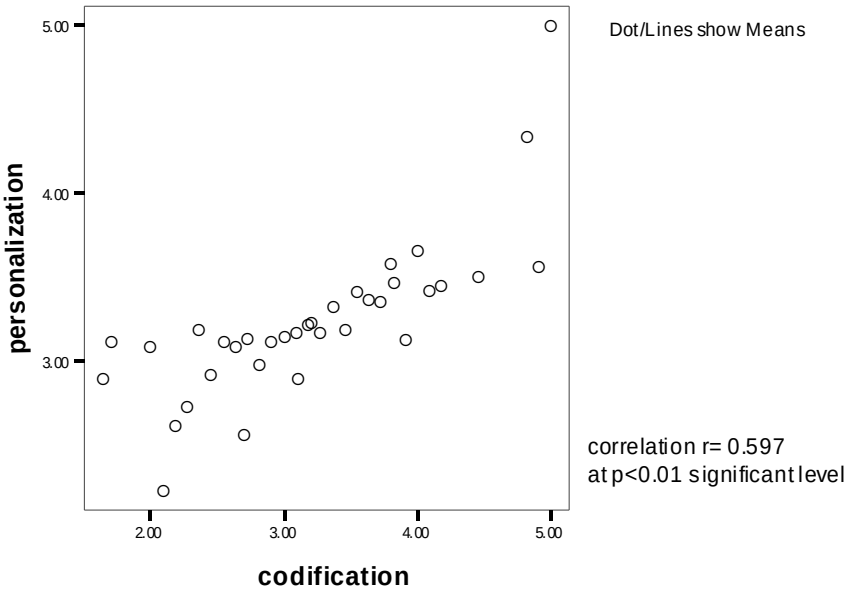
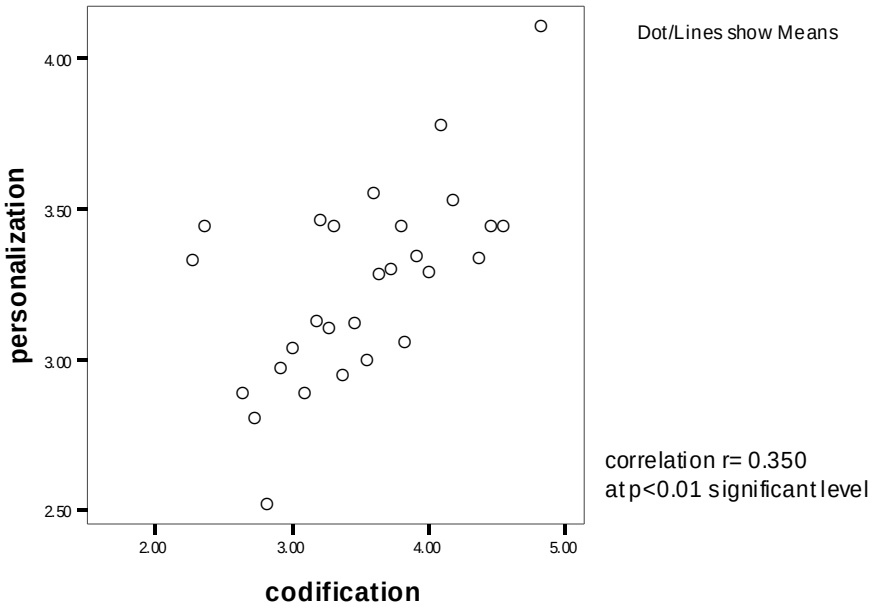


Figure 13: Scatterplot - Correlation between Codification and Personalization for Private Organization



In total (for both public and private organizations), the relationship is weakly and positively correlated with a pearson coefficient of $r = 0.45$ at $p < 0.01$ significance level (see Figure 11). However, the correlation between codification and personalization in public organization ($r = 0.60$ at $p<0.01$: Figure 12) is higher than that in private organizations ($r = 0.35$ at $p<0.01$: Figure 13).

The results support Nonaka's (1998) comment that, to survive in today's knowledge based competition, knowledge management practices that focus on managing explicit data and information technology is not enough. Tacit knowledge must be considered. This finding also is in line with Truch's (2004) research. The results of his research do not confirm codification as a distinct knowledge strategy that is followed as an alternative to a personalization. Rather the study indicates that "many elements of codification are present in all organizations and underpin those that are more advanced in knowledge management terms."

The results of this study inspires a caution regarding the application of Hansen, Nohria, and Tierney's (1999) model, which is put forward as a prescription for organizations formulating their knowledge management strategies. Organizations that fit the codification profile might take a risk of ignoring the personalization elements at their own peril, which this study shows as being important.

The major implication of the finding about knowledge management strategies is that, contrary to Hansen, Nohria, and Tierney's (1999) model, effective organizations tend to emphasize to a similar degree both codification and personalization strategies.

According to socio-technological perspective of organizations, technologies and social systems are equally important in knowledge management. The case study of Pan and Scarbrough (1999) illustrates that much of the value added by the technical changes associated with knowledge management results not from the technology itself but from the new arrangements and roles of the organizations, management and the people who can make the best use of technology. It is clearly indicated that knowledge management must be embedded in the processes in which people work. This case demonstrates that knowledge management is a process which facilitates knowledge creation and sharing through organization's intranets and communities of practice.

