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The relationship between knowledge
management and organizational
culture: An examination of cultural
factors that support the flow and
management of knowledge within
an organization

CAPSTONE REPORT

Antonina Holowetzki
Director, Information Management
and Communications
OMPRO

University of Oregon
Applied Information
Management
Program

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18640 NW Walker Road
Suite 1007
Beaverton, OR 97006-8927
(503) 725-2289

Approved by

Dr. Linda F. Ettinger
Academic Director, AIM Program

Abstract

for

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Because knowledge management (KM) initiatives won't take hold unless they are supported by an organization's culture, cultural factors must be considered when developing KM strategies. This study examines cultural factors in the culture-knowledge relationship. Applying content analysis methods, theory-based literature and case studies published between 1998 and 2002 are reviewed to examine the relationship between organizational culture and knowledge management. The findings are synthesized into a checklist of the cultural factors that impact KM initiatives.

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Chapter One. Purpose of the Study

Brief Purpose

The purpose of this study is to conduct an examination of the culture within organizations that reportedly supports effective knowledge management (KM). The goal of this examination is to identify critical success factors that appear to best support the flow and management of knowledge within an organization (Knapp and Yu, 1999, p. 16). The method of study is based on a literature review (Leedy, 2001; Rubin, Rubin, and Piele, 1996) and uses content analysis strategies (Krippendorff, 1980). This method provides a systematic way to examine organizational factors as reported in selected literature that appear to support an effective knowledge management infrastructure.

The intended audience is chief executive officers (CEO) of small or not-for-profit organizations, who have limited capital and human resources to invest in expensive KM initiatives. Findings from the examination are synthesized into a checklist of key cultural factors for use by CEOs when assessing their organization. The intent of such a list is to enable better assessment of the options available for promoting the management of effective flow of knowledge.

Full Purpose

Scholars, practitioners, and others in field of business management are still debating the concepts and definitions related to knowledge management (King, 2000; Martin, 2000). According to Davenport and Prusak (2000, p. 5), knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and

information. It originates and is applied in the minds of knowers. In organizations, knowledge often becomes embedded not only in documents or repositories, but also in organizational routines, processes, practices, and norms. Davenport and Prusak (2000, p. 5) explain that knowledge exists within people. Knowledge derives from information as information derives from data. The authors posit that if information is to become knowledge, humans must do virtually all the work (Davenport and Prusak, 2000, p. 6).

According to Malhotra (1997), knowledge that is contained in the minds of organizational members is the greatest organizational resource. Malhotra posits, therefore, that knowledge management is not only about managing knowledge assets, but also managing the interpersonal and organizational processes that act upon these assets. In a 1998 study, Malhotra further defines knowledge management as a synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings.

Rastogi (2000) defines knowledge management 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. It is the process through which organizations create and use their institutional and collective knowledge by incorporating organizational learning, knowledge production, and knowledge distribution.

Despite the nuances among definitions, researchers agree that knowledge management is important to businesses worldwide, whether this involves knowledge of markets, competitors, or processes (Martin, 2000; Nonaka and Takeuchi, 1995). Martin (2000) posits that knowledge has become increasingly important because of the

increased pace of globalization, and the interaction of technology and organizational change. Another reason for the rising valuation of knowledge in organizations is that it is no longer defined as just an input to businesses today; frequently, it is seen as the output and objective of the company. For example, the industrial economy that is based on goods and services is being matched and in some cases displaced, by a global knowledge economy, based on the production, distribution, and use of knowledge (Martin, 2000).

It is important, however, to underscore the difference between knowledge management and information management. Because all knowledge begins as information, many companies regard knowledge management as synonymous with information management (Gupta and Govindarajan, 2000). Gupta and Govindarajan (2000) point out that such a perspective results in the mistaken belief that developing an information-technology (IT) infrastructure results—automatically—in better knowledge management. Indeed, IT-based approaches to knowledge management dominated the early literature on the subject (Blackler, 2000, p. 61). Seeley observed in his 1999 study that many organizations began their journey into knowledge management with the development of specific information technology applications (Seeley, 1999, p. 18). However, literature now reveals that the efforts of many companies to manage knowledge have not achieved their objectives, and many executives have become disillusioned with the practicality of trying to enhance organizational knowledge (De Long, 2000).

Today, researchers are approaching knowledge management from a cultural perspective, based on studies of the interactions among people within a social (i.e., their

work) environment (Blackler, 2000). Gupta and Govindarajan (2000) describe a social environment as a social system, or organizational culture, in which people operate. The determinants of a social environment are culture, information systems, organizational structure, reward systems, processes, people, and leadership (Gupta and Govindarajan, 2000, p. 71). Miller (1995), in her work on organizational communication, describes organizational culture as a complicated set of assumptions, values, behaviors, and artifacts. More importantly, organizational cultures change over time as organizations adapt to environmental contingencies (Miller, 1995, p. 121). Miller concludes that organizational culture is complicated, emergent, and not unitary (p. 111). Organizational culture drives an organization's formal and informal expectations of individuals, defines the types of people who will fit into the organization, and affects how people interact with others both inside and outside the organization. Building an effective culture within which people operate in an organization is a crucial requirement for effective knowledge management (Gupta and Govindarajan, 2000; Gummer, 1998). While most managers may recognize the importance of culture, they find it difficult or impossible to articulate the culture-knowledge relationship in ways that lead to action (De Long and Fahey, 2000).

Studies conducted during the last five years, from 1998 through 2002, have recognized that traditional organizational cultures and systems include factors that create major barriers to successful knowledge management (De Long and Fahey, 2000; Rastogi, 2000; Bock, 1999; Knapp and Yu, 1999). In a study conducted by De Long and Fahey (2000), a case is made for the influence of organizational cultures on behaviors central to knowledge creation, sharing, and use. The authors conclude for example, that

most organizations lack a culture that supports collaborative work because people view personal ownership of knowledge as a method to ensure job security (De Long and Fahey, 2000, p. 113). As a result, they are reluctant to share information and knowledge—an important tenet of KM.

Studies in knowledge management today underscore the inseparable relationship between knowledge management and organizational culture (Davenport and Prusak, 2000; Von Krogh, 2000; Nonaka and Takeuchi, 1995). And while many studies describe cultural factors that impact knowledge management studies (De Long and Fahey, 2000; Rastogi, 2000; Bock, 1999; Knapp and Yu, 1999), the case study conducted by Gupta and Govindarajan (2000) synthesized these factors into six clear and well-defined categories: (1) information systems, (2) organizational structure, (3) reward systems, (4) processes, (5) people, and (6) leadership (p.71). The six categories are very similar to Gupta and Govindarajan's seven determinants of a social environment. The only determinant excluded from this list is culture. Indeed, this researcher posits that the six categories are, in fact, subcategories of culture and are viewed as cultural factors for purposes of this study.

The purpose of this study is to present findings from the literature that examine the culture-knowledge relationship in knowledge management that leads to action. First, the study broadly examines the relationship between organizational culture and knowledge management. Then, by adapting the six cultural factors identified by Gupta and Govindarajan (2000), the study examines how these factors impact knowledge management initiatives. Finally, the findings from this analysis are synthesized into a checklist. The information for the checklist is gathered through a literature review

(Leedy, 2001; Rubin, Rubin, and Piele, 1996), using a priori and emergent content analysis strategies (Weber, 1990; Krippendorff, 1980).

The study's methodology was to first review the literature using two a priori content categories—knowledge management and organizational culture. Words, phrases, and other units of text with related meanings were classified into these two central content categories (Weber, 1990). This first level of analysis resulted in a subset of literature that addressed knowledge management within the context of organizational culture. A second level of analysis was applied to the resulting subset of literature, using an emergent content analysis strategy. The aforementioned subset of literature was examined to determine which culture factors emerged as key factors impacting knowledge management initiatives. Six cultural factors emerged from this analysis and were clearly defined in a study conducted by Gupta and Govindarajan (2000) and supported by others (De Long and Fahey, 2000; Rastogi, 2000; Bock, 1999; Knapp and Yu, 1999). These six cultural factors were: (1) information systems, (2) organizational structure, (3) reward systems, (4) processes, (5) people, and (6) leadership. Words and phrases related in meaning to these six factors were included as descriptors for each factor (Weber, 1990). Literature focusing on business application and case studies was then reviewed to retrieve examples on how each cultural factor impacted knowledge management initiatives. The resulting data were then synthesized into a checklist to demonstrate the importance of each cultural factor in knowledge management and the impact of each factor on knowledge management initiatives. This checklist may provide senior executives with a starting point for evaluating their organization's ability and capacity to implement and sustain a knowledge management initiative.

Significance of the Study

Many authors agree that more than anything else, organizational culture holds the key to successful knowledge management (Gupta and Govindarajan, 2000; Martin, 2000; Knapp and Yu, 1999; Gummer, 1998). For example, According to Pan and Scarborough (1999), management researchers have outlined a theoretical case for knowledge management that demonstrates how organizational knowledge emerges as a major source of competitive advantage because of shortened product life-cycles and easily reproducible technologies (p. 259).

