BUILDING ORGANIZATIONAL CAPABILITY: A STUDY OF KNOWLEDGE

MANAGEMENT PRACTICES, REASONS, AND RESULTS

by

Patricia Anne Glines-Kotecki

KENNETH SILBER, PhD, Faculty Mentor and Chair

KEVIN FREER, PhD, Committee Member

ADELE SOMMERS, PhD, Committee Member

Barbara Butts Williams, PhD, Dean, School of Education

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

Capella University

July 2011

UMI Number: 3461721

UMI®
Dissertation Publishing

UMI 3461721

ProQuest®

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

المنارة للاستشارات

www.manaraa.com

© Patricia Glines-Kotecki, 2011

Abstract

Organizations are increasingly confronted by tremendous challenges, including competition, globalization, the economy, regulation, outsourcing, advances in technology, and the rapid creation of new knowledge. Knowledge management is a strategy that helps to address these challenges because it supports organizations in increasing their competitive advantage by leveraging the intellectual capital already present in the organizations. The purpose of this quantitative study was to identify the reasons human performance improvement (HPI) practitioners use knowledge management practices and the effectiveness they attribute to using knowledge management practices to increase organizational performance. This study also tested a hypothesis that there was a significant statistical relationship ($p \leq .05$) between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices. To conduct the study, a quantitative survey was sent via e-mail to members of two HPI professional organizations. Study participants shared information on their views related to knowledge management practices, the importance of reasons for using knowledge management practices, and the effectiveness of results for knowledge management practices in increasing organizational performance. Using descriptive statistics and factor analysis, it was found that though there are many reasons HPI practitioners use knowledge management practices, the majority of reasons fall within the dimension of human capital enablement. In terms of the effectiveness HPI practitioners attributed to using knowledge management practices to increase

organizational performance, study results find that market effectiveness was the most significant factor related to effectiveness of results. A chi-square analysis showed that there was a statistically significant relationship between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices.

Dedication

This work is dedicated to my family and friends, whose love and support helped to get me through the dissertation journey. This includes my ever-patient husband, Shawn Kotecki, and my inspiring sister (and best friend), Madeline Hubbard. A special dedication of this work goes to the memory of my mother, Mary Glines, whose amazing talent and positive spirit continues to provide guidance to my life. Onward and upward, my dear!

Acknowledgments

Dr. Silber, I am so grateful for your time, encouragement, guidance, and exceptional feedback. You have truly helped me make this dissertation all that it could be. Dr. Freer and Dr. Sommers, thank you for your time, direction, and thoughts on my dissertation. Your contributions have helped me to be a better scholar.

Thank you to my husband, Shawn Kotecki, for loving and supporting me. I recognize that this journey meant that we deferred many other aspects of our lives. You have patiently waited, and I know you are ready for adventure—let's get living!

Last, a special thank you to Randy Kohout—completing this dissertation would not have been possible without your support and investment in my potential. I promise to pay it forward.

Table of Contents

List of Tables

List of Figures

CHAPTER 1. INTRODUCTION

Introduction to the Problem

Today's business organizations are challenged by competition, globalization, the economy, regulation, outsourcing, advances in technology, and the rapid creation of new knowledge. Many companies are also feeling the impact of the retirement of a tenured and highly skilled workforce, with a less than optimal pipeline of talent to replace it (English & Baker, 2006; Hyde, 2008). Knowledge management is a strategy that helps to address these challenges because it supports organizations in increasing their competitive advantage by leveraging the intellectual capital already present in the organizations (Frappaolo, 2006).

Background of the Study

Organizations are increasingly confronted by tremendous challenges, including competition, globalization, the economy, regulation, outsourcing, advances in technology, and the rapid creation of new knowledge. Though change is not a new phenomenon, the increased pace of change and resulting development of new knowledge affect the organization and its workers. To be successful in today's fast-paced reality, organizations need the capacity to learn and effectively share those learnings across the enterprise (Cho, Cho, & McLean, 2009). Knowledge management provides a framework within which this information sharing can occur.

1

Leavitt (2003) revealed that knowledge workers spend approximately 20% of their time looking for information in the workplace. The suboptimal management of knowledge within an organization manifests as a gap between what organizations must know and what organizations actually know. The size of this gap represents a company's ability to mobilize and capably respond to situations in a timely manner (Perrott, 2008).

The concept and practice of knowledge management aligns with the theoretical perspectives for improving the performance of individuals, groups, and organizations such as *human performance improvement* (HPI). HPI is grounded in the notion that "human performance can be best improved through the use of a process that is systematic, systemic, and result-based" (Sanders & Thiagarajan, 2001, p. vii). Through the use of research and data, the goal of HPI is to address holistically performance gaps and opportunities for improvement (Stolovitch & Keeps, 1992). HPI is an applied approach to improving performance that has roots in several theoretical areas such as behavioral psychology, organizational learning, instructional systems design, systems theory, change management (International Society for Performance Improvement, n.d.; Sanders & Ruggles, 2000), and the concept of postindustrial society (Bell, 1999).

Gilbert's *behavioral engineering model* establishes a framework for HPI and follows the notion that all factors influencing performance are caused by the environment and the individual. There are three main categories that span across both areas: (a) information and data, (b) instrumentation, and (c) motivation. The model is organized to prompt investigation and analysis of the environment before looking at the individual because Gilbert believed that the absence of support in the work environment was the

2

greatest single factor affecting performance. To that end, Gilbert proposed that the greatest performance leverage would be gained by analyzing performance factors in the order of information, resources, and incentives that are provided by the organization within the work environment. From there, HPI practitioners focus on investigating knowledge and skills, capacity, and motives of the individual (Gilbert, 1978). *Knowledge management* is an HPI intervention aligned with addressing performance gaps related to information and resources, which are the first two areas of investigation in Gilbert's model.

Stolovitch and Keeps (1999) wrote that "HPI evolved from instructional technologists' realization that organizational instruction and training systems were ineffective or inappropriate if other organizational factors were not also attended to" (p. 12). The work of HPI practitioners is to identify the root causes of performance gaps occurring among individuals, groups, or organizations (Langdon, 2000). Similarly, Rummler (2004) noted the evolution of HPI practitioners from a focus on improving human performance toward a focus on improving results.

HPI practitioners play a pivotal role in organizations because they partner with clients to influence decisions, facilitate processes, and implement solutions where the goal is to enhance performance (Robinson, 2002). Practitioners build credibility by demonstrating knowledge of the client's business, implementing solutions that add value, and showing accountability for the results of the interventions they recommend and implement (Bolin, 2007; Robinson & Robinson, 2006a; Rummler & Morrill, 2004; Sala, 2003).

3

This research helped to fill a gap by determining practitioners' views regarding knowledge management, a key HPI intervention. Numerous studies have been conducted regarding the use and outcomes of knowledge management in specific industries such as pharmaceuticals, consulting, banking, and hospitality (Aguiar, 2009; Curado, 2008; Donnelly, 2008; Sanchez-Guitierrez, Gaytan-Cortes & Ortiz-Barrera, 2009). Other studies have been conducted to gain HPI practitioners' perspectives on their development in the field of HPI (Burns et al., 1999; Robinson & Robinson, 2006b; Werner & DeSimone, 2009). However, there is no known research representing HPI practitioners' perspectives on the reasons for using knowledge management and their views on the level of effectiveness of using knowledge management practices to increase organizational performance.

Statement of the Problem

The focus of knowledge management is the effective sharing and use of an organization's intellectual capital. Whereas knowledge has traditionally been viewed as a tool for competitive advantage (Chan & Chao, 2008), it is now recognized as an asset that supports the success and improves the performance of workers, teams, and organizations (Cho et al., 2009). Knowledge is critical to an organization's ability to succeed in an ever-changing and increasingly demanding marketplace (Wegmann, 2008). As large amounts of knowledge are created, the challenge becomes the effective use and dissemination of this knowledge for the benefit of the enterprise. Knowledge

4

management is a key intervention to meet this challenge and improve organizational performance (Haney, 2006).

The focus of the HPI practice is to impact positively business results through improved performance of the organization and its people. Factors hindering performance could result from discrepancies related to the organization, its processes, or the performance of the individuals within the organization. HPI practitioners follow a systemic and systematic approach to discern the discrepancies in performance and identify the appropriate interventions required to address them (Willmore, 2008). Though HPI practitioners may design and implement strategies to harness and use knowledge to improve performance, the reasons HPI practitioners use knowledge management practices and the level of effectiveness they attribute to using knowledge management practices to increase organizational performance were not known.

The rapid creation of new information can result in challenges that impede an organization's ability to share knowledge, increase productivity, and enable human resources. Companies that leverage knowledge most effectively are more likely to succeed in delivering new products and services to the marketplace before the competition (Almahamid, Awwad, & McAdams, 2010; Wegmann, 2008). Managing organizational knowledge is a component of the American Society for Training and Development competency model and is a required area of expertise to achieve the credential of Certified Professional in Learning and Performance (ASTD, 2010). An evaluation of the reasons HPI practitioners use knowledge management practices and the level of effectiveness they reported from using knowledge management practices to

increase organizational performance provided valuable insight into the theoretical and operational aspects of HPI and enhanced the current foundation for HPI practitioner training and professional practice.

Purpose of the Study

The purpose of this quantitative study was to learn the reasons why HPI practitioners use knowledge management practices and to discern the level of effectiveness of using knowledge management practices to increase organizational performance. The result of this research included an examination of the reasons HPI practitioners use knowledge management practices and the level of effectiveness they attribute to using knowledge management practices to increase organizational performance.

Research Questions and Hypothesis

This quantitative study was designed to answer the following questions:

1. For what reason do HPI practitioners use knowledge management practices?
2. How effective are knowledge management practices in increasing organizational performance?

On the basis of a review of the literature, the following hypothesis was tested:

Hypothesis: There is a significant statistical relationship ($p \leq .05$) between HPI

practitioner perception regarding the use of knowledge management to

increase efficiency by using knowledge to improve production processes

and HPI practitioner perception of the improvement of worker efficiency

and/or productivity through knowledge management practices.

Null hypothesis: There is no significant statistical relationship between HPI

practitioner perception regarding the use of knowledge management to

increase efficiency by using knowledge to improve production processes

and HPI practitioner perception of the improvement of worker efficiency

and/or productivity through knowledge management practices.

Delimitations

Many facets of knowledge management could be measured and explored. The survey instrument that was used in this study could be modified to collect different types of data that would be complementary to the study focus. Further data collection may be implemented in future studies. For this study, the type and scope of the data that were collected are appropriate to answer only the research questions posed.

Significance of the Study

This study is significant to the field of HPI for three reasons. First, HPI practitioners' perceptions of knowledge management may affect their use of knowledge management. Second, as change agents, HPI practitioners influence the choices made by their client organizations. Third, this study replicated a previous study conducted with project managers who had implemented knowledge management systems. In doing so, it moved from an audience with generalized knowledge of organizations to an audience

with deep knowledge of organizational performance gaps and the appropriate interventions to address them.

The focus on knowledge management as a high-impact strategy to promote organizational learning and competitiveness has become a key focus in the field of HPI. As organizations grow to realize that knowledge developed by workers is one of their most valuable assets, HPI practitioners may help the organizations adopt strategies to support the creation and dissemination of knowledge (Blankenship & Ruona, 2009; McCall, Arnold, & Sutton, 2008). The variety, diversity, and scope of knowledge management strategies may result in knowledge management interventions that are misunderstood, applied incorrectly, implemented poorly, or not maintained by the client organization. Because "practitioners' perspectives on knowledge management will shape their responses to and effective use of knowledge management" (Haney & Driggers, 2010, p. 366), this could affect both practitioner credibility and their viewpoints on knowledge management as a solution to improve performance.

HPI practitioners are change agents because they play a pivotal role in helping business organizations improve performance by influencing organizations to implement knowledge management interventions (American Society for Training and Development [ASTD], 2006). As change agents, HPI practitioners recommend and influence decisions on the adoption of discontinuous innovations such as knowledge management (Hazeldine & Miles, 2010; Raghupathi et al., 2009; Rogers, 2003; Shaffer & Keller, 2003). HPI practitioners' role in innovation resistance due to negative perspectives of knowledge management or fear of a loss of credibility as an expert could result in missed

8

opportunities to leverage knowledge management as an intervention to improve organizational performance (Ram & Sheth, 1989; Rogers, 2003; Shaffer & Keller, 2003).

This study replicates a study conducted to gauge project managers' perceptions of the reasons for using and value derived from knowledge management. Project managers were chosen as the population for the previous study because they "have general insight across organizations" (Aguiar, 2009, p. 51) from their experience in leading teams. In contrast, HPI practitioners have a deep understanding of the organization because they conduct systemic and systematic analyses to uncover performance gaps and recommend targeted solutions, such as knowledge management, to address them (Bolin, 2007; Robinson, 2002; Robinson & Robinson, 2006b). This study is significant because it provides an accurate portrayal of the reasons HPI practitioners use knowledge management practices. Additionally, it identifies HPI practitioners' views on the level of effectiveness of using knowledge management practices to increase organizational performance.

Definition of Terms

Definition of terms used in this study follow.

Community of practice (CoP). A group of individuals who share a common interest and interact regularly to share knowledge, deepen expertise, or solve a problem (Wenger, 1998).

9

Human performance improvement (HPI). A systematic and systemic approach to improving the performance, productivity, and competence of individuals, groups, and organizations (International Society for Performance Improvement, n.d.).

Human performance improvement (HPI) practitioner. An individual responsible for assessing, designing, developing, implementing, and evaluating solutions that affect human and organizational performance (Pershing, 2006).

Intellectual capital. The culmination of knowledge, expertise, and other intangible assets held by an organization's workers (Bontis, 1996).

Knowledge. A justified true belief held by an individual or organization (Nonaka & Takeuchi, 1995).

Knowledge management. The ability to create and capture knowledge, share it across the organization, and represent it in products and services while benefiting the organization and individuals (ASTD, 2006; Groff & Jones, 2003; Nonaka & Takeuchi, 1995).

Assumptions

For this research, the following assumptions were made:

1. Participants will provide accurate and honest information.
2. Participants in the study are HPI practitioners from business organizations.
3. The survey will reveal distinct trends related to the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance.

Nature of the Study

This quantitative study identified the reasons HPI practitioners use knowledge management practices and the level of effectiveness they attribute to using knowledge management practices to increase organizational performance within their organizations. As this research focused on providing an accurate portrayal of HPI practitioners' views on the use and effectiveness of knowledge management, the study followed a nonexperimental descriptive research approach. This approach is supported by Weimer (2006), who indicated that descriptive research describes and "seeks to establish what is" (p. 109). Nonexperimental quantitative research methods, such as predictive and explanatory research, were not considered because the research will not focus on predicting future status (Weimer, 2006). The stated hypothesis for this research was evaluated using Pearson chi-square analysis.

A quantitative survey design is appropriate because surveys are used to obtain information on beliefs, attitudes, and opinions. In survey research design, the researcher collects all data at a single point in time, analyzes all study participants as a single group, and draws conclusions from statistical results (Creswell, 2003, 2008). The survey design is cross-sectional because data will be collected at one point in time and will represent current beliefs and opinions of HPI practitioners regarding the reasons for using knowledge management and the level of effectiveness of using knowledge management practices to increase organizational performance. The intent of this study was to describe trends and identify relationships among and between these variables.

11

A link to an electronic survey Web site was sent via e-mail to all members of two HPI professional organizations. The survey was also promoted via newsletters from each organization. Convenience sampling was used to obtain a study sample. In convenience sampling, the researcher selects participants who are willing to participate in the study; this is a practical way to collect information (Creswell, 2008).

The anonymous survey was designed to have participants indicate the reasons for using knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance within their organizations. The survey comprised multiple-choice, single-answer, Likert-type scale questions. In quantitative research, the type of information the researcher collects is predetermined. The data collection instrument for this study was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada that has been evaluated for validity and reliability (Earl, 2002, 2005). For use in this study, the researcher made changes to demographic questions and date ranges and converted survey language from British to American English. Because of these changes, the survey was field tested to evaluate readability and ease of survey completion (Gall, Gall, & Borg, 2007).

Organization of the Remainder of the Study

This chapter presented background information on the study and outlined the research questions and reason for the study. Chapter 2 presents a literature review of key topics related to knowledge management, including knowledge creation, intellectual

12

capital, knowledge management strategies, and communities of practice. Chapter 3 describes the proposed research methodology for the study. Chapter 4 provides an analysis of the data collected. Chapter 5 discusses the results of the study and presents recommendations for practice and further study.

CHAPTER 2. LITERATURE REVIEW

Introduction

Knowledge management is a young but growing field. In addition to its relative infancy, knowledge management is different from other areas of study in that it is a practice-driven field in which practitioners outside academia contribute to the body of knowledge more than other disciplines (Serenko, Bontis, & Grant, 2009). There are at least 20 academic journals that focus on the topic, with case studies being the most frequent methodology employed by researchers (Perrott, 2008; Serenko & Bontis, 2009). Existing and emerging knowledge management research revolves around four key themes: (a) knowledge creation, (b) intellectual capital, (c) knowledge management strategies, and (d) communities of practice (Bontis, 2002; Bontis, Crossan, & Hulland, 2002; Bontis & Serenko, 2007; Choo & Bontis, 2002; McLean, 2009).

The purposes of the proposed study were (a) to investigate the reasons HPI practitioners use knowledge management practices and (b) to determine the level of effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance. In support of these purposes, the literature review comprises five major topics, beginning with a theoretical framework that discusses theories related to knowledge management. The remaining four topics address knowledge creation, intellectual capital, knowledge management strategies, and communities of practice. Owing to a scarcity of information and literature specific to the relationship between the role of HPI practitioners and knowledge management concepts and practices,

14

the literature in many of these areas is generic, yet presents the HPI practitioner with a base of foundational knowledge to support his or her work in increasing human and organizational performance.

Theoretical Framework

In 1959, Peter Drucker introduced the term *knowledge worker* to differentiate workers who focus on information technology. At the time, these roles included programmers, analysts, researchers, and technical writers. Over the last 40 years, this term has progressed to include the majority of professional workers in today's business organizations (Ichijo & Nonaka, 2007). Since that time, it has been "broadly accepted that systematic knowledge management is tightly linked with gaining and sustaining competitive advantage" (Bogner & Bansal, 2007, p. 165–166).

The theoretical foundation for the majority of knowledge management literature, including this study, is Daniel Bell's *theory of postindustrial society*. This theory describes a society in which knowledge-based service work has replaced manufacturing work as the predominant mode of employment. Additionally, knowledge-based goods and services are the main generators of wealth (Bell, 1999). In postindustrial society, knowledge and information play an increased and critical role in the economy and society. Owing to a focus on service work, theoretical knowledge is most important because it supports the creation, use, and application of abstract knowledge, which can be systematized and embedded in systems, rules, and processes (Bell, 1999; Hislop, 2009; Webster, 2002).

15

The concept and practice of knowledge management aligns with the theoretical perspectives for improving the performance of individuals, groups, and organizations such as HPI. Organizational growth and development require a heightened focus on increasing intellectual and human capital (Gilbert, 2007). HPI is grounded in the notion that "human performance can be best improved through the use of a process that is systematic, systemic, and result-based" (Sanders & Thiagarajan, 2001, p. vii). Through the use of research and data, the goal of HPI is to address holistically performance gaps and opportunities for improvement (Stolovitch & Keeps, 1992). Successful application of HPI is "something an organization must do to succeed" (Swanson, 1995, p. 207), meaning that HPI practitioners have an opportunity "to play a critical role in helping organizations develop more nimble organizational structures and more adaptable workers" (Burkett, 2005, p. 2). Knowledge management provides a framework with which to help organization achieve these goals.

Systems theory is a way of looking at an organization that espouses the notion that "the whole is greater than the sum of its parts" (Wang, 2004, p. 395). It was "first described by Boulding and von Bertalanffy with a clear *antimechanistic* view of the world and the full acknowledgement that all systems are ultimately *open systems*" (Holton & Swanson, 2001, p. 16), which means that all aspects within a system are influenced by both internal and external factors and components. When working to understand organizational performance, it is easier to understand a system by examining the interrelationship between the elements of the system than by looking at each element independently (Holton & Swanson, 2001; Senge, 1990). Systems theory is "a conceptual

16

framework, a body of knowledge and tools that have been developed over the past fifty years to make full patterns clearer and to help us see how to change them effectively" (Senge, 1990, p. 7). Systems theory supports HPI in that HPI practitioners examine organizational performance gaps in a holistic manner to determine and address root causes and implement interventions that improve performance (Robinson, 2002). Systems theory informs HPI because it purports that failing to improve performance of an individual may result in a negative impact on the organization. Similarly, systems theory is related to knowledge management because the focus of knowledge management is to create and capture knowledge at the individual and group levels; share it across the organization; and represent it in products, services, and strategies that benefit the organization (ASTD, 2006; Groff & Jones, 2003; Nonaka & Takeuchi, 1995).

Knowledge Creation

To leverage knowledge to increase organizational performance, it must first be created. This section discusses the difference between knowledge and information. The differences between tacit and explicit knowledge will be explored. Theories of knowledge creation are explained, including a discussion of the five phases of the theory of organizational knowledge creation. Last, the cultural implications of knowledge creation are examined.

The literature regarding knowledge creation is rooted in the work of Nonaka and Takeuchi, who published a theory of organizational knowledge creation in the 1995 book *The Knowledge Creating Company*. This work draws on Polanyi's (1962; see also Ray,

17

2009) concept of tacit knowledge, which posits that a person has more knowledge than can actually be shared with others and that experience shapes the tacit knowledge held by the individual.

The Difference Between Knowledge and Information

To discuss knowledge creation, it is important first to differentiate the terms *knowledge* and *information*. Though the terms are often used interchangeably, Nonaka and Takeuchi (1995) indicated that knowledge is different from information because it is subjective in that it relates to a person's beliefs, experience, and commitment. Information, which is easy to express in words, diagrams, and pictures, informs knowledge, which is often intuitive and can be hard to express to others. The definition of *knowledge* as presented by Davenport and Prusak (as cited in Tiwana, 2009) highlights the perplexing nature of knowledge:

> Knowledge is a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the mind of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms. (p. 37)

Knowledge is created by individuals and within organizations. Because knowledge is fluid, it requires formal and informal processes and structures that support acquiring, distributing, and using knowledge (Breedt & van Rensburg, 1999; Davenport, Jarvenpaa, & Beers, 1996; Ramesh & Sengupta, 1995).

18

Tacit and Explicit Knowledge

The concept of *tacit knowledge* was defined by Polanyi (1966) as knowledge that an individual is not aware of having. It cannot easily be articulated, conceptualized, or measured. An aspect of an individual's practical intelligence, it is the know-how that supports the achievement of personal goals (Sternberg et al., 2000). Tacit knowledge is seen as a source of competitive advantage for organizations (Fernie, Weller, Green, & Newcombe, 2003) and has been shown to result in differences in manager effectiveness (Wagner & Sternberg, 1991), leadership efficacy (Hedlund et al., 2003), learning styles (Armstrong & Anis, 2008), and group performance (Edmondson, Winslow, Bohmer, & Pisano, 2003). Though tacit knowledge has been viewed as an individual characteristic (von Krogh & Roos, 1995) that is subjective and situational (Kidd, 1998), Grant (1996) argued that the ability to collect and integrate tacit knowledge into existing knowledge exists in both individuals and teams. Measurements of team tacit knowledge have demonstrated that tacit knowledge can be quantified (Ryan & O'Connor, 2009).

Explicit knowledge is knowledge that an individual is aware of having. It is easy to express, codify, externalize, and systematically communicate to others (Fernie et al., 2003; Nonaka & Takeuchi, 1995). It can be expressed in specifications, words, and numbers (Chua, 2001), which allows it be dispensed and leveraged without regard to time or space (Federici, Ferrante, & Vistocco, 2008). Though Polyani was thought to reject the existence of purely explicit knowledge (Fernie et al., 2003), the concept of explicit knowledge is present in the knowledge management literature (Ichijo, 2002; McLean, 2009; Nafukho, 2009; Ziori & Dienes, 2008). The degree to which knowledge is explicit

19

can be measured by the extent to which it can be expressed or represented in words or documents, the ease with which it can be taught, and the quantity of inputs and interacting components needed to accomplish a process or task (Chua, 2001; Kogut & Zander, 1993).