The effectiveness and value of knowledge management for public and private organizations depends on the active participation of each employee. An equal emphasis on technology, structures, and cultural factors might help to provide for the success of knowledge management strategies. In particular, as Pan and Scarbrough (1999) say, "the task for the organization is to continuously create and maintain a knowledge-enterprising culture and community whereby associates feel comfortable with knowledge and are motivated and rewarded."

Chapter 5

CONCLUSIONS

This chapter presents the conclusions for this study. It is divided into five sections. In first section, an overview of the purpose of the study and the summary of research are presented. The second section covers the suggestions for KM to public organizations. The third section discusses the implication and contributions of this study. The fourth section discusses the possible future research. The final section presents the limitations of this study.

Summary of the Findings

The purpose of this research is to test empirically the basic KM argument that KM in public organizations differs from that carried out in private organizations. To achieve this research purpose, I set some objectives. First of all, key dimensions of KM are described in literature review (Chapter 2). These are about ‘what knowledge is’ (definition, features, types, and perspective of knowledge), and ‘what knowledge management is’ (definition, principles, process, and implementation of knowledge management). Moreover, I explained current situation that KM in public organizations is still underrated even thought KM is so important to public organizations. As needed for the purpose of research, I reviewed general arguments about similarities or differences between public and private organization. Lastly, in the literature review, I introduced the ‘management in the 1990s research program by MIT’ as one part of the research model.

In Chapter 3, the methodology for this study is presented. Research model and the hypotheses were developed based on Hansen, Nohria, and Tierney's model (1999) and MIT90s Framework (Scott Morton, 1991). The processes of measurement such as variables operationalization, methods of data collection, units of analysis, and sample are presented.

Chapter 4 covers the analysis and the findings from the survey. In here, first, I analyzed the characteristics of survey respondents according to position, age, gender and education. The survey respondents from public organizations are younger and have higher education than those of private organization. Moreover, the number of employees and female from public organization is higher than those from private organization.

Secondly, I tested the hypotheses which were developed based on Hansen, Nohria, and Tierney's model (1999) and MIT90s Framework (Scott Morton, 1991) to compare KM in both the private and the public sector. Most hypotheses are not supported (see Table 10) except 4 hypotheses. *H3* (Most knowledge flows vertically from subordinate to superior and vice-versa to a greater extent in public organizations than in private organization), *H7*(In knowledge management processes, private organization focuses more on knowledge acquisition and creation than public organization), *Sub H1*(Detailed knowledge of customers is treated as a priority and is continuously updated to a greater extent in private organizations than in public organizations), and *Sub H4* (Private organizations are more effective than public organizations at creating or acquiring new knowledge assets). Only one hypothesis which is about vertical structure is related to public organization. The result supports the typical argument that public organizations often are more centralized (Rainey, 1997). According to Zhou (2004: 220), "the top-

down control structure and the working culture of bureaucratic procedures are the two major obstacles for KM practice in the public sector." Other barriers include lack of recognition of individuals, leadership assignments not based on merit or experience, and the nature of organization driven by legislation" (Rubenstein-Montano, Buchwalter, and Liebowitz, 2001: 239).

Even though the results are contrary to my hypotheses, I found significant differences between public and private organization in some aspects of KM. For dispatches for people network *(Sub. 13*) aspect (personalization strategy), public organization shows higher mean score than private organization.

In knowledge management process, the private organization focuses more on all knowledge processes stages (the storage and retrieval, transfer and sharing, and application of knowledge) than the public organization. Moreover, the result of the test for the degree of codification (*H1*) hypothesis shows that the private organization follows more codification knowledge strategies than personalization knowledge strategies. The means of private organization for the rest of all aspects which are related to codification strategy is significantly higher than those of public organization:

1) dedicated staff for capturing and storing knowledge *(Sub. H2)*
2) people-to-documentation *(Sub. H5)*
3) without reference to author *(Sub. H8)*
4) access to document *(Sub. H10)*
5) documents and database sharing *(Sub. H12)*
6) reuse economics *(Sub. H14)*
7) pay system for using and contributing to documents and database *(H10)*
8) reliance of training on document and manuals *(H12)*
9) technology for accessing documents and data *(H14).*

Why? I think it is a big reason that KM practices in the public sector falls behind the private sector. Even though researches and practices into KM and IC (intellectual capital) in the past decade have produced a significant body of knowledge in terms of both practice and theory, much of the documented KM practice is related to the private sector (Brooking, 1996; Davenport and Prusak, 1998; Stewart, 2002).

Suggestions for Public Organization

Public organizations no longer have a monopoly of knowledge in their field as information about policies and service delivery has become much more available to citizens, lobby groups, and users. “Citizens increasingly require individualized solutions, and policy-making and service delivery have been made more complex as the public sector works with more partners. This has created new demands on governments to obtain and integrate individualized knowledge for customizing policies and service delivery” (OECD, 2001). Moreover, rapid staff turnover has replaced the culture of life-long employment, calling into question the traditional ways of maintaining institutional memory. What or how should public organizations do in this situation? I will present some recommendations in here for KM in public organizations founded on the MIT90’s framework.

Strategy

“A knowledge management strategy and implementation plan are vital for government’s long-term success for transforming government into agile, adaptive, and

learning organization" (Liebowitz, 2003). One of the problems identified is that public organizations have no strategy (OECD, 2001). I guessed that public organizations would follow more codification knowledge strategies than personalization knowledge strategies. However, I got the opposite result: private organizations follow more codification strategies than personalization one.