According to Martin (2000), the key to effective management of knowledge is to create an organizational culture that understands what knowledge is important and then to create processes to put that knowledge into action. Knowledge management aims at adding value for customers through the acquisition, creation, sharing, and reuse of any aspect of knowledge relevant to the organization and its environment, internal and external (Martin, 2000). Organizations need to think beyond what works today (Rastogi, 2000). They need to think outside the boundaries of current practices, products, services, organizations, and industries in order to keep up with the more rapid pace of change (Rastogi, 2000). This new business environment puts a premium on creativity and innovation more than ever before (Lahti and Beyerlein, 2000; Rastogi, 2000). As a result, organizations need to analyze and plan their business strategies in terms of the knowledge they currently possess and the knowledge they will need for future business processes (Cross and Baird, 2000). They need to identify and formalize existing knowledge, acquire new knowledge for future use, archive it in organizational

memories, and create systems that enable effective and efficient application of the knowledge within the organization (Cross and Baird, 2000, p. 69).

This study attempts to examine cultural factors that best support the flow and management of knowledge within an organization. The intended outcome of the study is a checklist of factors that CEOs can use to assess their organizational culture, and its ability to foster and sustain a knowledge management initiative. The intent of such a list is to enable better assessment of the options available for promoting the management and effective flow of knowledge.

Limitations

The method of study is based on literature review (Leedy, 2001; Rubin, Rubin, and Piele, 1996) and uses content analysis strategies (including an emergent approach) (Weber 1990; Krippendorff, 1980). This method provides a systematic approach to identifying organizational factors as reported in selected literature that appear to support an effective knowledge management infrastructure.

The broad descriptor of "knowledge management" (Davenport and Prusak, 2001; Pearlson, 2001; Dixon, 2000; Nonaka and Takeuchi, 1995) is narrowed through the descriptor of "organizational culture" (Davenport and Prusak, 2001; Pearlson, 2001; Dixon, 2000; Von Krogh, Ichijo, and Nonaka, 2000; Nonaka and Takeuchi, 1995; Senge, 1990) to assist in identification of literature relevant to the topic. The topic is further categorized into key cultural factors of information systems, organizational structure, reward systems, processes, people, and leadership.

Definitions of knowledge management continue to evolve (Davenport and Prusak, 2000; Lee, 2000; Von Krogh, Ichijo, and Nonaka, 2000). Karl Eric Sveiby

began thinking about knowledge management in the 1970s and writing about it in the mid 1980s (Kirrane, 1999, p. 38). In 1979, Peter Drucker first coined the phrase "knowledge workers" (Kelloway and Barling, 2000). The first definitions began appearing in academic and business literature in the late 1980s, mostly defined as information-based organizations (Drucker, 1988) or organizational learning (Nonaka, 1991; Senge, 1990). These earlier definitions are excluded from this study. Although current definitions of knowledge management recognize these two concepts as integral subsets, independently, neither term adequately defines knowledge management principles today. To provide a current understanding of organizational culture and its impact on knowledge management, the literature reviewed for this study was limited to the past five years, from 1998 through the most complete information available in 2002.

The definition provided by Rastogi in his 2000 study is used for purposes of this study. The definition is

knowledge management as a systematic and integrative process of coordinating organization-wide activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by *individuals* [ed. emphasis] and *groups* [ed. emphasis] in pursuit of major organizational goals. It is the process through which organizations create and use their institutional and collective knowledge.

This definition recognizes the importance of the human factor in knowledge management by focusing on the ability of individuals and groups to enable knowledge creation, use, and sharing. Because the human factor is foundational to organizational culture, this definition becomes central to this study (Davenport and Prusak, 2000; Martin, 2000; Von Krogh, Ichijo, and Nonaka, 2000; Nonaka and Takeuchi, 1995).

This study is limited to examination of organizational factors in small and not-for-profit organizations. This study posits that effective knowledge management is feasible for organizations with limited capital investment, because effective knowledge management begins with cultural considerations or the social environment within an organization. Small or not-for-profit organizations can effectively implement a knowledge management system by keeping their efforts simple, yet focused on key cultural factors. For purposes of this study, a small business is defined using the United States Small Business Administration's definition of "a small business as one with fewer than 500 employees" (www.sba.gov). Not-for-profit organizations are defined using IRS Code 501 (c)(3) found at www.mycorporation.com/nonprofitfaq.htm:

a not-for-profit corporation may be formed to operate for some religious, charitable, educational, literary, or scientific purpose. These five purposes are usually included as purposes accepted by the individual states as a valid not-for-profit corporate purpose. A not-for-profit corporation cannot issue shares and cannot pay dividends. In addition, under the Federal Tax code Section 501(c)(3), a tax-exempt corporation cannot pay dividends and, upon dissolution, must distribute its remaining assets to another not-for-profit group.

The study does not attempt to analyze organizational psychology or why organizations behave the way they do. Organizational psychology addresses complex and multidimensional dynamics of human behavior and interactions, systems, socialization and social support processes, performance control, decision-making process, and conflict management within organizations (Miller, 1995). These attributes, although key in creating organizational cultures, are beyond the scope of this study.

Change management is not examined in this study. Indeed, most organizations will need to make decisions about cultural transformation in order to succeed in knowledge management initiatives. No template, however, exists for making these changes, because it ultimately requires complex interrelated changes in organizational culture and systems (Kirrane, 1999). As a result, each organization chooses the characteristics that best fit its culture and business needs. (Kirrane, 1999). The study, however, attempts to present key cultural factors that appear to support an effective knowledge management infrastructure.

A review of information technology and its role in knowledge management is also excluded from this study. While most authors agree that information technology plays a significant role in knowledge management initiatives, this study will not address this aspect of knowledge management (Pearlson, 2001; Davenport, 2000; Gupta and Govindarajan, 2000; King, 2000; Martin, 2000). However, it is important to differentiate information systems from information technology. This study will review information systems as a key factor of a knowledge-centered culture. In the context of this study, information systems are defined as a combination of people, processes, and technology.

Finally, it is important to define the limitations of the checklist, the intended outcome of this study. The checklist will not provide a formula, algorithm, or step-by-step action plan for senior executives. Its intent is to provide a starting point from which senior executives can begin assessing their organizational culture, and its ability to develop and sustain a knowledge management initiative. The checklist will define cultural factors that impact knowledge management initiatives, as evidenced in the body

of literature. These definitions will be based on data retrieved from the literature. Examples of the impact of the cultural factors will be derived from case studies and other studies of applied research. It is the researcher's hope that the checklist may provide the foundation in specific organizations for the development of an ethnographic study, or the development of a questionnaire to assess cultural readiness, or an assessment of the organization's capacity to accept knowledge management principles.

Problem Area

The study of human knowledge is as old as human history itself (Nonaka and Takeuchi, 1995, p. viii). In their book, Nonaka and Takeuchi explain how the study of human knowledge can be traced as far back as the Greek period, and has once again begun to draw attention in recent years. Nonaka and Takeuchi write:

Not only socio-economic theorists such as Peter Drucker and Alvin Toffler call for our attention to the importance of knowledge as management resource and power, but also an increasing number of scholars in the fields of industrial organization, technology management, management strategy, and organizational theory, have begun to theorize about management of knowledge (Nonaka and Takeuchi, 1995).

Since the early 1990s, knowledge management has become a widely discussed topic in organizational management (Von Krogh, Ichijo, and Nonaka, 2000, p. 3). Organizations increasingly recognize that employee knowledge is their most valuable

asset (Sharon et al, 2000). Business leaders talk about knowledge as the chief organizational asset and the key to a sustainable competitive advantage (Davenport and Prusak, 2000, p. xxiii). And although organizations recognize knowledge as a key source of competitive advantage, they have little understanding of how to create and leverage it in practice (Wenger, 1998). Wenger posits that traditional knowledge management approaches attempt to capture existing knowledge within formal systems, such as databases (p. 2). Yet, Wenger argues, that it is the participation of people that makes a difference in knowledge management practices (Wenger, 1998, p.2).

Knowledge management initiatives almost always include some mix of information and knowledge, but it is not always easy to disentangle the two (Davenport and Prusak, 2000, p. viii). As a result, organizations believe that a sophisticated information-technology infrastructure is the solution to knowledge management. Davenport and Prusak state that organizations mistakenly assume that technology can replace the skill and judgment of an experienced human worker. The assumption that technology can replace human knowledge or create its equivalent has proven false time and again (Botkin and Seeley, 2000; Coleman, 2000; Davenport and Prusak, 2000; Gupta and Govindarajan, 2000; Wolf, 2000). Effective knowledge management depends not merely on information and information technology, but more on the social environment within which people operate (Gupta and Govindarajan, 2000; Gummer, 1998).

Senior executives agree that people are an organization's most important resource, the most versatile and dynamic knowledge resource, and the basis for an organization's ability to know and learn (Wenger, 1998). For this reason, successful

knowledge management must entail cultural considerations (Davenport and Prusak, 2000, p. ix). Davenport and Prusak explain that a company is a collection of people organized to produce something, whether it be goods, services, or some combination of the two. Their ability to produce depends on what they currently know and on the knowledge that has become embedded in the routines and machinery of production (Davenport and Prusak, 2000, p. xxii). Therefore, the material assets of a firm are of limited worth unless people know what to do with them. If "knowing how to do things" defines what a firm is, then knowledge actually is the company in an important sense (Davenport and Prusak, 2000, p. xxii).

