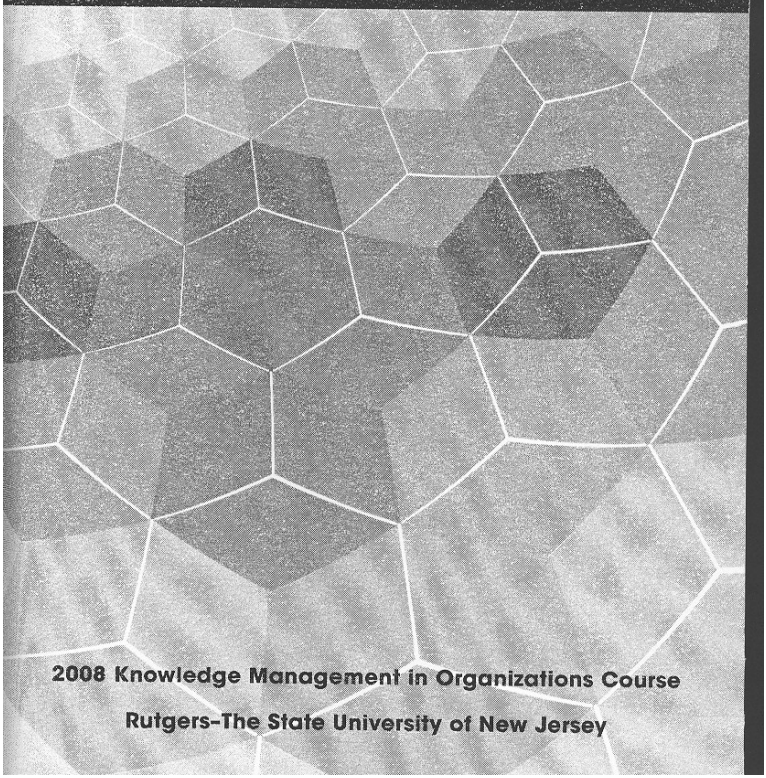
KNOWLEDGE ABOUT KNOWLEDGE



2008 Knowledge Management in Organizations Course

Rutgers-The State University of New Jersey

Knowledge

about

Knowledge

Knowledge Management in Organizations

School of Communication, Information, and Library Science

Rutgers—The State University of New Jersey

Manufactured in the United States of America

Contents

Preface
Claire R. McInerney **5**
Understanding Knowledge-Sharing Behavior: A Theoretical Framework
Bibi Alajmi **6**
Knowledge Management 2.0?: The Relationship between Web 2.0 Technologies and KM Theory
Kevin Andreano **15**
Social Capital and Knowledge Exchange: A Business Perspective
Kelly Bergman **23**
Cultural Variations and Knowledge Management: Diversity's Impact and Successful Ways to Handle Differences
Katalin Bergou **31**
Knowledge Management in University Athletic Communications: A Study of the Princeton University OAC
Andrew Borders **38**
Storytelling as Knowledge Transfer in Medical Contexts
Marilyn Campbell **46**
Implementing Knowledge Management within Market Research for Advertising
James Caverly **57**
E-learning Systems: Promises for the Future and Obstacles to Success
Beth Csider **65**
Librarians and the Knowledge Artifact
Amy Di Dario **74**
Mitigating Bounded Rationality: The Role of Decision Support Systems and Group Support Systems in Achieving Optimal Group Decision Quality
Crystal DeCotiis **82**
Codifying Your Corporation's Knowledge
Joe Donnelly **92**
Tacit-Explicit Knowledge: Is It Possible to Separate One from the Other?
Mohamed Rashad Elbanna **99**
Online Communities of Practice
Marguerite Estephan **112**
Knowledge Management in Small Decentralized Organizations
Joshua Gelles
E-learning: What We Need to Know
Beth Gard **127**
Knowledge Management Implementation for Personalization and Codification Strategies: Influencing Fidelity and Uniformity in Outcomes
Christine Goldthwaite **136**
E-learning Systems: Taking Over Face-to-Face Learning?
Paige Grosnick **148**
Knowledge Codification: Strategies toward Storing and Capturing Knowledge
Michael G. Hall **154**
Instant Messaging as a Knowledge Sharing Tool

Contents

Karen Hanson **160**
Knowledge Management and the Nonprofit Sector
Timothy Horras **168**
The Importance of Social Capital from the Perspective of Knowledge Management
Laura A. Mannix **173**
Knowledge Management and Major League Baseball
Jonathan McCue **181**
Beyond Best Practices: Knowledge Management for Innovation
Dorothy Meaney **188**
The Role of Social Software Technologies in Knowledge Management Programs
Jennifer Nelson **195**
Creating the Conditions of Trust for Knowledge Transfer and Creation: A Consensus Model
Connie Pascal **202**
The Codification and Transfer of Knowledge
Lisa Pierce **210**
Leveraging Organizational Structure and Communities of Practice for the Transmission of Tacit Knowledge
Carla Schubach **217**
A Right to Mental Privacy?: The Clash of Technology, Knowledge, and Civil Rights
David B. Spira **224**
Organizations as Complex Adaptive Systems: Implications for Knowledge Management
Iulian Vamanu **230**
Measuring Knowledge Management
Emmy de Visser **240**
Knowledge Management in Nonprofit, Volunteer-based Organizations
Melissa Waggenspack **247**
Managing and Distributing Knowledge: Application of Knowledge Management Principles in an Organizational Setting
Samantha Yakal-Kremski **257**
Crime Suppression Through Knowledge Management
Theodore Yurgel
264

Preface

Knowledge Management (KM) is a practice that increases the ability of an organization to develop new knowledge and encourages communication and documentation that allow members to share what they know. KM is an interdisciplinary field of study as well as an organizational practice that universities are increasingly offering to students in business schools, schools of communication, and schools of library and information science. This monograph is a compilation of papers written by students majoring in Communication and Information Studies or in Library and Information Science at Rutgers, the State University of New Jersey, during the spring semester 2008. Graduate students studied the traditional KM theories, discussed controversial issues, and gave presentations that demonstrated the relationship between knowledge and decision making. In consultation with the course instructor, students identified a topic related to knowledge management that they wanted to study in depth. The resulting essays focus on theoretical aspects of KM or on real-world applications of knowledge processes. In the spirit of knowledge sharing, the book allows all those in the class and beyond to share what they have learned through the writing resulting from the semester's intellectual work. The references at the end of each chapter offer an array of resources for anyone interested in pursuing further study.