Theories of Knowledge Creation

Polanyi's theory of tacit knowledge has been described as a critical contribution to social epistemology because it posits that the foundation of personal knowledge is social beliefs, which result from individual and shared social experiences (Polanyi, 1962, 1966; Ray, 2008, 2009). A research chemist, Polanyi developed this concept to challenge assumptions regarding research in the physical sciences by demonstrating that the personal beliefs and experiences held by scientists directly influence the way they conduct their research. Polanyi posited that cultural and social factors are a part of tacit knowledge in the form of "tendencies, impressions, temperaments or impulses of 'conviviality' that lead people to lean both cognitively and normatively in one direction or another" (Fischer & Mandell, 2009, p. 36). This position supported Polyani's claim that the outcomes of scientific research and scientific decisions regarding validity of findings are influenced by tacit knowledge possessed by the scientists in question (Polanyi, 1966).

Drawing from Polanyi, Nonaka and Takeuchi's theory of organizational knowledge creation describes the process of converting tacit knowledge into explicit knowledge that can be shared (1995). These types of knowledge are complementary; the

20

interaction between tacit and explicit knowledge is said to support the transformation of personal knowledge into organizational knowledge. The creation of new knowledge depends on this relationship (Buchel, 2007; Kane, Argote, & Levine, 2005; Nonaka & Takeuchi, 1995; Perrott, 2008; Polanyi, 1966). The theory of organizational knowledge creation comprises five phases, which are described in the following paragraphs.

Phase 1: Sharing tacit knowledge. Organizational knowledge is created by interactions between individuals within the organization. Because tacit knowledge cannot easily be shared with others, a boundary of interaction must be engaged to support the accumulation and sharing of tacit and explicit knowledge through experiences. Teams composed of people with different backgrounds and experiences are provided a challenging goal and a high degree of autonomy in which to accomplish it. Team member variety ensures that information and knowledge related to goal attainment are interpreted and shared to establish a shared mental model (Niu, 2009; Nonaka & Takeuchi, 1995; Rasmussen & Wangel, 2007). The outcome is the accumulation of new tacit and explicit knowledge.

Subramaniam and Venkatraman (2001) showed that employees play a critical role in the sharing of tacit knowledge and that individual workers with a strong group identity are more likely to share and incorporate tacit knowledge for collective performance. The extent to which tacit knowledge of group members is successfully incorporated and put to use toward the achievement of group objectives is key to organizational performance (Hollensbe & Guthrie, 2000; Kieslinger, Pata, & Fabian, 2009). Human resource strategies such as group-based pay have been shown to support the establishment of

21

group identity and assist in the sharing and creation of tacit knowledge (Grant, 1996; Kim & Gong, 2009).

Phase 2: Creating concepts. In this phase, the group continues to dialogue and engages in shared reflection. Throughout this process, tacit knowledge is expressed in words, phrases, and metaphors. This helps group members consider and contribute their own experiences while integrating the experiences of others (Nonaka & Takeuchi, 1995). In this phase, shared tacit knowledge is transformed into shared explicit knowledge.

The focus on integrating one's tacit knowledge with the tacit knowledge of others emphasizes a process of inquiry whereby "something new is created and the initial knowledge is either substantially enriched or significantly transformed during the process" (Paavola, Liponen, & Hakkarainen, 2002, p. 24). In this phase, growth of group knowledge supports trust among members and the establishment and advancement of the group as a knowledge-creating community (Hmelo-Silver, 2004; Hong & Sullivan, 2009; Wei-Li, Chien-Hsin, Bi-Fen, & Ryh-Song, 2009).

Phase 3: Justifying concepts. Individuals and the group are continuously reflecting and validating knowledge as it is created. New knowledge is screened against established criteria to determine if it is in line with cultural norms and of value to the organization. In this discursive process, knowledge deemed worthwhile for the organization is justified, and the knowledge creation process moves on to the next phase (Ichijo & Nonaka, 2007; Nonaka & Takeuchi, 1995; Schilhab, 2007).

Social interaction and culture play important roles in the justification process. Knowledge creation is an ongoing social process of truth justification. An individual's

22

subjective knowledge is shaped by experiences and values and is then validated by members of the organization. From a broader perspective, organizational knowledge can be justified with external groups, whose viewpoints can be incorporated, validated, and integrated into the organizations' explicit knowledge (Nonaka & Toyama, 2007; Paavola et al., 2004). Culture plays a critical role in the justification process because "procedures, routines, and assumptions that are commonplace in one culture may be inappropriate, insensitive, or ineffective in another" (Leonard, 2007, p. 60). Culture provides the rules for interpretation and guidance for action (Rasmussen & Wangel, 2007).

Phase 4: Building an archetype. In this phase, new explicit knowledge is combined with existing explicit knowledge within the organization. Justified knowledge is transformed into something tangible such as a refined business model or a new product or prototype that can be used by the organization. This transformational process requires input and collaboration among individuals from various departments within the organization (Ichijo & Nonaka, 2007; Nonaka & Takeuchi, 1995; von Krogh, Ichijo, & Nonaka, 2000).

Archetype creation is a form of *formal knowledge transfer*, which occurs when "prior learned knowledge and skills affect the learning and performance of new knowledge and skills" (Singh & Premarajan, 2007, p. 94). This process requires both the transmission and assimilation and transformation of knowledge and is considered successful when the attainment or integration of new knowledge occurs (Attewell, 1992; Davenport & Prusak, 1998). Knowledge created by the group is synthesized and refined to create knowledge tools to support the organization (Straus, Tetroe, & Graham, 2009).

23

Phase 5: Cross-leveling knowledge. Knowledge creation is a continual process. This phase represents the notion that once a concept is created, justified, and transformed into a tangible asset, the knowledge creation process starts anew by building on the knowledge that has been codified across and outside of the organization (Ichijo & Nonaka, 2007; Nonaka & Takeuchi, 1995).

The continuation of knowledge creation requires enablers such as management support, technology infrastructure, and a flexible culture that promotes trust, communication, and knowledge sharing beyond departmental boundaries and hierarchical structures (Ichijo & Nonaka, 2007; Morabito, Sack, Stohr, & Bhate, 2009; Rasmussen & Wangel, 2007). These enablers support knowledge creation and organizational learning because they increase the social-exchange relationship among individuals within the organization and reduce the likelihood that subcultures within the organization will have differing tacit assumptions and resist change (Schein, 1996; Wei-Li et al., 2009). Organizational cultures that focus on competition and individualism over teamwork do not stimulate collaboration, trust, or knowledge-sharing activity (Singh & Premarajan, 2007; Szulanski, 2000). This could create barriers to communication and experience sharing that insulate organizational knowledge and may lead to conflicting understanding or codification of knowledge (Reay, 2010).

Cultural Implications of Knowledge Creation

Theorists and practitioners from numerous cultures and varied fields have posited that the phenomenon of knowledge creation occurs in distinct phases. The mathematician

24

Poincaré (1952) indicated that knowledge creation occurs in three distinct time phases, which he named Preparation, Incubation, and Illumination. These were later described in the more informal terms of "Research it!, Sleep on it!, and Aha!" (Murphy, 2009, p. 10). This is similar to the Japanese concept of *shu ha ri*, the translation of which means to "learn, break, and create." These three activities are part of a self-renewing routine focused on learning a new concept and then breaking away to create a new concept from the original (Nonaka & Toyama, 2007).

Though there are similarities in the phases of knowledge creation across cultures, the process of organizational knowledge creation differs by geography. Western organizations are said to view knowledge creation as a formal and systematic process that must be managed. In this view, organizations are knowledge-processing machines in which explicit knowledge is quantified, assigned value, and passed on through education and training (Nonaka & Takeuchi, 1995; Toffler, 1990). Eastern organizations consider the process of knowledge creation as containing physical, mental, and spiritual elements (Johanson, Koga, Almqvist, & Skoog, 2009). Instead of a machine, the organization is a living organism in which knowledge creation takes place through the sharing of subjectivity through interpersonal relationships. Synthesis of knowledge happens physically, spiritually, and mentally (Nonaka & Nishiguchi, 2001; Nonaka & Tiyanam, 2005; Nonaka & Toyama, 2007).

Similarly, Kurtz and Snowden (2003) described the creation and management of knowledge as a process for making sense. The Welsh word *cynefin* is used to describe both the state and process of knowledge creation. The word, which has no literal English

25

translation, reflects the notion that the state and process of knowledge generation and interpretation are profoundly influenced by an individual's multiple affiliations, experiences, and relationships (Kurtz & Snowden, 2003; Sturmberg & Martin, 2008).

Conclusion

Knowledge creation is a way to help organizations meet the demands of the global market. Organizations positioned to address competition successfully are those that include a focus on intangible assets such as knowledge and information (Guthrie, 2001). The creation, accumulation, sharing, and integration of knowledge help an organization support ongoing operations and increase organizational value (Wu, Tsai, Cheng, & Lai, 2006). The result of these practices is intellectual capital (F-Jardón & Martos, 2009; Shih, Chang, & Lin, 2010).

Intellectual Capital

This section discusses the concept of intellectual capital. Typologies of intellectual capital will be explored. The section concludes with a discussion of the gap between intellectual capital theory and practice.

Intellectual capital has been defined as "the intellectual material that has been formalized, captured, and leveraged to produce a higher valued asset" (Stewart, as cited in Bontis, 1996, p. 1). It is a culmination of what each person in the company knows that supports the company's competitive advantage and includes intangible assets such as knowledge, expertise, and the ability to innovate successfully. Intellectual capital is

26

considered the most important asset within an organization because it shapes the future of the organization (Cohen & Pruzac, 2001; Nahapiet & Ghoshal, 2002; Stewart, 1997; Wiig, 1997). As intellectual capital represents the accumulation of knowledge that is present in organizations, it relates to all organizational knowledge. This includes knowledge that exists individually among workers and collectively across the organization. Where the intellectual capital resides relates to how the knowledge was created and categorizes it as either tacit or explicit knowledge (de Carolis, 2002).

Typologies of Intellectual Capital

Intellectual capital is different from traditional aspects of capital because unlike land, labor, or financial capital, it is an intangible asset (Caddy, Guthrie, & Petty, 2001; Sanchez, Chaminade, & Olea, 2000; Sveiby, 2001a, 2001b; Winter & Szulanski, 2002). The literature refers to different typologies of intellectual capital. These include human capital, structural capital, and relational capital (Bart, 2001; Bontis, 1998; Bontis et al., 2002; McElroy, 2002; Petrash, 1996; Saint-Onge, 1996; Wexler, 2002).

Human capital. *Human capital*, or the people within an organization, reflects tacit knowledge that is portable within an organization's workers. Though the organization can make use of this knowledge, it leaves the organization when workers do, either at the end of the workday or at the end of a career (Bontis, Keow, & Richardson, 2000). Many researchers consider the theory of human capital to be the root of intellectual capital "because the key of the development of the intellectual capital is in the people since the knowledge is in them" (F-Jardón & Martos, 2009, p. 604). Human capital theory posits that an increase in worker knowledge and abilities supports the

27

generation of new ideas and knowledge that can be applied to business processes and increased performance (Becker, 1964).

Structural capital. *Structural capital* is created by and for human capital and refers to the inventory of knowledge that stays within an organization. This is the tacit and explicit knowledge composed of documents, databases, processes, procedures, and organizational culture that remains in an organization regardless of worker tenure or movement outside the company (Roos, Roos, Dragonetti, & Edvinnson, 1997). Structural capital relates to the concept of social capital, which indicates that improved organizational performance is not related solely to the people within the system but is also due to the organization itself (Coleman, 1994). A study of the wood industry in Argentina revealed that structural capital was the only one of the three typologies that directly affected organizational performance and that both human and relational capital exerted an effect only through structural capital (F-Jardón & Martos, 2009).

Relational capital. *Relational capital* refers to an organization's relationships with external entities such as customers, suppliers, business partners, regulatory institutions, and other external organizations (Sanchez et al., 2000). Kaplan and Norton (1996) pointed out that exchanges between workers and customers may spark the creation and absorption of new information and knowledge. Owing to the focus on outside relationships, research models and findings sometimes refer to this typology as *client capital* (Wang & Chang, 2005).

28

Gap Between Intellectual Capital Theory and Practice

Though the field of intellectual capital is of interest to both academics and practitioners (Nonaka & Peltokorpi, 2006), research has shown a disconnect between intellectual capital theory and practice. The term *capital* reflects the notion of material wealth possessed by an organization. Similar to other investment scenarios, organizations are more likely to invest in the development and management of intellectual capital when they are profitable and reduce their focus on intellectual capital when they are not (Mouritsen, 2009). This contradicts intellectual capital theory, which promotes the investment of human capital to sustain and increase financial performance of the organization. For example, an international insurance company represented itself as a leading proponent of intellectual capital practices but dramatically scaled back its investments during challenging economic times (Dumay, 2009b).

The literature points to 34 divergent frameworks for measuring the value of intellectual capital (Sveiby, 2001b) and refers to a number of approaches for intellectual capital development and management. Strategies such as flexible organizational structure (Isaac, Herremans, & Kline, 2009), team design and indoctrination (Pearse, 2009), establishing networks for collaboration (Solitander & Tidström, 2010), and promoting a culture of trust and safety for workers (Shih et al., 2010) are promoted to support intellectual capital practices.

This variation makes it impossible to gain consensus on practices, models, and frameworks among scholars and practitioners (Dumay, 2009b) and leaves organizations without a consistent framework from which to operate. For example, in a study of the

29

Portuguese banking industry, Curado (2008) found that though all the organizations that participated in the study engaged in practices to retain intellectual capital, the vast majority of the organizations did not have job positions, strategies, or metrics focused on the development or management of intellectual capital.

Practitioners perceive the scholarly body of intellectual capital knowledge to be valuable, but they do not typically read academic journals or spend time determining how to apply academic research to business contexts (Booker, Bontis, & Serenko, 2008; Dumay, 2009b). This gap aligns with research findings in other management fields, including marketing (Ankers & Brennan, 2002) and information technology (Anandarajan & Lippert, 2006). It has been suggested that this gap in communication could be addressed if the body of knowledge of intellectual capital were to be delivered to practitioners via indirect distribution channels that could convert and summarize academic research in a way that is easily digested and applied (Booker et al., 2008).

Much of the literature regarding intellectual capital theory relates the creation and sharing of intellectual capital as a positive phenomenon. However, recent literature calls for a critical approach to intellectual capital research, practice, and theory (Dumay, 2009a, 2009b; Solitander & Tidström, 2010). Though academic research in the field of intellectual capital has introduced a number of definitions, frameworks, and measurement strategies, evidence of practitioners applying this research to their organizations is scant (Brennan, 2001; Bontis, 2003; Ordonez de Pablos, 2003). Chatzkel (2004) argued that scholars and practitioners

> must substantially demonstrate the relevance of [intellectual capital] as a working
> discipline that is useful to organizations to use to gauge and generate significant

30

value and to effectively navigate to achieve strategy goals. Otherwise, the notion of intellectual capital and all it stands for will be seen as merely one more set of very interesting ideas that is continually elusive to grasp and use. (p. 337)

Conclusion

Although intellectual capital is often viewed as a source of strategic and competitive advantage, practitioners need resources to help them translate theory into practice. Realities such as the increase in digitized information, globalization, and the growing complexity of business require companies to successfully translate espoused theories into theories-in-use that are actionable by workers and support organizational learning. These intangible assets are key in helping knowledge workers connect their work to shareholder, company, or organizational value (Cho et al., 2009; Choudhury, 2010; McLean, 2009; Nafukho, 2009; Perrott, 2008). As organizational growth and position are based on intellectual capital, organizational leaders need tools and frameworks to support analysis, design, development, identification, evaluation, and management to drive value creation and manage knowledge effectively (Schiuma, Lerro, & Carlucci, 2008).

Knowledge Management Strategies

This section includes a discussion of knowledge management frameworks and strategies. Considerations for adoption of knowledge management strategies are explored. The section concludes with a description of benefits achieved from adopting knowledge management strategies.

31

Understanding and nurturing the relationship between tacit knowledge and explicit knowledge has little value if the knowledge creation does not take place within a strategic framework for knowledge management (von Krogh et al., 2000). Cameron (2000) explained that "without the adequate management of that knowledge, the consequences for organizations could be devastating" (p. 3). One of the greatest challenges facing organizations is the ability to accumulate, store, retain, and distribute knowledge. As organizations grow to realize that knowledge developed by workers is one of their most valuable assets, they have to adopt strategies to support the creation and dissemination of knowledge (Blankenship & Ruona, 2009; McCall et al., 2008).

The literature points to two distinct frameworks for knowledge management. These include exploitation and exploration (Bierly & Daly, 2002; Choo & Bontis, 2002; Ichijo, 2002; Knott, 2002; Lovas & Ghoshal, 2000; March, 1991). Within these frameworks reside three strategies for knowledge management. These include the *codification* strategy and the *personalization* strategy, which align with the exploitation strategy, and the *learning organization* strategy, which is a component of the exploration strategy (Chua, 2001; Hansen, Nohira, & Tierney, 1999; Hwang, 2008). Frameworks and related strategies are discussed in the following.

Exploitation Framework

The *exploitation framework* focuses on the transfer and diffusion of knowledge within an organization. Two key strategies reside within this framework. The codification strategy leverages technology to transform the knowledge of individuals within the

32

organization into explicit knowledge that can be stored and used across an organization (Chan & Chao, 2008). The personalization strategy argues that knowledge used to increase an organization's ability to compete is implicit knowledge that can easily be created and shared through people-to-people interaction. This explanation focuses on human behavior within organizations (Cho et al., 2009). Further discussion on codification and personalization strategies is provided subsequently.

Codification strategy. The codification strategy depends on technology-supported mechanisms to transfer and transform tacit knowledge into explicit knowledge. Using technology, assets such as manuals, documents, and electronic databases are developed, housed, and shared with a goal to increase and speed up productive activity (Arvidsson, 2000; Boisot, 1998; Donnelly, 2008). This strategy focuses on reuse, repetition, and replication of knowledge by workers, who search for the information that is recorded and stored (Winter & Szulanski, 2001).

Organizational knowledge that is published is thought to be a more effective approach for communicating best practices because it can be categorized and searched and is typically vetted by experts (Davenport & Klahr, 1998). This is supported by a number of studies. For example, McCall et al. (2008) found that workers who leveraged knowledge management systems that were built based on the codification strategy were better at problem solving and were able to complete tasks with less cognitive effort than those who did not. Boyce, LaVoie, Streeter, Lochbaum, and Psotka (2008) found that technology-supported strategies helped to develop tacit knowledge required for military leadership. Looking beyond organizations, Perrott (2008) suggested that industry

33

associations could play a role in collecting, codifying, and transferring industry knowledge between industry members and relevant organizations such as governmental agencies and suppliers.

Personalization strategy. The personalization strategy focuses on sharing knowledge through social relationships and person-to-person interaction (Gourlay, 2001; Parise, 2007). Organizations that employ the personalization strategy deliberately set up strategic communities to develop solutions, create best practices, and solve complex problems (Ruuska & Vartiainen, 2005). Tactics employed within the personalization strategy to transfer employee knowledge include team-working arrangements (Bhardwaj & Monin, 2006; Swart & Kinnie, 2003), apprentice training programs (Nonaka & Takeuchi, 1995), and network relationships (Kalling, 2003).

Personalization as a strategy for knowledge management facilitates the opportunity for workers to dialogue, question, probe, and clarify; this allows workers to assess relevance in relation to the context in which the knowledge is applied (Gray & Meister, 2005). Personalization is the most prevalent knowledge management strategy in the Swedish construction industry (Styhre, 2008) and in U.K. clinical medicine practices (Nicolini, Powell, Conville, & Martinez-Solano, 2008). Hansen et al. (1999) described the successful use of the personalization strategy in strategic consulting, health care, and high-tech organizations. In all cases, workers collaborate, exchange information, and share experiences using oral communication to solve complicated problems and interact in complex situations.

Exploitation strategies should reflect competitive strategy. An organization's knowledge management strategy should be aligned with its competitive strategy. Organizations that employ the codification strategy deal with similar client situations over and over again, rely on economies of scale and reuse, and hire large numbers of entry-level workers (Hansen et al., 1999). Organizations that follow the personalization strategy create highly customized solutions; rely on the sharing of expertise among colleagues, and hire small numbers of highly skilled workers (Hansen et al., 1999). An overview of how exploitation framework knowledge management strategies align with competitive strategies is presented in Table 1.

Table 1. *Managing Organizational Knowledge Within the Exploitation Framework*

	Codification strategy	Personalization strategy
Knowledge management considerations	Electronic knowledge management system rationalizes, stores, and distributes knowledge assets.	Knowledge management promotes tacit knowledge sharing among workers.
IT considerations	Information systems are high quality and fast and facilitate the reuse of explicit knowledge. Large investment in IT infrastructure to facilitate access to explicit knowledge.	System relies on worker expertise to translate guidance and advice in solving strategic issues. Low to moderate investment in IT infrastructure to facilitate sharing of tacit knowledge.
Personnel considerations	Hire workers who can prove capability to use knowledge base and reuse knowledge. Use Web-based training to train groups of workers. Reward workers for using and contributing to knowledge management system.	Hire workers who are comfortable with ambiguity and are adept at problem solving. Use on-the-job training to train individuals. Reward workers for proactively sharing knowledge.
Economic considerations	Reuse knowledge asset many times to address simple issues. Large teams with high worker-to-manager ratio. Organizational focus on generating revenue.	Custom knowledge assets to address complex issues. Small teams with a low worker-to-manager ratio. Organizational focus on high profit margins.

35

Exploration Framework

The *exploration framework* promotes innovation and the development of new intellectual capital (Curado, 2008). The learning organization is the strategy associated with this framework. Senge (2006) defined a learning organization as "an organization that is continually expanding its capacity to create its future" (p. 14). Learning organizations are those in which people persistently grow their capability through the "renewal of resources by configuring them into new capabilities and competencies" (Easterby-Smith & Prieto, 2008, p. 235). In a learning organization, new knowledge is created through experimentation and innovation, exchange of ideas, and sharing of new and existing knowledge (Cho et al., 2009; Curado, 2008; Senge, 2006). This approach, which combines both personal and codification strategies, promotes nimbleness and ongoing evolution and growth within the organization (Hovland, 2003; Raelin, 2008).

Prieto (2009) explained that the major components of a learning organization include organizational structure and organizational culture. These components are interdependent; structural and cultural approaches to learning and knowledge sharing were found to be difficult to separate (Moynihan & Landuyt, 2009). The structure of a learning organization should be dynamic in permitting, promoting, and making sense of new knowledge to encourage creativity, innovation, and the ability to adapt (DeJarnett, 1999; Hung, Lien, & McLean, 2009; March, 1991; Prieto, 2009). In creating this structure, a learning organization must possess dynamic capabilities and align its organizational processes effectively (Easterby-Smith & Prieto, 2008; Hung et al., 2009). Eisenhardt and Martin (2000) explained that dynamic capabilities are the "organizational

36

and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die" (p. 1107). Workers have the ability and expectation to continually learn and apply new knowledge to their specific contexts. As this expectation is achieved, learning becomes the norm for process improvement through the organization (Ciborra & Andreu, 2001; Kuei-Hsien, 2009; Zollo & Winter, 2002). The adaption of learning is supported by organizational processes that are designed to account for changes and contingencies related to internal and external environments, technology, and strategy (Hung et al., 2009; Lewin, 1999).