This study attempts to examine key factors of organizational culture, as evidenced in the literature, that support or hinder effective knowledge management. As senior executives contemplate ways to enable and manage organizational knowledge, they will encounter cultural factors that either facilitate or create barriers to knowledge management. This study presents a selected compilation of these cultural factors that can help an organization create, share, and use knowledge effectively.

Chapter Two. Review of References

The following review presents an annotated bibliography of the key references used to support this study. Each annotated entry includes a description of

- the key aspects of the references relative to the purpose and problem of this study
- the role the reference played in the content of this study
- the criteria used to select the reference

Davenport, Thomas H. and Prusak, Laurence. (2000). Working Knowledge: How Organizations Manage What They Know. Boston, Massachusetts: Harvard Business School Press.

Davenport and Prusak trace the development of knowledge management and link it to business strategy, work processes, culture, and behavior. Importantly, the authors demonstrate the move away from technology-driven solutions in knowledge management toward the focus on human interaction within organizations to stimulate knowledge flow. The authors underscore the importance of linking cultural and organizational factors to the implementation and sustainability of knowledge management initiatives. The authors provide not only conceptual frameworks for knowledge management, but also examples of implementation in 39 organizations throughout the world.

The authors underscore the importance of linking theoretical frameworks of knowledge management with the application of knowledge management initiatives in the business environment. This approach provides the context for this researcher's study, helps define the problem area, and supports the significance of this study.

De Long, David W. and Fahey, Liam. (2000). Diagnosing Cultural Barriers to Knowledge Management. Academy of Management Executive, 14 (4), 113-127.

De Long and Fahey posit that organizational culture is a major barrier to leveraging intellectual assets. The authors focus on four ways in which culture influences organizational behaviors central to knowledge creation, sharing, and use. The first is the shared assumptions about what knowledge is and which knowledge is worth managing. Second is the relationship between individual and organizational knowledge. Third is the context for social interaction that determines how knowledge will be used in particular situations. Fourth is the processes by which knowledge is created, legitimated, and distributed in organizations.

The authors conducted research in more than 50 organizations that have implemented knowledge management initiatives to discover that most managers have recognized organizational culture as the major barrier to creating and leveraging knowledge assets.

For this study, De Long and Fahey investigated how 24 organizations initiated and managed knowledge-related projects, and interviewed 12 chief knowledge officers across a range of manufacturing and service organizations. The authors conducted a systematic and detailed review of knowledge management literature to identify a small number of case studies of organizations identified as exemplars in the practice of knowledge management. The authors also had access to a less formal, but significant source of anecdotes, vignettes, and insights into the relationship between culture and knowledge from the many executive education programs they have conducted, as well as

from a series of knowledge management corporate consortium meetings sponsored by Ernst & Young's Center for Business Innovation.

In this article, De Long and Fahey set out to demonstrate the importance of culture on many of the issues central to effective knowledge management and to explore the four ways in which organizational culture shapes knowledge creation, sharing, and use. The authors propose diagnostic action steps that managers can take to assess the fit between their organization's existing culture and desired behaviors related to effective knowledge management.

This article supports this researcher's assumption that effective knowledge management is directly linked to an organization's culture. By providing examples from the business environment, De Long and Fahey support the problem area and significance of this researcher's study. This is particularly important when senior executives of small or not-for-profit organizations look for affordable ways to implement and sustain a knowledge management initiative.

Gupta, Anil K. and Govindarajan, Vijay. (2000). Knowledge Management's Social Dimension: Lessons From Nucor Steel. *Sloan Management Review*, 42(1), 71-81.

Gupta and Govindarajan present a case study where they examine the gap between the rhetoric of knowledge management and how knowledge is actually managed in organizations. The authors examine the role of social ecology, or organizational culture, in knowledge management and the requirements for an effective knowledge management initiative.

The authors examine six cultural factors that impact knowledge management activities within organizations. These factors are: (1) information systems, (2) organizational structure, (3) reward systems, (4) processes, (5) people, and (6) leadership.

Gupta and Govindarajan examine how these factors impact knowledge creation, acquisition, retention, and sharing in Nucor Steel Corporation, the most innovative and fastest-growing steel company for the past 30 years.

The six factors examined in this case study provide the framework for this researcher's study design. This case study plays a central role in this researcher's study because it clearly defines cultural factors that are supported in other research studies. As a case study, it also supports the researcher's study design by juxtaposing the theoretical concepts of knowledge management with business application.

Martin, Bill. (2000). Knowledge Management within the Context of Management: An Evolving Relationship. *Singapore Management Review*, 22(2), 17-37.

Martin presents the importance of knowledge as a business resource and the need to manage it. The author examines the difficulty in managing knowledge because of its intangible nature and because existing management practices focus primarily on managing tangible resources. Martin argues that knowledge management is related to the wider field of management and that both address activities such as learning and innovation, benchmarking and best practice, strategy, culture, and performance measurement. And like management, knowledge management involves a range of processes that affect people, technology, and systems to add or create value in pursuit of organizational aims and objectives.

The author emphasizes the importance of learning and the need to create processes that support organizational learning and knowledge creation. Martin argues that organizational culture holds the key to successful organizational learning and knowledge management, and that leadership plays a critical role in creating and sustaining this culture.

Because Martin posits that the human element is the most important factor in knowledge management, he examines the role of leadership, systems, processes, and incentives in motivating knowledge-sharing behaviors. These factors are part of the six cultural factors that the researcher examines in this study. They also support the six factors presented by Gupta and Govindarajan in their case study, which is central to this researcher's study.

Miller, Katherine. (1995). Organizational Communication: Approaches and Processes. Belmont, California: Wadsworth Publishing Company.

The author presents traditional and emerging perspectives on organizational communication processes, from classical through human relations and human resources to systems, cultural, and critical approaches. Particularly important is the author's examination of organizational culture in Chapter 6 of the book. Miller presents the challenges of defining organizational culture and the varying theoretical frameworks that have been used in attempting to define cultural factors of high-performing companies. The author presents three concepts that most cultural scholars today agree are key cultural characteristics: (1) culture is complicated, (2) culture is emergent, and (3) culture is not unitary.

Organizational communication is an integral component of knowledge management within organizations, particularly when examining cultural factors, and the norms and values that surround the dissemination of information and knowledge. Furthermore, this book supports the premise of this study by underscoring the importance and impact of human factors not only in organizational culture, but in the behaviors that impact the communication of information and knowledge within organizations.

Nonaka, Ikujiro and Takeuchi, Hirotaka. (1995). The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. New York, New York: Oxford University Press.

Nonaka and Takeuchi present a case for knowledge management practices by detailing how Japanese companies leverage their organizational knowledge into a competitive advantage. Nonaka and Takeuchi focus their work on how organizations create knowledge and the importance of organizational culture in knowledge creation. The authors dedicate much of their work on defining two types of knowledge—tacit and explicit. The authors posit that tacit knowledge is the most valuable of the two because it is knowledge that is learned by experience and that leads to innovation and sustainable competitive advantage. Explicit knowledge, on the other hand, is procedural knowledge that is contained in manuals, protocols, and procedures.

Because tacit knowledge is communicated indirectly through human interaction, Nonaka and Takeuchi emphasize the importance of organizational culture in determining whether or not the exchange and communication of tacit knowledge will

occur. The authors support their theory of knowledge creation and exchange with case studies from more than 15 organizations.

Nonaka and Takeuchi are recognized leaders in the field of knowledge management, and have contributed significantly to the foundational study of knowledge management. The authors are referenced in many studies, and are recognized for their work in examining the relationship between human interactions and cultural characteristics. The aforementioned book provided the researcher with an understanding of the problem area and significance of this study.

Pearlson, Keri E. (2001). Managing and Using Information Systems: A Strategic Approach. New York, New York: John Wiley & Sons.

Pearlson takes a strategic approach to information systems by expanding beyond information technology to include people and processes. According to Pearlson, this approach to information systems facilitates communication of data, information, and knowledge throughout an organization. The author presents a system hierarchy that begins with three main elements—people, processes, and technology—and ends with organizational management, which oversees the design and structure of the system, and monitors its overall performance.

The author devotes Chapter 9 of his book to the relationship between information systems and knowledge management. Pearlson addresses the two types of knowledge—tacit and explicit—and describes how information systems can be developed to capture, share, and manage these types of knowledge.

The author dispels the belief that information systems are synonymous with information technology. This is particularly important in the study of knowledge

management, because many earlier initiatives focused on information technology, which resulted in expensive technology-based solutions that did not create effective knowledge management systems. For small and not-for-profit organizations, expensive technology systems are often out of reach. And although many authors, including Pearlson, have redirected attention from technology to information systems, many business leaders continue to use technology-driven strategies. Pearlson's reframing of technology as a part of a larger information system supports this researcher's assumption that small and not-for-profit businesses can develop effective knowledge management initiatives by addressing larger cultural issues within their organizations.

Rastogi, Prabandh, N. (2000). Knowledge Management and Intellectual Capital - The New Virtuous Reality of Competitiveness. Human Systems Management, 19(1), 39-49.

Rastogi examines processes that are fundamental to effective knowledge management initiatives. The author defines knowledge management 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. This is the definition that is used to support this study.