The book begins with a theoretical framework for understanding knowledge-sharing behavior among individuals and then moves to an exploration of organizations as complex adaptive systems. Organizational contexts represented in the book include libraries, law enforcement, sports communication groups, creative services organizations, child protection, medical practices, and nonprofit volunteer organizations. Standard knowledge management practices that are discussed include: storytelling, communities of practice, codification, and electronic (or distance) learning. The KM net in this work is cast fairly wide with some chapters investigating instant messaging, social networking, and Web 2.0 applications and their relationship to knowledge development and knowledge sharing. The importance of trust, innovation, and social capital are also subjects of some chapters. The chapter focusing on decision support systems takes the interesting view of bounded rationality as applied to decision support technology, reflecting one of the units of study undertaken in the course. Some of the chapters contain graphic models that represent knowledge processes; these models can be extremely useful as learning tools to help the reader understand subtle interactions between theory and practice

My wish for this work is that it serve as a lasting representation of learning that occurred in the 2007–2008 academic year. Thanks and acknowledgment go to all the students, especially the publication committee, and to Professor Michael Lesk for his assistance in producing the book.

Claire R McInerney
Director, Information Technology and Informatics Program
School of Communication, Information and Library Studies
Rutgers, the State University of New Jersey

Understanding Knowledge-Sharing Behavior: A Theoretical Framework

Bibi Alajmi
Doctoral Program in Communication, Information and Library Science and Media Studies

Abstract

This paper develops an understanding of knowledge-sharing behavior through the adaptation of different theories imported from other disciplines including *social psychology, economics, organizational climate,* and *information science.* Exploring these theories from a knowledge-sharing perspective could facilitate a distinctive theoretical knowledge-sharing framework. At the end, the paper develops a theoretical framework for explaining knowledge-sharing behavior. Though effective knowledge sharing cannot be forced or mandated, it is essential to deepen our understanding of the factors that might increase or lessen employee tendencies to engage in knowledge-sharing behaviors. The framework should work as a guideline to assist organizations in creating an environment that can support and encourage knowledge sharing to breed the benefits of sharing expertise and knowledge to improve the individuals' as well as the organizations' performance.

Introduction

Knowledge sharing has received major attention in organizations because it is one of the primary pillars in knowledge management (KM) initiatives—and even is the most controversial one. Lee & Al-Hawamdeh (2002) define knowledge sharing as the deliberate act in which knowledge is made reusable through its transfer from one party to another. On the other hand, Bordia, Irmer, Garden, Phaire, and Abusah (2004) have classified knowledge sharing as an organizational citizenship behavior, and defined knowledge-sharing behavior as "an individual behavior that is discretionary, not directly or explicitly recognized by the formal rewards system, and that in the aggregate promotes the effective functioning of the organization (p. 130)."

The level of human issues and problems embedded in knowledge-sharing behavior is much higher than that of any other process within KM. This is so because knowledge sharing is a people-to-people process (Ryu, 2003) and is often difficult to implement. Sharing knowledge often seems unnatural. People will not share their knowledge because they think it is valuable and important. Moreover, the natural tendency is to hoard knowledge and look suspiciously upon knowledge from others (Davenport, 1997).

As we look over the existing work in knowledge-sharing behavior, we find two main categories of research and thinking. First, knowledge sharing as a focus area is characterized by imported theories, that is, theories borrowed from other disciplines, including *social psychology, economics,* and *information science.* Second, there are at least two claimants to the title of home-grown or indigenous knowledge-sharing behavior: *dynamic theory of organizational knowledge creation* and *knowledge-based theory of the firm.*

This paper considers explaining how our understanding of knowledge-sharing behavior has been built from different theories imported from other

disciplines, as well as how these theories have facilitated distinctive theoretical knowledge-sharing research. At the end, the paper attempts to develop a theoretical framework for explaining knowledge-sharing behavior. The framework will be designed in a systematic way, where knowledge-sharing behavior is the middle process which requires inputs—i.e., motivational factors—and eventually will lead to outputs and outcomes (See Figure 1). Both the motivational factors as well as the outputs/outcomes will be viewed through the imported theories.

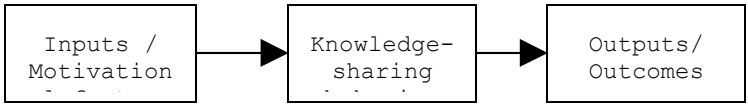


Figure 1: a systematic view of knowledge-sharing behavior

This paper is divided into five main sections:

1. Indigenous Knowledge Management/Knowledge Sharing Theories
2. Imported Theory: Borrowing from Other Disciplines
3. A Synthesized Theoretical Framework
4. Implications
5. Conclusion

Indigenous KM/Knowledge Sharing Theories

Basically indigenous theories are home-grown theories—theories developed within the discipline of KM. Understanding indigenous theories will provide key guidelines on how to build the knowledge-sharing behavior theoretical framework which is the main focus of this paper. Thus, the focus is to present these theories in such a way that could contribute to the development of the framework, and not merely a general presentation of knowledge sharing theories.