Anyway, which knowledge management strategy should be emphasized for public organizations between two strategies (codification vs. personalization)? Hansen, Nohria, and Tierney (1999) present three aspects for choosing strategy: 1) offering standardized or customized products and service, 2) having a mature or innovative products and services, and 3) relying on explicit or tacit knowledge to solve problems.

First, organizations that are creating standardized products and services should consider the codification knowledge management strategy, which is based on reuse. Meanwhile, some organizations offer customized products and services, which go toward particular customers' needs. Because those needs may vary dramatically, codified knowledge is of limited value. So, organizations that follow a customized product approach should consider the personalization model. Second, an organization's strategy based on mature products and services typically benefits most from a reuse model. The processes for developing and delivering such products and services involve well-understood tasks and knowledge that can be codified. A strategy based on products and service innovation is best supported by a personalization strategy. Lastly, when an organization's employees rely on explicit knowledge to do their work, the people-to-documents approach makes the most sense. By contrast, tacit knowledge is difficult to articulate in writing and is acquired through personal experience. So, when people use

tacit knowledge most often to solve problems, the person-to-person approach works best (Hansen, Nohria, and Tierney, 1999).

Can these two knowledge management strategy models coexist in one organization? Hansen, Nohria, and Tierney (1999) say that they can coexist – but only in organization where units of the organization operate like stand-alone organizations. The exact approach or strategy to KM that the public organization should attempt will depend on the particular organization's needs and the technological and human capacities currently available (or that the public organization is willing to acquire) (O'Looney, 2002).

Suggestions for public organizations that emphasize personalization model are: 1) building stakeholder capital by obtaining the right knowledge for all stakeholders, and involving stakeholders in the decision making process (OECD, 2001). Citizens, users, private firms, lobby group, and etc. can be stakeholder for a public organization, and 2) strengthening connections with private firms, research institutes, universities, etc. For public organizations that emphasize the codification model, first of all, they need to broaden the strategy for record retention.

Lastly, within the organization, employees will be confused about priorities. This issue will quickly become politicized, and people will battle for resources without seeing the whole picture. "Only strong leadership can provide the direction a company needs to choose, implement, and overcome resistance to a new knowledge management strategy" (Hansen, Nohria, and Tierney, 1999: 116).

Structure

According to OECD survey (2003) for KM, there is an important change in the role of managers. More than 90 percent of organizations consider that the role of managers is evolving. And, more than 85 percent of organizations agree or strongly agree with the ideas that managers spend more time disseminating information to their staff and facilitating the horizontal flow of information between their staff, and are also more frequently required to devolve authority to lower levels. Finally, more than 75 percent of organizations say they spend more time building project teams rather than managing projects directly. That is, public organizations can improve human and social capital by flattening rigid pyramidal hierarchies and opening up bureaucratic divisions to promote horizontal knowledge-sharing.

Another suggestion we can consider for KM in public organizations is to develop some type of knowledge infrastructure. As Demarest (1997) says, knowledge management requires an infrastructure – cultural, operational and technical. Approximately half of the organizations surveyed (OECD, 2003) "have established central co-ordination units for knowledge and information management, knowledge networks, and Chief Knowledge Officers, and more than 20 percent have planned to establish them in the next three years."

A Chief Knowledge Officer (CKO) (or The Knowledge Management Officer) needs to be appointed to manage the company's knowledge assets in much the same way as the CFO (Chief Finance Officer) manages its financial capital (Demarest, 1997). Liebowitz (2003) says that public organization needs to assign people for building and nurturing a knowledge sharing culture: a Knowledge Management Officer (or Chief

Knowledge Officer – CKO), a Knowledge Steward, and a Knowledge Retention Managers.

The Knowledge Management Officer (or CKO) is responsible for spearheading the knowledge management initiatives at public organization and for chairing some 'Knowledge Management Working Group (act as a steering committee for KM related initiatives at public organization).'

Full time knowledge stewards (or possibly called, 'knowledge management specialists') should be appointed in each directorate. They would:

1) Be responsible for leading and coordinating the knowledge management activities within their respective directorates,
2) Conduct knowledge capture sessions, on a quarterly basis, of experts within their directorate whose knowledge is 'at risk' of being lost and those in the Directorate who have announced their retirement,
3) Be responsible for encouraging their personnel in their directorate to enter and update their entries in the Expertise locator directory at government,
4) Enlist and coordinate the writing of short case studies of successful and unsuccessful projects, whereafter the case studies will be housed in the government intranet portal to be used to identify "lessons learned" for each project, and
5) Input and coordinate the respective directorate and associated branch news on a weekly basis in the government intranet portal (Liebowitz, 2003).

A designated Knowledge Retention Manager should be appointed on each government project team (part-time function provided by one of the project team members). The Knowledge Retention Manager would:

1) Act as a facilitator to the project team to elicit tacit knowledge from he project team members typically in the form of lessons learned, successes, and bittersweet stories,
2) Formally enter the lessons learned into the lessons learned repository and post other types of tacit knowledge conveyed (which don't easily lend themselves to a lessons learned format),
3) Develop a 'good practices' document throughout the project life cycle that describe useful insights gained and good procedures to follow for the given project,
4) Act as the interviewer in conducting a final lessons learned session via videotaping the project team members at the end of the project, and this videotape shall then be sent to the government library for posting on government's online searchable video knowledge preservation website (Liebowitz, 2003).