Rastogi supports the importance of organizational culture in knowledge management by positing that knowledge management cannot be accomplished in the absence of a social environment that is built on trust, cooperation, sincerity, goodwill, help and care, shared values and vision.

The author presents eight operational requirements of knowledge management initiatives and examines organizational structures that support knowledge management. Rastogi presents a list of problems and difficulties in implementing knowledge management initiatives, and also details action imperatives for knowledge management.

This study presents a theoretical framework for knowledge management initiatives and plays a key role in the researcher's study design. In his article, Rastogi provides many of the definitions and concepts for the six cultural factors identified in the case study presented by Gupta and Govindarajan (2000). By comparing the theoretical concepts presented by Rastogi to the case study presented by Gupta and Govindarajan, as well as to other case studies, the researcher intends to use Rastogi's study as supporting evidence for the validity of the resulting checklist.

Von Krogh, Georg, Ichijo, Kazuo, and Nonaka, Ikuji. (2000). Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation. New York, New York: Oxford University Press.

The authors posit that knowledge cannot be managed, only enabled. For this reason, the authors address the concept of knowledge enabling in contrast to the widely accepted concept of knowledge management. Von Krogh et al. argue that the term management implies control of processes that are inherently uncontrollable or stifled by heavy-handed direction. In contrast, knowledge enabling refers to an overall set of organizational activities that positively affect knowledge creation.

Despite this differing point of view, the authors agree that knowledge is dynamic, relational, and based on human action; that it depends on a situation and people involved rather than on absolute truth or hard facts. The authors describe knowledge as

a social and individual process that relies on the interplay among community members and human processes. And because knowledge is created by people working together, knowledge creation relies on cultural factors and human interaction. The authors support their work with case studies from more than 15 organizations worldwide, and through collaboration with more than 25 academicians in the field of knowledge management.

Von Krogh, Ichijo, and Nonaka are recognized leaders in the field of knowledge management, and have contributed significantly to the study of knowledge management. This particular book is referenced in many studies, and is recognized as foundational work in the study of human interactions and cultural characteristics. The aforementioned book provided the researcher with an understanding of the problem area and significance of this study.

Chapter Three. Methods

Literature review was chosen as the primary research method for this study. The review focused on collected materials that addressed both the theoretical framework of knowledge management and application of knowledge management within a business environment. This strategy was important in this study because of the focus on knowledge management within the context of organizational culture.

The literature review was constrained by two delimiters: (1) time frame and (2) categories. Because concepts, definitions, and applications of knowledge management continue to evolve, the review of literature was limited to a selection of documents published within the past five years, from 1998 to the most currently available information in 2002. This approach enabled retrieval of the most current approaches to knowledge management and identified the most current factors of organizational culture. Because the outcome of the study was to provide a checklist of organizational factors that appeared to support an effective knowledge management infrastructure, it was important to rely on documents that reflected factors of the current business environment.

The initial search for data was constrained by two a priori content categories: (1) knowledge management and (2) organizational culture. The selection of these terms was the result of a two-year focus on the topic of knowledge management through academic coursework in the Applied Information Management (AIM) graduate program, as well as preliminary investigations in the literature during the initial stages of this study. The intent of this search strategy was to begin with larger general concepts related to the topic of interest and then to review the selected literature, searching for

related terms, phrases, and concepts that could be used to further define the impact of organizational culture on knowledge management initiatives.

The selection of literature was then further narrowed by applying emergent content analysis strategies. The purpose of this step was to identify key cultural factors within organizational cultures that impact knowledge management initiatives. The cultural factors used for this study were based on research conducted by Gupta and Govindarajan (2000) in their case study of Nucor Steel Corporation. These cultural factors were supported by other research and case studies found in the literature review (De Long and Fahey, 2000; Rastogi, 2000; Bock, 1999; Knapp and Yu, 1999).

The final component of this study's design was to compile and synthesize the emergent data into the checklist. The checklist provided key characteristics and definitions of each cultural factor, and the impact of each factor on knowledge management initiatives.

Data Collection

Multiple sources of documents were included in the literature search. Academic databases were used to collect literature that focused on the theoretical framework of knowledge management and organizational culture. Business databases were used to collect literature that focused on business applications and case studies. These databases were accessed through the University of Oregon Online Libraries at <http://libweb.uoregon.edu/index.php>. The databases accessed through this system were

- ABI_INFORM
- Academic Source Elite
- Business Source Elite
- SocAbs

- ArticleFirst

In addition to these sources, the following books were used as foundational resources in both knowledge management and organizational culture:

Davenport, Thomas H, and Prusak, Laurence. (2000). Working Knowledge: How Organizations Manage What They Know. Boston: Harvard Business School Press.

Dixon, N. M. (2000). Common Knowledge: How Companies Thrive by Sharing What They Know. Harvard Business School Press, Boston, Massachusetts.

Harvard Business School Press. (1998). Harvard Business Review On Knowledge Management. Harvard Business School Press, Boston, Massachusetts.

Nonaka, I. and Takeuchi, H. (1995). The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford University Press, New York.

Pearlson, K. E. (2001). Managing and Using Information Systems: A Strategic Approach. John Wiley & Sons, New York.

Senge, Peter M. (1990). The Fifth Discipline: The Art & Practice of the Learning Organization. Doubleday, New York, New York.

Von Krogh, G., Ichijo, K. and Nonaka, I. (2000). Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation. Oxford University Press, New York.

To collect the most current literature available, online resources were also used. In instances where advanced search capabilities were available, the two a priori content categories were applied (knowledge management and organizational culture) as search strategies to the online databases. In instances where advanced search capabilities were not available, the a priori content category of knowledge management was applied. In this latter instance, the literature was scanned to retrieve documents that appeared to examine knowledge management within the context of organizational culture. In many

instances, the title or abstract of the document provided that information. The following table documents the Web sites that were used to collect literature:

American Productivity and Quality Center	www.apqc.org
American Society for Training and Development	www.astd.org
@Brint.com	www.brint.com
Buckman Laboratories	www.knowledge-nurture.com
Knowledge Management Resource Center	www.kmresource.com
Teleos	www.knowledgebusiness.com
Knowledge Management Review	www.melcrum.com
Knowledge Management World	www.KMworld.com
CIO Magazine	www.cio.com
David Skyrme Associates	www.skyrme.com

Table 1. Web Site Search

Data Analysis

Data analysis was comprised of three steps. The first analytic step was to produce a data set (Data Set 1) of literature relevant to two a priori content categories—knowledge management and organizational culture. To retrieve these data, terms and phrases related to these two content categories were used in the literature search strategy. Both a priori content categories included a large vocabulary of closely associated terms. These terms and descriptors are presented in Table 2 below. The resulting Data Set 1 yielded 163 documents.

Content Categories	
Organizational Culture	Knowledge Management
corporate culture	organizational knowledge
organizational structure	learning organization
management style	knowledge assets
business systems	intellectual assets
human resources	intellectual capital
	human capital

Table 2. A Priori Categories: Detailed Descriptors for Data Set 1

Review of Data Set 1 revealed that organizational culture was multifaceted, complex, and comprised of many critical factors. By applying an emergent content analysis strategy, the researcher began identifying concepts, terms, and descriptors that appeared to describe distinct categories of cultural factors. A study conducted by Gupta and Govindarajan (2000) synthesized these emergent categories into six clear and well-defined categories: (1) information systems, (2) organizational structure, (3) reward systems, (4) processes, (5) people, and (6) leadership. These categories, supported by other studies (De Long and Fahey, 2000; Rastogi, 2000; Bock, 1999; Knapp and Yu, 1999) formed the six cultural factors used for this study. Using these six cultural factors, terms and descriptors related to these categories were identified and used for a second review of Data Set 1. Although some of these terms were similar to those used to classify the two a priori content categories—such as organizational structure and business process—new terms and descriptors also emerged. These descriptors are provided in Table 3: Emergent Content Categories for the Six Cultural Factors.

Six Categories of Cultural Factors	Descriptors
Information Systems	information systems, technology systems, information sharing, knowledge map, communication, organizational memory, explicit knowledge, tacit knowledge
Organizational Structure	organization, organizational structure, infrastructure, organizational infrastructure, functions, social structure, social ecology, social system, business enterprise, organizational policies, teams, work groups, communities of practice
Reward Systems	reward systems, rewards, incentives, incentive systems, recognition, motivators, bonuses, performance appraisal
Processes	processes, business processes, operations, programs, procedures, support systems, work processes, work flow
People	people, human systems, human resources, human capital, intellectual capital, intellectual assets, people-centered strategy, personnel, human relationships
Leadership	leadership, senior management, senior executive(s), CEO, managerial leadership

Table 3. Emergent Content Categories for the Six Cultural Factors: Descriptors for Data Set 2

This analytic process yielded Data Set 2. The documents in Data Set 2 were then divided into two categories: (1) literature that provided a theoretical framework for the cultural factors (n = 67) and (2) literature that provided case studies or an applied framework for the cultural factors (n = 35). Seven case studies were eliminated from Data Set 2 because they did not examine any of the cultural factors. The resulting Data Set 2 was comprised of 102 documents.