Culture is the core set of attitudes, practices, values, rituals, and codes that are shared and demonstrated across the organization (Tellis, Prabhu, & Chandy, 2009). Though culture is viewed as a complex, dynamic, and layered system, it is also widely regarded as a variable that can be managed and controlled by business leaders (Ogbonna & Wilkinson, 2003). As the willingness of workers to share information is related to the level of trust workers have in an organization (Hwang, 2008; Ipe, 2003; Moitra & Kumar, 2007), it is critical that cultural aspects are considered in supporting the establishment and evolution of a learning organization (Bennett, 2009; Prieto, 2009). A common organizational purpose established as part of the culture must be developed in a manner that includes participation across the organization (Prieto, 2009). Additionally, organizational communications should serve to reinforce the organization's confidence in its workers (Nelson, 1999; Shieh, 2011) by integrating past knowledge with the organizational vision while incorporating knowledge, ideas, beliefs, and potential reactions of workers within the organization (Bennett, 2009; Prieto, 2009).

37

Considerations in Adopting Knowledge Management Strategies

The act of trying to follow more than one predominant knowledge management strategy has been shown to be detrimental to an organization's success (Cho et al., 2009). Hansen et al. (1999) explained that "companies that use knowledge effectively pursue one strategy predominantly and use the second strategy to support the first" (p. 112). Organizations that focus on personalization should not invest heavily in technology solutions to collect explicit knowledge; conversely, organizations focusing on codification should not overinvest in systems that facilitate person-to-person interaction (Hansen et al., 1999). This is consistent with a study of knowledge management in the Portuguese banking industry, where Curado (2008) found that banks leveraged the codification strategy to support knowledge sharing among the majority of workers, while the smaller commercial department followed the personalization strategy to support innovative product development.

Larsen (2001) found that in some cases, the promotion of knowledge management tools and strategies hindered the facilitation of knowledge transfer. Without regular use and a focus on maintenance, electronic databases can become incomplete, grow out of date, or contain irrelevant knowledge (Donnelly, 2008). Alavi and Leidner (2001) raised concerns related to the decrease of worker knowledge acquisition and expertise development due to a dependency on knowledge management. Others have found that strict management and dogmatic strategies to codify and diffuse organizational knowledge were unsuccessful (Leonard-Barton, 1992; McKinlay, 2002). In some cases,

38

this was because knowledge management strategies were deployed at a global level and did not account for localized needs (Zander & Sorvell, 2000).

Organizations that work within the exploration framework and adopt the mantel of a learning organization must allow mistakes to occur to promote innovation and the creation of new knowledge (Bennett, 2009; Sanchez-Guitierrez et al., 2009). This philosophy is sometimes stated but not practiced. In a study of small- and medium-sized enterprises in Asia, workers reported that while their organizations claimed to be learning organizations, mistakes and failure were associated with poor performance evaluations, workers and teams being identified as incompetent and wasting organizational resources, which resulted in poor performance evaluations (Chan & Chao, 2008). Chan and Chao (2008) found that 54% of workers who participated in their study were unwilling to share knowledge because of either a lack of personal benefit or a threat of adverse consequences.

Benefits of Adopting Knowledge Management Strategies

While the considerations discussed earlier can be barriers to the organizational adoption of a knowledge management framework, the literature shows that organizations do experience tangible benefits when following a knowledge management strategy, regardless of the framework and strategy employed. Allameh and Abbas (2010) found a strong correlation between the adherence to a knowledge management framework and increased levels of innovation. Additionally, knowledge management strategies were found to improve research efficiency and effectiveness in university research centers

39

(Akhavan, Hosnavi, & Sanjaghi, 2009; Numprasertchai & Igel, 2005) and to reduce project time and cost of construction projects (Kivrak, Arslan, Dikmen, & Birgonul, 2008). An overview of specific benefits achieved through the adoption of the codification, personalization, and learning organization strategies is discussed subsequently.

Codification strategy benefits. The codification strategy has been shown to result in value for organizations that adopt it. Key, Thompson, and McCann (2009) showed that knowledge management practices most associated with improved market performance of the organization include a focus on improving operating efficiency and productivity while reducing duplication of effort. Hansen et al. (1999) reported that consulting, medical, and high-tech organizations that leverage the codification strategy have experienced annual growths from 20% to 87%, with correlating growths in revenue. Aaron (2009) described one company that achieved a return on investment of 20:1 through the implementation of an electronic knowledge management system designed to improve the efficiency and productivity of a global workforce.

Personalization strategy benefits. Similarly, organizations that subscribe to the personalization strategy also experience benefits. Hansen et al. (1999) described how a strategy consulting company that leverages the personalization strategy to solve complex client problems achieves daily fees that are 4 times the amount of those that leverage a codification strategy and focus on efficient reuse of knowledge to address client situations. Shih et al. (2010) found that by creating a place for meaningful knowledge sharing and collaboration, banks effectively created knowledge and boosted intellectual

40

capital. Liew (2008) showed that workers at a luxury car distributor in Taiwan successfully shared knowledge related to customers and distribution initiatives through personal interactions through planning meetings, event debriefings, and personal networks. Last, the personalization strategy, and specifically the phenomenon of person-to-person knowledge sharing, has been shown to result in tangible benefits for management, sales, customer service, manufacturing, and research and development departments within multinational organizations (Bjorkman, Barner-Rasmussen, & Li, 2004; Noorderhaven & Harzing, 2009; Persson, 2006; Schultz, 2003).

Learning organization strategy benefits. As a strategy for knowledge management, the learning organization has been shown to be successful in a number of industries. In a study of the Mexican hospitality industry, it was discovered that the combination of customer feedback and employee work experience contributed to organizational knowledge that informed policy and processes and improved institutional profit (Sanchez-Guitierrez et al., 2009). Trainor, Brazil, and Lindberg (2008) showed that by adopting the learning organization strategy, learning and knowledge sharing occurred among divisions of the U.S. Army that are not typically connected by organizational design or chain of command. Though the ability to calculate specific benefits of knowledge management practices is said to be difficult (Zar Wajidi & Asim, 2009), Chun, Sohn, Arling, and Granados (2009) demonstrated an annual benefit of $22.5 million at a rocket manufacturing company. The development of a searchable online knowledge base and the implementation of an internal yellow pages provided immediate

41

access to intellectual capital, identified knowledge experts, and promoted generative learning through expert dialogue among engineers.

Conclusion

Competition, shifting market conditions, and technology advances require organizations to accumulate, store, retain, and distribute knowledge among their workers so that they can intelligently respond to changes affecting the organization (Garvin, Edmondson, & Gino, 2008; Moynihan & Landuyt, 2009). As organizations grow to realize that knowledge developed by workers is one of their most valuable assets, they have to adopt frameworks and strategies to support the creation and dissemination of knowledge (Blankenship & Ruona, 2009; McCall et al., 2008). The knowledge management strategies of codification, personalization, and learning organization have been shown to help organizations promote knowledge sharing and achieve tangible results. Communities of practice are "an emerging organizational form that promises to complement existing structures and galvanize knowledge sharing, learning, and change" (Cho et al., 2009, p. 267).

<div align="center">

Communities of Practice

</div>

The success or failure of knowledge management as a tool to increase organizational performance is dependent on four main factors: (a) people, (b) culture, (c) leadership, and (d) process (Inkpen, 1996; Ruggles, 1998). In a study that examined over 100 knowledge management initiatives, it was found that though all factors acted as

<div align="center">

42

</div>

constraints, the top reasons why knowledge management initiatives failed were a lack of knowledge sharing among people and the absence of an organizational culture that supported knowledge sharing (Ruggles, 1998). The reluctance to share information can be diminished by an organization formally establishing and supporting communities of practice (Haney & Driggers, 2010). Studies by Johnson (2007) and Lesser and Storck (2001) found communities of practice to be an effective way for organizations to transfer tacit knowledge among workers and improve organizational performance.

Communities of practice (CoPs) are an emerging strategy for organizations that want to proactively support workers in creating, capturing, sharing, and applying knowledge in a way that benefits the organization (Wenger, McDermott, & Snyder, 2002). This section describes the three features common to all CoPs. This is followed by a discussion of considerations in establishing CoPs within organizations. The section concludes with an exploration of electronic CoPs.

The literature regarding CoPs is grounded in Lave and Wenger's (1991) work on situated learning and in Wenger's (1998) book describing CoPs as a theory of learning. Since that time, CoPs have been defined in a number of ways. Wenger et al. (2002) indicated that CoPs are "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interaction on an ongoing basis" (p. 4). Eckert and McConnel-Ginet (1992) defined CoPs as "an aggregate of people who come together around mutual engagement in an endeavor. Ways of doing things, ways of talking, beliefs, values, power relationships—in short, practices emerge in the course of this mutual endeavor" (p. 464). Last, Hemmasi

43

and Csanda (2009) simply described CoPs as "a method to promote organizational learning through information sharing" (p. 262).

CoPs have three features that must be consistently demonstrated for a group to be considered a CoP. These include *mutual engagement*, *joint enterprise*, and *shared repertoire* (Wenger, 1998; Wenger et al., 2002). These interdependent dimensions help CoP members exchange and experience knowledge, learn, and improve practice (Blankenship & Ruona, 2009).

Mutual Engagement

For a CoP to exist, its members must engage in regular interaction with one another (Davies, 2005). The purpose of CoPs is to build and exchange knowledge while developing the capabilities of members (Wenger, 2001). It is the relationship among members that facilitates member engagement in joint activities, sharing information, and supporting each other (Hemmasi & Csanda, 2009). While complementary in nature, CoPs are different from formal work groups, project teams, or information networks because membership is based on self-selection (Wenger & Snyder, 2000), established and maintained through social practices (Davies, 2005), and establishes power hierarchies only when and how members feel they make sense (Eckert & Wenger, 2005; Gee, 2005). The CoP is held together through member identification with group expertise and lasts as long as members possess an interest in maintaining the group (McWilliam, Kothari, Kloseck, Ward-Griffin, & Forbes, 2008). This is consistent with Davies (2005), who

44

explained that the heart of the CoP concept resides in the significance of doing things in a way that supports the establishment of member identities, which reinforces membership.

Joint Enterprise

Joint enterprise refers to the domain of focus in which CoP members share an interest and to which they commit (Wenger et al., 2002). An evolution of the team goal–based problem-solving approach (Kaplan & Norton, 1996), joint enterprise is defined by CoP members by the very act of the CoP pursing a specific area of focus (Wenger, 1998). The development of member knowledge is often focused on practical applications that cannot be separated from context (Blankenship & Ruona, 2009). Supporting this, Raelin (1997) provided an example of dairy delivery drivers who were highly accurate in solving dairy-related pricing problems but scored low on math tests requiring similar skills.

Shared passion and community focus build trust, which in turn supports knowledge sharing among members (Kokavcová & Malá, 2009). Hong and Sullivan (2009) explained that this is critical to the development of knowledge and capability for both CoP members and the community as a whole. One of the first documented examples of joint enterprise as a component of CoP is Orr's ethnography of machine repair representatives presented by Brown and Duguid (1991), which demonstrated how workers in a group that focused on a single domain were able to move the organization from a focus on process reengineering to a focus on knowledge management, knowledge dissemination, and innovation. The workers formed a CoP because as individuals, they

45

found it difficult to follow the repair manual provided to them (Brown & Duguid, 1991; Hemmasi & Csanda, 2009).

Shared Repertoire

Shared repertoire refers to the development and evolution of a shared practice among members that consists of shared resources, stories, styles, tools, language, and other artifacts (Davies, 2005; Wenger, 1998). This component of CoPs has been recognized as supporting knowledge management because CoPs develop a robust shared practice comprising resources, information, experiences, and tools (Hemmasi & Csanda, 2009). Droege and Hoobler (2003) demonstrated that CoPs can prevent the loss of tacit knowledge due to employee attrition in organizations by facilitating the opportunities and personal connections required for knowledge transfer and retention. James (2002) showed that CoPs helped organizations effectively change from traditional organizations to learning organizations. The notion of shared repertoire's relationship to knowledge management is highlighted by Perrott (2008), who explained that knowledge management is more than a simple repository of information because it should include the social context of others' experiences, with the goal of codifying how the dynamics of a given CoP apply within the context of the organization.

Establishing Communities of Practice in Organizations

Murray and Peyrefitte (2007) reminded us that "for firms to maximize the competitive advantage arising from knowledge, knowledge must be effectively

46

transferred within organizations" (p. 111). Though CoPs are said to evolve informally and reside on the periphery of standard practices (Cho et al., 2009), the literature points to a number of cases in which CoPs were purposefully established to provide business benefits to organizations.

Storck and Hill's (2000) case study of Xerox's Alliance Network CoP showed how the community resulted in a new knowledge management capability for the organization. Resources were provided to support and facilitate the CoP, and company leadership encouraged participation. The study revealed that the Alliance Network CoP added value to the organization by creating higher quality knowledge, effectively sharing knowledge across the organization, developing organizational capacity to handle unstructured problems, and increasing member efficacy and business acumen.

Wenger and Snyder (2000) provided an example of how formal CoPs drive business strategy at the World Bank. The organization established and supported formal CoPs as part of the bank's increased focus on knowledge management. This has helped the bank move beyond its role as a lending institution and establish itself as an expert source for economic development, which is part of the World Bank's continued growth strategy.

To determine the value that CoPs provide, Lesser and Storck (2001) conducted a study with seven organizations with active CoPs. Study organizations were large and complex and from multiple industries, including software, telecom, international banking, pharmaceutical, and chemical. Benefits resulting from CoPs were consistent in all organizations, including decreased learning curves for new employees, the ability to

47

respond more quickly to customer requests, reduced rework, and the creation of new products and services (Lesser & Storck, 2001; Trainor et al., 2008).

Electronic Communities of Practice

Though Gray and Meister (2005) argued that CoPs provide an opportunity for contextual situation-based knowledge exchange that cannot be achieved via technology, electronic CoPs are growing in prevalence (Chen, Chen, & Kinshuk, 2009). This is especially true in large multinational companies where person-to-person interaction is not viable (Hildreth, Kimble, & Wright, 2000; Lesser & Storck, 2001). Electronic CoPs were found to be part of the knowledge management strategy of corporations such as Chevron, Ford, Raytheon (Ellis, 2001), Shell (Haimila, 2001), and Caterpillar (Powers, 2004).

Other examples include the U.S. Army, IBM, and other international organizations. Trainor et al. (2008) developed a case study of the ArmyBaseCamp online CoP, which has over 500 members and facilitates mission-critical discussions and fosters ongoing research opportunities among otherwise disparate groups within the army. Gongla and Rizzuto (2001) described an electronic CoP at IBM with over 20,000 active members. Wenger and Snyder (2000) shared a case study of an international lab where members respond to practice-specific inquiries to solve complex customer problems within 24 hours. Last, Hildreth et al. (2000) described distributed CoPs in two large international organizations where members from Japan, the United Kingdom, and the United States shared knowledge, built skills, and developed new working strategies that were shared beyond the community.

48

A key consideration for electronic CoPs is the question of motivation. Similar to traditional CoPs, successful functioning of electronic CoPs requires active participation from the majority of members (Ardichvili, 2008). This includes participation in knowledge-exchange activities such as creating and posting content, posting questions, and participating in synchronous chats and virtual seminars (Ardichvili, Page, & Wentling, 2003; Fitzgerald & Feller, 2001; Hayes & Walsham, 2000). A number of recent studies showed that contributor motivations in electronic CoPs are split between self-interest and community-focused collaboration (Ardichvili, 2008; Wasko & Faraj, 2000, 2005). Though altruism is stated as a motivation in online CoPs, contributors were found to be individualistic and driven to participate by peer recognition, increased reputational stature, and potential career opportunities (Hars & Ou, 2002; Wasko & Faraj, 2000). Conversely, Wasko and Faraj (2005) found that contributors to wikis were motivated purely by collaboration. It has been suggested that this is because individual wiki contributions are incremental, organic, and incorporated into the existing body of knowledge (Prasarnphanich & Wagner, 2009). This is similar to Ardichvili et al. (2003), who found that members of electronic CoPs in large international organizations considered any knowledge developed by the members as public knowledge owned by the organization.

Conclusion

While once thought of as an informal group of members sharing a passion and developing knowledge around a specific area of focus (Wenger, 1998), CoPs have been

49

shown to be a source of competitive advantage for organizations (Ellis, 2001; Haimila, 2001; Powers, 2004; Trainor et al., 2008; Wenger & Snyder, 2000). Organizations seeking to leverage CoPs to create opportunities for knowledge creation and dissemination should seek to understand how workers use knowledge, skills, and competencies to perform their jobs and establish ways to facilitate the creation of tacit and explicit knowledge through culture (Ardichvili, 2002). Though the use of electronic CoPs may serve to connect global organizations (Hildreth et al., 2000; Lesser & Storck, 2001), they also require facilitation and active support from organizational leadership. The presence of technology resources can facilitate collaborative learning and knowledge sharing but cannot guarantee that it will occur (Cook-Craig & Sabah, 2009).

Summary

This literature review has provided a discussion of the theory of knowledge creation and the concept of intellectual capital. Knowledge management strategies and the use of CoPs as an approach for knowledge management were explored. Evidence has been provided through a review of studies and journal articles that knowledge management positively affects business performance and organizational strategy.

Knowledge creation is a way to help organizations meet the demands of the global market. Organizations positioned to address competition successfully are those that include a focus on intangible assets such as knowledge and information (Guthrie, 2001). The creation, accumulation, sharing, and integration of knowledge help an organization support ongoing operations and increase organizational value (Wu et al.,

50

2006). The result of these practices is intellectual capital (F-Jardón & Martos, 2009; Shih et al., 2010).

Although intellectual capital is often viewed as a source of strategic and competitive advantage, practitioners need resources to help them translate theory into practice. Realities such as the increase in digitized information and globalization and the growing complexity of business require companies to translate successfully espoused theories into theories-in-use that are actionable by workers and support organizational learning. These intangible assets are key in helping knowledge workers connect their work to shareholder, company, or organizational value (Cho et al., 2009; McLean, 2009; Nafukho, 2009; Perrott, 2008). As organizational growth and position are based on intellectual capital, organizational leaders need tools and frameworks to support the analysis, design, development, identification, evaluation, and management to drive value creation and manage knowledge effectively (Schiuma et al., 2008).

Competition, shifting market conditions, and technology advances require organizations to accumulate, store, retain, and distribute knowledge among their workers so that they can intelligently respond to changes affecting the organizations (Garvin et al., 2008; Moynihan & Landuyt, 2009). As organizations grow to realize that knowledge developed by workers is one of their most valuable assets, they have to adopt frameworks and strategies to support the creation and dissemination of knowledge (Blankenship & Ruona, 2009; McCall et al., 2008). The knowledge management strategies of codification, personalization, and learning organization have been shown to help organizations promote knowledge sharing and achieve tangible results. CoPs are "an

51

emerging organizational form that promises to complement existing structures and galvanize knowledge sharing, learning, and change" (Cho et al., 2009, p. 267).

While once thought of as an informal group of members sharing a passion and developing knowledge around a specific area of focus (Wenger, 1998), CoPs have been shown to be a source of competitive advantage for organizations (Ellis, 2001; Haimila, 2001; Powers, 2004; Trainor et al., 2008; Wenger & Snyder, 2000). Organizations seeking to leverage CoPs to create opportunities for knowledge creation and dissemination should seek to understand how workers use knowledge, skills, and competencies to perform their jobs and establish ways to facilitate the creation of tacit and explicit knowledge through culture (Ardichvili, 2002). Though the use of electronic CoPs may serve to connect global organizations (Hildreth et al., 2000; Lesser & Storck, 2001), they also require facilitation and active support from organizational leadership. The presence of technology resources can facilitate collaborative learning and knowledge sharing but cannot guarantee that it will occur (Cook-Craig & Sabah, 2009).

Although a number of studies have been conducted, knowledge management is still a relatively young field of research. Within the last 15 years, knowledge management has been noted as a viable tool to increase organizational performance (Haney & Driggers, 2010). Subramaniam and Venkatraman (2001) showed that employees play a critical role in the sharing of tacit knowledge to improve collective performance. When tacit knowledge of group members is successfully incorporated and put to use toward the achievement of efficiency and productivity of group members, it positively affects the performance of the organization (Hollensbe & Guthrie, 2000; Kieslinger et al., 2009).

52

This phenomenon was examined by testing a hypothesis that posited that there is a significant statistical relationship ($p \leq .05$) between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes (Survey Question 2E) and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices (Survey Question 3C).

The relationship between knowledge management and HPI will continue to evolve as internal and external pressure on organizations continues to evolve. Haney (2006) wrote that

> in the early 1970s, nobody was talking about knowledge management. In 2025, perhaps nobody will be talking about it, except for historians. However, the challenge in managing effective and purposeful communication of what individuals know in organizations will remain (Drucker, 1993). The actions involved in [knowledge management], even if they are termed organizational development actions, or another type of HPT [Human Performance Technology] intervention, will be an ongoing part of organizational success. HPT has a role in those actions, whatever they are called, and HPT professionals have a stake in that success. (p. 619)

This study added to the body of knowledge because it determined the reasons HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attributed to using knowledge management practices to increase organizational performance.

CHAPTER 3. METHODOLOGY

Introduction

This study identified the reasons HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attributed to using knowledge management practices to increase organizational performance within their organizations. This chapter describes the study design, including the research design strategy, sampling design, procedures for data collection, instrumentation, field testing of the instrument, procedures for data analysis, and study limitations.

Research Design Strategy

This quantitative study identified the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. The study was conducted using survey research methods. A quantitative survey design was appropriate because surveys are used to obtain information on beliefs, attitudes, and opinions. Creswell (2008) indicated that surveys are appropriate as a research design to describe trends, determine relationships, or compare groups.

The quantitative survey questions were descriptive in nature. Descriptive research is an exploratory and nonexperimental form of quantitative research (Johnson & Christensen, 2008). Descriptive research and analysis can aid in learning about and describing the reasons HPI practitioners use knowledge management practices and the

level of effectiveness of using knowledge management practices to increase organizational performance. Numerical indexes, such as averages, percentages, and measures of spread, can be calculated, and variables can be summarized one at a time or examined for interrelationships. The research hypothesis was evaluated using Pearson chi-square analysis. This is consistent with other quantitative descriptive exploratory studies (Weimer, 2006) and is supported by Johnson and Christensen (2008), who wrote that

> the primary purpose of descriptive research is to provide an accurate description or picture of the status or characteristics of a situation or phenomenon. The focus is not on how to ferret out cause-and-effect relationships but rather on describing the variables that exist in a given situation. (p. 377)

The survey was distributed to determine the reasons HPI practitioners use knowledge management practices and the level of effectiveness they attribute to using knowledge management practices to increase organizational performance. The survey was designed to be completed electronically using SurveyMonkey in 10 min or less. The survey design was cross-sectional because data were collected at one point in time and represented current beliefs, attitudes, and opinions of HPI practitioners regarding the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. In survey research design, the researcher collects all data at a single point in time, analyzes all study participants as a single group, and draws conclusions from statistical results (Alden, 2007; Creswell, 2003, 2008). The data collection instrument for this study was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada that has been evaluated for validity and reliability (Earl,

55

2002, 2003, 2005). The purpose of the survey was to determine the reasons HPI

practitioners use knowledge management practices and the level of effectiveness of using

knowledge management practices to increase organizational performance.

Research Questions and Hypothesis

This quantitative study was designed to answer the following questions:

1. For what reason do HPI practitioners use knowledge management practices?
2. How effective are knowledge management practices in increasing organizational performance?

On the basis of a review of the literature, the following hypothesis was tested:

Hypothesis: There is a significant statistical relationship ($p \leq .05$) between HPI

practitioner perception regarding the use of knowledge management to

increase efficiency by using knowledge to improve production processes

and HPI practitioner perception of the improvement of worker efficiency

and/or productivity through knowledge management practices.

Null hypothesis: There is no significant statistical relationship between HPI

practitioner perception regarding the use of knowledge management to

increase efficiency by using knowledge to improve production processes

and HPI practitioner perception of the improvement of worker efficiency

and/or productivity through knowledge management practices.