Dynamic Theory of Organizational Knowledge Creation. Nonaka's dynamic theory of organizational knowledge creation (Nonaka, 1994) informs its readers of how individuals share their tacit knowledge. Two basic factors would be beneficial in developing the theoretical framework of knowledge-sharing behavior based on Nonaka's theory. First, knowledge sharing is a *dynamic process* through which organizational knowledge is created by means of a continuous dialogue between tacit and explicit knowledge. In fact, any organization that dynamically deals with a changing environment ought to perceive knowledge sharing as a process in which knowledge is created, shared and transferred, and then actively contributes to the development of a competitive edge; that is, when knowledge is shared and created in one part of the organization it will in turn trigger changes in organization systems and eventually influence the organization's performance.

Second, this dynamic process is *constitutive* in that different factors, including individual, organizational as well as contextual factors, are involved. This constitutive process also emphasizes factors influencing knowledge-sharing behavior, whether they are individually based or organizationally based.

Knowledge-Based Theory of the Firm. Even though this theory was developed

outside the field of information science, it is highly cited as one of the most informative KM theories in understanding knowledge sharing as well as many other concepts and controversies within KM. The knowledge-based theory of the firm (Grant, 1996) considers knowledge to be the most strategically important input in production and the primary resource of the firm. The basic assumption of this theory is that all human productivity is knowledge-dependent, and technologies are simply embodiments of knowledge. Extending this theory, knowledge is considered to be a resource embedded in organizational culture and in identity, routines, and systems, as well as in individuals' minds. Knowledge as a resource can facilitate the understanding of the basic assumptions imported theories might emphasize, such as Resource Dependency Theories.

Imported Theories: Borrowing from other Disciplines

Borrowing from Social Psychology

Theory of Reasoned Action and Theory of Planned Behavior. An individual's knowledge-sharing behavior can derive much of its understanding from social psychology theories. Concepts such as attitude and behavioral intention (Fishbein & Ajzen, 1975) derived from these theories could definitely count for understanding how and why individuals are motivated to either share or hoard their knowledge. Ajzin and Fishbein's Theory of Reasoned Action (TRA) (1975) and Theory of Planned Behavior (TPB) (1983) were adopted widely to understand and predict deliberate behavior, because behavior can be deliberative and planned. TRA suggests that a person's behavior is determined by his or her intention to perform the behavior and that his or her intention is, in turn, a function of his or her attitude toward the behavior and his or her subjective norm—i.e., their beliefs about how people they care about will view the behavior in question (See Figure 2). The best predictor of behavior is intention. Intention is the cognitive representation of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. The theory of planned behavior holds that only specific attitudes toward the behavior in question can be expected to predict that behavior.

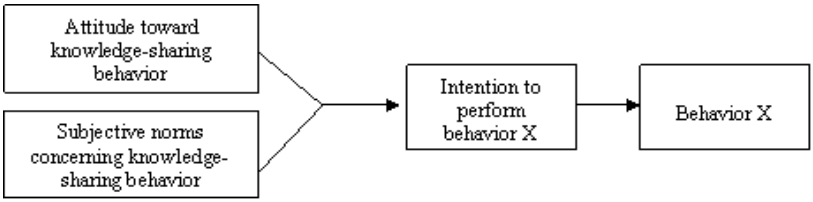


Figure 2: Schematic presentation of conceptual framework for the prediction of specific behavioral intention. Fishbein, M., & Ajzen, I. (1975), (p. 16)

Applying this framework to understanding knowledge-sharing behavior, researchers found that subjective norms have the strongest total effects on behavioral intention to share knowledge. Attitudes were found to be the second most important factors influencing individual's intention (Ryu, Ho & Han, 2003). Though effective knowledge sharing cannot be forced or mandated, it is essential to deepen our understanding of the factors that might increase or lessen employee

tendencies to engage in knowledge-sharing behaviors. That takes us to the second of the imported theories.

Balance Theory. This theory has been developed in a wide-range framework for understanding interpersonal relationships. Interpersonal Balance Theory (Heider, 1958) starts with some simple postulates concerning people's preferences. The theory is based on two main features that could balance the relationship between A and B: reciprocity and homophily. People prefer balanced relationships, i.e., they prefer their relationships to be reciprocated. People prefer to interact with others with whom they share strong attachments to one or more characteristics they have in common.

People will by either changing individuals' attitudes or breaking off relationships. Thus, an individual who is hesitant to share his or her expertise could feel the pressure to keep a balanced relationship with those who share. In order to keep a balanced relationship with other individuals the person has to reciprocate, i.e. share with those who share. Seeking a balanced relationship will also facilitate the creation of strong ties among individuals and, consequently, develop the trust necessary for successful collaboration and knowledge sharing. The result is illustrated in Figure 3.

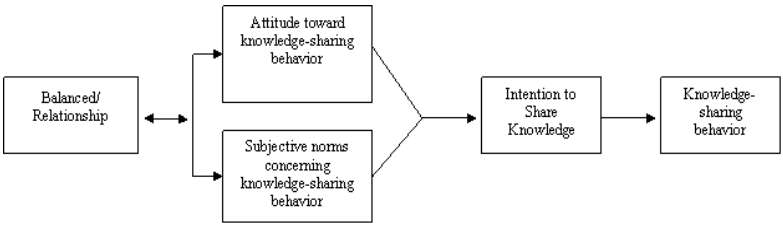


Figure 3: Schematic presentation of conceptual framework for the prediction of specific behavioral intention and the Balanced Relationship as a motivation factor.