The theory-based literature was examined first to retrieve and synthesize theoretical concepts and definitions for the six cultural factors. Next, the case studies were reviewed to examine how organizations addressed these cultural factors when initiating or maintaining knowledge management initiatives. The key criterion for reviewing the case studies and business applications was to retrieve data on the impact of the six cultural factors on organizations that implemented knowledge management. The intent of this strategy was to combine the two frameworks: theoretical and applied, as a method to support the validity of the resulting checklist.

The third and final analytic phase was to: (1) synthesize the emergent content on the six cultural factors into a checklist; (2) provide a description of each factor, as supported by the theory-based literature; and (3) provide examples of the impact each factor had on knowledge management initiatives, as supported by the case studies and other research studies of business applications.

Data Presentation

The intended outcome of the analysis was to present a checklist to CEOs on cultural factors that impacted knowledge management initiatives. The data were presented in six groupings, based on the cultural factors identified in the literature review (Gupta and Govindarajan, 2000). The groupings were the cultural factors of information systems, organizational structure, reward systems, processes, people, and leadership. Each cultural factor was defined by a set of key points to consider when implementing a knowledge management initiative, as evidenced in the body of literature. The checklist also presented examples of the impact of these cultural factors on the implementation and sustainability of knowledge management initiatives, as

supported by the case studies and other application-based research. The table below presents a possible prototype of the final checklist.

Key Factors of Organizational Culture	Impact on Knowledge Management Initiatives
Key Factor: Information Systems Key Point 1 Key Point 2 Key Point 3	Impact:
Key Factor: Organizational Structure Key Point 1 Key Point 2 Key Point 3	Impact:
Key Factor: Reward Systems Key Point 1 Key Point 2 Key Point 3	Impact:
Key Factor: Processes Key Point 1 Key Point 2 Key Point 3	Impact:
Key Factor: People Key Point 1 Key Point 2 Key Point 3	Impact:
Key Factor: Leadership Key Point 1 Key Point 2 Key Point 3	Impact:

Table 4. Checklist of Key Cultural Factors that Impact KM Initiatives

Chapter Four. Analysis of Data

Results

The data analytic processes defined in Chapter 3 of this study resulted in two data sets. Data Set 1 established the set of documents that combined the two a priori content categories of knowledge management and organizational culture. Using the descriptors presented in Table 2: A Priori Categories: Detailed Descriptors for Data Set 1 (p. 28), this data set yielded 163 documents from academic and business indexes, and Web sites. These documents were then reviewed for emerging cultural factors that appeared to best support knowledge management initiatives. Using the descriptors for cultural factors (Table 3: Emergent Content Categories for the Six Cultural Factors: Descriptors for Data Set 2, p. 30), the number of documents was reduced to 102. These 102 documents comprised Data Set 2.

Data Set 2 was separated into two categories: (1) documents providing a theoretical framework; and (2) documents providing an applied framework or case studies. Of the 102 documents, 67 presented a theoretical framework for the cultural factors and 35 documents presented case studies of the business application and implications of the cultural factors to knowledge management initiatives.

Of the 67 theory-based documents, 28 were dedicated to more than one cultural factor, 17 were dedicated to **information systems**, eight to **organizational structure**, six to **processes**, four to **leadership**, five to **reward systems**, and three to **people** as a cultural factor. **Information systems** was the most examined cultural factor, with 35 documents examining this concept either solely or in combination with other cultural factors. The least examined cultural factor was **reward systems**, with 12

documents. Appendix B provides the frequency of each factor in the theory-based documents of Data Set 2, either as the sole focus of a document or in combination with other cultural factors.

Of the 35 case studies, 23 were dedicated to more than one cultural factor, seven to **information systems**, one to **reward systems**, one to **organizational structure**, and one to **people**. The cultural factor of **processes** was examined in 20 documents, although not as a primary focus. **Leadership** was examined in 14 case studies, but in conjunction with other cultural factors, and not as a primary focus. As with the theory-based documents, **information systems** was the most examined cultural factor, with 29 documents examining this concept either solely or in combination with other factors. **Reward systems** was the least documented cultural factor in the case studies ($n = 11$) as well. Appendix B provides the frequency of each factor in the case studies of Data Set 2, either as the sole focus of a document or in combination with other cultural factors.

Discussion

What follows is a discussion of the data analysis. Each cultural factor was first examined in the theory-based literature to establish theoretical concepts and definitions. These concepts and definitions were then applied to the case studies to examine how organizations addressed these cultural factors when initiating or maintaining knowledge management initiatives. The impact of these cultural factors was also examined, if presented in the case studies.

Information Systems

The most widely examined cultural factor, **information systems** dominated most of the documents retrieved for this study. This is not surprising, given that technology-driven solutions were the first approach to developing knowledge management initiatives. Many theory-based documents, however, expanded the definition of information systems to include not only technology, but activities such as storytelling (Reamy, 2002), knowledge mapping (Seeley and Dietrick, 2000; Vail, 1999; Zack, 1999), and information sharing through interview techniques (Bednar, 1999). This broadening of the definition corresponded to Pearlson's (2001) definition of information systems to include people, processes, and technology. Organizational information systems combine the attributes of culture, history, business processes, and human memory (Hackbarth, 1999). As a result, these systems must be flexible and tailored to the type of knowledge being captured, shared, or created in order to be effective and efficient.

The case studies supported this theoretical framework. For example, a case study presented on BP Amoco emphasized the importance of conversation (Collison, 1999). Collison stated that BP Amoco's underlying knowledge management philosophy was that the best medium for knowledge was the human brain, and the best networking protocol was conversation. Thus, the emphasis at BP Amoco was to generate conversation, build relationships, and develop trust among employees. And because BP Amoco was a large international company, with employees worldwide, the company built a simple intranet-based system that allowed for virtual conversations among all employees. This allowed the company to generate a collaborative environment for its

workforce, which it felt was the greatest contribution of its information system. BP Amoco believed that its ability to harness the intellectual capacity of its rapidly evolving workforce was its key competitive advantage.

In yet another case study, the key strategy for knowledge sharing was the role of formal and informal "skills networks" (Sheehan, 2000). Sheehan examined how Arup, a global design consultancy firm, used networks of skilled engineers to explore common themes across projects and start to define best practices within the firm. Arup believed it was ineffective to spend excessive time trying to capture tacit knowledge because by its very nature, tacit knowledge was in people's heads and was going to stay there. But in order to map activities, skills, and to provide supporting tools through virtual teams and face-to-face meetings, Arup developed a network of personal Web pages that allowed people to share information voluntarily with the rest of the firm. In parallel, the Web site also hosted a section of a pages that listed validated content, highlighting individuals' recognized skills by their skills network. As a result, all Arup employees knew who knew what, which jobs had been done before, and used this knowledge to resolve problems quickly and effectively. The firm attributed its success and growth to its knowledge management initiatives, which it measured through a balanced scorecard and financial performance (Sheehan, 2000).

Organizational structure

The theory-based literature supported the importance of **organizational structure** in implementing effective knowledge management initiatives. The literature provided evidence, however, that the formal structure of most companies prevented effective knowledge management from taking hold (De Long and Seeman, 2000;

Guptara, 1999). The traditional structure of organizations, whether organized by function, region, or business unit, tended to prevent the free flow of knowledge throughout organizations because of the focus on silos. The organizational structure that supported effective knowledge management was more permeable, thus allowing for the flow of knowledge regardless of employee role, job function, or other traditional boundaries (Symon, 2000).

When addressing an organizational structure that facilitated effective knowledge management, many theory-based studies referred to learning organizations and the need to create an organizational structure that encouraged learning through knowledge creation and sharing (Martin, 2000; Davenport and Prusak, 2000; Von Krogh et al, 2000; Nonaka and Takeuchi, 1995; Senge, 1990). The studies presented methods of building an organizational structure that supported learning, which included teams, work groups, and communities of practice (Blackler, 2000; Cross and Baird, 2000; De Long and Seeman, 2000; Lahti and Beyerlein, 2000). Perhaps the most discussed concept of **organizational structure** was the formation of communities of practice (Blackler, 2000; Cross and Baird, 2000; Lahti and Beyerlein, 2000; Wenger, 1998). In contrast to teams and work groups, which formed collaborative work structures on a project-by-project basis, communities of practice formed informal groups that interacted and collaborated regularly around work-related issues and challenges (Cross and Baird, 2000). And although these informal groups were not formally recognized on organizational charts, they often played a critical role in sharing knowledge and solving problems.

Another widely discussed concept in the theory-based literature was the creation of a new position designated as Chief Knowledge Officer or CKO (Bonner, 2000; Herschel, 2000; Rastogi, 2000; Kirrane, 1999; Davenport and De Long, 1998; Skyrme, 1998). The CKO oversaw and promoted knowledge management activities and operations at the individual, team, community of practice, and organizational levels.

The case studies supported the theoretical concepts of **organizational structure** discussed above. The most widely described characteristic of **organizational structure** was again the formation of communities of practice. For example, in a case study of the World Bank, Egan and Kim (2000) described the agency's belief that knowledge sharing depended on organizational infrastructure. The World Bank believed that people interacted to share and create knowledge, and effective knowledge sharing was facilitated through effective interaction. The agency promoted this sharing by supporting communities of practice. These communities of practice shared knowledge and learning that was synthesized to create even more knowledge. And as this knowledge was shared, new communities formed and older ones evolved. The result of this infrastructure was that people found out who knew what and where the best expertise could be drawn upon, both inside and outside the agency. This structure was further supported with a self-authoring Web-based tool that expanded the communities to virtual ones.