Sampling Design

The specific population for this study included HPI practitioners. The sampling frame of this population included members of two professional organizations for HPI practitioners. Both professional organizations serves individuals who focus on training, organizational design, performance consulting, instructional design, management and technical training, and continuing education. Contacts for the study were obtained through two main channels. First, a link to an electronic survey Web site was sent via e-mail to members from organizational leadership. Second, the survey was promoted via newsletters from each organization. Convenience sampling was used to obtain a study sample. In convenience sampling, the researcher selects participants who are willing to participate in the study; this is a practical way to collect information (Creswell, 2008).

Simon and Francis (2001) indicated that there are five aspects that can affect sample size, including (a) population size, (b) purpose of the study, (c) utilization of study results, (d) statistical tests that will be applied to the research, and (e) the overall research design. Salkind (2003) discussed the notion that a sample that is too small will result in a high degree of sampling error, whereas samples that are too large are cumbersome and could result in sampling that is "uneconomical and inefficient" (p. 95). To address a high proportion of nonresponders, Salkind (2003) recommended that the researcher consider "increasing . . . sample size by 40% to 50%" (p. 96). Although Creswell (2008) suggested a sample size of 350 respondents for a survey study, he did indicate that a number of factors must be considered when establishing the size of the sample.

57

Determining an appropriate sample size can be achieved through the use of formulas. Bartlett, Kotrlik, and Higgins (2001) indicated that Cochran's formula is suitable for establishing the sample size of survey research. The formula uses margin of error and alpha level to determine sample size. A 5% margin of error and an alpha level of .05 are appropriate for most research studies (Bartlett et al., 2001). With a population of approximately 1500 HPI practitioners, the sample size to achieve 90% confidence for this study should be 230.

It was anticipated that the response rate would be approximately 15%. This is consistent with the response rates for electronically distributed surveys to similar audience groups (Aguiar, 2009; Deutskens, de Ruyter, Wetzels, & Oosterveld, 2004; Holland, Smith, Hasselback, & Payne, 2010). Creswell (2008) indicated that response rates are influenced by appropriate notification and promotion for the study, respondent interest in the study and the quality of the instrument. These approaches were used to support an adequate survey response rate. Survey participants were solicited via an e-mail from organizational leaders that contained a brief cover letter and a link to the electronic survey. It was anticipated that potential participants would be interested in the study due to their work avocation and participation in a related professional organization. The instrument was designed to be completed quickly and easily.

Instrument

This study sought to identify the reasons HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attribute to using

58

knowledge management practices to increase organizational performance. Additionally, demographics information of HPI practitioners was gathered. Given the lack of research conducted on this topic, the results of this research provide insights regarding HPI practice that could be used to enhance education and professional development programs designed to develop HPI competence, while informing decisions made by HPI practitioners regarding the use of knowledge management as an intervention to improve organizational performance.

The data collection instrument for this study (see the appendix) was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada that was created using SurveyMonkey, which allowed for the distribution and collection of survey data using the Internet. Creswell (2008) indicated that Internet-based surveys "provide a quick, easy form of data collection" (p. 396). Permission to use the survey was provided by Statistics Canada.

Earl (2002) explained that "the survey is based on in-use/planned-use identification of a series of knowledge management practices" (p. 27), followed by questions designed to capture the reasons for and effectiveness of using knowledge management practices to increase organizational performance. The survey comprised four sections: (a) use of knowledge management practices, (b) reasons for using knowledge management, (c) effectiveness of using knowledge management to increase organizational performance, and (d) employment structure.

Section 1: Use of Knowledge Management Practices

Section 1 of the survey was designed to determine if knowledge management practices are employed by the business organizations to which respondents belonged. This section comprised 23 statements in six areas to identify in-use and planned-use knowledge management practices. The statements, designed to determine the use of knowledge management practices, were validated by the literature review (Isaac et al., 2009; Leonard, 2007; Nonaka & Toyama, 2007; Paavola et al., 2004; Pearse, 2009; Schilhab, 2007; Shih et al., 2010; Solitander & Tidström, 2010; Sveiby, 2001b).

A question was included to identify additional practices not included in the survey. Respondents who indicated that practices were "in use" were directed to continue to Section 2. Respondents who indicated that they did not use any of the practices listed in the first section were skipped to Section 4.

Section 2: Reasons for Using Knowledge Management

Section 2 was designed to answer the research question regarding HPI practitioners' perceptions of the reasons for using knowledge management in business organizations. This section comprised 12 statements to be rated on a 4-point Likert-type scale ranging from 1 (*important*) to 4 (*critical*). The statements were developed to measure the reasons for using knowledge management practices and were supported by information presented in the literature review (Bierly & Daly, 2002; Blankenship & Ruona, 2009; Cameron, 2000; Cohen & Pruzac, 2001; McCall et al., 2008; Nahapiet & Ghoshal, 2002; Stewart, 1997; Wiig, 1997; Winter & Szulanski, 2001).

60

Section 3: Effectiveness of Knowledge Management Practices

Section 3 was designed to answer the research question regarding HPI practitioners' perceptions of the level of effectiveness for knowledge management practices in business organizations. This section comprised 14 statements to be rated on a 4-point Likert-type scale ranging from 1 (*not at all effective*) to 4 (*very effective*). The statements were developed to measure the effectiveness of using knowledge management practices. The statements presented in this section aligned with the discussion presented in the literature review (Boyce et al., 2008; Davenport & Klahr, 1998; Hansen et al., 1999; McCall et al., 2008; Perrott, 2008; Zollo & Winter, 2002).

Section 4: Background Information

Section 4 comprised multiple-choice questions designed to gather background and employment information on study participants. This included information on the employment structure of respondents' organizations, respondents' years of experience in the HPI field, respondents' professional organization affiliations, and gender. The design for this section of the survey was informed by previous studies (Becher-Young, 2010) and by the instrument field trial test.

<div align="center">

Survey Modification

</div>

The data collection instrument for this study was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada. The survey, which was developed in 2001, was originally used to determine the practices Canadian businesses used to support the sharing, transfer, acquisition, and retention of

61

knowledge (Earl, 2002, 2005). The survey was also previously used to gauge project manager perceptions of knowledge management practices in the pharmaceutical industry (Aguiar, 2009). This study is differentiated from other studies using this survey because it provided an accurate portrayal of the reasons HPI practitioners use knowledge management practices. Additionally, it identified HPI practitioners' views on the level of effectiveness of using knowledge management practices to increase organizational performance.

The survey was modified in four key areas: (a) dates related to knowledge management practices in Section 1 were changed from 1999 to 2008 to reflect current time frames; (b) the language was changed from British English to American English; (c) demographic questions were added to determine the HPI experience of respondents; and (d) questions related to responsibility, organizational measures, incentives, sources, spending, and resistance to knowledge management were eliminated from the survey.

Reliability and Validity

Reliability and *validity* are an important part of research design and instrument selection. Salkind (2003) explained that "reliability is when a test measures the same thing more than once and results in the same outcomes" (p. 108). Creswell (2008) indicated that validity "means that the individual's scores from an instrument make sense, are meaningful, and enable you, as the researcher, to draw good completing from the sample you are studying" (p. 169). There is a strong relationship between reliability and validity because while "a test can be reliable but not valid, a test cannot be valid without

62

first being reliable. In other words, reliability is a necessary, but not sufficient, condition of validity" (Salkind, 2003, p. 120).

The data collection instrument for this study was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada in collaboration with nine economic development, statistics, and knowledge management research organizations in Canada, Norway, Germany, France, the Netherlands, Sweden, Italy, and the United States and has been evaluated for reliability and validity (Earl, 2002). The survey design is based on the Oslo Manual, which outlines guidelines for collecting and interpreting data that "allow for the production of internationally comparable, meaningful indicators" (Earl, 2005, p. 31) and provides a framework to assist researchers in leveraging existing surveys for future studies (Earl, 2005).

The pilot study of the survey conducted by Statistics Canada found that data reliability was very high, with a measure of standard error of ≤2.5% from 348 respondents (Earl, 2002, 2003). To determine validity, Statistics Canada performed cognitive testing of the survey through extensive interviews to ensure that the questions were well understood in English and French; similar tests were conducted in Germany and Denmark (Earl, 2002). Feedback from respondents was incorporated into the design of the questionnaire (Earl, 2002, 2003).

Data Collection Procedures

An electronic survey was distributed to HPI practitioners to explore the research questions for this study. The items on the questionnaire were designed to gather specific

information related to the research questions. Table 2 shows the relationship between the research questions, the data collection method, and the data analysis procedures.

The electronic survey was sent to members of two HPI professional organizations via an e-mail from organizational leadership. The e-mail included an overview of the study, a request for participation, a statement that data would be collected over a 2-week period, and a link that directed participants to SurveyMonkey.

Table 2. *Data Collection and Analysis Procedures for Research*

Research question/hypothesis	Data collection method	Data analysis procedure
For what reasons do HPI practitioners use knowledge management practices?	Survey section 2	Descriptive statistics, factor analysis
How effective are knowledge management practices in increasing organizational performance?	Survey section 3	Descriptive statistics, factor analysis
Hypothesis: There is a significant statistical relationship ($p \leq .05$) between the use of knowledge management to increase efficiency by using knowledge to improve production processes and the improvement of worker efficiency and/or productivity through knowledge management practices.	Survey questions 2E and 3C	Cross-tabulation, chi-square

Upon entering SurveyMonkey, participants saw a description of the study, an assurance that survey responses would be anonymous, and a statement that participants would provide their consent to participate in the study by proceeding to the next page of the survey. Respondents answered survey questions, and responses were stored on the secure SurveyMonkey server. Results were downloaded from SurveyMonkey to a Microsoft Excel spreadsheet.

64

Ethical Issues

The survey instrument included an opening statement that explained confidentiality and human subject requirements and requested respondents' consent to participate in the study. SurveyMonkey (n.d.) will support confidentiality and respondent privacy because the company

> utilizes some of the most advanced technology for Internet security commercially available today. When a user accesses secured areas of our site, Secure Sockets Layer (SSL) technology protects user information using both server authentication and data encryption, ensuring that user data is [*sic*] safe, secure, and available only to authorized persons. In addition, SurveyMonkey is hosted in a secure data center environment that uses a firewall, intrusion detection systems, and other advanced technology to prevent interference or access from outside intruders. The data center is a highly protected environment with several levels of physical access security and 24-hour surveillance.

The study was submitted for approval to the Capella University Institutional Review Board to ensure compliance with federal guidelines regarding research with human subjects. The researcher will protect all personal information of study participants. Data will be stored in a locked safe for a period of 7 years, after which it will be destroyed.

Field Testing

The data collection instrument for this study was a survey developed by the Science, Innovation, and Electronic Information Division of Statistics Canada that has been evaluated for validity and reliability (Earl, 2002, 2003, 2005). For use in this study, the researcher made changes to demographic questions and date ranges, converted survey language from British to American English, and eliminated questions not related to study parameters. Because of these changes, the survey was field tested with HPI practitioners

65

to evaluate readability and language use (Gall et al., 2007). An e-mail request for participation was sent to 10 HPI practitioners, which is consistent with field studies for similar sample populations and sizes (Becher-Young, 2010). Participants were asked to provide feedback on readability and language use for questions where language changed from British to American English and to provide general feedback on demographic questions. Feedback was collected by e-mail and was used to make adjustments to the survey.

The field test participants identified two formatting errors, which were addressed in the final instrument. Additionally, feedback received indicated that the demographics section was too lengthy, resulting in the removal of four questions focusing on industry, background, ethnicity, and department in which participants worked because these data were not required to answer the research questions for this study. Finally, field trial participants recommended adding a question to collect participants' years of experience as training, human performance, or knowledge management professionals.

Data Analysis Procedures

The results of the survey provided an overview of the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. Collected data were retrieved from the electronic survey and uploaded into Microsoft Excel. The software package SPSS was used to conduct statistical tests. Nonparametric statistical analysis focusing on descriptive statistics was used to determine the frequency, mean, and mode

of the Likert-type scale responses for each statement presented within each question. This approach to data analysis is consistent with other studies using the same instrument (Aguiar, 2009; Earl, 2002, 2005). Factor analysis was used to determine principle components related to each research question. Cross-tabulation and chi-square analysis were used to test the study hypothesis. An external statistician reviewed and corroborated the statistics.

Limitations

Limitations of this study included the convenience sampling methodology, a sampling design that included only members of the target professional organizations, and sampling error.

The primary focus of this study was to determine the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. The convenience sampling technique was intended to include only study participants who are HPI practitioners. The sampling design of including members of two specific professional organizations as potential participants eliminated collection of data from HPI practitioners who are not members of these organizations. This could have led to *sampling error*, which is the difference between an estimate derived from sample data and the value obtained through a survey of an entire population (Earl, 2005). To mitigate sampling error, Creswell (2008) explained that a researcher should choose as large a sample as possible. It was anticipated that any risks related to sampling error were mitigated due to use of Cochran's formula to

67

determine sample size (Bartlett et al., 2001). Should the survey achieve a response rate lower than 230, it would result in a lower confidence level and findings which may not be accurately generalized to the target population.

Summary

As discussed in this chapter, this study intended to identify the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. This chapter described the study design, including the research design strategy, sampling design, procedures for data collection, instrumentation, field testing of the instrument, procedures for data analysis, and study limitations.

CHAPTER 4. DATA COLLECTION AND ANALYSIS

Introduction

This study sought to identify the reasons HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance within their organizations. This study also sought to determine if there was a relationship between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes (Survey Question 2E) and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices (Survey Question 3C).

In this quantitative study, members of two HPI professional organizations were invited to participate in the survey both through e-mails from organizational leadership and through advertisements in both organizations' monthly newsletters. Ninety-one individuals began the survey, and a total of 74 respondents completed the survey. Survey responses were downloaded from SurveyMonkey into a Microsoft Excel spreadsheet. Incomplete surveys were identified and removed from the data set. Frequencies, mode, mean, factor analysis, cross-tabulation, and chi-square values were calculated with SPSS. An external statistician reviewed and corroborated the statistics.

This chapter consists of eight sections. The first section describes demographics of study participants. The second section presents knowledge management practices used by participants. The third and fourth sections analyze the research questions using

69

nonparametric statistical analysis focusing on descriptive statistics, including the frequency, mode, and scoring mean of the Likert-type scale responses. The fifth section tests the hypothesis through a parametric statistical analysis using the chi-square statistic. The sixth section describes post hoc analysis conducted by the researcher. The seventh and eighth sections provide a summary of the results and the chapter conclusion.

Participant Demographics

Of the 91 individuals who began the survey, 74 respondents completed the survey, resulting in an 81.3% survey completion rate. Of respondents who completed the survey, 60.8% were women and 39.2% were men. The majority of participants reported working for companies with 4999 or fewer employees. Of respondents, 59.5% reported working for a global organization, and 51.3% have between 6 and 15 years of experience in the fields of training, human performance, and/or knowledge management. All participants were members of the two target professional organizations. Table 3 summarizes the demographics of the participants.

Table 3. *Participant Demographics* (N = 74)

Variable	Frequency	%
Gender		
Male	29	39.2
Female	45	60.8

Table 3. (*continued*)

Variable	Frequency	%
Global organization		
Yes	44	59.5
No	30	40.5
Total Employees		
1–4999	31	41.9
5000–9999	10	13.5
10,000–24,999	7	9.5
25,000–49,999	5	6.8
50,000–74,999	9	12.2
75,000–99,999	7	9.5
Over 100,000	5	6.8
Years of experience in training, human performance, and/or knowledge management		
0–5	11	14.9
6–10	22	29.7
11–15	16	21.6
16–20	12	16.2
21–25	5	6.8
26 or more	8	10.8
Membership		
Professional Organization 1	27	36.5
Professional Organization 2	31	41.9
Both Professional Organizations 1 and 2	16	21.6

71

Knowledge Management Practices: Survey Section 1

Section 1 of the survey was designed to determine the reasons HPI practitioners employ knowledge management practices. This section comprised 23 statements in six areas to identify in-use and planned-use knowledge management practices. Of the 23 statements designed to identify knowledge management practices within the participant's organization, the knowledge management practice most frequently selected was related to training and mentoring (87.8%). Responses for the first section of the survey are summarized in Table 4. The mode and median for each statement are identified. Because there are an even number of observations and no single middle value, the median presented is the mean of the two middle values for each statement. As the purpose of the questions related to knowledge management practices was to qualify study participants to provide data that answered the research questions, these questions were not designed to be scored. For this reason, the mean was not calculated.

The results for mode demonstrate that knowledge management practices related to policies and strategies, knowledge capturing and acquisition, training and mentoring, and communication were more likely than not to be present in participants' organizations prior to 2008. Similarly, leadership for knowledge management was reported to be the responsibility of executives, managers, and nonmanagement workers since 2008 for the majority of participants' organizations. Last, mode results demonstrated that the majority of participants did not report that their organizations provide monetary incentives to promote knowledge sharing.

72

Table 4. *Knowledge Management Practices* (N = 74)

Knowledge management practice	In use before 2008		Used since 2008		Plan to use in next 24 months		Don't know/not applicable		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Policies and strategies									
Your organization:									
has a written knowledge management policy or strategy	32*	43.2	12	16.2	10	13.5	20	20.7	16
has a value system or culture intended to promote knowledge sharing	42*	56.8	18	24.3	6	8.1	8	10.8	13
has policies or programs intended to improve worker retention	43*	58.1	10	13.5	4	5.4	17	23	13.5
uses partnerships or strategic alliances to acquire knowledge	46*	62.2	15	20.3	4	5.4	9	12.2	12
Leadership									
In your organization, knowledge management practices are:									
a responsibility of managers and executives	42*	56.8	11	14.9	4	5.4	17	23	14
a responsibility of nonmanagement workers	36*	48.6	11	14.9	4	5.4	23	31.1	17
a responsibility of the knowledge officer or knowledge management unit	31	41.9	3	4.1	6	8.1	34*	45.9	18.5
explicitly criteria for assessing worker performance	21	28.4	10	13.5	7	9.5	36*	48.6	15.5
Incentives									
Your organization rewards knowledge sharing with:									
monetary incentives	14	18.9	4	5.4	2	2.7	54*	73	9
nonmonetary incentives	27	36.5	9	12.2	5	6.8	33*	44.6	18

73

Table 4. (*continued*)

Knowledge management practice	In use before 2008		Used since 2008		Plan to use in next 24 months		Don't know/not applicable		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	

Knowledge capture and acquisition

Your organization regularly:

captures and uses knowledge obtained from other industry sources such as industrial associations, competitors, clients, and suppliers	56*	75.7	6	8.1	2	2.7	10	13.5	8
captures and uses knowledge obtained from public research institutions, including universities and government laboratories	44*	59.5	7	9.5	1	1.4	22	29.7	14.5
dedicates resources to detecting and obtaining external knowledge and communicating it within your organization	45*	60.8	3	4.1	5	6.8	21	28.4	13
encourages workers to participate in project teams with external experts	35*	47.3	7	9.5	1	1.4	31	41.9	19

Training and mentoring

Your organization:

provides formal training related to knowledge management practices	30*	40.5	13	17.6	6	8.1	25	33.8	19
provides informal training related to knowledge management practices	41*	55.4	18	24.3	4	5.4	11	14.9	14.5
uses formal mentoring practices, including apprenticeships	29*	39.2	9	12.2	9	12.2	27	36.5	18
encourages experienced workers to transfer their knowledge to new or less experienced workers	49*	66.2	13	17.6	5	6.8	7	9.5	10

74

Table 4. (*continued*)

Knowledge management practice	In use before 2008		Used since 2008		Plan to use in next 24 months		Don't know/not applicable		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
encourages workers to continue their education by reimbursing tuition fees for successfully completed work-related courses	65*	87.8	2	2.7	1	1.4	6	8.1	4
offers off-site training to workers in order to keep skills current	60*	81.1	2	2.7	1	1.4	11	14.9	6.5
Communications									
In your organization, workers share knowledge or information by:									
regularly updating databases of good work practices, lessons learned, or listening to experts	40*	54.1	11	14.9	8	10.8	15	20.3	9.5
preparing written documentation such as lessons learned, training manuals, good work practices, articles for publication, etc. (organizational memory)	50*	67.6	10	13.5	3	4.1	11	14.9	10.5
facilitating collaborative work by project teams that are physically separated ("virtual teams")	42*	56.8	16	21.6	3	4.1	13	17.6	14.5

*Mode.

Of the 74 participants, a total of 71 respondents indicated that their organizations used knowledge management practices (Survey Section 1) and were directed to complete the sections of the survey that addressed the research questions for this study. Three respondents indicated that their organizations did not use any of the practices listed in the first section. Per the original survey design, these respondents were directed to complete the demographics section and did not complete the remaining portions of the survey.

75

Reasons for Using Knowledge Management: Survey Section 2

The first research question asked, For what reasons do HPI practitioners use knowledge management practices? To address this question, participants were asked to respond to 12 statements by rating the level of importance of each statement on a 4-point Likert-type scale, with answers ranging from 1 (*not at all important*) to 4 (*critical*). Table 5 provides a summary of the level of importance participants attributed to each reason for using knowledge management practices.

The results for median and mode demonstrate that the majority of participants felt that the reasons for using knowledge management practices were critical or very important. Of the 71 participants, 66.2% ranked improving competitive advantage of the organization as the most critical reason for using knowledge management practices; 59.2% of participants ranked helping to integrate knowledge within the organization as the second most critical reason for using knowledge management practices.

Table 5. *Reasons for Using Knowledge Management Practices* (N = 71)

Reason	Critical		Important		Somewhat important		Not at all important		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
A. To improve competitive advantage of your organization	47*	66.2	18	25.4	3	4.2	3	4.2	10.5
B. To help integrate knowledge within your organization	42*	59.2	26	36.6	3	4.2	0	0.0	14.5
C. To improve the capture and use of knowledge from sources outside your organization	15	21.1	36*	50.7	17	23.9	3	4.2	16

76

Table 5. (*continued*)

Reason	Critical		Important		Somewhat important		Not at all important		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
D. To improve sharing or transferring knowledge with partners in strategic alliances, joint ventures, or consortia	13	18.3	28*	39.4	24	33.8	6	8.5	18.5
E. To increase efficiency by using knowledge to improve production processes	39*	54.9	27	38.0	4	5.6	1	1.4	15.5
F. To protect your organization from loss of knowledge due to workers' departure	33*	46.5	25	35.2	7	9.9	6	8.5	16
G. To train workers to meet strategic objectives of your organization	34*	47.9	29	40.8	7	9.9	1	1.4	18
H. To increase worker acceptance of innovations	17	23.9	33*	46.5	16	22.5	5	7.0	16.5
I. To improve worker retention	20	28.5	27*	38.0	15	21.1	9	12.7	17.5
J. To identify and/or protect strategic knowledge present in your organization	29	40.8	32*	45.1	6	8.5	4	5.6	17.5
K. To ease collaborative work of projects or teams that are physically separated (i.e., different work sites)	21	29.6	28*	39.4	14	19.7	8	11.3	17.5
L. To promote sharing or transferring knowledge with clients or customers	15	21.1	36*	50.7	15	21.5	5	7.0	15

*Mode.

77

Per the research design, statements were also analyzed to determine the mean score for each statement. The statements were rated on a 4-point Likert-type scale ranging from 1 (*not at all important*) to 4 (*critical*). Table 6 shows the score for each response presented in order of highest mean to lowest mean.

The range for the mean scores related to the reasons for using knowledge management practices is .73. The mean scores show that the three highest ranked reasons to use knowledge management practices included helping to integrate knowledge within an organization, improving the competitive advantage of an organization, and increasing the efficiency of workers to improve production processes. The three lowest ranked reasons for using knowledge management were to ease collaborative work of physically separated project teams, to promote sharing or knowledge transfer with clients and customers, and to improve worker retention.