Borrowing from Economics

Resource Dependency Theory. Knowledge-sharing behavior can also be described and understood through Resource Dependency Theory (RDT) (1996). Given Grant's assumption of the characteristics of knowledge as a resource, RDT can shed light on the type of relationship between individuals, based on their need for knowledge to complete their tasks. Research on individual relationships and organizational networks emphasizes that individuals and organizations emerge as cooperators due to their need for resources. RDT, however, posits that organizations that are more reliant on other organizations for resources are more likely to cooperate with them (Pfeffer & Salancik, 1978). This theory could also be extended to understand the factors influencing and motivating individuals to share their knowledge. An individual's reliance on others for seeking knowledge could put some pressure to reciprocate and thus maintain a balanced relationship with those knowledge providers.

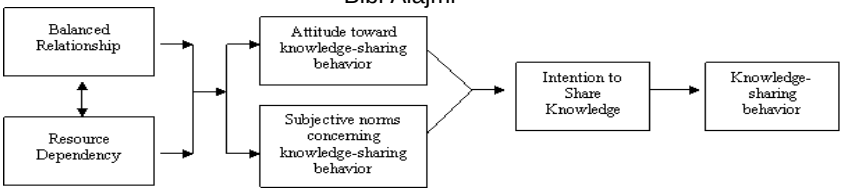


Figure 4: Schematic presentation of conceptual framework for the prediction of specific behavioral intention and Balanced Relationship and Resource Dependency as motivational factors.

Borrowing from Information Science

Anomalous State of Knowledge Theory (ASK). The basic assumption of the Anomalous State of Knowledge Theory (ASK) (Belkin, 1980) is that information need arises from a recognized anomaly in the information systems user's state of knowledge concerning a topic or a situation and that, in general, the user is unable to specify precisely what is needed to resolve that anomaly. This gap between what is needed and how to satisfy these needs could motivate individuals to share more in order to get insight into what is required to satisfy their knowledge needs. Knowledge sharing is conducted not solely for the sharing of information, but also for the seeking of more information and insights about/into a problem or a topic of interest. Thus, a decision maker could share his or her knowledge about a situation with the aim of getting more understanding—knowledge from a different perspective—which could fill in the anomalous knowledge gap he might be facing. This relation is presented in figure 5.

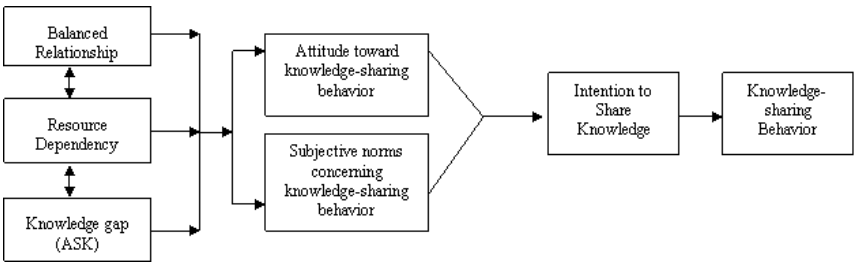


Figure 5: Schematic presentation of conceptual framework for the prediction of specific behavioral intention and the Balanced Relationship, Resource Dependency and Knowledge Gap as motivation factors.

Borrowing from Organizational Climate

In knowledge sharing research, organizational climate has been identified as the first and most critical component for the success of knowledge-sharing strategies. Organizational climate is defined as a "set of characteristics that describe an organization and that (a) distinguishes the organization from other organizations; (b) are relatively enduring over time; and (c) influence the behavior of people in the organization (Forehand & Gilmer, 1964, p. 362 cited in James & Jones, 1974). The effect of organizational climate on individual behavior can be assessed in

terms of the definition of stimuli presented to individual members (James & Jones, 1974; Denison, 1996). Thus, organizational climate is perceived as a critical factor for motivating individuals to share their expertise with their peers (Bock, Zmud, Kim, & Lee, 2005). Organizational climate necessary to motivate individuals' knowledge-sharing behavior is characterized by trust-based intra-team relationships, innovativeness (Burton, Lauridsen, & Obel, 1999; McInerney & Mohr, 2007), autonomy, and fairness (Eisenberge & Riley, 2001).

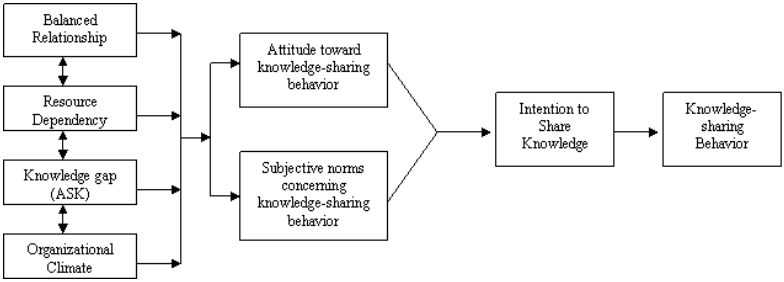


Figure 6: Schematic presentation of conceptual framework for the prediction of specific behavioral intention and the Balanced Relationship, Resource Dependency, Knowledge Gap, and Organizational Climate as motivation factors.

A Synthesized Theoretical Framework

The previous sections of the paper map the understanding of knowledge-sharing behavior in particular. At the same time the paper examined the different motivational factors that could influence individuals to share their knowledge by importing theories from various disciplines. From a different perspective, knowledge sharing theories and practices play a contributing role that could influence organizational as well as individual performances.