Other examples of communities of practice were found in several case studies of (perhaps) the most studied organizations in knowledge management, Buckman Laboratories, a pioneer organization in knowledge management practices (Ellis and Rumizen, 2002; Fulmer, 1999; Pan and Scarborough, 1999; Rumizen, 1998). The heart

of Buckman's approach was to build an organizational structure that supported and promoted knowledge sharing. A key aspect of this approach was the formation of communities of practice. These communities formed informally, yet bonded socially and technically, to share information and build on the knowledge of others to solve customers' problems while gathering knowledge for widespread corporate use. Buckman Laboratories supported these communities of practice with formal and informal information systems, including feedback loops, after-action reviews, and corporate intranets. Interestingly, when Buckman began its knowledge management practices in the 1980s, information technology was not available to support these early efforts. The organization has demonstrated that the challenge of initiating and sustaining effective knowledge management is not one of technology, but one of the infrastructure and processes in which people operate. The case study conducted by Ellis and Rumizen (2002), Buckman's Chief Learning Officer and Knowledge Strategist, respectively, further revealed that the organization's knowledge management program has led to a 50 percent rise in sales from new products since the inception of its knowledge-sharing system.

Many more case studies examined the formation of communities of practice to support and grow knowledge management initiatives (Owens and Thompson, 2001; Bumbo and Coleman, 2000-b; Martin et al, 2000; O'Dell, 2000; Wolf, 2000; Skyrme, 1998). Although these case studies were not examined in detail in this discussion, it is important to note that all presented similar characteristics described in the two case studies presented above.

Finally, although the case studies did not discuss the role of a chief knowledge officer, it is important to note that eight case studies were written by an executive or manager whose primary responsibility was to develop and manage an organization's knowledge management initiative. This finding supported the theory-based recommendation of creating such a position within an organizational structure.

Examples of job titles were Chief Knowledge Officer, Knowledge Manager, KM Program Manager, Chief Learning Officer, Knowledge Strategist, Vice President of Learning Technologies and Exchange, and Vice President of Knowledge Management (Ellis and Rumizen, 2002; Moon and Park, 2002; Chamish, 2001; Owens and Thompson, 2001; Egan and Kim, 2000; Martin et al, 2000; Sheehan, 2000; Baladi, 1999).

Reward Systems

Many theory-based studies emphasized the need to develop **reward systems** that recognized the contribution of people who created or shared knowledge (APQC, 2001; Brelade and Harman, 2000; Roberts, 2000; Seeley, 2000). The studies revealed that most reward systems, however, continued to be linked to traditional financial measures and did not recognize knowledge contributions (Davenport and De Long, 1998; Skyrme, 1998). Because knowledge was intimately connected with people's egos and occupations, knowledge sharing did not flow easily across role or functional boundaries, unless knowledge sharing was encouraged. It was important, therefore, to create reward systems that maintained a balance between intrinsic and extrinsic rewards in order to encourage employee behavior (Hasanali, 2002; APQC, 2001; Brelade and Harman, 2000; Davenport and De Long, 1998). Studies conducted by the American Productivity & Quality Center have demonstrated that there is an interaction

between intrinsic and extrinsic motivators (APQC, 2002). APQC, in its 30 years of research, has discovered that as organizations increased extrinsic motivation, they ran the risk of driving out or diminishing intrinsic reward. And as intrinsic motivation declined, organizations were required to increase the extrinsic rewards to maintain or motivate the desired behavior.

Examples of long-term extrinsic motivators found in the theory-based literature were performance evaluations and compensations structures (APQC, 2001; Brelade and Harman, 2000; Lahti and Beyerlein, 2000; Roberts, 2000; Davenport and De Long, 1998). To reward knowledge management through a formal compensation system, organizations needed to create a flexible structure that allowed it to make payments to employees who demonstrated effective acquisition, application, and sharing of knowledge. This system included an assessment of achievements against knowledge management objectives such as (1) acquiring new skills and knowledge; (2) undertaking new projects or responsibilities; (3) contributing to a community or team; and (4) contributing to the development of another employee (Brelade and Harman, 2000). The studies revealed that regardless of how organizations designed reward systems to recognize knowledge sharing, it was critical that organizations did not create incentives that were perceived by employees as trivial (Hasanali, 2002; APQC, 2001; Davenport and De Long, 1998). In these cases, the organizations created barriers rather than enablers by trivializing the knowledge-sharing efforts.

Examples of intrinsic motivators found in the theory-based studies were informal, short-term rewards, such as expressing appreciation for knowledge sharing, recognizing employees as subject matter experts, and recognizing peer-to-peer and

team-to-team knowledge sharing (APQC, 2002; Williams, 2002; APQC, 2001; Brelade and Harman, 2000; Kirrane, 1999). In these instances, acknowledging the value of sharing knowledge, the contributions people made, and increasing awareness about the importance of not hoarding information or knowledge all aligned with the importance of knowledge management within an organization.

The case studies supported the theoretical framework presented above, especially in presenting examples of reward systems that targeted extrinsic motivators. The case studies, however, dedicated little attention to intrinsic motivators and provided little detail on reward systems that leveraged these motivators. This is an interesting finding, especially because organizations, such as APQC, have devoted many years of research to exploring the relationship between extrinsic and intrinsic motivators. The findings from APQC's research, for example, supported the premise that organizations must find a balance between the two motivators and cautioned against over-relying on extrinsic motivators. Despite these theory-based findings, intrinsic motivators were mentioned, but not explored, in only four case studies (Fickel, 2001; Gupta and Govindarajan, 2000; O'Dell and Grayson, 2000; Rumizen, 1998).

The following two case studies described examples of extrinsically-driven reward systems. In the case study of Nucor Steel, Gupta and Govindarajan (2000) revealed how the steel company cultivated a "hunger for new knowledge" through an incentive system for every employee—from the production worker to the CEO. Nucor Steel did not have an upper cap on incentive payouts. In the 1990s, for example, payouts for production employees averaged 80 percent to 150 percent of base wage, making those workers the best paid in the steel industry. The financial incentive structure for department

managers and senior officers was even steeper (Gupta and Govindarajan, 2000). The incentive structure motivated employees three ways. First, because these incentives were a function of production output, employees could earn higher bonuses by discovering new ways to boost production. Second, because the incentive payouts depended on the output that met quality standards, employees were motivated to develop innovations that would help them do things right the first time. Third, because the bonus payouts were not limited and employees' discovery of new process innovations did not lead to a resetting of the standards, people were challenged to expand the frontiers of process know-how. This reward system allowed Nucor Steel to master manufacturing processes and put the steel company in the leading role of adopting new technology. Nucor Steel made history in 1987 by building the first mini mill that could make fiat steel—an innovation that moved the company into the premium segment of the steel industry. The first plant built by a competitor using the same technology did not appear until 1995. By 1997, Nucor built two more mini mills using the innovative manufacturing process.

In the case study of Samsung Life Insurance, Moon and Park (2002) described how the insurance company encouraged knowledge sharing through a Web-based know-how bank. This case study demonstrated the challenges of designing a reward system that addressed extrinsic motivators, but seemingly ignored intrinsic ones. The program awarded reward points to employees based on the contributions made for the creation of knowledge and for its institutional relevance. For example, each time an employee logged into the bank, that employee received 10 points. If an employee searched the know-how bank, the employee received one point for each content search. An employee

received 200 points if he or she created knowledge material. The points could then be redeemed once a year for overseas training or as cash-in opportunities. Initially, the reward system caused knowledge inflow to spike artificially, with some poor information creeping into the system. Also at the time of point redemption, knowledge outflow spiked with serious problems of knowledge overload. Another problem of the reward system was the quality of knowledge registered into the know-how bank. Once information entered the bank, it went through knowledge approval stages before it was accessed by users. The rejection rate of information was 3.2 percent on average. The company analyzed the correlation between knowledge flow and business performance for year 2000 and found a positive correlation between knowledge outflow and business performance. The analysis, however, did not demonstrate a clear relationship between knowledge inflow and business performance. As a result, the insurance company planned to redesign this reward system to allow point redemption on a daily rather than yearly basis.

Processes

The cultural factor **processes** was broad in definition and application. For purposes of this study, the researcher examined the theory-based literature to define processes that were directly related to knowledge management initiatives. In most instances, this cultural factor was inherent to the other five cultural factors and was, therefore, not readily distinguishable as an independent factor.

The theory-based literature most often examined the importance of developing standardized information systems to capture best practices, lessons learned, process maps, and other codified information for use and reuse (Bixler, 2002-b; Bixler 2001;

Lee, 2000; Martin, 2000; McElroy, 2000; Blosch, 1999; Lesser and Bengtson, 1998).