Table 6. *Mean Score for Importance of Reasons for Using Knowledge Management Practices* (N = 71)

Reason	Mean score
B. To help integrate knowledge within your organization	3.55
A. To improve the competitive advantage of your organization	3.54
E. To increase efficiency by using knowledge to improve production processes	3.46
G. To train workers to meet strategic objectives of your organization	3.35
J. To identify and/or protect strategic knowledge present in your organization	3.21
F. To protect your organization from loss of knowledge due to workers' departures	3.20

Table 6. (*continued*)

Reason	Mean score
C. To improve the capture and use of knowledge from sources outside your organization	2.89
H. To increase worker acceptance of innovations	2.87
K. To ease collaborative work of projects or teams that are physically separated (i.e., different work sites)	2.87
L. To promote sharing or transferring knowledge with clients or customers	2.86
I. To improve worker retention	2.82

Factor Analysis

To answer the first research question, exploratory factor analysis using principal component analysis (PCA) with varimax rotation was used to identify and extract significant factors related to the reasons HPI practitioners use knowledge management practices. First, the factor analysis was performed to extract as many factors as indicated by the data. Table 7 provides an overview of the total values, component variance, and cumulative variance for the initial eigenvalues; the extraction sum of squared loadings; and the rotational sum of squared loadings. The Kaiser criterion prescribes that only factors with eigenvalues greater than 1 should be retained as common factors and that factors with eigenvalues less than 1 should be considered for deletion (George & Mallery, 2007). On the basis of the Kaiser criterion, the results of the PCA factor analysis suggested that two factors with a cumulative variance of 51.453% should be retained.

Table 7. *Factor Analysis Total Variance Explained for Reasons of Using Knowledge Management Practices*

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cum. %	Total	% of variance	Cum. %	Total	% of variance	Cum. %
1	4.555	37.955	37.955	4.555	37.955	37.955	3.510	29.251	29.251
2	1.620	13.498	51.453	1.620	13.498	51.453	2.664	22.202	51.453
3	0.995	8.296	59.748						
4	0.968	8.065	67.814						
5	0.926	7.713	75.527						
6	0.755	6.294	81.821						
7	0.464	3.865	85.686						
8	0.429	3.574	89.261						
9	0.398	3.313	92.574						
10	0.350	2.917	95.491						
11	0.331	2.762	98.252						
12	0.210	1.748	100.000						

Note. Extraction method was principal component analysis.

A review of the literature and analysis of the items associated with each factor was conducted and resulted in each factor being assigned a name. The first factor was called *human capital enablement*, and the second factor was named *sharing and integrating knowledge*. With a Kaiser-Mayer-Olkin sampling adequacy measure of .793, the results of the PCA factor analysis were adequate in providing an answer to the first

80

research question of this study: For what reasons to HPI practitioners use knowledge

management practices (George & Mallery, 2007). Table 8 describes the factors resulting

from the PCA along with the related components and survey item descriptions.

Table 8. *Factors, Components, and Survey Items for Reasons of Using Knowledge Management Practices*

| | Component | | |
Factor	1	2	Survey item
Human capital enablement	.754	.261	I. To improve worker retention
	.744	.277	F. To protect your organization from loss of knowledge due to workers' departures
	.732	.141	H. To increase worker acceptance of innovations
	.706	.161	K. To ease collaborative work of projects or teams that are physically separated (i.e., different work sites)
	.615	–.124	E. To increase efficiency by using knowledge to improve production processes
	.600	.171	G. To train workers to meet strategic objectives of your organization
	.464	.411	J. To identify and/or protect strategic knowledge present in your organization

Table 8. (*continued*)

Factor	Component 1	Component 2	Survey item
	.424	.274	A. To improve the competitive advantage of your organization
Sharing and integrating knowledge	–.022	.861	C. To improve the capture and use of knowledge from sources outside your organization
	.073	.796	L. To promote sharing or transferring knowledge with clients or customers
	.347	.744	D. To improve sharing or transferring of knowledge with partners in strategic alliances, joint ventures, or consortia
	.307	.507	B. To help integrate knowledge within your organization

The first research question yielded data regarding the reasons that HPI

practitioners use knowledge management practices. It identified the importance HPI

practitioners attribute to each reason for using each knowledge management practices.

From these data, significant factors were extracted. The second research question

addressed the effectiveness of knowledge management practices in increasing

organizational performance.

Results of Using Knowledge Management: Survey Section 3

The second research question explored the question, How effective are knowledge

management practices in increasing organizational performance? To address this

question, participants were asked to respond to 14 statements by rating the level of

82

importance of each statement on a 4-point Likert-type scale ranging from 1 (*not at all effective*) to 4 (*very effective*). Table 9 provides a summary of the level of effectiveness participants attributed to each result of using knowledge management practices.

Table 9. *Results of Using Knowledge Management Practices* (N = 71)

Result	Very effective		Effective		Somewhat effective		Not at all effective		Median
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
A. Increased our knowledge sharing horizontally (across departments, functions, or business units)	20	28.2	28*	39.4	21	29.6	2	2.8	20.5
B. Increased our knowledge sharing vertically (up the organizational hierarchy)	10	14.1	29*	40.8	29*	40.8	3	4.2	19.5
C. Improved worker efficiency and/or productivity	18	25.4	35*	49.3	15	21.1	3	4.2	16.5
D. Improved skills and knowledge of workers	19	26.8	39*	54.9	13	18.3	0	0.0	16
E. Increased our number of markets (more geographical locations)	6	8.5	20	28.2	24*	33.8	21	29.6	20.5
F. Improved client or customer relations	11	15.5	27*	38.0	26	36.6	7	9.9	18.5
G. Helped us add new products or services	14	19.7	29*	40.8	16	22.5	12	16.9	13
H. Increased our adaptation of products or services to client requirements	13	18.3	33*	46.5	17	23.9	8	11.3	15
I. Increased flexibility in production and innovation	11	15.5	31*	43.7	21	29.6	8	11.3	16

83

Table 9. (*continued*)

	Very effective		Effective		Somewhat effective		Not at all effective		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Median
J. Prevented duplicate research and development	8	11.3	20	28.2	28*	39.4	15	21.1	17.5
K. Improved our corporate or organizational memory	14	19.7	29*	40.8	20	28.2	8	11.3	17
L. Increased our ability to capture knowledge from public research institutions, including universities and government laboratories	5	7.0	23*	32.4	21	29.6	22	31.0	21.5
M. Increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.	7	9.9	31*	43.7	22	31.0	11	15.5	16.5
N. Improved involvement of workers in workplace activities	14	19.7	31*	43.7	22	31.0	4	5.6	13

*Mode.

The results for mode demonstrate that the majority of participants felt that 12 of the 14 results of using knowledge management practices were effective; 54.9% ranked improved skills and knowledge of workers as an effective result of using knowledge management practices, whereas 49.3% indicated that improved worker efficiency and/or productivity was also an effective result. Mode scores also revealed that the majority of participants indicated that results were only somewhat effective in increasing knowledge sharing vertically, increasing number of markets, and preventing duplicate research and development.

84

Statements were also analyzed to determine a mean score for each statement. The statements were rated on a 4-point Likert-type scale ranging from 1 (*not at all effective*) to 4 (*very effective*). Table 10 shows the score for each response presented in order of highest mean to lowest mean.

Table 10. *Mean Score for Effectiveness of Results for Using Knowledge Management Practices* (N = 71)

Result	Mean score
D. Improved skills and knowledge of workers	3.08
C. Improved worker efficiency and/or productivity	2.96
A. Increased our knowledge sharing horizontally (across departments, functions, or business units)	2.93
N. Improved involvement of workers in workplace activities	2.77
H. Increased our adaptation of products or services to client requirements	2.72
K. Improved our corporate or organizational memory	2.69
B. Increased our knowledge sharing vertically (up the organizational hierarchy)	2.65
G. Helped us add new products or services	2.63
I. Increased flexibility in production and innovation	2.63
F. Improved client or customer relations	2.59
M. Increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.	2.48
J. Prevented duplicate research and development	2.30
E. Increased our number of markets (more geographical locations)	2.15
L. Increased our ability to capture knowledge from public research institutions, including universities and government laboratories	2.15

The range for the mean scores related to the results of using knowledge management practices is .93. Mean scores show that the three highest ranked results of using knowledge management practices included improved skills and knowledge of workers, improved worker efficiency and productivity, and increased knowledge sharing across the organization. The three lowest ranked results of using knowledge management practices included preventing duplication in research and development, increasing the number of markets, and retaining the ability to capture research from public research institutions.

Factor Analysis

To answer the second research question, exploratory factor analysis using PCA with varimax rotation was used to identify and extract significant factors related to the effectiveness of results for using knowledge management practices to increase organizational performance. First, the factor analysis was performed to extract as many factors as indicated by the data. Table 11 provides an overview of the total values, component variance, and cumulative variance for the initial eigenvalues; the extraction sum of squared loadings; and the rotational sum of squared loadings. The Kaiser criterion prescribes that only factors with eigenvalues greater than 1 should be retained as common factors and that factors with eigenvalues less than 1 should be considered for deletion (George & Mallery, 2007). On the basis of the Kaiser criterion, the results of the PCA factor analysis suggested that three factors with a cumulative variance of 65.652% should be retained.

Table 11. *Factor Analysis Total Variance Explained for Results of Using Knowledge Management Practices*

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cum. %	Total	% of variance	Cum. %	Total	% of variance	Cum. %
1	6.324	45.173	45.173	6.324	45.173	45.173	3.518	25.131	25.131
2	1.749	12.493	57.666	1.749	12.493	57.666	2.851	20.366	45.497
3	1.118	7.987	65.652	1.118	7.987	65.652	2.822	20.155	65.652
4	0.970	6.929	72.581						
5	0.695	4.963	77.544						
6	0.641	4.578	82.122						
7	0.553	3.949	86.071						
8	0.466	3.327	89.399						
9	0.386	2.760	92.159						
10	0.319	2.277	94.436						
11	0.261	1.865	96.301						
12	0.213	1.524	97.826						
13	0.165	1.178	99.004						
14	0.139	0.996	100.000						

Note. Extraction method was principal component analysis.

A review of the literature and analysis of the items associated with each factor was conducted and resulted in each factor being assigned a name. The first factor was called *market effectiveness*, the second factor was named *human capital effectiveness*,

87

and the third factor was named *business process effectiveness*. With a Kaiser-Mayer-Olkin sampling adequacy measure of .834, the results of the PCA factor analysis were adequate in providing an answer to the second research question of this study: How effective are knowledge management practices in increasing organizational performance (George & Mallery, 2007)? Table 12 describes the factors resulting from the PCA along with the related components and survey item descriptions.

Table 12. *Factors, Components, and Survey Items for Results of Using Knowledge Management Practices*

	Component			
Factor	1	2	3	Survey item
Market effectiveness	.831	−.031	.196	M. increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.
	.762	.358	.119	E. increased our number of markets (more geographic locations)
	.697	.492	.082	H. increased our adaptation of products or services to client requirements
	.681	.492	−.041	F. improved client or customer relations
	.671	−.116	.353	L. increased our ability to capture knowledge from public research institutions including universities and government laboratories
	.634	.342	.259	G. helped us add new products or services
Human capital effectiveness	.103	.857	.282	D. improved skills and knowledge of workers
	.108	.785	.427	C. improved worker efficiency and/or productivity

88

Table 12. (*continued*)

Factor	Component 1	Component 2	Component 3	Survey item
	.290	.558	.269	N. improves involvement of workers in workplace activities
Business process effectiveness	–.018	.282	.808	K. improved our corporate or organizational memory
	.156	.254	.762	A. increased our knowledge sharing horizontally (across departments, functions, or business units)
	.348	.063	.668	J. prevented duplicate research and development
	.211	.369	.569	B. increased our knowledge sharing vertically (up the organizational hierarchy)
	.383	.403	.480	I. increased flexibility in production and innovation

The second research question yielded data regarding the results of using knowledge management practices. It identified the effectiveness HPI practitioners attribute to the results of using each knowledge management practice. From these data, significant factors were extracted. The next section discusses hypothesis testing to determine if there is a statistical relationship ($p \leq .05$) between HPI practitioners' perceptions of using knowledge management practices to increase efficiency by improving knowledge to improve production processes (Survey Question 2E) and the effectiveness attributed to the result of improved worker efficiency and/or productivity (Survey Question 3C).

**Relationship Between the Reasons and Results
of Using Knowledge Management Practices**

The hypothesis for this study was that there is a significant statistical relationship ($p \leq .05$) between HPI practitioners' perceptions regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes (Survey Question 2E) and HPI practitioners' perceptions of the improvement of worker efficiency and/or productivity through knowledge management practices (Survey Question 3C).

To test the hypothesis, a cross-tabulation and chi-square statistic were calculated to determine if a relationship exists between HPI practitioners' perceptions of using knowledge management practices to increase efficiency by improving knowledge to improve production processes and the effectiveness attributed to the result of improved worker efficiency and/or productivity. Both the cross-tabulation and the chi-square analysis were conducted using SPSS.

A review of the cross-tabulation developed as input to the chi-square statistic revealed that 10, or 62.5%, of the expected cell frequencies were smaller than 5. These data are presented in Table 13. For a row × column chi-square test, at least 80% of the cells must have an expected frequency of 5 or greater, and no cell may have an expected frequency smaller than 1 (Wielkiewicz, 2000). Owing to these factors, the chi-square statistic cannot be used to test the hypothesis for this study with data represented in a four rows × four columns format.

90

Table 13. *Reasons/Results Cross-Tabulation* (N = 71)

Reason	Result				
	Very effective	Effective	Somewhat effective	Not at all effective	Total
Critical					
Count	16	19	3	1	39
Expected count	9.9	19.2	8.2	1.6	39.0
% within reason	41.0	48.7	7.7	2.6	100.0
% within results	88.9	54.3	20.0	33.3	54.9
% of total	22.5	26.8	4.2	1.4	54.9
Important					
Count	1	13	11	2	27
Expected count	6.8	13.3	5.7	1.1	27.0
% within reason	3.7	48.1	40.7	7.4	100.0
% within results	5.6	37.1	73.3	66.7	38.0
% of total	1.4	18.3	15.5	2.8	38.0
Somewhat important					
Count	1	2	1	0	4
Expected count	1.0	2.0	.8	.2	4.0
% within reason	25.0	50.0	25.0	.0	100.0
% within results	5.6	5.7	6.7	.0	5.6
% of total	1.4	2.8	1.4	.0	5.6

91

Table 13. (*continued*)

Reason	Result				
	Very effective	Effective	Somewhat effective	Not at all effective	Total
Not at all important					
Count	0	1	0	0	1
Expected count	.3	.5	.2	.0	1.0
% within reason	.0	100.0	.0	.0	100.0
% within results	.0	2.9	.0	.0	1.4
% of total	.0	1.4	.0	.0	1.4
Total					
Count	18	35	15	3	71
Expected count	18.0	35.0	15.0	3.0	71.0
% within reason	25.4	49.3	21.1	4.2	100.0
% within results	100.0	100.0	100.0	100.0	100.0
% of total	25.4	49.3	21.1	4.2	100.0

Post Hoc Analysis

A review of the cross-tabulation revealed a distinct relationship between HPI practitioners' perceptions of the importance of using knowledge management practices to increase efficiency by improving knowledge to improve production processes (Survey Question 2E) and the effectiveness attributed to the result of improved worker efficiency and/or productivity (Survey Question 3C). To test the hypothesis for this study, survey responses for these questions were grouped into categories and recoded so that the data

92

met the criteria to perform the chi-square statistic. A representation of data grouping is presented in Table 14.

Table 14. *Variable Response Coding for Chi-Square Analysis*

	Data grouping		
	A	B	C
Reasons for using knowledge management practices	Critical	Important, somewhat important, not at all important	Not applicable
	Code: Critical	Code: Not critical	
Effectiveness of results of using knowledge management practices	Very effective	Effective	Somewhat effective, not at all effective
	Code: Very effective	Code: Effective	Code: Not effective

In conducting the chi-square analysis, the researcher evaluated the count, expected count, residual count, Pearson chi-square value, and p value to determine if there was a relationship between the variables. A p value of .05 and a standard residual value of 1.96 were used to determine significance. Table 15 provides details on the count, expected count, and residual count results. Table 16 provides details of the chi-square results.

The chi-Square analysis revealed a value of 16.169 and a p value of .000. Given these criteria, there is sufficient evidence to conclude that there is a relationship between the variables of HPI practitioners' perceptions of the importance of using knowledge management practices to increase efficiency by improving knowledge to improve

production processes and the effectiveness attributed to the result of improved worker

efficiency and/or productivity. Therefore the null hypothesis is rejected.

Table 15. *Count Results for Reasons for Using Knowledge Management Practices in Regard to Effectiveness of Results of Using Knowledge Management Practices*

| | Result | | | |
Reason	Effective	Very effective	Not effective	Total
Critical				
Count	19	16	4	39
Expected count	19.2	9.9	9.9	39.0
Residual	–0.2	6.1	–5.9	
Not critical				
Count	16	2	14	32
Expected count	15.8	8.1	8.1	32.0
Residual	0.2	–6.1	5.9	
Total				
Count	35	18	18	71
Expected count	35.0	18.0	18.0	71.0

Table 16. *Chi-Square Results for Reasons for Using Knowledge Management Practices in Regard to Effectiveness of Results of Using Knowledge Management Practices*

	Value	*df*	*p* Value
Pearson chi-square	16.169	2	.000

94

Summary

This quantitative analysis provided information on a sample of 74 HPI practitioners. Specifically, it gathered information on the reasons why HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance. It also collected demographic information about the survey respondents. The majority of the study participants worked for global organizations and had between 6 and 15 years of experience in the fields of training, human performance, and/or knowledge management. More than half of participants worked in organizations with fewer than 10,000 employees.

In answering the first research question, the factor analysis revealed that the two prevalent reasons HPI practitioners use knowledge management practices are human capital enablement and sharing and integrating knowledge. In answering the second research question regarding the effectiveness of knowledge management practices, factor analysis revealed that the most significant results of using knowledge management practices include market effectiveness, human capital effectiveness, and business process effectiveness. To test the hypothesis, the chi-square statistic confirmed a relationship between the variables of HPI practitioners' perceptions of the importance of using knowledge management practices to increase efficiency by improving knowledge to improve production processes and the effectiveness attributed to the result of improved worker efficiency and/or productivity.

95

CHAPTER 5. RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This study sought to identify the reasons HPI practitioners use knowledge management practices and the level of effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance within their organizations. This study also sought to determine if there was a relationship between HPI practitioners' perceptions regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes. The intent of this study was to make a contribution to the literature by evaluating the views of HPI practitioners with regard to the reasons they use knowledge management practices and the results they derive from using knowledge management practices and to derive recommendations based on study findings.

This study is significant to the field of HPI for three reasons. First, HPI practitioners' perceptions of knowledge management may affect their use of knowledge management. Second, as change agents, HPI practitioners influence the choices made by their client organizations. Third, this study replicated a previous study conducted with project managers who implemented knowledge management systems. In doing so, it moved from an audience with generalized knowledge of organizations to an audience with deep knowledge of organizational performance gaps who are skilled at recommending appropriate interventions to address them.

This chapter starts with a review of the research questions and hypothesis, followed by a discussion of the results of the study presented in chapter 4. An analysis of the results was performed and is presented, including a comparison with the literature and the identification of potential limitations. Conclusions, recommendations, and potential implications and suggestions for HPI practice are also presented.

Research Questions and Hypothesis

This quantitative study was designed to answer the following questions:

1. For what reason do HPI practitioners use knowledge management practices?
2. How effective are knowledge management practices in increasing organizational performance?

On the basis of a review of the literature, the following hypothesis was tested:

Hypothesis: There is a significant statistical relationship ($p \leq .05$) between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices.

Null hypothesis: There is no significant statistical relationship between HPI practitioner perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes and HPI practitioner perception of the improvement of worker efficiency and/or productivity through knowledge management practices.

97

Limitations of the Study

Limitations of this study included three elements: (a) the convenience sampling methodology, (b) a sampling design that included only members of the two target professional organizations, and (c) the potential for sampling error due to limited audience and sample size.

The primary focus of this study was to determine the reasons HPI practitioners use knowledge management practices and the level of effectiveness of using knowledge management practices to increase organizational performance. The convenience sampling technique was intended to include only study participants who were HPI practitioners. The sampling design of including members of two specific professional organizations as potential participants eliminated collection of data from HPI practitioners who were not members of these organizations. There is no guarantee that the research sample accurately reflects the views of the target population.

The practice of convenience sampling resulted in the potential for sampling error, which is the difference between an estimate derived from sample data and the value obtained through a survey of an entire population (Earl, 2005). To mitigate risks related to sampling error for the 1500 person population, Cochran's formula was used to determine a sample size of 230 (Bartlett et al., 2001). With a total of 74 completed surveys, the study resulted in a margin of error of 9.4% at the 90% level of confidence. This results in the limited ability to generalize some findings to the total population of HPI practitioners. Factor analysis results are considered reliable because the number of

www.manaraa.com

variables and factors included in the analysis are appropriate for $N \geq 50$ (de Winter, Dodou, & Wieringa, 2009).

Discussion of Results

This study intended to identify the reasons HPI practitioners use knowledge management practices and the effectiveness they attribute to using knowledge management practices to increase organizational performance. This section presents a discussion of the results for the research questions and hypothesis testing presented in chapter 4. As part of the discussion, research findings are related to the literature.

Research Question 1

The purpose of Research Question 1 was to determine the reasons that HPI practitioners use knowledge management practices. Study results demonstrate that the majority of HPI practitioners rated all statements representing the reasons for using knowledge management practices as critical or important. Mean scores showed that the three highest ranked reasons to use knowledge management practices included helping to integrate knowledge within an organization, improving the competitive advantage of an organization, and increasing efficiency of workers to improve production processes. Mean scores also showed that the three lowest ranked reasons to use knowledge management practices included easing collaborative work of virtual project teams, promoting knowledge sharing with customers, and improving worker retention. Factor analysis revealed that the two prevalent factors related to HPI practitioners' use of

99

knowledge management practices were human capital enablement (37.955% of variance) and sharing and integrating knowledge (13.498% of variance) within an organization.

The literature suggests that in general, the use of knowledge management practices is recognized as supporting workers and organizations in performing better (Fernie et al., 2003). The creation, accumulation, sharing, and integration of knowledge helps an organization to support ongoing operations and increase organizational performance (Wu et al., 2006). The results of this research add to the literature by suggesting that HPI practitioners use knowledge management practices to improve human performance and help organizations share and integrate knowledge.

Research Question 2

The purpose of Research Question 2 was to identify the effectiveness HPI practitioners attribute to using knowledge management practices in increasing organizational performance. Study results demonstrate that the majority of participants rated 10 result statements as very effective, effective, and somewhat effective. There were four statements for which the majority of participants rated effectiveness as effective, somewhat effective, or not at all effective. Statements reflecting lower effectiveness ratings showed that knowledge management practices are less effective in increasing the number of markets, preventing duplicate research and development, increasing the organization's ability to capture external knowledge from business enterprises and technical literature, and increasing the capture and use of knowledge from public institutions such as universities and government laboratories.

100

Mean scores showed that the three most important and highest ranked results of using knowledge management practices included improved skills and knowledge of workers, improved worker efficiency and productivity, and increased knowledge sharing across the organization. Mean scores also showed that the three lowest ranked results of using knowledge management practices included preventing duplicate research, increasing the number of markets, and increasing the ability to capture knowledge from public research institutions.

Factor analysis revealed that the three prevalent factors related to the effectiveness of results of knowledge management practices were market effectiveness (45.173% of variance), human capital effectiveness (12.493% of variance), and business process effectiveness (7.987% of variance). The factor analysis results are interesting because the most significant factor, market effectiveness, represents knowledge management practices that were ranked by participants as the lowest in effectiveness.

The results of this research add to the literature by suggesting that though HPI practitioners use knowledge management practices to support human capital enablement and promote the sharing and integration of knowledge within an organization, the most significant factor of effectiveness achieved falls within the realm of market effectiveness. Though factors related to human capital effectiveness and business process effectiveness were identified and specific knowledge management practices within these variables were found to be effective, the data suggest that these dimensions are less significant.