Knowledge sharing in organizations manifests itself through improvements in both individual learning experiences and organization performance (Argote & Ingrame, 2000). Knowledge transfer and sharing have proved to be key factors in lowering production unit costs and enhancing learning processes (Argote & Ingram, 2000; Baum & Ingram, 1998; Darr, Argote & Epple, 1995). Performance has been studied by objective measures (such as unit of cost or grade), while other studies rely on more subjective measures—i.e. team efficacy and individual satisfaction (Hardin, Fuller & Valacich, 2006). Thus, knowledge-sharing behavior can have an influential role on an organization's performance, as well as on individuals' levels of satisfaction. Moreover, knowledge sharing among organizational members facilitates and strengthens group dynamics and brings about the development of more satisfactory relationships among members at the team level. These recursive relationships among motivational factors, knowledge-sharing behavior, and performance are presented in Figure 7.

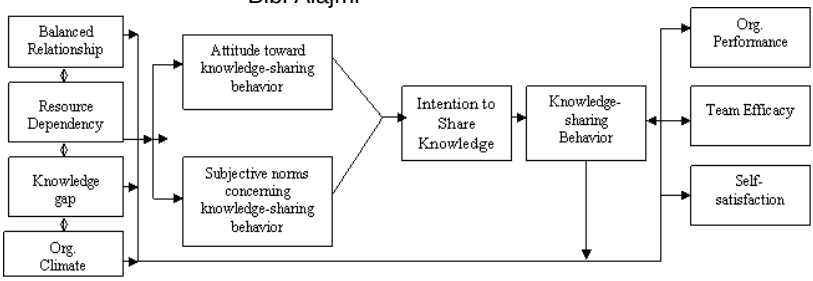


Figure 7: Schematic presentation of conceptual framework for the predictions of specific behavioral intention.

Implications

Although firms that seek to increase knowledge sharing among their employees often invest in a variety of new technologies, there may be more significant predictors of knowledge sharing than the mere availability of technology. Thus, by understanding the recursive relationships among different organizational and individual motivational factors, knowledge-sharing behavior and outcomes may provide clues as to how organizations can adjust knowledge-sharing processes to improve performance. Furthermore, because organizations may not manage all modes of knowledge, understanding contextual factors essential for facilitating knowledge sharing allows for the creation of robust strategies that result in trade-offs. Furthermore, this framework could assist the organizations to understand the context in which knowledge sharing is encouraged. Understanding social as well as business ties will help focus organizational efforts to build and improve different types of ties that could facilitate the transfer of complex and tacit knowledge. Also, this framework could influence the strategies adopted for knowledge sharing in such a way that could assist and enhance organizational and individual's performance.

Conclusion

This paper aimed to provide in-depth understanding of individuals' knowledge-sharing behavior. Basically, and in order to explain individuals' knowledge-sharing behavior—i.e. why individuals tend either to share or hoard their personal knowledge and experience – there was a need to import theories from other disciplines that were capable of providing more understanding of the psychological, economical, organizational as well as individual capabilities that could influence individuals' intention to share knowledge with others.

References

Andrews, K. M., & Delahay, B. L. (2000). Influences on knowledge processes in organizational learning: The psychosocial filter. *Journal of Management Studies. 37*, 797–810.

Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes, 82*(1), 150–169.

Baum, J. A. C., & Ingram, P. (1998). Survival-enhancing learning in the Manhattan hotel industry, 1898–1980, *Management Science, 44*, 996–1016.

Belkin, N.J. (1980). Anomalous states of knowledge as a basis for information retrieval. *Canadian Journal of Information Science. 5*, 133–143.

Bock, G., Zmud, W., Kim, Y. G., & Lee, J., (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces and organizational climate. *MIS Quart., 29*(1), 87–111.

Bordia, P., Irmer, B. E., Garden, M., Phair, K., & Abusah, D. (2004). Knowledge sharing in response to a supportive work environment: evidence from an Australian engineering firm. In B. Trezzeni, P. Lambe, S. Hawamdeh (Eds.), *People, knowledge and technology: what have we learnt so far.* Proceeding of the first iKMS International conference on knowledge management (pp. 129–139). Singapore: World Scientific.

Burton, R., Lauridsen, J., & Obel, B. (1999). Tension and resistance to Change in organizational climate: Managerial implications for a Fast Paced World. Retrieved on April, 2008, from http://ir.lib.cbs.dk/download/ISBN/8791023025.pdf

Davenport, T. H., Prusak, L. (1998, 2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Darr, E., Argote, L., & Epple, D. (1995). The acquisition, transfer and depreciation of knowledge in service organizations: Productivity in franchises. *Management Science, 41*, 1750–1762.

Denison, D. R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. *The Academy of Management Review, 21*(3), 619–654.

Eisenberge, E. M., & Riley, P. (2001). Organizational culture. In F. M. Jablin, L. L. Putnam (Eds.). *Handbook of organizational communication* (pp. 291–321). Newbury Park: Sage.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: an introduction to theory and research. Reading,* MA: Addison-Wesley.

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

Hardin, A. M., Fuller, M. A., & Valacich, J. (2006). Measuring team efficacy in virtual teams: New questions in an old debate. *Small Team Research, 37*(1), 65–85.

Heider, F. (1958). *The psychology of interpersonal relations*. New York, Wiley.

James, L. R., Jones, A. P. (1974). Organizational climate: A review of theory and research. *Psychological Bulletin, 81*(12), 1096–1112.

Lee, C. K., & Al-Hawamdeh, S. (2002). Factors impacting knowledge sharing. *Journal of Information and Knowledge Management, 1*(1), 49–56.

Lee, H. (2003). Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination. *Journal of Management Information Systems, 20* (1), 179-288.

McInerney, C., & Mohr, S. (2007). Trust and knowledge sharing in organizations: Theory and practice. In C. McInerney, and R. E. Day (Eds). *Rethinking knowledge management* (pp. 65–86). Berlin; New York: Springer.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 51,* 24–38.