Knowledge Management Process

"Public managers should understand the full array of KM steps and processes (e.g., data capture, retrieval, use, display, etc.), the technologies that can be used in support of these steps (e.g., expert system), and the administrative practices that help organizations to manage their knowledge better (e.g., the use of metadata)" (O'Looney, 2002: 93). Nelson (2000) suggests that managers first create a vision of the ideal interaction with the customer (or citizen), then develop strategies and tactics to support this vision. Finally, within the context of the strategies and tactics, managers should examine the processes used and the skill sets needed.

The general knowledge management goal for public organizations is to 'share knowledge with each other through a formal knowledge management program and create

new knowledge to better support our human capital and organizational strategic objectives.

Here, I classified some suggestions according to KM processes in public organizations.

Creating and Capturing:

- Improve productivity through embedding knowledge management processes into daily work activities;
- Educate people about what types of knowledge are valuable and how they can be used;
- Have dedicated staffs for codifying and storing documents in electronic repositories: Have staff scour the Web for sample ordinances, reports, evaluations, best practices, innovations, and so on, on key policy issues to create online, searchable repositories of these documents for policy makers (Buchwalter, 2000).

Storage and Retrieval: Increase a sense of community for continued people retention;

Sharing:

- Build communities of practices (group of practitioners sharing their knowledge in a specific area without working on the same specific project). (OECD, 2001);
- Integrate knowledge sharing into everyone's job;
- Acquaint people with knowledge sharing and its benefits;
- Share the message that with creativity comes failure and we all benefit from talking about our successes and our failures;
- Rotate individuals between jobs to gain more knowledge of all the system processes. Rotations should be carved out in a systematic and reasoned

> fashion, based on experience and qualifications (Rubenstein-Montano, Buchwalter, and Liebowitz, 2001: 242).

Application: Increase collaboration for expanding partnerships and generating new work.

Individual and Roles

Knowledge work and learning are important. According to Rubenstein-Montano, Buchwalter, and Liebowitz (2001)' study, 75 percent of respondents from public organizations agreed or strongly agreed that knowledge workers are primary contributors to success in organization. Many researchers said that public organizations should include a knowledge performance factor as part of the annual job performance review report and provide a reward structure to motivate employees to share knowledge (Rubenstein-Montano, Buchwalter, and Liebowitz, 2001; OECD, 2001; and Liebowitz, 2003).

Moreover, training should be improved: 1) codify lessons learned in the lessons learned repository and continue to 'push' appropriate lessons to users, and 2) continue and webcast the government colloquia and mini-courses/tutorials (Rubenstein-Montano, Buchwalter, and Liebowitz, 2001).

Information and Communication Technology

O'Looney (2002) says, "Where knowledge management has the most to offer is in work environments where judgment, discretion and customization of services and responses are highly valued. What makes KM ever more important to government and the private sector alike is that as more and more of the routine work is automated, a

higher percent of public service jobs require discretion and customized service delivery." There are jobs that can be supported by knowledge management IT approaches Besides the collection and organization of knowledge, "the connectivity of knowledge also needs to exist to form the bridges among isolated islands of knowledge. With web-based and intranet technologies, we now have the technology to form the connectivity" (Liebowitz, 2003). Public organizations must make sure that every employee has the necessary hardware, software, and telecommunication facilities to access the knowledge management system. However, we should make sure technology works for people, not vice versa.

There are some technology-related efforts to facilitate the knowledge management. I classify these by codification and personalization strategies. Mainly, I got these from Buchwalter's (2000) article. First, the efforts related to codification model are: 1) creating searchable repositories of time-stamped minutes of meetings, e-mail, documents, notes on conversations and so on, 2) having staff organize all e-mail correspondence into a large searchable archive, 3) developing and institutionalizing public organization's (government's) intranet, and integrate it within a portal concept, 4) developing a multimedia asset management system for knowledge and record retention, and build the government wide network infrastructure to support its development and usage, 5) creating an online database of citizen concerns and complaints ordered by variables such as department, work process, time of day, district, key concern, workable solutions, and so on, and 6) developing an online searchable video, web-based government knowledge preservation project in critical knowledge areas (Liebowitz, 2003).

I find two different efforts related to personalization strategy. First is creating a virtual conference room where citizens are invited to collaborate and communicate with public organization staff using groupware and database and communications technology. Second is creating an expertise directory for public organization-wide population contained within and outside the public organization.

Additionally, numerous KM methodologies (Marquart, 1996) have documented the initial step of KM as a knowledge audit or some variant of a cultural assessment to identify the strengths and weaknesses of KM in an organization. The output from this document will provide the needed insight into the organization and its abilities to provide the elements needed for knowledge management activities.

Furnishing the correct culture for KM to succeed is the first hurdle for these types of organizations. However, changing a culture in a public organization where people are permanent employees, where there is a strict organizational structure, and directives come from numerous sources is a formidable obstacle. Buchwalter (2000) proposes a methodology to effectuate change in an organization's culture via a three step process: 1) a focused approach to KM, 2) government specific inducements, and 3) a social process to change an organization's culture in order to accomplish its goals.

It is also important to note that knowledge management could be a powerful weapon in the wrong hands. "Within the community, there is a risk of capture of knowledge by those with a strong voice to the exclusion of those without a voice (*e.g.* through the digital divide). This exclusion introduces knowledge biases and undermines principles of equity and efficiency in the public sector. Finally, there is also a risk that

some might use the new knowledge management capacity for illegitimate political influence or for invading people's privacy" (OECD, 2001).