Hypothesis

The purpose of the hypothesis was to test if there was a significant statistical relationship ($p \leq .05$) between HPI practitioners' perception regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes (Survey Question 2E) and HPI practitioners' perceptions of the improvement of worker efficiency and/or productivity through knowledge management practices (Survey Question 3C). The chi-square analysis revealed a value of 16.169 and a *p* value of .000. Given these criteria, there is sufficient evidence to conclude that there is a statistically significant relationship between the variables.

A thorough analysis of the data revealed that in general, the reasons HPI practitioners reported as critical or important were related to the ranking of the effectiveness of results along similar dimensions. As both variables ranked in the top three statements of reasons and results, the outcome of the hypothesis test was expected. The findings from this portion of the study support existing literature on knowledge management practices that have been used effectively to increase efficiency and productivity within an organization. The adoption of knowledge management strategies was recently found to improve research efficiency and effectiveness in university research centers (Akhavan et al., 2009; Numprasertchai & Igel, 2005). In another recent case study, the use of knowledge management practices was also shown to reduce the project time and cost of a construction project (Kivrak et al., 2008).

102

Conclusions

Findings from this study support much of the existing literature related to the reasons and results associated with knowledge management practices. Additionally, the findings add to the literature by revealing the specific reasons HPI practitioners use knowledge management practices and the effectiveness HPI practitioners attribute to using them. Though there are many reasons HPI practitioners use knowledge management practices, study results indicate that the majority fall within the dimension of human capital enablement, followed by the dimension of sharing and integrating knowledge. In terms of the effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance, study results find that the most significant factors of effectiveness results fall within the categories of market effectiveness, followed by human capital effectiveness and business process effectiveness.

The focus on knowledge management as a high-impact strategy to promote organizational performance has become a key focus in the field of HPI. As organizations grow to realize that knowledge developed by workers is one of their most valuable assets, HPI practitioners may help them to adopt strategies to support the creation and dissemination of knowledge (Blankenship & Ruona, 2009; McCall et al., 2008). The findings of this study suggest that the variety, diversity, and scope of knowledge management practices employed by HPI practitioners is vast. Because there are so many choices, HPI practitioners should be certain to consider specific performance improvement reasons and related results, or measurements, to ensure that they are

103

targeting the appropriate knowledge management practices. This will support HPI practitioners in their role as change agents who recommend and influence decisions on the adoption of discontinuous innovations such as knowledge management (Hazeldine & Miles, 2010; Raghupathi et al., 2009; Rogers, 2003). HPI practitioners' confidence in knowledge management practices can support change management and reduce innovation resistance (Ram & Sheth, 1989; Rogers, 2005).

Study results reveal a confounding relationship between the reasons for using knowledge management practices to increase organizational performance and the results achieved from doing so. The majority of HPI practitioners ranked the reasons to use individual knowledge management practices as critical or important, yet reported that the results achieved from using knowledge management practices had varying degrees of effectiveness that trended downward. This suggests that either HPI practitioners do not fully understand how knowledge management practices affect organizational performance or they do not recognize the lift in organizational performance they were anticipating as the result of implementing knowledge management practices.

Furthermore, the factor analyses show that the most significant factor of results is human capital enablement, whereas the most significant factor of effectiveness is market effectiveness. Knowledge management practices most associated with improved market performance of the organization include a focus on improving operating efficiency and productivity while reducing duplication of effort (Key et al., 2009). This is an important consideration for HPI practitioners, as study results show that preventing duplicative

research and development ranked as one of the least effective knowledge management practices.

Last, this study replicates a study conducted to gauge project managers' perceptions of the reasons for using and value derived from knowledge management (Aguiar, 2009). Project managers were chosen as the population for the previous study because they "have general insight across organizations" (Aguiar, 2009, p. 51) from their experience in leading teams. In contrast, HPI practitioners have a deep understanding of the organization because they conduct systemic and systematic analyses to uncover performance gaps and recommend targeted solutions, such as knowledge management, to address them (Bolin, 2007; Robinson, 2002; Robinson & Robinson, 2006a). This study was significant because it provided an accurate portrayal of the reasons HPI practitioners use knowledge management practices to increase organizational performance and the results achieved from doing so. Though knowledge management was recognized by HPI practitioners as having an effect on organizational performance, the significance of factors related to the reasons and effectiveness of results varied.

Suggestions for Future Research

Though this study identified the reasons HPI practitioners use knowledge management practices and the type of effectiveness HPI practitioners attribute to using knowledge management practices to increase organizational performance, a number of additional areas could be elaborated. This study could have been improved by including a quantitative research question to determine if years of experience in the field of HPI

105

influenced participant responses related to the reasons for and results of knowledge management practices. Additional relationships between variables could also be explored. Last, this study could be expanded to include a wider audience of HPI practitioners.

The study's results also point to opportunities for additional research. A longitudinal study could be conducted to examine how the frequency and type of use of a knowledge management system contributes to actual performance measures for related activities within the organization. To build on this knowledge, a study could be conducted to determine how different knowledge management practices affect organizational performance. A researcher could look at a selection of practices (e.g., the ones that ranked highest or lowest within this study) to determine their actual impact on organizational performance.

A qualitative study could be conducted to determine how and when knowledge management practices are being used by participants to improve organizational performance. The study could be expanded to gather considerations and models used by HPI practitioners. This could lead to the development of a knowledge management practices model that could be validated and widely used by HPI professionals.

Whereas this and other studies have linked knowledge management to increased organizational performance, additional research could help determine the specific roles HPI practitioners play in the life cycle of analyzing, designing, developing, and implementing knowledge management practices. The results of such a study could lead to

a series of best practices that could be leveraged by HPI practitioners who are involved in activities that support knowledge management practices.

Further study could be conducted to determine the types of training and professional development in which HPI practitioners engage to build capability related to knowledge management. A qualitative component could be added to evaluate how topics covered in training are actually implemented by HPI practitioners on knowledge management initiatives. The results of this study could be used by universities and professional organizations to make decisions regarding curriculum and professional development offerings for HPI professionals.

Given that the foundation of organizational performance is attributed to the intellectual capital of its people, it would be interesting to determine the specific practices HPI practitioners employ to promote knowledge creation and sharing within their client organizations. Further analysis could be conducted to determine if differences exist by experience level of HPI practitioners or the industries in which they work.

A study could be conducted with organizational leaders to determine their perception related to the effectiveness of HPI practitioners as change agents or consultants when engaged in knowledge management initiatives. Further questions could be asked to gather leaders' perceptions about the value of the initiatives to their organizations. This customer perspective could help inform change management and consulting activities conducted by HPI practitioners.

Last, it would be interesting to explore if there are difference in professional practices for HPI practitioners depending on the knowledge management strategies they

employ. Articulating differences between practices for codification, personalization, and learning organization strategies could result in a series of considerations that would be tailored to knowledge management strategies and useful to HPI practitioners engaging in them.

When considering opportunities for future research, it is also critical to consider strategies to increase participation and achieve a sample size appropriate to the population. For this study, a larger *N* may have been achieved through the use of reminders and incentives (Creswell, 2008; Shih & Fan, 2008). These strategies could help future studies to achieve an adequate response which would result in findings that are more generalizable.

Implications for Human Performance Improvement Practice

Human performance is a starting point from which to support increased organizational performance. In improving organizational performance, HPI practitioners have an opportunity "to play a critical role in helping organizations develop more nimble organizational structures and more adaptable workers" (Burkett, 2005, p. 2). This study showed that knowledge management practices provide a critical framework to help organizations achieve these goals and improve organizational performance.

The results of this study indicate that though HPI practitioners use many knowledge management practices, the factors that influence their use can be summarized into two: human capital enablement and sharing and integrating knowledge. It is suggested that during intervention selection and design, HPI practitioners could use the

results of the factor analysis as a guide to pinpoint the exact use of knowledge

management practices and specific methods, which could support implementation and

change management considerations. A model representing this guide is presented in

Figure 1.

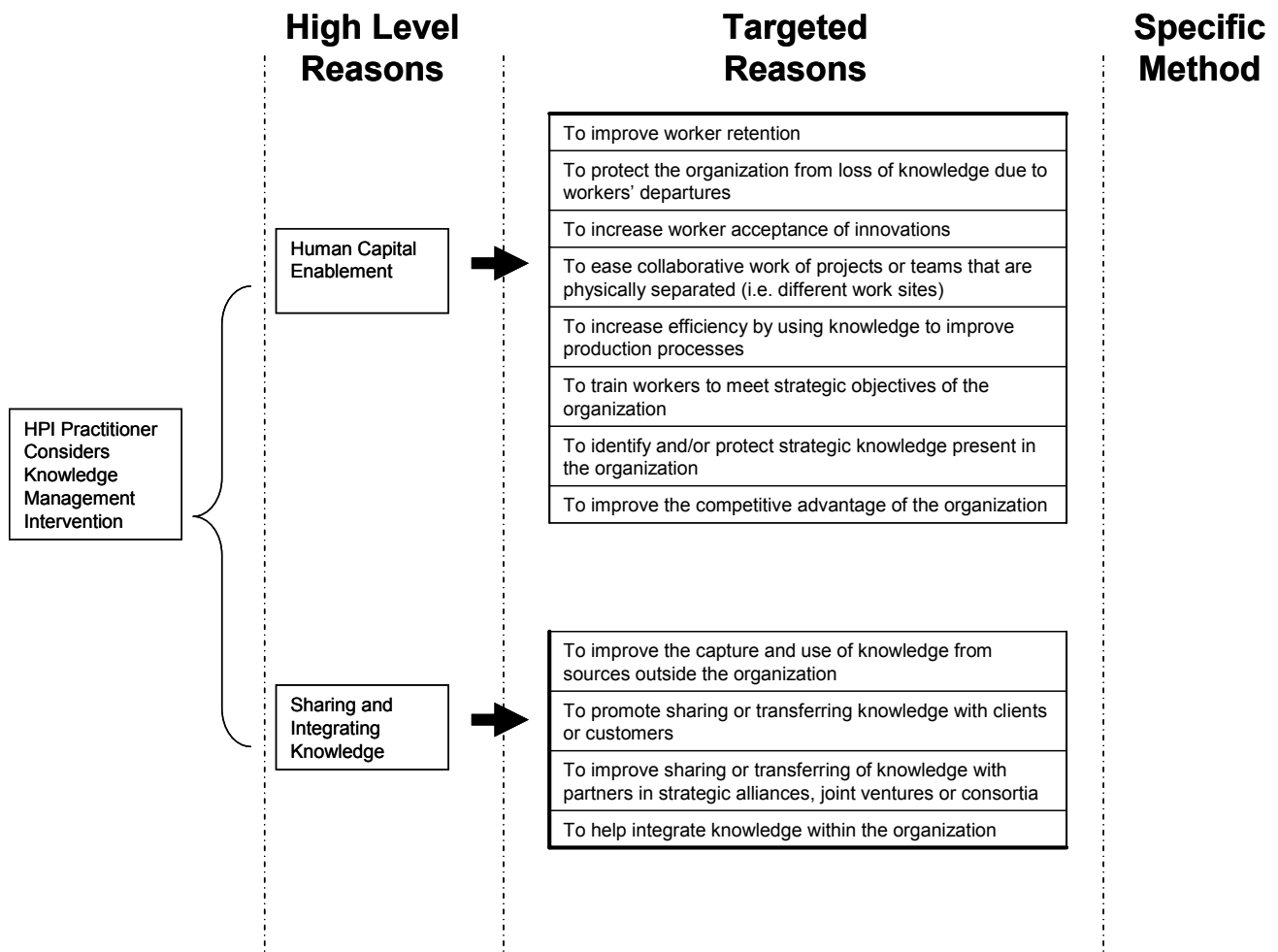| High Level Reasons	Targeted Reasons	Specific Method
HPI Practitioner Considers Knowledge Management Intervention		
Human Capital Enablement	To improve worker retention	
	To protect the organization from loss of knowledge due to workers' departures	
	To increase worker acceptance of innovations	
	To ease collaborative work of projects or teams that are physically separated (i.e. different work sites)	
	To increase efficiency by using knowledge to improve production processes	
	To train workers to meet strategic objectives of the organization	
	To identify and/or protect strategic knowledge present in the organization	
	To improve the competitive advantage of the organization	
Sharing and Integrating Knowledge	To improve the capture and use of knowledge from sources outside the organization	
	To promote sharing or transferring knowledge with clients or customers	
	To improve sharing or transferring of knowledge with partners in strategic alliances, joint ventures or consortia	
	To help integrate knowledge within the organization	

Figure 1. Factor Analysis as Input to Recommend Specific Method

109

Building on this model, HPI practitioners may also choose to use the results of the effectiveness factor analysis to support their work in intervention evaluation. This model is provided in Figure 2.
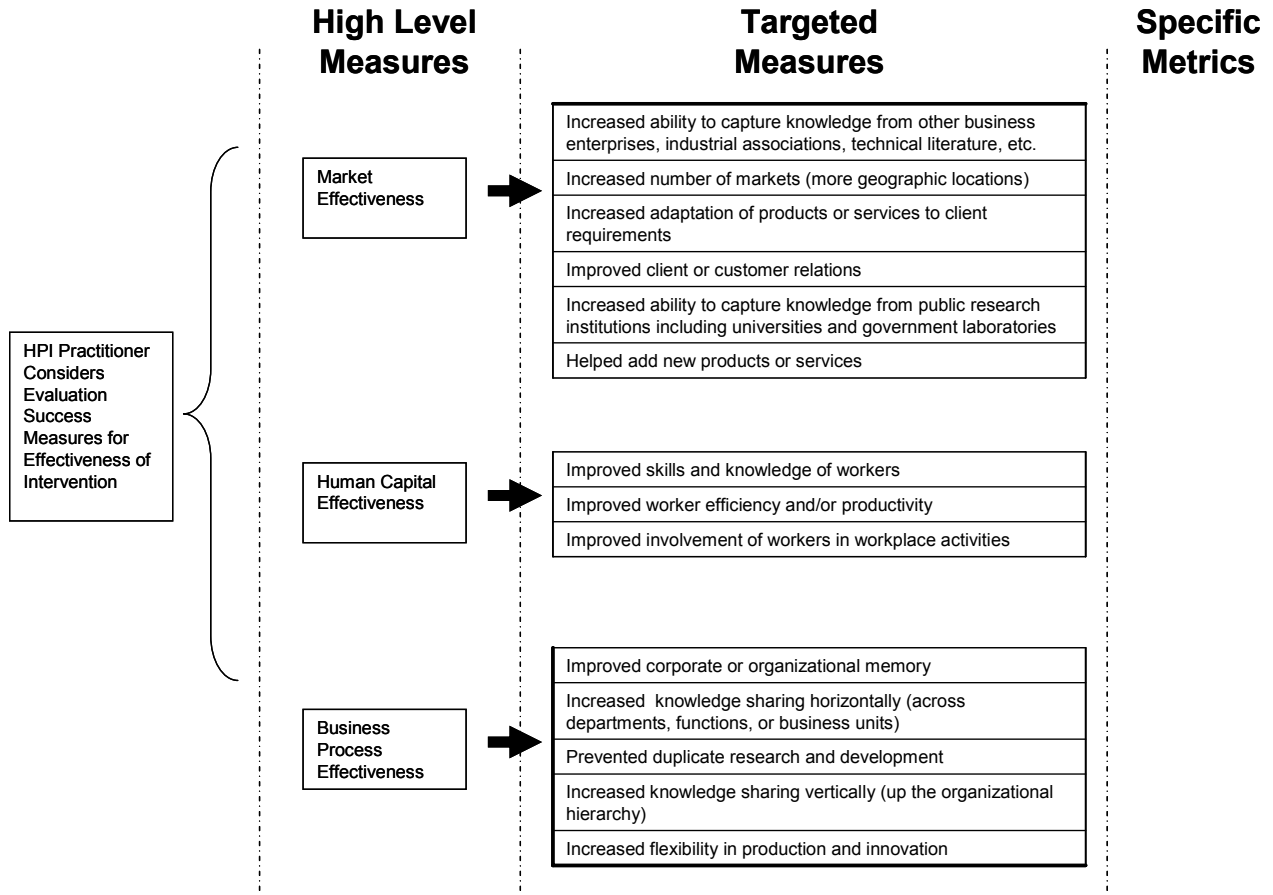

High Level Measures	Targeted Measures	Specific Metrics
Market Effectiveness	Increased ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc. Increased number of markets (more geographic locations) Increased adaptation of products or services to client requirements Improved client or customer relations Increased ability to capture knowledge from public research institutions including universities and government laboratories Helped add new products or services	
Human Capital Effectiveness	Improved skills and knowledge of workers Improved worker efficiency and/or productivity Improved involvement of workers in workplace activities	
Business Process Effectiveness	Improved corporate or organizational memory Increased knowledge sharing horizontally (across departments, functions, or business units) Prevented duplicate research and development Increased knowledge sharing vertically (up the organizational hierarchy) Increased flexibility in production and innovation	

(HPI Practitioner Considers Evaluation Success Measures for Effectiveness of Intervention)

Figure 2. Factor Analysis as Input to Recommend Specific Metric.

The literature revealed that though academic research related to knowledge management practices and related concepts is considered valuable by business leaders,

110

business leaders do not have time to determine how to apply it to their specific business contexts (Booker et al., 2008; Dumay, 2009b). Study results show that some of the least effective knowledge management practices include capturing and using knowledge from business enterprises, trade associations, technical literature, universities, and government institutions. It is recommended that HPI practitioners take the time to review, convert, and summarize academic research in a form that is easily digested by the business leaders with whom they partner so that it may be put into practice.

Results from this study also show that the quantity and variation of knowledge management practices coupled with the number of divergent frameworks and approaches for knowledge management make it impossible to gain consensus on practices and models among scholars and practitioners (Sveiby, 2001b) and leave organizations without a consistent framework from which to operate (Dumay, 2009b). HPI practitioners have an opportunity to address this gap proactively because they follow a systematic approach to improving human and organizational performance by utilizing consistent methods, strategies, and procedures.

Last, HPI practitioners who recommend and implement knowledge management practices and did not participate in the study may wish to evaluate the results to determine what knowledge management practices are employed in organizations, the reasons HPI practitioners use knowledge management practices, and the results achieved from using knowledge management practices. HPI practitioners may use this information to identify knowledge management practices to incorporate into their own professional practices.

111

Summary

The intent of this research was to contribute to the body of knowledge related to HPI practitioners and HPI practice. Study results demonstrate that the reasons HPI practitioners use knowledge management include human capital enablement and sharing and integrating knowledge. Study results also conclude that organizational results from using knowledge management practices include market effectiveness, human capital effectiveness, and business process effectiveness. Last, in testing the study hypothesis, study results demonstrate that there is a direct positive association between HPI practitioners' perceptions regarding the use of knowledge management to increase efficiency by using knowledge to improve production processes and HPI practitioners' perceptions of the improvement of worker efficiency and/or productivity through knowledge management practices.

It is interesting to note that the topics of knowledge creation and knowledge sharing were cited as one of three main areas where human resource development research has contributed to the literature of social science disciplines during the past 20 years (Jeung, Yoon, Park, & Jo, 2011). Knowledge is fluid and requires formal and informal processes and structures that support its creation, acquisition, distribution, and use throughout an organization to support competitive advantage and improve organizational performance (Davenport et al., 1996; Ramesh & Sengupta, 1995). As Haney and Driggers (2010) have discussed,

> knowledge management has the potential to increase productivity, decrease costs, and raise the skills and competencies of employees. It can be applied at the individual, team, and organizational levels. . . . With its wide applications,

112

knowledge management is recognized as a critical part of leveraging human and organizational performance. (p. 366)

HPI practitioners need a deep understanding of knowledge management practices and strategies so that they are prepared to make meaningful recommendations that result in improved performance.

REFERENCES

Aaron, B. (2009). Determining the business impact of knowledge management. *Performance Improvement, 48*(4), 35–45.

Aguiar, L. (2009) *Applying knowledge management for research and development in the pharmaceutical industry* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses: Full Text. (Publication No. AAT 3353745)

Akhavan, P., Hosnavi, R., & Sanjaghi, M. (2009). Identification of knowledge management critical success factors in Iranian academic research centers. *Education, Business, and Society: Contemporary Middle Eastern Issues, 2*(4), 276–288.

Alavi, M., & Leidner, D. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly, 25*(1), 1–10.

Alden, J. (2007). Surveying attitudes: Questionnaires versus opinionnaires. *Performance Improvement, 46*(6), 42–48.

Allameh, S., & Abbas, S. (2010). The relationship between knowledge management practices and innovation level in organizations: Case study of sub-companies of selected corporations in the city of Esfahan. *Journal of Business Case Studies, 6*(1), 89–97.

Almahamid, S., Awwad, A., & McAdams, A. (2010). Effects of organizational agility and knowledge sharing on competitive advantage: An empirical study in Jordan. *International Journal of Management, 127*(3), 387–404, 579.

Anandarajan, M., & Lippert, S. (2006). Competing mistresses? Academics vs. practitioner perceptions of system analysis. *Journal of Computer Information Systems, 46*(5), 114–126.

Ankers, P., & Brennan, R. (2002). Managerial relevance in academic research: An exploratory study. *Marketing Intelligence & Planning, 20*(1), 15–21.

Ardichvili, A. (2002). Knowledge management, human resource development, and Internet technology. *Advances in Developing Human Resources, 4*(4), 451–463. doi:10.1177/152342202237522

Ardichvili, A. (2008). Learning and knowledge sharing in virtual communities of practice: Motivators, barriers, and enablers. *Advances in Developing Human Resources, 10*(4), 541–554. doi:10.1177/1523422308319536

Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge sharing teams. *Journal of Knowledge Management, 7*(1), 64–77.

Armstrong, S., & Anis, M. (2008). Experiential learning and the acquisition of managerial tacit knowledge. *Academy of Management Learning & Education, 7*(2), 189–208.

Arvidsson, N. (2000). Knowledge management in the multinational enterprise. In J. Birkinshaw & P. Hagstrom (Eds.), *The flexible firm: Capability management in network organizations* (pp. 177–193). New York, NY: Oxford University Press.

American Society for Training and Development. (2006). *ASTD Learning System*. Alexandria, VA: ASTD Press.

American Society for Training and Development. (2010). *When they ask for it, will you have something to show?* Retrieved from http://www.astd.org/content/ASTD certification

Attewell, P. (1992). Technology diffusion and organizational learning: The case of business computing. *Organizational Science, 3*(1), 1–19.

Bart, C. (2001). Measuring the mission effect in human intellectual capital. *Journal of Intellectual Capital, 2*(3), 320–330.

Bartlett, J., Kotrlik, J., & Higgins, C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning, and Performance Journal, 19*(1), 43–50.

Becher-Young, L. (2010). *Learn on the run: A study of instructional design practices in podcasting* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses: Full Text. (Publication No. AAT 3378825)

Becker, G. (1964). *Human capital.* New York, NY: Columbia University Press.

Bell, D. (1999). *The coming of post-industrial society: A venture in social forecasting* (2nd ed.). New York, NY: Basic Books.

Bennett, E. (2009). Virtual HRD: The intersection of knowledge management, culture, and intranets. *Advances in Developing Human Resources, 11*(3), 362–374.

Bierly, P., & Daly, P. (2002). Aligning human resource management practices and knowledge strategies: A theoretical framework. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual and organizational knowledge* (pp. 277–295). New York, NY: Oxford University Press.

115

Bhardwaj, M. & Monin, J. (2006). Tacit to explicit: An interplay shaping organization knowledge. *Journal of Knowledge Management, 10*(3), 72-85. doi:10.1108/13673270610670867

Bjorkman, I., Barner-Rasmussen, W., & Li, L. (2004). Managing knowledge transfer in MNCs: The impact of headquarters control mechanisms. *Journal of International Business Studies, 35*(5), 443–455.