Knowledge Management 2.0? The Relationship between Web 2.0 Technologies and KM Theory

Kevin Andreano
Master of Library and Information Science

Abstract

Taking as its starting point recent debates over the nature of knowledge management, Enterprise 2.0, and Web 2.0, this paper will present an analysis of the relationship between knowledge management theory and Web 2.0 technologies. This will be achieved primarily through an in-depth examination of the place of Web 2.0 tools in Nonaka's (1994) SECI model for tacit to explicit knowledge conversion. The argument will be made that, because Web 2.0 tools fit so well into Nonaka's fundamental theory of KM, these tools should not be understood as revolutionizing KM or making it obsolete. Instead, the use of Web 2.0 technologies should be seen as a method for revitalizing classic KM theory.

Background and Literature Review

In 2005, Tim O'Reilly introduced the idea of "Web 2.0." The term, which is most widely understood as referring to internet applications that focus on user creativity and collaboration, has become a major buzzword in many different industries (Shimazu & Koike, 2007). Knowledge management (KM) is no exception. In fact, the term and its relationship to KM have even sparked something of a controversy within the KM community.

At the heart of this controversy is Andrew McAfee, a professor at Harvard Business School who has provoked a great deal of discussion by coining another buzzword: Enterprise 2.0 (McAfee, 2006). Enterprise 2.0 (E2.0) is, quite simply, the application of Web 2.0 technologies to organizations. There is no doubt that organizations are starting to use Web 2.0 tools such as blogs, wikis, RSS feeds, and social networking sites; a 2007 survey of 2,847 executives worldwide found that over 30% were using or planning to use all of these tools (Totty, 2007). There is a great deal of doubt, however, surrounding the question of what this all means for knowledge management.

Shortly after McAfee introduced the idea of E2.0, KM guru Tom Davenport wrote a blog post entitled "Why Enterprise 2.0 Won't Transform Organizations" in which he labeled E2.0 "the next small thing" (Davenport, 2007). The two have since held something of a debate on the topic of E2.0 and its relationship to KM (Farber, 2007). Recently, however, Davenport has begun to give E2.0 some credit, and sees it as something that can "give KM a mid-life kicker" (Davenport, 2008). Still, there are those who would disagree. Numerous other discussions about E2.0 and KM have broken out outside of the Davenport/McAfee debate. One of the liveliest discussions has been taking place recently at the Fast Forward blog, the companion blog to the Fast Forward business and technology conference, which involves some of the most influential thinkers in this field. At the center of the discussion is a post by Jon Husband (2008) which presents a "retrospective" on the impact of Web 2.0 on KM. The post itself is interesting, but even more fascinating are the 35 comments that have been added to it. Within these comments it is possible to locate nearly every position on KM and Web 2.0 there is.

Some say that Web 2.0 is revolutionary and that KM is now obsolete. Some suggest that with E2.0 and Web 2.0, we are now arriving at KM 2.0. Some see KM and E2.0 as completely separate entities; others see them as the same thing. All of this leaves us with more questions than answers, and we are still left to wonder, what is the relationship between KM and Web 2.0?

This paper will attempt provide some answer to that question by taking a step back from the current controversy and analyzing the relationship of Web 2.0 technologies to classic KM theory. In particular, Nonaka's (1994) theory of tacit to explicit knowledge conversion, as illustrated by the SECI model, will be used to examine the place of Web 2.0 tools in this most fundamental knowledge management process. Traditional academic articles will also be used to supplement the arguments coming from the key players in the blogosphere. A great deal has been written recently about KM and Web 2.0, with Wagner's (2006) concept of "conversational technologies" being a particularly noteworthy example. Using these articles to understand how and where emerging social software tools fit into Nonaka's knowledge spiral will help to provide some insight into how Web 2.0 technologies fit into KM theory in general.

It should be noted that Chatti, Klamma, Jarke, and Naeve (2007) have already examined, to some extent, the relationship between the SECI model and Web 2.0 tools. These authors have been primarily interested in e-learning, and they have used Web 2.0 technology and the SECI model to develop a theory of a blended learning process that integrates these two concepts. By beginning to sketch out the relationship between SECI and Web 2.0, this article provides a very useful starting point for the current examination of Web 2.0 tools to KM theory. This article, however, will focus more directly on the theoretical aspects of KM and will provide a much more in-depth analysis of the relationship between social software tools and Nonaka's tacit to explicit knowledge spiral.

SECI Meets Web 2.0

This section of the paper will provide an analysis of each process in Nonaka's (1994) SECI model and an examination of how Web 2.0 tools relate to that process. It will be shown that Web 2.0 technology fits into the model at each step, making Web 2.0 tools ideal for the knowledge creation process as it was conceptualized by Nonaka. In fact, it will be shown that current Web 2.0 technologies can actually bring KM closer to an optimized knowledge creation spiral than some of the earlier tools used in the KM field. Demonstrating the close relationship between Nonaka's SECI model and Web 2.0 tools will illustrate the idea that Web 2.0 tools are not at all in conflict with fundamental KM theory and that it would be a mistake to see this technology as somehow revolutionizing KM. Instead, this section will show how KM theory will remain the same, with Web 2.0 tools actually helping it to realize its potential.

Socialization. Socialization is described by Nonaka (1994) as the "process of creating tacit knowledge through shared experience" (p. 19). Experience is vital to this mode of knowledge creation because it allows tacit knowledge to be transferred from one person to another through such social interactions as apprenticeship or training. Numerous authors, including Davenport and Prusak (1998) have stressed the importance of direct, face to face interaction for the successful transfer of tacit knowledge (p. 100). Nonaka (1994) makes no direct distinction between face to face human interaction and virtual, technology-mediated interaction however, writing only

that "without some form of shared experience, it is extremely difficult for people to share each others' thinking process" (p. 19). In this section, evidence will be offered to support the idea that Web 2.0 tools can enable socialization by providing a means by which organizations can create or exploit "shared experiences" among their employees that allow them to better share their tacit knowledge. This is not to suggest that Web 2.0 technologies are an improvement over direct, human interaction, but simply to show that they can be useful tools in the process of tacit to tacit knowledge conversion known as socialization.