Implication for Public Organization

The uses and benefits of KM within the public organizations include: 1) Facilitates better, more informed decision, 2) Contributes to the intellectual capital of an organization, 3) Encourages the free flow of ideas which leads to insight and innovation, 4) Eliminates redundant processes, streamlines operations, and enhances employee retention rates, 5) Improves customer service and efficiency, and 6) Leads to greater productivity. However, KM as a discipline is still in infancy, especially in the public sector. Issues, challenges, and opportunities exist in the practicing of KM. This research attempts to improve the understanding of current practice to assist in developing KM practice guidelines for public sector organizations.

Both public and private sector organizations have much to gain by developing effective KM systems. The public sector appears to have recognized that KM is a powerful enabler in the current drive for increased in efficiency in all areas **(**McAdam and Reid, 2000). However, clearly, investment in information technology systems alone is not enough to produce substantial efficiency and effectiveness of KM. Along with technology, other changes are necessary in a broad range of areas including strategic management, management processes, structure of organization, human resource management, and, more generally, the ways of working and collaborating with external

networks of people and organizations. The conceptual models developed and tested in this study support the needs of the composite changes for KM.

Moreover, the proper choice of a knowledge management approach brings about the increase of efficiency and effectiveness of an organization. When top managers actively choose a knowledge management strategy, both the organization and customers (or citizens) benefit. When they fail to make such a choice, both suffer. This research can assist managers in choosing a proper knowledge management approach.

Limitations and Recommendations for Future Research

The subjects for this study include just one public organization and one private organization in South Korea (Republic of Korea: ROK). A sample of 908 participants (556 from public organization and 352 from private organization) was drawn from these subjects. And, the data analysis was based on a total of 295 (32.16%) usable questionnaires of which 161 (54.5%) were from public organization, and 134 (45.5%) were from private organization. Because the focus is limited to Korea's public and private organizations, and the small sample size, the findings of this study may not be generalized to other organizations in Korea, or more generally, to any other settings. Thus, a larger sample of organizations from Korea or, perhaps, the US, might show different patterns. This needs to be investigated with future research.

Another limitation of this study is related to research methods and the data collection method. Because this study employed quantitative research methods, future research should employ also qualitative methods which would include detailed interviews to elicit verbal descriptions of characteristics, cases, and the setting. Qualitative research

usually involves fewer cases investigated in more depth than quantitative research. Therefore, this research method could develop further insights into the KM practices and theories in public organization. Actual observations, structured interviews, focus groups, and case studies are examples of qualitative research methods. All of these methods could be used. Moreover, because of cross-sectional nature of study (comparing two different organizations: public and private organizations), 'developmental cycle of knowledge management' cannot be studied or detected. Some qualitative research such as interviews and focus groups could point to common patterns in terms of the routes taken by different organizations to design and develop their knowledge management systems. The study of developmental patterns would add to the deep interpretation of the finding and further dimensions.

The survey questionnaire (done through the internet) was the only instrument used to collect data from this study's subjects. Thus, a large part of the reliability of the collected data depended on the respondent's attention to detail when answering the questions. So, it is impossible to guarantee the reliability of the data.

Last, my research model is an association between the descriptions of codification and personalization knowledge strategies, and MIT90's framework with types of organizations – public and private organization. According to MIT90's framework, an organization can be thought of as comprising five sets of forces - strategy, structure, management process, individuals and roles, and technology - in dynamic equilibrium among themselves even as the organizations is subjected to influences from an external environment. But, this model does not cover the elements of knowledge management such as stakeholders, competition, performance and measures. More research is needed to

systematically examine the contextual differences in relation to stakeholders, competition, performance and measures between private and public sector.

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http://www.samsungengineering.com/

APPENDIXES

Appendix A

Agreement Letter for Using the Survey Instruments

Agreement Letter for Using the Survey Instruments in Edward Truch's Book.

From: Truch, Edward[edward.truch@lancaster.ac.uk]
Sent: Monday, February 06, 2006 11:38 AM
To: scp138
Subject: RE: about permission of using the part of book

Dear Sung Chul

Very nice to hear from you.

I am pleased to confirm my agreement to your using the survey instrument in my book "Knowledge Orientation....." provided of course that you make the necessary acknowledgements.

I think it worth pointing out that I used 7-point Likert scales in order to increase the sensitivity of the survey instrument. It is always possible to compress the scale, but not to expand it. This may be an important factor if the survey sample is relatively small, i.e. smaller than 200. If you are working with larger samples, say of 500+ then the difference in scale is less likely to be important.

I would be very interest to hear how you get on.

Best wishes
Edward Truch

Prof. Edward Truch
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Lancaster University Management School
Lancaster LA1 4YX
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edward.truch@lancaster.ac.uk

Appendix B

Letter of Approval from the Office for Research Protections

From: Mathieu, Jodi [zjc2@psu.edu]
Sent: Friday, May 12, 2006 1:05 PM
To: scp138@psu.edu
Cc: rfm@psu.edu
Subject: IRB# 23158 - "The Comparison of Knowledge Management between Public and Private Organizations"

Hi Sung Chul,

The Office for Research Protections (ORP) has reviewed the above-referenced study and determined it to be exempt from IRB review. You may begin your research. This study qualifies under the following category(ies):

Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior unless: (i) information obtained is recorded in such a manner that human participants can be identified, directly or through identifiers linked to the participants; and (ii) any disclosure of the human participants' responses outside the research could reasonably place the participants at risk of criminal or civil liability or be damaging to the participants' financial standing, employability, or reputation. [45 CFR 46.101(b)(2]

PLEASE NOTE THE FOLLOWING:

- Include your IRB number in any correspondence to the ORP.
- The principal investigator is responsible for determining and adhering to additional requirements established by any outside sponsors/funding sources.
- Record Keeping
  - The principal investigator is expected to maintain the original signed informed consent forms, if applicable, along with the research records for at least three (3) years after termination of the study.
  - This will be the only correspondence you will receive from our office regarding this modification determination.
    - MAINTAIN A COPY OF THIS EMAIL FOR YOUR RECORDS.
- Consent Document(s)
  - The exempt consent form(s) will no longer be stamped with the approval/expiration dates.
  - The most recent consent form(s) that you sent in for review is the one that you are expected to use.
- Follow-Up
  - The Office for Research Protections will contact you in three (3) years to inquire if this study will be on-going.
  - If the study is completed within the three year period, the principal investigator may complete and submit a Project Close-Out Report. (http://www.research.psu.edu/orp/areas/humans/applications/closeout.rtf)

Revisions/Modifications

- Any changes or modifications to the study must be submitted to the Office for Research Protections on the Exempt Modification Request Form available on our website: http://www.research.psu.edu/orp/areas/humans/applications/exemptmod.rtf

Please do not hesitate to contact me if you have any questions or concerns.
Thank you,
Jodi

Jodi L. Mathieu, BS, CIP
Research Compliance Coordinator
Office for Research Protections
The Pennsylvania State University
201 Kern Graduate Building
University Park, PA 16802
Phone: (814) 865-1775, Fax: (814) 863-8699, http://www.research.psu.edu/orp/

Appendix C

English Version of the Consent Form and Questionnaire

PENNSTATE
Pennsylvania State University – Harrisburg

School of Pubic Affairs
777 West Harrisburg Pike
Middletown, PA 17057
Tel.: (717) 948-6140

Dear Sir/Madam

The purpose of this research is to explore the basic argument Knowledge Management (KM) and to compare KM in public and private organizations. You will be asked 35 questions on a survey.

Conducting the study in your organization has been approved by the top management, However, you have the right to withdraw at any time and decline to answer any questions. You have to be 18 years or older to participate in this study.

You might learn more about KM in your organization by participating in this study. You might have better understanding of how knowledge is managed in your organization and of what important factors are considered in KM.

Consequently, your participation is essential for its success in achieving the purpose of this study. Participation is voluntary. If you decide to participate in this study, please carefully read the instructions and answer all questions without discussing with anyone. There are no right and wrong answers to these questions. Usually, it is your first reaction to a question that is a good indication of how you feel. After completing the survey, please return (send) it back to me. It will take about 10 to 15 minutes to complete the survey. Completion and return of the survey implies consent to participate in this study.

Your answer will be kept strictly confidential. That is, the data will be aggregated and analyzed only on group basis. Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet by ay third parties.

The finding of this study will be provided to you upon request. In advance, thank you for your participation in this study. Please print off this form to keep for your records.

If you have any question, please do not hesitate to contact my advisor or me. My contact information is as follow:

Advisor: Dr. Robert Munzenrider
Address: The Penn State University – Harrisburg
School of Public Affairs
Middletown, PA 17057 U.S.A.
Telephone: (717) 948-6057 Email: rfm@psu.edu

Principal Investigator: Sung Chul Park
Address: 1810 Georgetown Road, Middletown, PA 17057 U.S.A.
Telephone: (717) 985-1451 Email: scp138@psu.edu

Here is the link to the survey:

http://www.personal.psu.edu/scp138/KM_survey_pr.htm

Sincerely,
Sung Chul Park

Please indicate to what extent you agree or disagree with each of following statements when applied your organization (Please circle or check one number for each statement).

Strongly disagree 1	**Disagree 2**	**Neutral 3**	**Agree 4**	**Strongly agree 5**	
1. Detailed knowledge of our customers is treated as a priority and is continuously updated.					1 2 3 4 5
2. We are effective at acquiring and/or creating new knowledge.					1 2 3 4 5
3. Knowledge management in our organization is coordinated centrally from the top.					1 2 3 4 5
4. We have dedicated staff for capturing knowledge around the organization and storing it in readily accessible documents and databases.					1 2 3 4 5
5. The knowledge that our organization relies on requires rapid and continuous updating.					1 2 3 4 5
6. Our information system provide access to documents generated anywhere in the organization.					1 2 3 4 5
7. Once we have developed new knowledge, we re-use it as many times as possible in our product/service.					1 2 3 4 5
8. A high proportion of our internal knowledge sharing is achieved through documents and database.					1 2 3 4 5
9. We have comprehensive and up-to-date shared guidance of experts who provide information about their experience and current work.					1 2 3 4 5
10. Dispatches to and from departments are used to foster people networks.					1 2 3 4 5
11. My organization supports knowledge sharing.					1 2 3 4 5
12. We can generally access the information that we need without having to refer to the person who created it.					1 2 3 4 5
13. Information technologies are used effectively in our organization to facilitate knowledge storage, sharing, and use.					1 2 3 4 5
14. Our pay systems encourage using and contributing to our document database.					1 2 3 4 5
15. People are willing to share their knowledge with others in our organization.					1 2 3 4 5
16. A high proportion of our internal knowledge sharing is achieved through direct people-to-people contact.					1 2 3 4 5
17. We mainly use our information and communications technology (ICT) to contact people and to exchange knowledge.					1 2 3 4 5