Blankenship, S., & Ruona, W. (2009). Exploring knowledge sharing in social structures: Potential contributions to an overall knowledge management strategy. *Advances in Developing Human Resources, 11*(3), 290–306. doi:10.1177/1523422309338578

Bogner, W., & Bansal, P. (2007). Knowledge management as the basis of sustained high performance. *Journal of Management Studies, 44*(1), 165–188. doi:10.1111/j.1467–6486.2007.00667.x

Boisot, M. (1998). *Knowledge assets: Securing competitive advantage in the information economy*. Oxford, England: Oxford University Press.

Bolin, A. (2007). HPT in military settings. *Performance Improvement, 46*(3), 5–7.

Bontis, N. (1996). There's a price on your head: Managing intellectual capital strategically. *Business Quarterly, 60*(4), 40–46.

Bontis, N. (1998). Intellectual capital: An exploratory study that develops measures and models. *Management Decision, 36*(2), 63–76.

Bontis, N. (Ed.). (2002). *World Congress of Intellectual Capital Readings.* Boston, MA: Butterworth-Heinemann KMCI Press.

Bontis, N. (2003). Intellectual capital disclosures in Canadian corporations. *Journal of Human Resource Costing and Accounting, 7*(1), 9–20.

Bontis, N., Crossan, M., & Hulland, J. (2002). Managing an organizational learning system by aligning stock and flows. *Journal of Management Studies, 39*(4), 437–469.

Bontis, N., Keow, W., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital, 1*(1), 85–97.

Bontis, N., & Serenko, A. (2007). The moderating role of human capital management practices on employee capabilities. *Journal of Knowledge Management, 11*(3), 31–51. doi:10.1108/13673270710752090

116

Booker, L., Bontis, N., & Serenko, A. (2008). The relevance of knowledge management and intellectual capital research. *Knowledge and Process Management, 15*(4), 235–246. doi:10.1002/kpm.314

Boyce, L., LaVoie, N., Streeter, L., Lochbaum, K., & Psotka, J. (2008). Technology as a tool for leadership development: Effective use of automated Web-based systems in facilitating tacit knowledge acquisition. *Military Psychology, 20,* 271–278. doi:10.1080/08995600802345220

Breedt, M., & van Rensburg, A. (1999). Knowledge management principles. *South African Journal of Industrial Engineering, 10*(1), 1–2.

Brennan, N. (2001). Reporting intellectual capital in annual reports: Evidence from Ireland. *Accounting, Auditing & Accountability Journal, 14*(4), 423–436.

Brown, J., & Duguid, P. (1991). Organizational learning and communities of practice: Toward a unified view of working, learning, and innovating. *Organization Science, 2*(1), 40–57.

Buchel, B. (2007). Knowledge creation and transfer. In K. Ichijo, & I. Nonaka, (Eds.), *Knowledge creation and managemen*t (pp. 44–56). New York, NY: Oxford University Press.

Burkett, H. (2005). HPT in a mobile and agile world. *Performance Improvement, 4*(6), 2.

Burns, J. Z., Dean, P. J., Hatcher, T., Otte, F. L., Preskill, H., & Russ-Eft, D. (1999). Standards on ethics and integrity. *Performance Improvement Quarterly, 12*(3), 5–30.

Caddy, I., Guthrie, J., & Petty, R. (2001). Managing orphan knowledge: Current Australian best practices. *Journal of Intellectual Capital, 2*(4), 384–397.

Cameron, P. (2000). Managing the wealth. *CMA Review, 74*(9), 46–49.

Chan, I., & Chao, C.-K. (2008). Knowledge management in small and medium-sized enterprises. *Communications of the ACM, 51*(4), 83–88. doi:10.1145/1330311.1330328

Chatzkel, J. (2004). Moving through the crossroads. *Journal of Intellectual Capital, 5*(2), 337–339.

Chen, I., Chen, N., & Kinshuk. (2009). Examining the factors influencing participants' knowledge sharing behaviors in virtual learning communities. *Educational Technology and Society, 12*(1), 134–148.

Cho, Y., Cho, E., & McLean, G. N. (2009). HRD's role in knowledge management. *Advances in Developing Human Resources, 11*(3), 263–272. doi:10.1177/1523422309337719

Choo, C., & Bontis, N. (2002). Knowledge, intellectual capital, and strategy: Themes and tensions. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 3–19). New York, NY: Oxford University Press.

Choudhury, J. (2010). Performance impact of intellectual capital: A study of Indian IT sector. *International Journal of Business and Management, 5*(9), 72–80.

Chua, A. (2001). Relationship between the types of knowledge shared and types of communications channels used. *Journal of Knowledge Management Practice, 2*. Retrieved from http://www.tlainc.com/articl26.htm.

Chun, M., Sohn, K., Arling, P., & Granados, N. (2009). Applying systems thinking to knowledge management systems: The case of Pratt-Whitney Rocketdyne. *Journal of Information Technology Case and Application Research, 11*(3), 43–67.

Ciborra, C., & Andreu, R. (2001). Sharing knowledge across boundaries. *Journal of Information Technology, 16*(2), 73–81.

Cohen, D., & Pruzac, L. (2001). *In good company: How social capital makes organizations work.* Boston, MA: Harvard Business School Press.

Coleman, J. (1994). Rational choice in economic sociology. In E. Smelser & R. Swedberg (Eds.), *The handbook of economic sociology* (pp. 166–182). Princeton, NJ: Princeton University Press.

Cook-Craig, P., & Sabah, Y. (2009). The role of virtual communities of practice in supporting collaborative learning among social workers. *British Journal of Social Work, 39*(4), 725–739.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches.* Thousand Oaks, CA: Sage.

Creswell, J. W. (2008). *Educational research.* Upper Saddle River, NJ: Pearson.

Curado, C. (2008). Perceptions of knowledge management in intellectual capital in the banking industry. *Journal of Knowledge Management, 12*(3), 141–155. doi:10.1108/13673270810875921

Davenport, T. (2005). *Thinking for a living: How to get better performance and results from knowledge workers.* Boston, MA: Harvard Business School Press.

118

Davenport, T., Jarvenpaa, S., & Beers, M. (1996). Improving knowledge work processes. *Sloan Management Review, 37*(4), 53–65.

Davenport, T., & Klahr, P. (1998). Managing customer service knowledge. *California Management Review, 403*(3), 195–208.

Davenport, T., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know.* Boston, MA: Harvard Business School Press.

Davies, B. (2005). Communities of practice: Legitimacy not choice. *Journal of Sociolinguistics, 9*(4), 557–581.

de Winter, J., Dodou, D., & Wieringa, P. (2009). Exploring factor analysis with small sample sizes. *Multivariate Behavioral Research, 44,* 147 – 181. doi: 10.1080/00273170902794206

De Carolis, D. (2002). The role of social capital and organizational knowledge in enhancing entrepreneurial opportunities in high-technology environments. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 699–709). New York: Oxford University Press.

DeJarnett, L. (1999). Knowledge, the latest thing: Information strategy. *The Executive Journal, 12*(2), 3–5.

Deutskens, E., de Ruyter, K., Wetzels, M., & Oosterveld, P. (2004). Response rate and response quality of Internet-based surveys: An experimental study. *Marketing Letters, 15*(1), 21–36.

Donnelly, R. (2008). The management of consultancy knowledge: An international comparative analysis. *Journal of Knowledge Management, 12*(3), 71–83. doi:10.1108/13673270810875877

Droege, S., & Hoobler, J. (2003). Employee turnover and tacit knowledge diffusion: A network perspective. *Journal of Managerial Issues, 15*(1), 50–64.

Dumay, J. (2009a). Intellectual capital measurement: A critical approach. *Journal of Intellectual Capital, 10*(2), 190–210. doi:10.1108/14691930910952614

Dumay, J. (2009b). Reflective discourse about intellectual capital: Research and practice. *Journal of Intellectual Capital, 10*(4), 489–503. doi:10.1108/14691930910996607

Earl, L. (2002). *Are we managing our knowledge? Results from the pilot knowledge management survey*. Ottawa, Canada: Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/88f0006x/88f0006x2002006-eng.pdf

Earl, L. (2003). *Who's sharing what with whom? How Canadian businesses used electronic networks to share information in 2001*. Ottawa, Canada: Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/88f0006x/88f0006x2003002-eng.pdf

Earl, L. (2005). *Knowledge sharing succeeds: How selected service industries rated the importance of using knowledge management practices to their success*. Ottawa, Canada: Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/88f0006x/88f0006x2005004-eng.pdf

Easterby-Smith, M., & Prieto, I. (2008). Dynamic capabilities and knowledge management: An integrative role for learning? *British Journal of Management, 19*(3)*,* 235–249. doi:10.111/j.1467–8551.2007.00543.x

Eckert, P., & McConnel-Ginet, S. (1992). Think practically and look locally: Language and gender as community-based practice. *Annual Review of Anthropology, 21,* 461–490.

Eckert, P., & Wenger, É. (2005). Communities of practice in sociolinguistics. *Journal of Sociolinguistics, 9*(4), 582–589. doi:10.1111/j.1360–6441.2005.00307.x

Edmondson, A., Winslow, A., Bohmer, R., & Pisano, G. (2003). Learning how and learning what: Effects of tacit and codified knowledge on performance improvement following technology adoption. *Decision Sciences, 34*(2), 197–223.

Eisenhardt, K., & Martin, J. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10/11), 1105–1121.

Ellis, K. (2001). Sharing the best practices globally. *Training, 38*(7), 32–38.

English, M., & Baker, W. (2006). Rapid knowledge transfer: The key to success. *Quality Progress, 39*(2), 41–48.

Federici, D., Ferrante, F., & Vistocco, D. (2008). On the sources of entrepreneurial talent: Tacit vs. codified knowledge. *ICFAI Journal of Knowledge Management, 6*(6), 7–28.

Fernie, S., Weller, S., Green, S., & Newcombe, R. (2003). Knowledge sharing: Context, confusion, and controversy. *International Journal of Project Management, 21*(3), 177–187.

Fischer, F., & Mandell, A. (2009). Michael Polanyi's republic of science: The tacit dimension. *Science as Culture, 18*(1), 23–46. doi:10.1080/09505430802705889

120

Fitzgerald, B., & Feller, J. (2001). Open source software: Investigating the software, engineering, psychological, and economic issues. *Information Systems Journal, 11*(4), 273–276. doi:10.1046/j.1365–2575.2001.00108.x

F-Jardón, C., & Martos, M. (2009). Intellectual capital and performance in wood industries of Argentina. *Journal of Intellectual Capital, 10*(4), 600–616. doi:10.1108/14691930910996670

Frappaolo, C. (2006). *Knowledge management.* Oxford, England: Capstone.

Gall, M. D., Gall, J. P., & Borg, W. E. (2007). *Educational research: An introduction.* Boston: Pearson Education.

Garvin, D., Edmondson, A., & Gino, F. (2008). Is yours a learning organization? *Harvard Business Review, 86*(3), 109–117.

Gee, J. P. (2005). Meaning making, communities of practice, and analytical toolkits. *Journal of Sociolinguistics, 9*(4), 590–594.

George, D., & Mallery, P. (2007). *SPSS for Windows.* Boston, MA: Pearson.

Gilbert, T. (1978). *Human competence: Engineering worthy performance.* New York, NY: McGraw-Hill.

Gilbert, T. F. (2007). *Human competence* (Tribute ed.)*.* San Francisco, CA: Pfeiffer.

Gongla, P., & Rizzuto, C. (2001). Evolving communities of practice: IBM global services experience. *IBM Systems Journal, 40*(4), 842–862.

Gourlay, S. (2001). Knowledge management and HRD. *Human Resource Development International, 4*(1), 27–46. doi:10.1080/13678860121778

Grant, R. (1996). Towards a knowledge-based theory of the firm. *Strategic Management Journal, 17,* 109–122.

Gray, P., & Meister, D. (2005). Knowledge sourcing methods. *Information & Management, 43*(2006), 142–156. doi:10.1016/j.im.2005.03.002

Groff, T. R., & Jones, T. P. (2003). *Introduction to knowledge management: KM in business.* Boston, MA: Butterworth-Heinemann.

Guthrie, J. (2001). The management, measurement and reporting of intellectual capital. *Journal of Intellectual Capital, 2*(1), 27–41. doi:10.1108/14691930110380473

Haimila, S. (2001). Shell creates communities of practice. *KM World, 19,* 1–2.

121

Haney, D. (2006). Knowledge management, organizational performance, and human performance technology. In J. Pershing (Ed.), *Handbook of human performance technology* (3rd ed., pp. 619–639). San Francisco, CA: Pfieffer.

Haney, D., & Driggers, J. (2010). Knowledge management. In D. Leigh & R. Watkins (Eds.), *Handbook of improving performance in the workplace: The handbook of selecting and implementing performance interventions* (Vol. 2, pp. 366–391). San Francisco, CA: Pfieffer.

Hansen, M. T., Nohira, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review, 77*(2), 106–116.

Hars, A., & Ou, S. (2002). Working for free? Motivations for participating in open-source projects. *International Journal of Electronic Commerce, 6*(3), 25–39. doi:10.1109/HICSS.2001.927045

Hayes, N., & Walsham, G. (2000). Competing interpretations of computer supported cooperative work. *Organization, 7*(1), 49–67. doi:10.1177/135050840071004

Hazeldine, M. F., & Miles, M. P. (2010). An exploratory role analysis of opinion leaders, adopters, and communicative adopters with a dynamically continuous innovation. *Journal of Applied Business Research, 26*(4), 117-129.

Hedlund, J., Forsythe, G., Hovath, J., Williams, W., Snook, S., & Sternberg, R. (2003). Identifying and assessing tacit knowledge: Understanding the practical intelligence of military leaders. *Leadership Quarterly, 14*(2), 117–140. doi:10.1016/S1048–9843(03)00006-7

Hemmasi, M., & Csanda, C. M. (2009). The effectiveness of communities of practice: An empirical study. *Journal of Managerial Issues, 21,* 262–279.

Hildreth, P., Kimble, C., & Wright, P. (2000). Communities of practice in the distributed international environment. *Journal of Knowledge Management, 4*(1), 27–38. doi:10.1108/13673270010315920

Hislop, D. (2009). *Knowledge management in organizations.* Oxford, England: Oxford University Press.

Hmelo-Silver, C. (2004). Problem-based learning. *Educational Psychology Review, 16*(3), 235–266. doi:10.1023/B:EDPR.0000034022.16470.f3

Holland, R., Smith, A., Hasselback, J., & Payne, B. (2010). Survey responses: Mail versus email solicitations. *Journal of Business & Economics Research, 8*(4), 95–98.

122

Hollensbe, E., & Guthrie, J. (2000). Group pay-for-performance plans: The role of spontaneous goal setting. *Academy of Management Review, 25*(4), 864–872. doi:10.2307/259211

Holton, E., III, & Swanson, R. (2001). *Foundations of human resource development.* San Francisco, CA: Berrett-Koehler.

Hong, H., & Sullivan, F. (2009). Towards an idea-centered, principle-based design approach to support learning as knowledge creation. *Educational Technology Research & Development, 57*(5), 613–627. doi:10.1007/s11423-009-9122-0

Hovland, I. (2003). Knowledge management and organizational learning: An international development perspective. *Overseas Development Institute Journal, 8*(6), 22–30.

Hung, R., Lien, B., & McLean, G. (2009). Knowledge management initiatives, organizational process alignment, social capital, and dynamic capabilities. *Advances in Developing Human Resources, 11*(3), 320–333. doi:10.1177/1523422309339908

Hwang, Y. (2008). A preliminary examination of the factors for knowledge sharing in technology mediated learning. *Journal of Information Systems Education, 19*(4), 419–429.

Hyde, R. (2008). Capturing knowledge that makes the company great. *Chief Learning Officer, 7*(12), 82–87.

Ichijo, K. (2002). Knowledge exploitation and knowledge exploration: Two strategies for knowledge creation companies. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 477–483). New York: Oxford University Press.

Ichijo, K., & Nonaka, I. (2007). *Knowledge creation and management: New challenges for managers.* Oxford, England: Oxford University Press.

Inkpen, A. (1996). Creating knowledge through collaboration. *California Management Review, 39*(1), 123–140.

International Society for Performance Improvement. (n.d.). *What is HPT?* Retrieved from http://www.ispi.org/content.aspx?id=54

Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *Human Resource Development Review, 2*(4), 337–359. doi:10.1177/1534484303257985

123

Isaac, R., Herremans, I., & Kline, T. (2009). Intellectual capital management: Pathways to wealth creation. *Journal of Intellectual Capital, 10*(1), 81–92. doi:10.1108/14691930910922914

James, C. (2002). Designing learning organizations. *Organizational Dynamics, 32*(1), 46–61. doi:10.1016/S0090-2616(02)00137-7

Jeung, C., Yoon, H., Park, S., & Jo, S. (2011). The contributions of human resource development research across disciplines: A citation and content analysis. *Human Resource Development Quarterly, 22*(1), 87–109.

Johanson, U., Koga, C., Almqvist, R., & Skoog, M. (2009). Breaking taboos: Implementing intellectual assets-based management guidelines. *Journal of Intellectual Capital, 10*(4), 520–538. doi:10.1108/14691930910996625

Johnson, B., & Christensen, L. (2008). *Educational research: Quantitative, qualitative, and mixed approaches* (3rd ed.). Boston, MA: Pearson Education.

Johnson, H. (2007). Communities of practice and international development. *Progress in Development Studies, 7*(4), 277–290.

Kalling, T. (2003). Organizational-internal transfer of knowledge and the role of motivation: A qualitative case study. *Knowledge and Process Management, 10*(2), 115–126.

Kane, A., Argote, L., & Levine, J. (2005). Knowledge transfer between groups via personnel rotation: Effects on social identity and knowledge quality. *Organizational Behavior and Human Decision Processes, 42*(4), 56–71. doi:10.1016/j.obhdp.2004.09.002

Kaplan, R., & Norton, D. (1996). *Translating strategy into action: The balanced scorecard.* Boston, MA: Harvard Business School Press.

Key, M., Thompson, H., & McCann, J. (2009). Knowledge management: A glass half full. *People and Strategy, 32*(4), 42–47.

Kidd, J. (1998). Knowledge creation in Japanese manufacturing companies in Italy. *Management Learning, 29*(2), 131–146. doi:10.1177/1350507698292001

Kieslinger, B., Pata, K., & Fabian, C. (2009). A participatory design approach for the support of collaborative learning and knowledge building in networked organizations. *International Journal of Advanced Corporate Learning, 2*(3), 34–38. doi:10.3991/ijac.v2i3.999

124

Kim, H., & Gong, Y. (2009). The roles of tacit knowledge and OCB in the relationship between group-based pay and firm performance. *Human Resource Management Journal, 19*(2), 120–139. doi:10.1111/j.1748–8583.2009.00093.x

Kivrak, S., Arslan, G., Dikmen, I., & Birgonul, M. (2008). Capturing knowledge in construction projects: Knowledge platforms for contractors. *Journal of Management in Engineering, 24*(2), 87–95. doi:10.1061/(ASCE)0742-597X(2008)24:2(87)

Knott, A. (2002). Exploration and exploitation are compliments. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 339–358). New York, NY: Oxford University Press.

Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies, 24*(4), 625–645. doi:10.1057/palgrave.jibs.8490248

Kokavcová, D., & Malá, D. (2009). Knowledge sharing—the main prerequisite of innovation. *Management of Organizations: Systematic Research, 51,* 47–56.

Kuei-Hsien, N. (2009). Knowledge management and organizational adaptation: A theoretical framework of mediation and moderation. *Review of Business Research, 9*(1), 8–19.

Kurtz, C., & Snowden, D. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM System Journal, 42*(3), 462–483.

Langdon, D. (2000). *Aligning performance: Improving people, systems, and organizations.* San Francisco, CA: Jossey-Bass/Pfeiffer.

Larsen, J. (2001). Knowledge, human resources and social practice: The knowledge-intensive business service as a distributed knowledge system. *Service Industries Journal, 21*(1), 81–102. doi:10.1080/714004998

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, England: Cambridge University Press.

Leavitt, P. (2003). *The role of knowledge management in new drug development.* Retrieved from http://www.providersedge.com/docs/km_articles/Role_of_KM_in_new_drug_development.pdf

Leonard, D. (2007). Knowledge transfer within organizations. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management* (pp. 57–68). New York, NY: Oxford University Press.

125

Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal, 13,* 111–125. doi:10.1002/smj.4250131009

Lesser, E., & Storck, J. (2001). Communities of practice and organizational performance. *IBM Systems Journal, 40*(4), 831–841. doi:10.1093/0195165128.003.0007

Lewin, A. (1999). Prolegomena on coevolution: A framework for research on strategy and new organizational forms. *Organization Science, 10*(5), 519–534. doi:10.1287/orsc.10.5.519

Liew, C. A. (2008). Strategic integration of knowledge management and customer relationship management. *Journal of Knowledge Management, 12*(4), 131–146. doi:10.1108/13673270810884309

Lovas, B., & Ghoshal, S. (2000). Strategy as guided evolution. *Strategic Management Journal, 21,* 875–896. doi:10.1002/1097-0266(200009)21:9<875::AID-SMJ126>3.0.CO;2-P

March, J. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87. doi:10.1287/orsc.2.1.71

McCall, H., Arnold, V., & Sutton, S. (2008). Use of knowledge management systems and the impact on the acquisition of explicit knowledge. *Journal of Information Systems, 22*(2), 77–101. doi:10.2308/jis.2008.22.2.77

McElroy, M. (2002). Social innovation capital. *Journal of Intellectual Capital, 3*(1), 30–39. doi:10.1108/14691930210412827

McKinlay, A. (2002). The limits of knowledge management. *New Technology, Work, and Employment, 17*(2), 76–88. doi:10.1111/1468-005X.00095

McLean, J. (2009). Does your organisation know what it knows? *Manager: British Journal of Administrative Management, 66*, 32–33.

McWilliam, C., Kothari, A., Kloseck, M., Ward-Griffin, C., & Forbes, D. (2008). Organizational learning for evidence-based practice: A "PAKT" for success. *Journal of Change Management, 8*(3–4), 233–247. doi:10.1080/14697010802397016

Moitra, D., & Kumar, K. (2007). Managed socialization: How smart companies leverage global knowledge. *Knowledge and Process Management, 14*(3), 148–157. doi:10.1002/kpm.278

126

Morabito, J., Sack, I., Stohr, E., & Bhate, A. (2009). Designing flexible organizations. *Global Journal of Flexible Systems Management, 10*(2), 1–10.

Mouritsen, J. (2009). Classification, measurement and the ontology of intellectual capital entities. *Journal of HRCA: Human Resource Costing & Accounting, 13*(2), 154–162.

Moynihan, D., & Landuyt, N. (2009). How do public organizations learn? Bridging cultural and structural perspectives. *Public Administration Review, 69*(6), 1097–1105. doi:10.1111/j.1540-6210.2009.02067.x

Murphy, R. (2009). The role of time in the creation of knowledge. *ICFAI Journal of Knowledge Management, 7*(3/4), 7–26.

Murray, S., & Peyrefitte, J. (2007). Knowledge type and communication media choice in the knowledge transfer process. *Journal of Managerial Issues, 19*(1), 111–133.

Nafukho, F. M. (2009). HRD's role in identifying, measuring, and managing knowledge assets in the intangible economy. *Advances in Developing Human Resources, 11*(3), 399–410. doi:10.1177/1523422309337718

Nahapiet, J., & Ghoshal, S. (2002). Social capital, intellectual capital, and the organizational advantage. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 673–697). New York, NY: Oxford University Press.

Nelson, B. (1999). Unleash your talent. *Executive Excellence, 16*(1)*,* 19 –20.

Nicolini, D., Powell, J., Conville, P., & Martinez-Solano, L. (2008). Managing knowledge in the healthcare sector: A review. *International Journal of Management Reviews, 10*(3), 245–263. doi:10.1111/j.1468-2370.2007.00219.x

Niu, K. (2009). Knowledge management and organizational adaptation: A theoretical framework of mediation and moderation. *Review of Business Research, 9*(1), 8–19.