One way Web 2.0 tools can be applied to the process of socialization is by using them to expose some of the existing "shared experiences" between employees and providing a means by which these employees can connect and eventually share knowledge with one another. One popular Web 2.0 tool that enables this sort of functionality is a social networking site (SNS). Social networking sites such as Facebook and MySpace are well known primarily for their popularity with young people, but SNSs are beginning to be widely used within organizations. In fact, the growth of enterprise social networking has even prompted the emergence of a new buzzword, "socialprise," in a recent *New York Times* article (Flynn, 2008). One such "socialprise" application, Web Crossing Neighbors, was built "on the premise that social networking can connect employees based on common interests and goals to make the most of the company's human resources" (Dye, 2007, p. 36). By allowing these individuals with "common interests" to be made aware of and have a means of communicating with one another, SNSs are enabling the "process of creating tacit knowledge through shared experience" that Nonaka has identified as socialization (1994, p. 19). The individuals themselves are still responsible for actually transferring knowledge with one another, but the Web 2.0 technology has exposed their shared experience, and has provided a medium through which they could easily and informally transfer that knowledge. As Reid and Gray (2007) have pointed out, organizations using enterprise SNSs "empower their employees to find experts within their own organization," and help employees to understand and visualize "real communication paths within an organization" (p. 35). Both of these increase the potential for tacit knowledge exchange within the organization and should be understood as part of the socialization process.

In addition to connecting users with shared experiences, Web 2.0 tools can actually help to foster those shared experiences by creating a common area in which members of an organization can gather and informally share information. The concept of the water cooler as an informal meeting space has always been considered important in KM. As Daveport and Prusak (1998) note, "Conversations at the water cooler or in the company cafeteria are often occasions for knowledge transfer" (p. 90). Some theorists believe that the knowledge transferred during these informal discussions is actually tacit knowledge, because tacit knowledge can be shared through storytelling (Snowden, 1999) or conversation (Kikoski & Kikoski, 2004). If this is the case, water coolers and cafeterias can be directly understood as sites for socialization. Even if the discussions don't lead directly to tacit knowledge conversion, however, they might still be useful as a means of engendering a sense of community and promoting a common organizational culture. This is just as important to the process of socialization, because, as Nonaka (1994) has stated, "the socialization mode usually starts with the building of a "team" or "field" of interaction" (p. 20). The mere act of creating a common culture, then, is of vital importance to the socialization process.

Web 2.0 tools such as SNSs but also wikis and blogs are able to serve as virtual water coolers, directly contributing to this sense of conversation and organizational culture. Wagner and Bolloju (2005) explicitly identify these types of Web 2.0 tools as "conversational technologies," to "reflect that much of . . . knowledge creation and sharing is carried out through a process of discussion" (p. *ii*). Indeed, all of these tools promote community and conversation in some significant way. SNSs, as we have already seen, are all about connecting people. The co-founder of one enterprise SNS, Visible Path, has stated that, fundamentally, "companies using social networking are trying to help employees put a face on the other people in the firm" (Flynn, 2008). Virtual networks with personalized pages enable employees to "see," get to know, and even communicate with their co-workers in an informal space that is reminiscent of the water cooler. Although less explicitly designed for it, wikis and blogs also help to create this space. Reporting on the enterprise wiki used by the European investment bank Dresdner Kleinwort Wasserstein (DrKW), McAfee (2006) describes how conversations concerning poker games or advice on camcorder purchases would periodically appear on the wiki. Although the wiki was not designed as a social networking space, employees were able to use it for these water cooler type conversations. Blogs also present the opportunity for informal discussion by allowing readers to share their comments on posts.

Web 2.0 tools can and do play a significant role in the socialization process as it is defined by Nonaka (1994). By creating informal spaces for communication, they are able to foster a sense of community and shared experiences that can lead to tacit knowledge transfer. They also allow employees within an organization to identify coworkers with similar interests and engage them in a way that enables the sharing of tacit knowledge.

Externalization. The process of externalization, the conversion of tacit knowledge to explicit knowledge, is often understood as one of the most important steps in the SECI model, and even the goal of knowledge management itself. The process involves harvesting the knowledge resources that are present in the minds of an organization's personnel. Finding ways to do this, to extract tacit knowledge and make it explicit, has long been one of the purposes of KM. It has also been, in the eyes of some writers, one of the primary stumbling blocks of knowledge management. A great deal of KM criticism has been leveled at early KM solutions that centered on overly structured computerized repositories that focused on collecting and making accessible documents and other forms of codified knowledge (Husband, 2008). Wagner (2006) has identified a number of "knowledge acquisition bottlenecks" that characterize traditional KM systems, and even Davenport and Prusak (1998) have called for change, saying that "it is time for firms to shift their attention to the more human aspects [of KM] . . . from documents to discussions" (p. 106).

Web 2.0 tools present the opportunity to make exactly this change, and in so doing, they can actually create a KM strategy that is much closer to Nonaka's knowledge spiral than the document repositories of the 1990s. Nonaka (1994) does not describe externalization as a process that is marked by an individual sitting at a desk, producing a document that contains his or her tacit knowledge, and submitting it to a central repository. Instead, he describes the externalization process as being "triggered by successive rounds of meaningful 'dialogue'" (p. 20). Wikis, blogs, and other Web 2.0 tools, when understood as "conversational technologies," can be seen

as directly meeting this need for "meaningful dialogue." Take an enterprise wiki, for example. Wiki technology allows users to directly interact with the content they encounter. If an employee using a best practices manual, for example, comes across a problematic or inaccurate piece of information, he or she can immediately edit the wiki to reflect his or her own recent experience. If another user finds something wrong with this edit, this other user can similarly change what appears on the wiki. What is created here is not one static document, but a "meaningful dialogue" comprised of the externalized knowledge of users.