According to Martin (2000), knowledge management processes should meet the following five organizational objectives:

- Connect people with other knowledge people
- Connect people with information
- Enable the conversation of information to knowledge

- Encapsulate knowledge, making it easier to transfer
- Disseminate knowledge around the organization

In order to meet these objectives, an organization must build processes that promote collaborative problem solving, streamlined workload, and enhanced performance (Bixler, 2002-b; Blosch, 1999). This is accomplished through information systems that enable learning, sharing of cross-functional expertise, and sharing of worker-to-worker knowledge.

Here again the emphasis was not on technology, but on the role of people and their knowledge. Several studies explained how organizations mistakenly examined processes as a set of repeatable activities that required little human interaction, thereby developing technology-driven processes (Bixler, 2002-b; Martin, 2000; McElroy, 2000; Lesser and Bengtson, 1998). Most routine processes, however, required some form of human judgment and intervention, and only human judgment could accurately determine how or why activities were occurring. Defining processes to facilitate knowledge management, therefore, required evaluation of the knowledge *generated* from work activities (e.g., project oversight, plan development, recovery planning) as

well as the evaluation of the processes that *managed* that knowledge (e.g., creating, capturing, refining, distributing, using, and monitoring knowledge) (Lee, 2000).

The case studies did not review **processes** as an independent cultural factor, but rather as an integral component of each of the other five cultural factors. As with the theory-based literature, the case studies primarily focused on developing processes for information systems that enabled the flow of information and knowledge among people. For example, in the case study of World Bank, the discussion of processes centered around streamlining and consolidating information, and enabling information to seamlessly cross traditional silos (Egan and Kim, 2000). This same approach was evidenced in other case studies, and in the cases presented in this study: Arup, BP Amoco, and Buckman Laboratories.

People

The cultural factor of **people** was similarly as broad and complex as the previously discussed cultural factor **processes**. Although the theory-based literature supported the concept that **people** were the most significant element of a knowledge management system (King, 2000; Martin, 2000;), clear definitions for this cultural factor were not provided. Because an organization cannot create knowledge without people, the relationship between people and knowledge management was a core theme in all studies. This was evidenced by the discussion of sub-factors related to the cultural factor **people**, such as *employee competence* (Bixler, 2002-a; Williams, 2002; Stewart, 2001; Blackler, 2000; Cross and Baird, 2000; Martin, 2000; Rastogi, 2000); *trust* (Williams, 2002; Hubert, 2002; Cross and Baird, 2000; De Long and Fahey, 2000; Martin, 2000; Rastogi, 2000; Davenport and De Long, 1998); *teamwork* (Bixler, 2002-

a; Cross and Baird, 2000; Dalley and Hamilton, 2000; Lahti and Beyerlein, 2000; Rastogi, 2000); and *motivation* (Williams, 2002; Martin, 2000; Rastogi, 2000; Davenport and De Long, 1998). Perhaps the single most sub-factor that determined if knowledge management initiatives took hold was *trust*. Persuading people to share their knowledge required not only new processes, but also a new covenant between employers and employees, as well as between employees and employees: Employees needed reassurance that they were still valued after they gave up their knowledge (Williams, 2002; De Long and Fahey, 2000; Martin, 2000; Davenport and De Long, 1998). The level of trust that existed within an organization greatly influenced the amount of knowledge that was shared both between individuals and from individuals into an organization's knowledge management initiative. And in instances where trust was low, organizations needed to first rebuild trust levels, before they could expect individuals to share expertise freely without worrying about the impact of this sharing on their value to the company (De Long and Fahey, 2000).

The case studies described similar concepts of **people** as evidenced in the theory-based literature. For example, in the case study of Viant, Bumbo and Coleman (2000-a) described how the Internet solutions company developed a business model built on organizational, psychological, or anthropological studies. A core component of this business model was the understanding that knowledge was something that occurred in and between people. Viant understood the importance of cultivating an environment that allowed collaboration among its employees to flourish. As a result, Viant spent as much, or more, on building the people who build its knowledge culture as it did for the technology that helped capture that knowledge. Viant developed a cross-company team

called PKG (People, Growth, and Knowledge) that worked to ensure that the culture at Viant continued to grow in the right manner, at the right pace, and with the right people, in the right mix. And although Viant had very impressive technology to support knowledge management, the organization recognized that if the culture did not support a strong sense of inclusiveness, trust and community, no technology would deliver the desired results.

In the case study of Premier Healthcare, Martin et al (2000) described how Premier's knowledge management approach was focused on processes, tools, and behaviors. To build its knowledge management approach, the organization focused on **people** as one of its core values. Premier believed that knowledge management was 80 percent culture, therefore, people were a key part of the system. To integrate knowledge management into the organizational culture, Premier did four things: (1) engaged Human Resources to integrate knowledge management into organizational development initiatives; (2) ensured that employees understood the philosophy, goals, and benefits of knowledge management; (3) made sure special interest individuals and groups were identified and engaged; and (4) promoted executive team buy-in so that they became champions of knowledge management. As a result of its efforts, Premier boasted a work environment where all business information was accessible from one central location. This helped employees do their jobs better by aggregating useful information and making it available to those who needed it when they needed it.

Leadership

The last cultural factor examined in this study was **leadership**. For purposes of this study, **leadership** included the CEO and other senior executives or directors. The

theory-based literature supported **leadership** as one of the critical factors for successful knowledge management initiatives (Bixler, 2002-a, 2002-d; Hasanali, 2002; Bonner, 2000; Rastogi, 2000; Ireland and Hitt, 1999; Kirrane, 1999; McClenahan et al, 1999; Davenport and De Long, 1998; Halal, 1998; Skyrme, 1998). In fact, most studies concluded that successful knowledge management systems required a champion or leader at or near the top of an organization to provide strong and dedicated leadership, and to lead by example. This often meant accepting candid feedback from others while encouraging others to make changes (Kirrane, 1999). Bonner (2000) summarized five characteristics of leadership to be:

- a high support of knowledge management and leading by example
- a mindset of rapid growth, sometimes manifested as threats from outside competitors
- a high level of internal trust among employees, which fostered open knowledge sharing
- a belief that organizational learning and knowledge management were critical business advantages
- an exceptionally well-defined orientation to providing customer-centered products and services

These characteristics were supported by other studies as well (Bixler, 2002-d; Hasanali, 2002; Ireland and Hitt, 1999; Davenport and De Long, 1998; Halal, 1998; Skyrme, 1998).

Leadership was a widely discussed cultural factor in the case studies. In the case studies conducted on Buckman Laboratories, the role of the CEO was often noted

as critical to the company's successful knowledge management system. Bob Buckman, CEO, was the company's knowledge champion, who enthusiastically supported and encouraged the widespread use of knowledge management processes (Ellis and Rumizen, 2002; Robin, 2001; Fulmer, 1999). Bob Buckman realized that not only employees, but management at all levels must be convinced of the value of knowledge management. Initially, little emphasis was given to the buy-in at the middle management levels. Buckman realized, however, that middle management had the most impact on the day-to-day work environment of its employees, and therefore, buy-in from these managers became critical (Ellis and Rumizen, 2002).

In other case studies, leadership, again, was described as an important factor for building and maintaining knowledge management initiatives. Leadership's role was critical to creating the vision, mission, objectives, and ethics code that the organization would follow as it developed its knowledge management systems. Senior leaders were seen as coaches and mentors, who led by example. In the case study of Chevron, for example, O'Dell and Grayson (2000) described how Ken Derr, CEO, provided a dramatic example of what a leader could do to support knowledge sharing. Derr created and published a mission, vision, and values statement that endorsed and sustained learning and transfer. He encouraged storytelling of successful events at each senior executive meeting; he removed barriers to progress; and reinforced and rewarded positive behaviors and promoted the right people. Derr also led by example, showed commitment to learning through action, and received upward feedback on how he was doing. And Derr applied these principles to the total corporation (O'Dell and Grayson, 2000). Other case studies, such as those of Bezeq, St. Paul Companies, Premier

Healthcare, and Viant, underscored the importance of senior leadership in mentoring and moving the entire organization toward knowledge management (Chamish, 2001; Owens and Thompson, 2001; Bumbo and Coleman, 2000-a; Martin et al, 2000).

Chapter Five. Conclusion

The concept of knowledge management continues to evolve. Regardless of its evolution, knowledge management is recognized as an important competitive factor for businesses worldwide (Martin, 2000; Nonaka and Takeuchi, 1995). The literature revealed that the first organizational efforts to manage knowledge focused on information technology solutions. These technology-driven solutions, although important to knowledge management, often failed to achieve their objectives because they did not consider cultural factors critical to effective knowledge management (De Long, 2000). Organizations failed to consider the relationship between knowledge management and organizational culture, and the cultural factors that impacted effective knowledge management initiatives. Just as knowledge management is critical to an organization's competitive advantage, organizational culture is critical to an organization's definition and execution of its business strategy. Hence, knowledge management cannot be effectively addressed without addressing organizational culture.

Organizational culture, however, is complex and multi-faceted. It consists of many factors that are embedded into an organization's system of norms, beliefs, values, and rules (Blackler, 2000; Gupta and Govindarajan, 2000; Rastogi, 2000; Miller, 1995). The theory-based literature and case studies reported in this paper both support this supposition. The literature and case studies also present a framework for addressing the relationship between knowledge management and organizational culture by identifying the cultural factors that impact knowledge management initiatives. These cultural factors are information systems, organizational structure, reward systems, processes, people, and leadership. Senior leaders who plan to implement knowledge management

initiatives must carefully address these cultural factors. And although the cultural factors may be defined and investigated independently, they are in fact interdependent. For this reason, each cultural factor should be addressed in relationship to the others.