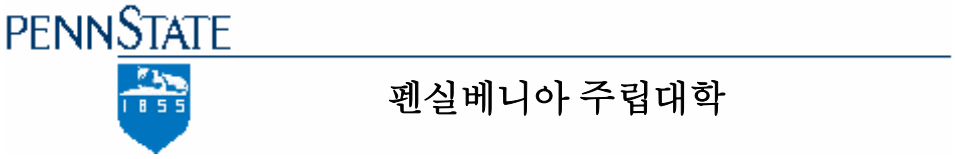
18. We can quickly find the documents that we need with a simple search in our electronic database.	1 2 3 4 5
19. A high proposition of the knowledge in our organization resides within individuals.	1 2 3 4 5
20. Our training relies on documentation and manuals.	1 2 3 4 5
21. The product/service that we provide always involve bringing together experts with relevant knowledge and experience.	1 2 3 4 5
22. Our management emphasizes capturing knowledge in documents and storing them in electronic databases for later reuse.	1 2 3 4 5
23. Our training relies on knowledge transfer through coaching or mentoring.	1 2 3 4 5
24. Most knowledge in our organization flows vertically from subordinate to superior and vice verse.	1 2 3 4 5
25. Our pay systems encourage direct sharing of knowledge with others.	1 2 3 4 5
26. People joining our organization are well suited to effectively implementing standard solutions.	1 2 3 4 5
27. We mainly use our information and communications technology (ICT) to access to documents and data.	1 2 3 4 5
28. Most knowledge in our organization flows horizontally across the organization at all levels.	1 2 3 4 5
29. People joining our organization are good at problem solving in ambiguous situation.	1 2 3 4 5

Demographic Information

1. Your job title _____
2. How long you have been in this position? _____year _____months
3. Your gender ( ) Male ( ) Female
4. Your age: ( ) Less than 20 ( ) 20 to 29 ( ) 30 to 39
   ( ) 40 to 49 ( ) 50 to 59 ( ) More than 60
5. Your education:
   ( ) Less than high school ( ) High school ( ) High school and some college
   ( ) Bachelor Degree ( ) Master's degree ( ) Doctorate
6. How many years you have been working in your organizations?
   ( ) Less than one year ( ) 1-5 years ( ) 6-10 years
   ( ) 11-15 years ( ) 16-20 years ( ) 21-25 years ( ) More than 26

Appendix D

Korean Version of the Consent Form and Questionnaire



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안녕하세요?

본 설문조사는 지식경영에 관한 기본적 논의와 공조직과 사조직간 지식경영의 비교를 목적으로 설계되었습니다. 설문문항은 모두 35 개의 질문으로 이루어 졌습니다.

만 18 세 이상인 성인만이 본 설문에 참여 할 수 있으며, 의무사항은 아닙니다. 개인의 자유의사에 따라 참여하여 주시고, 언제든지 설문을 중단하실 수 있습니다.

본 설문조사에 참여는 귀하에게 조직의 지식경영에 관한 이해의 폭을 늘릴 수 있는 기회를 제공할 것이라 사료됩니다. 귀하의 조직에서 어떻게 지식이 활용되고, 지식경영을 위해 어떤 요소가 중요하게 고려되어야 하는지에 대한 이해를 돋구워 주리라 생각됩니다.

결과적으로, 귀하의 참여는 이 연구의 목적을 성공적으로 달성하게 하는 중요한 요소입니다. 자유의사에 따라 설문조사에 응해 주시기 바라며, 주의깊게 지문에 따라 주십시요. 모든 질문은 다른 사람과 상의 없이 응답해주십시요. 질문에 대한 옳고 그른 답은 없습니다. 질문을 읽으시고 처음으로 느껴지는 응답이 가장 적절하다고 생각됩니다. 모든 설문이 끝나면, 전송 버튼을 눌러 주십시오. 설문은 10 분에서 15 분정도 소요될 것으로 예상되며, 설문을 마치고 전송하는 것으로 이 연구에 참여에 동의 하는 것으로 간주하겠습니다.

귀하의 응답은 귀하의 신상정보와 분리되어 모집, 분석이 이루어 질 것이며, 사용된 기술이 허용되는 한 철저하게 비밀이 보장될 것입니다. 인터넷상의 자료전송중 제 3 자에 의해 자료가 유출되는 것은 보장 할 수 없습니다.

연구결과는 귀하의 요청에 따라 제공될 수 있습니다. 귀하의 참여에 감사드리며, 기록을 위해 이 양식을 출력하시기 바랍니다.

의문점이 있으시면, 제 지도교수나 저에게 연락주시기 바랍니다. 연락처는 다음과 같습니다.

지도교수: Dr. Robert Munzenrider
주소: The Penn State University – Harrisburg
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Middletown, PA 17057 U.S.A.
전화번호: 미국 (717) 948-6057 Email: rfm@psu.edu
주 연구원: 박성철
주소: 1810 Georgetown Road, Middletown, PA 17057 U.S.A.
전화번호: 미국 (717) 985-1451 Email: scp138@psu.edu

설문에 참여하시고자 하시면, 설문지와 연결된 다음의 주소를 클릭하여 주십시요.
http://www.personal.psu.edu/scp138/KM_survey_pr.htm

작성자: 박 성철

귀하의 조직에 다음 문항을 적용하였을 때 가장 적절하다고 생각되는 번호에 표시해 주십시오 (한 문항에 한번 만 응답해 주시기 바랍니다).