Nonaka, I., & Nishiguchi, T. (2001). *Knowledge emergence—social, technical and evolutionary dimensions of knowledge creation.* Oxford, England: Oxford University Press.

Nonaka, I., & Peltokorpi, V. (2006). Objectivity and subjectivity in knowledge management: A review of 20 top articles. *Knowledge and Process Management, 13*(2), 73–82. doi:10.1002/kpm.251

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company: How Japanese companies create the dynamics of innovation.* New York, NY: Oxford University Press.

Nonaka, I., & Tiyanam, R. (2005). The theory of the knowledge-creation firm: Subjectivity, objectivity, and synthesis. *Industrial and Corporate Change, 14*(3), 419–436.

Nonaka, I., & Toyama, R. (2007). Why do firms differ? The theory of the knowledge-creating firm. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management* (pp. 13–31). New York, NY: Oxford University Press.

Noorderhaven, N., & Harzing, A. (2009). Knowledge-sharing and social interaction within MNEs. *Journal of International Business Studies, 40*(5), 719–741. doi:10.1057/jibs.2008.106

Numprasertchai, S., & Igel, B. (2005). Managing knowledge through collaboration: Multiple case studies of managing research in university laboratories in Thailand. *Technovation, 25,* 1173–1182. doi:10.1016/j.technovation.2004.03.001

Ogbonna, E., & Wilkinson, B. (2003). The false promise of organizational culture change: A case study of middle managers in grocery retailing. *Journal of Management Studies, 40*(5), 1151–1178. doi:10.1111/1467-6486.00375

Ordonez de Pablos, P. (2003). Intellectual capital reporting in Spain: A comparative view. *Journal of Intellectual Capital, 4*(1), 61–81. doi:10.1108/14691930310455397

Paavola, S., Liponen, L., & Hakkarainen, K. (2002). Epistemological foundations for CSCL: A comparison of three models of innovative knowledge communities. In G. Stahl (Ed.), *Computer-supported collaborative learning: Foundations for a CSCL community* (pp. 24–32). Hillsdale, NJ: Lawrence Erlbaum Associates.

Paavola, S., Liponen, L., & Hakkarainen, K. (2004). Models of innovative knowledge communities and three metaphors of learning. *Review of Educational Research, 74*(4), 557–576. doi:10.3102/00346543074004557

Parise, S. (2007). Knowledge management and human resource development: An application in social network analysis. *Advances in Developing Human Resources, 9*(3), 359–383. doi:10.1177/1523422307304106

Pearse, N. (2009). The role of experiences in creating and developing intellectual capital. *Management Research News, 32*(4), 371–382. doi:10.1108/01409170910944317

128

Perrott, B. E. (2008). Knowledge management from an industry perspective: Findings from an industry study. *Journal of General Management, 34*(1), 55–70.

Pershing, J. (2006). Human performance technology fundamentals. In J. Pershing (Ed.), *Handbook of Human Performance Technology* (3rd ed.). (pp. 5–34). San Francisco, CA: Pfieffer.

Persson, M. (2006). The impact of operational structure, lateral integrative mechanisms and control mechanisms on intra-MNE knowledge transfer. *International Business Review, 15*(5), 547–569. doi:10.1016/j.ibusrev.2006.06.001

Petrash, G. (1996). Dow's journey to a knowledge value management culture. *European Management Journal, 14*(4), 365–373. doi:10.1016/0263-2373(96)00023-0

Poincaré, H. (1952). *Science and method.* New York, NY: Dover.

Polanyi, M. (1962). *Personal knowledge: Towards a post-critical philosophy.* London, England: Routledge.

Polanyi, M. (1966). *The tacit dimension.* New York, NY: Doubleday.

Powers, V. (2004). Virtual communities at Caterpillar foster knowledge sharing. *Training and Development, 58*(6), 40–45.

Prasarnphanich, P., & Wagner, C. (2009). The role of wiki technology and altruism in collaborative knowledge creation. *Journal of Computer Information Systems, 49*(4), 33–41.

Prieto, L. (2009). Some necessary conditions and constraints for successful learning organizations. *Competition Forum, 7*(2), 513–520.

Raelin, J. A. (2008). *Work-based learning: Bridging knowledge and action in the workplace.* San Francisco, CA: Jossey-Bass.

Raghupathi, V., Arazy, O., Kumar, N., & Shapira, B. (2009). Opinion leadership: Non-work-related advice in a work setting. *Journal of Electronic Commerce Research, 10*(4), 220-234.

Ram, S., & Sheth, J. (1989). Consumer resistance to innovations: The marketing problem. *The Journal of Consumer Marketing, 6*(2), 5-14.

Ramesh, B., & Sengupta, K. (1995). Multimedia in a design rationale decision support system. *Decision Support Systems, 15*(3), 181–196. doi:10.1016/0167-9236(94)00060-6

129

Rasmussen, L., & Wangel, A. (2007). Work in the virtual enterprise—creating identities, building trust, and sharing knowledge. *AI & Society, 21*(1/2), 184–199. doi:10.1007/s00146-005-0029-y

Ray, T. (2008). Rethinking Michael Polanyi's realism: From personal knowledge to intersubjectively viable communication. *Prometheus, 26*(3), 241–257. doi:10.1080/08109020802270208

Ray, T. (2009). Rethinking Polanyi's concept of tacit knowledge: From personal knowing to imagined institutions. *Minerva: A Review of Science, Learning & Policy, 47*(1), 75–92. doi:10.1007/s11024-009-9119-1

Reay, M. (2010). Knowledge distribution, embodiment, and insulation. *Sociological Theory, 28*(1), 91–107. doi:10.1111/j.1467-9558.2009.01363.x

Robinson, D. G. (2002). Performance consultant—the job. In G. M. Piskurich (Ed.), *HPI essentials: A just-the-facts primer on human performance improvement* (pp. 177–189). Alexandria, VA: American Society for Training and Development.

Robinson, D. G., & Robinson, J. C. (2006a). Making the transition from a learning to a performance function. In J. A. Pershing (Ed.), *Handbook of human performance technology: Principles, practices, and potential* (3rd ed., pp. 903–923). San Francisco, CA: Pfeiffer.

Robinson, D., & Robinson, J. (2006b). Performance consulting: The art and the science. *Performance Improvement, 45*(4), 5–8.

Rogers, E. (2003). *Diffusion of innovation theory*. New York, NY: Free Press.

Roos, J., Roos, G., Dragonetti, N., & Edvinnson, L. (1997). *Intellectual capital: Navigating in the new business landscape.* New York, NY: New York University Press.

Ruggles, R. (1998). The state of the notion: Knowledge management in practice. *California Management Review, 40*(3), 80–89.

Rummler, G. A. (2004). *Serious performance consulting according to Rummler.* Silver Spring, MD: International Society for Performance Improvement.

Rummler, G., & Morrill, K. (2004). Know your client's business. *Performance Improvement, 43*(3), 21–27.

Ruuska, I., & Vartiainen, M. (2005). Characteristics of knowledge sharing communities in project organizations. *International Journal of Project Management, 23*(5), 374–379. doi:10.1016/j.ijproman.2005.01.003

130

Ryan, S., & O'Connor, R. (2009). Development of a team measure for tacit knowledge in software development teams. *Journal of Systems & Software, 82*(2), 229–240. doi:10.1016/j.jss.2008.05.037

Saint-Onge, H. (1996). Tacit knowledge: The key to the strategic alignment of intellectual capital. *Strategy & Leadership, 24*(2), 10–14. doi:10.1108/eb054547

Sala, S. (2003). Improve performance. *Credit Union Management, 26*(11), 32–35.

Salkind, N. (2003). *Exploring research* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Sanchez, P., Chaminade, C., & Olea, M. (2000). Management of intangibles—an attempt to build theory. *Journal of Intellectual Capital, 1*(4), 312–327. doi:10.1108/14691930010359225

Sanchez-Guitierrez, J., Gaytan-Cortes, J., & Ortiz-Barrera, M. (2009). Effects of stakeholder in knowledge management in hotel industry in Guadalajara, Mexico. *Competition Forum, 7*(1), 176–180.

Sanders, E., & Ruggles, J. (2000). HPI soup. *Training & Development, 54*(6), 26–36.

Sanders, E., & Thiagarajan, S. (2001). *Performance intervention maps: 36 strategies for solving your organization's problems.* Alexandria, VA: American Society for Training and Development.

Schaffer, S., & Keller, J. (2003). Measuring the results of performance improvement interventions. *Performance Improvement Quarterly, 16*(1), 73-92.

Schein, E. (1996). Three cultures of management: The key to organizational learning. *Sloan Management Review, 38*(1), 9–20.

Schilhab, T. (2007). Knowledge for real: On implicit and explicit representations and education. *Scandinavian Journal of Educational Research, 51*(3), 223–238. doi:10.1080/00313830701356034

Schiuma, G., Lerro, A., & Carlucci, D. (2008). The knoware tree and the regional intellectual capital index: An assessment within Italy. *Journal of Intellectual Capital, 9*(2), 283–300. doi:10.1108/14691930810870346

Schultz, M. (2003). Pathways of relevance: Exploring inflows of knowledge into subunits of multinational corporations. *Organization Science, 14*(4), 440–459.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization.* New York, NY: Doubleday/Currency.

131

Senge, P. (2006). *The fifth discipline* (2nd ed.). New York, NY: Doubleday.

Serenko, A., & Bontis, N. (2009). Global ranking of knowledge management and intellectual capital academic journals. *Journal of Knowledge Management, 13*(1), 4–15. doi:10.1108/13673270910931125

Serenko, A., Bontis, N., & Grant, J. (2009). A scientometric analysis of the proceedings of the McMaster world congress on the management of intellectual capital and innovation for the 1996–2008 period. *Journal of Intellectual Capital, 10*(1), 8–21. doi:10.1108/14691930910922860

Shieh, C. (2011). Study on the relations among the customer knowledge management, learning organization, and organizational performance. *Service Industries Journal, 31*(5), 791 –807.

Tse-Hua, S., & Xitao, F. (2009). Comparing response rates in e-mail and paper surveys: A meta-analysis. *Educational Research Review, 4*, 26–40.

Shih, K., Chang, C., & Lin, B. (2010). Assessing knowledge creation and intellectual capital in banking industry. *Journal of Intellectual Capital, 11*(1), 74–89. doi:10.1108/14691931011013343

Simon, M., & Francis, J. B. (2001). *The dissertation and research cookbook* (3rd ed.). Dubuque, IA: Kendall/Hunt.

Singh, T., & Premarajan, R. (2007). Antecedents to knowledge transfer: Trust and culture. *South Asian Journal of Management, 14*(1), 93–104.

Solitander, M., & Tidström, A. (2010). Competitive flows of intellectual capital in value creating networks. *Journal of Intellectual Capital, 11*(1), 23–38. doi:10.1108/14691931011013316

Sternberg, R., Forsythe, J., Hedlund, J., Hovarth, J., Wagner, R., Williams, W., Snook, S., & Grigorenko, E. (2000). *Practical intelligence in everyday life.* Cambridge: Cambridge University Press.

Stewart, T. (1997). *Intellectual capital: The new wealth of organizations.* New York: Doubleday.

Stolovitch, H., & Keeps, E. (1992). What is human performance technology? In H. Stolovitch & E. Keeps (Eds.), *Handbook of human performance technology: A comprehensive guide for analyzing and solving performance problems in organizations* (pp. 3–13). San Francisco: Jossey-Bass.

132

Stolovitch, H., & Keeps, E. (1999). Human performance technology fundamentals. In H. Stolovitch & E. Keeps (Eds.), *Handbook of human performance technology: Improving individual and organizational performance worldwide* (2nd ed., pp. 5–34). San Francisco, CA: Jossey-Bass/Pfeiffer.

Storck, J., & Hill, P. (2000). Knowledge diffusion through "strategic communities." *Sloan Management Review, 41*(2), 63–74. doi:10.1016/B978-0-7506-7293-1.50008-1

Straus, S., Tetroe, J., & Graham, I. (2009). Defining knowledge translation. *Canadian Medical Association Journal, 181*(3/4), 165–168. doi:10.1503/cmaj.081229

Sturmberg, J., & Martin, C. (2008). Knowing—in medicine. *Journal of Evaluation in Clinical Practice, 14*(5), 767–770. doi:10.1111/j.1365-2753.2008.01011.x

Styhre, A. (2008). The role of social capital in knowledge sharing: The case of a specialist rock construction company. *Construction Management and Economics, 26,* 941–951. doi:10.1080/01446190802259035

Subramaniam, M., & Venkatraman, N. (2001). Determinants of transnational new product development capability: Testing the influence of transferring and deploying tacit overseas knowledge. *Strategic Management Journal, 22*(4), 359-378.

SurveyMonkey. (n.d.). *Security statement.* Retrieved from http://www.surveymonkey.com/Monkey_Security.aspx

Sveiby, K. (2001a). A knowledge-based theory of the firm to guide in strategic formulation. *Journal of Intellectual Capital, 2*(4), 334–358. doi:10.1108/14691930110409651

Sveiby, K. (2001b). *Methods for measuring intangible assets.* Retrieved from http://www.sveiby.com/articles/IntangibleMethods.htm

Swanson, R. (1995). Human resource development: Performance is the key. *Human Resource Development Quarterly, 6*(2), 207–213.

Swart, J., & Kinnie, N. (2003). Sharing knowledge in knowledge-intensive firms. *Human Resource Management Journal, 13*(2), 60–75.

Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes, 82*(2), 9–27. doi:10.1006/obhd.2000.2884

Tellis, G., Prabhu, J., & Chandy, R. (2009). Radical innovation across nations: The preeminence of corporate culture. *Journal of Marketing, 73*(1), 3–23. doi:10.1509/jmkg.73.1.3

Tiwana, A. (2009). *The knowledge management toolkit.* Upper Saddle River, NJ: Prentice Hall.

Toffler, A. (1990). *Powershift: Knowledge, wealth, and violence at the edge of the 21st century.* New York, NY: Bantam Books.

Trainor, T., Brazil, D., & Lindberg, T. (2008). Building knowledge from organizational experience: Approaches and lessons learned from US Army base camp workshops. *Engineering Management Journal, 20*(2), 37–45.

Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation.* New York, NY: Oxford University Press.

Von Krogh, G., & Roos, J. (1995). A perspective on knowledge, competency, and strategy. *Personnel Review, 24*(3), 56–76.

Wagner, R., & Sternberg, R. (1991). *TKIM: The common sense manager—tacit knowledge inventory for managers test booklet.* San Antonio, TX: Harcourt Brace Jovanovich.

Wang, T. (2004). From general system theory to total quality management. *Journal of American Academy of Business, 4*(1/2), 394–402.

Wang, W., & Chang, C. (2005). Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan. *Journal of Intellectual Capital, 6*(2), 222–236. doi:10.1108/14691930510592816

Wasko, M., & Faraj, S. (2000). It is what one does: Why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems, 9,* 155–173.

Wasko, M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly, 29*(1), 35–57.

Webster, F. (2002). *Theories of the information society.* London, England: Routledge.

Wegmann, G. (2008). The balanced scorecard as a knowledge management tool: A French experience in a semi-public insurance company. *ICFAI Journal of Knowledge Management, 6*(3), 22–38.

Wei-Li, W., Chien-Hsin, L., Bi-Fen, H., & Ryh-Song, Y. (2009). Interpersonal trust and knowledge sharing: Moderating effects of individual altruism and a social interaction environment. *Social Behavior & Personality: An International Journal, 37*(1), 83–93. doi:10.2224/sbp.2009.37.1.83

134

Weimer, M. (2006). *Enhancing scholarly work on teaching and learning: Professional literature that makes a difference.* San Francisco, CA: Jossey-Bass.

Wenger, E. (1998). *Communities of practice.* Cambridge, England: Cambridge University Press.

Wenger, E. (2001). Organically grown. *T+D, 55*(6), 40–43.

Wenger, E., McDermott, R., & Snyder, W. (2002). *Cultivating communities of practice.* Boston, MA: Harvard Business School Press.

Wenger, E., & Snyder, W. (2000). Communities of practice: The organizational frontier. *Harvard Business Review, 78*(1), 139–145.

Werner, J. M., & DeSimone, R. L. (2009). *Human resource development* (5th ed.). Mason, OH: Cengage Learning.

Wexler, M. (2002). Organizational memory and intellectual capital. *Journal of Intellectual Capital, 3*(4), 393–414. doi:10.1108/14691930210448314

Wielkiewicz, R. (2000). *SPSS online guide.* Retrieved from http://www.mhhe.com/socscience/psychology/runyon/spss/chisquare.html

Wiig, K. (1997). Integrating intellectual capital and knowledge management. *Long Range Planning, 30*(3), 399–405. doi:10.1016/S0024-6301(97)00020-4

Willmore, J. (2008). The evolution of human performance improvement. In E. Beich (Ed.), *ASTD handbook for workplace learning professionals* (pp. 33–46). Alexandria, VA: ASTD Press.

Winter, S., & Szulanski, G. (2001). Replication as strategy. *Organizational Science, 12*(6), 730–743. doi:10.1287/orsc.12.6.730.10084

Winter, S., & Szulanski, G. (2002). Replication of organizational routines: Conceptualizing the exploitation of knowledge assets. In C. Choo & N. Bontis (Eds.), *The strategic management of intellectual capital and organizational knowledge* (pp. 201–221). New York: Oxford University Press.

Wu, W., Tsai, H., Cheng, K., & Lai, M. (2006). Assessment of intellectual capital management in Taiwanese IC design companies: Using DEA and the Malmquist productivity index. *R&D Management, 36*(5), 531–545. doi:10.1111/j.1467-9310.2006.00452.x

Zander, I., & Sorvell, O. (2000). Cross-border innovation in the multinational corporation. *International Studies of Management and Organisation, 30,* 44–67.

135

Zar Wajidi, M., & Asim, M. (2009). The realms of knowledge management from an organizational perspective. *International Business & Economics Research Journal, 8*(11), 121–132.

Ziori, E., & Dienes, Z. (2008). How does prior knowledge affect implicit and explicit concept learning? *Quarterly Journal of Experimental Psychology, 61*(4), 601–624. doi:10.1080/17470210701255374

Zollo, M., & Winter, S. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13,* 339–351. doi:10.1287/orsc.13.3.339.2780

For this study, the researcher modified the Knowledge Management Practices

Survey originally developed by Statistics Canada.

Definitions
Please consider the following definitions when completing this survey. Knowledge: The sum of what is known by an individual. Knowledge Management: Any systematic activity related to the capture and sharing of knowledge by the organization. Worker: The term worker includes your regular workers (employees) as well as managers, executives, partners, directors, and persons employed under contract.
Knowledge Management Practices
This section measures the use of formal, informal, and everyday knowledge management practices. 1. **Using the tables below, please indicate the use your organization makes of each of the knowledge management practices listed.** Use the following response categories in your answers: ▪ **In Use Before 2008** Your organization began regularly using this practice before 1999 ▪ **Used Since 2008** Your organization has regularly used this practice since 1999 ▪ **Plan to Use in the Next 24 Months** Your organization intends to regularly use this practice in the next 24 months ▪ **Don't Know/Not Applicable** **Check <u>ONE</u> response for each item.**

Knowledge Management Practices Within Your Organization	In Use Before 2008	Used Since 2008	Plan to Use in the Next 24 Months	Don't Know/Not Applicable
1.1 Policies and Strategy **Your organization:**				
A. has a written knowledge management policy or strategy				
B. has a value system or culture intended to promote knowledge sharing				
C. has policies or programs intended to improve worker retention				
D. uses partnerships or strategic alliances to acquire knowledge				
1.2 Leadership **In your organization, knowledge management practices are:**				
A. a responsibility of managers and executives				
B. a responsibility of nonmanagement workers				
C. a responsibility of the knowledge offer or knowledge management unit				
D. explicit criteria for assessing worker performance				
1.3 Incentives **Your organization specifically rewards knowledge sharing with:**				
A. monetary incentives				
B. nonmonetary incentives				

138

1.4 Knowledge Capture and Acquisition **Your organization regularly:**				
A. captures and uses knowledge obtained from other industry sources such as industrial associations, competitors, clients, and suppliers				
B. captures and uses knowledge obtained from public research institutions, including universities and government laboratories				
C. dedicates resources to detecting and obtaining external knowledge and communicating it within your organization				
D. encourages workers to participate in project teams with external experts				
1.5 Training and Mentoring **Your organization:**				
A. provides formal training related to knowledge management practices				
B. provides informal training related to knowledge management practices				
C. uses formal mentoring practices, including apprenticeships				
D. encourages experienced workers to transfer their knowledge to new or less experienced workers				
E. encourages workers to continue their education by reimbursing tuition fees for successfully completed work-related courses				

139

F. offers off-site training to workers in order to keep skills current			
1.6 Communications **In your organization, workers share knowledge or information by:**			
A. regularly updating databases of good work practices, lessons learned, or listings of experts			
B. preparing written documentation such as lessons learned, training manuals, good work practices, articles for publication, etc. (organizational memory)			
C. facilitating collaborative work by project teams that are physically separated ("virtual teams")			

1.7 Are there any knowledge management practices that your organization uses that we have not included in this survey?

No		
Yes		
If Yes, please specify:		

If you checked **at least** one response in either the **In Use Before 2008** or **Used Since 2008** column in any of **Questions 1.1–1.6**, please **continue**. Otherwise, please **go to Question 5**.

Reasons for Using Knowledge Management Practices

This section measures the reasons for using knowledge management practices.

2. **Please indicate the level of importance you attribute to each reason for using the knowledge management practices currently in use in your organization.**

Check **ONE** response for each item.				
Reasons Knowledge Management Practices Are Used in Your Organization	**Critical**	**Important**	**Somewhat Important**	**Not at All Important**
A. To improve the competitive advantage of your organization				
B. To help integrate knowledge within your organization				
C. To improve the capture and use of knowledge from sources outside your organization				
D. To improve sharing or transferring of knowledge with partners in strategic alliances, joint ventures, or consortia				
E. To increase efficiency by using knowledge to improve production processes				
F. To protect your organization from loss of knowledge due to workers' departures				
G. To train workers to meet strategic objectives of your organization				
H. To increase worker acceptance of innovations				
I. To improve worker retention				
J. To identify and/or protect strategic knowledge present in your organization				

141

K. To ease collaborative work of projects or teams that are physically separated (i.e., different work sites)				
L. To promote sharing or transferring knowledge with clients or customers				

Results of Using Knowledge Management Practices

This section measures the results for using knowledge management practices.

3. **In the table below, please indicate the level of effectiveness you attribute to these results for the knowledge management practices currently in use in your organization.**

Check ONE response for each item.

Reasons Knowledge Management Practices are used in Your Organization	Very Effective	Effective	Somewhat Effective	Not at All Effective
Using knowledge management practices:				
A. increased our knowledge sharing horizontally (across departments, functions, or business units)				
B. increased our knowledge sharing vertically (up the organizational hierarchy)				
C. improved worker efficiency and/or productivity				
D. improved skills and knowledge of workers				
E. increased our number of markets (more geographic locations)				
F. improved client or customer relations				

142

G. helped us add new products or services				
H. increased our adaptation of products or services to client requirements				
I. increased flexibility in production and innovation				
J. prevented duplicate research and development				
K. improved our corporate or organizational memory				
L. increased our ability to capture knowledge from public research institutions, including universities and government laboratories				
M. increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.				
N. improved involvement of workers in workplace activities				

Background Information

4. **Please tell us about yourself**

Check ONE response for each item.

1.1 Is your organization global (located in more than one country)?	Yes
	No
1.2 Total Employees **How many total employees in your organization?:**	1–4999
	5000–9999
	10,000–24,999
	25,000–49,999
	50,000–74,000
	75,000–99,999
	100,000 or over
1.3 Your years of experience in Training, Human Performance, and/or Knowledge Management:	0–5
	6–10
	11–15

143

	16–20
	21–25
	26 or more
1.4 Are you a member of:	Professional Organization 1
	Professional Organization 2
	Both Professional Organizations 1 and 2
1.4 Gender?	Male
	Female