The purpose of this study was to present the impact of these cultural factors on knowledge management initiatives based on evidence in the literature, and to synthesize these data into a checklist for senior executives of small or not-for-profit organizations. Small and not-for-profit organizations face many of the same challenges as large organizations when implementing knowledge management initiatives. Small and large organizations alike must find ways to integrate knowledge management into their strategic vision, build an organizational culture that supports knowledge management, and motivate employees to support these initiatives. Small and not-for-profit organizations, however, have challenges that are unique to their environment (Skyrme, 2002). For example, they often lack the capital available to large organizations to implement large-scale or expensive initiatives. In many instances, large organizations have more capital to invest in expensive technology-based solutions, as evidenced in the early approaches to knowledge management initiatives discussed in the literature. Most of the case studies reviewed for this study presented examples of knowledge management initiatives at large organization. In fact, the case studies presented evidence that knowledge management was well established in many large organizations and that small organizations were only now beginning to look at ways to manage their knowledge. What, then, do the findings of this study mean for small or not-for-profit businesses?

Small or not-for-profit businesses have the benefit of the lessons learned from earlier approaches to knowledge management initiatives undertaken by the large organizations. The most important lesson revealed in this study is that expensive technology-based initiatives are not the solution to knowledge management. Rather, a focus on organizational culture and its ability to build and sustain a knowledge-sharing environment is key to effective knowledge management. By focusing on the cultural factors that define an organizational culture, a small or not-for-profit business can take small steps toward building a knowledge-centered culture. As shown in Appendix C of this study, these steps include a combination of formal and informal approaches to organizational structure, reward systems, processes, and the interaction between people and their information systems. Finally, the vision and direction for knowledge management initiatives must be provided by the organization's leaders.

In summary, organizational culture holds the key to successful knowledge management initiatives. As senior executives of small or not-for-profit organizations contemplate ways to enable and manage organizational knowledge, they will encounter cultural factors that either facilitate or hinder the management of knowledge. To implement successful knowledge management initiatives, senior executives should first approach knowledge management from a cultural perspective.

Appendix A. Definitions

Content analysis — a research method that uses a set of procedures to make valid inferences from text. A central idea in content analysis is that the many words of text can be classified into much fewer content categories. Words, phrases, or other units of text classified in the same category are presumed to have similar meanings (Weber, 1990).

Cultural factor — values, norms, and practices that define behavior within an organization (De Long, 2000). For purposes of this study, the following characteristics are considered cultural factors: information systems, organizational structure, reward systems, processes, people, and organizational leadership (Gupta and Govindarajan, 2000).

Explicit knowledge — objective, theoretical, and codified knowledge for transmission in a formal, systematic method using grammar, syntax, and the printed word (Pearlson, 2001).

Literature review — a systematic review of an existing body of research retrieved from valid and reliable sources, such as books, indexes, abstracts, and other general references, relevant to a research problem. The literature is read, evaluated, organized, and synthesized to provide supporting evidence for the research problem (Leedy, 2001).

Human systems — a disciplined, unified, and interactive approach to integrate human considerations into system design to improve total system performance

and reduce cost of ownership. Major categories of human considerations are manpower, personnel, training, human factors engineering, safety, and health.

(Source: Defense Systems Management College. Retrieved from miairforcemall.org/defs/FindDefs.asp, September 24, 2002.)

Information systems — the combination of technology, people, and process that facilitates the communication of data, information, and knowledge throughout an organization (Pearlson, 2001).

Intellectual capital — knowledge that has been combined, deployed, and leveraged to produce higher-value goods or services or some other competitive advantage for an organization. (Pearlson, 2001, p. 266; Rastogi, 2000)

Leadership — the art of mobilizing others to want to struggle for shared aspirations (Kouzes and Posner, 1995, p.30). For purposes of this study, leadership includes the CEO and other senior executives or directors.

Knowledge assets — often referred to as intellectual capital. The knowledge that has been identified, captured, and leveraged to produce higher-value goods or services or some other competitive advantage for an organization. (Pearlson, 2001, p. 266).

Knowledge management — 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. It is the process through which organizations create and use their institutional and collective knowledge (Rastogi, 2000).

Knowledge map — a list of people, documents, and databases telling employees where to go when they need help. A good knowledge map gives access to resources that would otherwise be difficult or impossible to find. Maps may also identify knowledge networks or communities of practice within the organization. A knowledge map serves as both a guide to where knowledge exists in an organization and an inventory of the knowledge assets available (Pearlson, 2001).

Organizational culture — a social environment that drives an organization's formal and informal expectations of individuals, defines the types of people who will fit into the organization, shapes individuals' freedoms to pursue actions without prior approval, and affects how people interact with others both inside and outside the organization (Gupta and Govindarajan, 2000).

Organizational structure — the physical and social environment within which an organization operates. This includes elements such as physical office space, departmental or business classifications and boundaries, lines of authority, and definition of employee roles (Von Krogh, Ichijo, Nonaka, 2000; Symon, 2000).

Processes — an interrelated, sequential set of activities and tasks that turn inputs into outputs, and have a distinct beginning, a clear deliverable at the end, and a set of metrics that are useful to measure performance (Pearlson, 2001).

Reward systems — intrinsic and extrinsic motivators or incentives that affect personal and organizational behavior. Intrinsic motivators originate internally and emerge when a task itself seems rewarding and meets a person's goal. Extrinsic motivators originate externally and can cause a task to be perceived as a means to a rewarding end (APQC, 2002).

Tacit knowledge — Personal, context-specific, and hard to formalize and communicate. Tacit knowledge consists of experiences, beliefs, and skills. It is entirely subjective and is often acquired through physically practicing a skill or activity (Pearlson, 2001).

Appendix B. Data Set 2

Cultural Factor	Literature Sources			
	Theory-Based		Case Studies	
	Sole Factor	With Other Factors	Sole Factor	With Other Factors
Information Systems	17	18	7	22
Organizational Structure	8	24	1	18
Reward Systems	5	7	1	10
Processes	6	14	0	21
People	3	15	1	15
Leadership	4	14	0	14

Appendix C. Checklist: Key Cultural Factors that Impact KM Initiatives

Key Factors of Organizational Culture	Impact on KM Initiatives
<p>Information Systems</p> <ul style="list-style-type: none"> • Combine people, processes, and technology • Must be flexible and tailored to the type of knowledge being captured, shared, or created • Include formal and informal approaches 	<p>Build networks that foster conversation, relationships, and trust among employees. Generate a collaborative environment in which employees know who knows what, know what was done before, and use this knowledge to resolve problems quickly and effectively.</p>
<p>Organizational Structure</p> <ul style="list-style-type: none"> • Must be permeable and minimize the focus on organizational silos • Must support learning and sharing of knowledge • Encourages the formation of teams, work groups, and communities of practice 	<p>Allows the flow of knowledge regardless of employee role, job function, or other traditional boundaries. Facilitates sharing of knowledge and learning to create even more knowledge. Allows employees to bond socially and technically to share information, build on each others knowledge, and to solve problems.</p>
<p>Reward Systems</p> <ul style="list-style-type: none"> • Consist of a balance between intrinsic and extrinsic motivators • Encourage knowledge sharing across role and functional boundaries; Must not trivialize knowledge-sharing efforts • Include a formal assessment of achievements against knowledge management objectives 	<p>Encourage knowledge sharing through formal systems, such as financial incentives and compensation structures; and through informal systems such as peer-to-peer recognition. Acknowledge the value of sharing knowledge, the contributions people make, and the importance of not hoarding information or knowledge. Motivate employees to develop innovations that would help them do things right the first time.</p>
<p>Processes</p> <ul style="list-style-type: none"> • Connect people with other knowledge people • Connect people with information • Enable conversation of information to knowledge • Encapsulate knowledge • Disseminate knowledge throughout organization 	<p>Promote collaborative problem solving, streamlined workload, consolidated information, and enhanced performance. Enable learning, sharing of cross-functional expertise, and sharing of worker-to-worker knowledge. Develop information systems that enable information to seamlessly cross traditional silos.</p>

Key Factors of Organizational Culture

Impact on KM Initiatives

People

- Most significant element of a knowledge management system
- Employees need reassurances that they are still valued after they give up their knowledge
- Level of trust greatly influences the amount of knowledge that is shared

Fosters an environment where employees trust that their knowledge is valued and ensures that the culture grows at the right pace, with the right people, and in the right mix. Allows employees to do a better job of aggregating useful information, and make it available to others who need it when they need it.

Leadership

- Provides strong and dedicated commitment to knowledge management initiatives
- Leads by example
- Fosters open knowledge sharing by creating an environment built on trust
- Fosters a belief that organizational learning and knowledge management are critical
- Develops a customer-centered business orientation

Creates the vision, mission, objectives, and ethics code for the organization as it develops its knowledge management system. Endorses and sustains knowledge management initiatives by taking on the role of coach and mentor. Removes barriers to progress. Reinforces and rewards positive behaviors and promotes the right people. Moves the entire organization toward knowledge management.

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