매우 그렇지 않다,	그렇지 않다,	그저 그렇다(중립),	그렇다,	매우 그렇다.
1	2	3	4	5

1. 우리 조직은 고객에 관한 상세한 지식을 매우 중요시 여기며, 지속적으로 새로운 지식(정보)을 갱신하고 있다.	1 2 3 4 5
2. 우리 조직은 새로운 지식(정보)을 효과적으로 습득하거나 창출하고 있다.	1 2 3 4 5
3. 우리 조직에 있어 지식경영은 상부에 집중되어 있다.	1 2 3 4 5
4. 우리 조직은 업무와 관련된 지식을 찾아내고, 이를 쉽게 접근 할 수 있도록 데이터베이스에 저장하는 일을 주로 하는 직원이 있다.	1 2 3 4 5
5. 우리 조직이 필요로 하는 지식은 빠르고 지속적인 갱신을 요구한다.	1 2 3 4 5
6. 우리의 정보시스템(IS)은 생성된 문서(기록)들을 조직 안의 어디에서든지 접근할 수 있도록 하고 있다.	1 2 3 4 5
7. 우리 조직은 새롭게 개발된 지식을 업무와 서비스 제공에 가능한 많이 재활용하고 있다.	1 2 3 4 5
8. 조직내부의 지식공유는 주로 서류(기록)와 데이터베이스를 통해 이루어 진다.	1 2 3 4 5
9. 우리 조직은 현재업무에 관한 정보를 갖고 있는 전문가로부터 종합적이고 최신의 정보를 제공 받고 있다.	1 2 3 4 5
10. 부서간의 파견근무는 조직원들간의 정보교류를 촉진하기 위해 사용된다.	1 2 3 4 5
11. 우리 조직은 지식을 공유하는데 도움을 주고 있다.	1 2 3 4 5
12. 우리 조직은 정보를 창출한 사람에게 의존하지 않고도 그 정보를 획득할 수 있다.	1 2 3 4 5

13. 우리 조직의 정보기술 (IT)은 지식을 저장, 공유, 사용을 용이하게 하는데 효과적으로 쓰이고 있다.	1 2 3 4 5
14. 우리 조직은 금전적 보상을 통해 조직원으로 하여금 자신의 지식을 데이터베이스에 입력하거나, 저장된 지식을 활용하도록 유도하고 있다.	1 2 3 4 5
15. 우리 조직의 구성원들은 서로의 지식을 기꺼이 공유하려고 한다.	1 2 3 4 5
16. 조직내부에서의 지식공유는 주로 구성원간의 직접적인 대면접촉을 통해 이루어진다.	1 2 3 4 5
17. 우리 조직이 가지고 있는 정보기술 조직내의 구성원간의 접촉과 지식을 교환하는데 주로 사용되고 있다.	1 2 3 4 5
18. 우리는 우리가 필요한 정보를 데이터베이스내에서 쉽고 빠르게 찾을 수 있다.	1 2 3 4 5
19. 우리 조직이 가지고 있는 지식의 많은 부분은 주로 사람에게 귀속되어 있다.	1 2 3 4 5
20. 우리 조직의 교육훈련은 정형화된 매뉴얼에 의해 주로 이루어진다.	1 2 3 4 5
21. 우리 조직의 업무와 서비스 제공은 관련된 지식과 경험을 가진 전문가와의 유기적인 협력을 항상 필요로 한다.	1 2 3 4 5
22. 우리 조직은 지식을 문서화하고, 다음의 사용을 위해 데이터베이스에 저장하고 있다.	1 2 3 4 5
23. 우리 조직의 교육훈련은 개인교습을 통해 지식을 전달하는 것에 주로 의존한다.	1 2 3 4 5
24. 우리 조직의 대부분의 지식은 상부에서 하부로 또는 하부에서 상부로 수직적으로 흐른다.	1 2 3 4 5
25. 우리 조직은 금전적 보상을 통해 조직구성원간에 직접적으로 지식을 공유하는 것을 장려한다.	1 2 3 4 5

26. 우리 조직의 구성원들은 문제해결에 있어서 정형화된 방식을 효과적으로 활용하고 있다.	1 2 3 4 5
27. 우리 조직의 정보기술(IT)은 데이터를 축적, 관리, 활용하기 위해 주로 사용된다.	1 2 3 4 5
28. 우리 조직의 대부분의 지식은 수평적으로 흐른다.	1 2 3 4 5
29. 우리 조직의 구성원들은 애매한 상황에서의 문제해결에 익숙하다.	1 2 3 4 5

인적사항

1. 당신의 직급은? _____
2. 당신은 이 직급에서 얼마나 일하셨습니까? _____년 _____개월
3. 당신의 성별은? ( ) 남자 ( ) 여자
4. 당신의 연령은? ( ) 20세 미만 ( ) 20대 ( ) 30대
   ( ) 40 대 ( ) 50 대 ( ) 60 세 이상
5. 당신의 교육정도는? ( ) 중졸 ( ) 고졸 ( ) 전문대졸
   ( ) 대졸 ( ) 석사 ( ) 박사
6. 지금 조직에서 얼마나 오래 일하셨습니까? _____년

VITA

Park, Sung Chul

Born in Seoul, Korea, Sung Chul Park received his Bachelor in Department of Public Administration from Hankuk University of Foreign Studies, Seoul, Republic of Korea, a Master in Department of Public Administration from Hankuk University of Foreign Studies, Seoul, Republic of Korea, and a Master of Science in Information Systems from Penn State University at Harrisburg, Middletown, PA.

For academy, he is interested in public management, organization theory, management information systems, and knowledge management.