Wikis and other Web 2.0 tools are able to achieve this dialogue because they are focused "not on capturing knowledge itself, but rather on the *practices* and *output* of knowledge workers" (McAfee, 2006, p. 23, emphasis in original). In the wiki example above, numerous employees are coming together and sharing their experiences on a particular issue. They are externalizing their experiences—their tacit knowledge of that issue—and submitting it to the wiki. They are not worrying about creating a document to place in a repository, they are simply dealing with a work-related issue, and the wiki is capturing the output of their discussion. In this sense, wikis are essentially able to "transform corporate communication into content" (Dye, 2007, p. 35). As knowledge is externalized and shared with the coworkers, it is immediately captured by the wiki and stored for reuse within the organization. The processes of externalization and capture are both linked directly to the practices and output of the members of the organization. "Employing wiki pages," writes Gonzalez-Reinhart (2005), "does more than just integrate the KM system into an employee's work process; it essentially becomes the actual work process" (p. 6). This type of knowledge management, in which knowledge externalization is triggered by interaction with others and immediately stored in a centralized location where it can be re-used, edited, and maintained seems to be very close to an embodiment of Nonaka's original concept of externalization as something that is triggered by a "meaningful dialogue" that reveals tacit knowledge.

Combination. The externalization of tacit knowledge is important, but it is not the end of the knowledge creation cycle. In order to continue creating new knowledge, the next process, that of explicit to explicit knowledge conversion, known as combination, must take place. Nonaka (1994) has described this process by noting that "the reconfiguring of existing information through sorting, adding, recategorizing, and recontextualizing of explicit knowledge can lead to new knowledge" (p. 19). By this definition, it would appear that Web 2.0 technology, with its arsenal of tags, folksonomies, RSS feeds, and mashups, is tailor made for the task of combining.

Let us begin with the first half of Nonaka's definition, which includes tasks such as sorting and adding new sources of explicit knowledge. User-generated tags and folksonomies have been emerging as ideal tools for these tasks. The inability of users to find information on a corporate intranet is often seen as a major impediment to the successful combination of explicit knowledge. "It might seem that orderly intranets maintained by a professional staff would be easier to search than the huge, dynamic, uncoordinated Internet," writes McAfee (2006), "but this is not the case" (p. 23). He contends that these problems could be solved by incorporating better search functionality and the use of user-created tags like those popularized by websites such as Flickr and del.icio.us. The popularity of these sites and their user-centered organization techniques have inspired the creators of enterprise content

management software packages like Koral to enable the use of folksonomies—taxonomies of the people—by incorporating a tagging tool (Dye, 2007). These tools allow the users of the organization's information to arrange and describe it in a way that makes sense to them and will aid them in their future discovery of relevant knowledge artifacts.

Combination also calls for the "recategorizing and recontextualizing of explicit knowledge." These functions might involve the use of explicit knowledge gathered from outside of the organization. Web 2.0 tools are making it easier than ever for knowledge workers to gather and repurpose all sorts of information from a variety of sources (Lopresti, 2008). The tools that McAfee (2006) defines as "signals" allow users to have up to date information on a specific topic sent directly to them. This can be done with e-mail alerts, but is increasingly done with RSS feeds, messages that notify a reader every time a specific source generates new content, and an RSS feed reader. Social bookmarking tools are also useful, because they enable a group of people to manage a shared collection of web links to relevant resources. Watson and Harper (2007), for example, discuss the use of del.icio.us bookmarks to support a list of shared resources for an Australian research organization. Chatti, et al. (2007) discuss an even more overt form of recontextualization by bringing up the Web 2.0 concept of the mashup. Mashups are combinations of content from more than one source that are reassembled to create a new source of information. Google Maps are frequently used in mashups, where users take the geographic data supplied by the Google Maps and add their own landmarks, photographs, or comments. All of these tools can be used by organizations and individuals to sort, add, recategorize, and recontextualize explicit knowledge so that it can be combined with other explicit knowledge to launch new ideas and create new knowledge.

Internalization. The final stop on our tour of the SECI knowledge spiral is the process of internalization. Internalization is the conversion of explicit knowledge into tacit knowledge, and is related to the concept of learning (Nonaka, 1994, p. 19). Nonaka contends that internalization is directly related to the idea of "learning by doing." Although Web 2.0 social software tools do exist that can facilitate experiential learning, it is unclear to what extent they are being used within organizations. Chatti et al. (2007), for example, suggest that "bringing learners competitively and cooperatively together via multi-player games and multi-user simulations offer the potential to learn through a new form of social experience." The technology for social learning by doing through gaming certainly exists, but it remains to be seen to what extent this tool will be used within organizations.

Web 2.0 tools can also contribute to internalization in other, more subtle ways as well, however. For example, Web 2.0 tools which encourage authorship, especially blogs, allow users to express themselves through storytelling and narrative. Wagner and Bolloju (2005) point out that various constructivist learning theorists have suggested that the process of expressing knowledge actually helps people to construct knowledge because the conversation serves to refine and make clearer knowledge of which the knower might have been unaware. These authors conclude that conversational technologies such as blogs and wikis, then, "should yield benefits at numerous stages of the knowledge management process beginning with knowledge creation and ending with knowledge use and refinement" (Wagner and Bolloju, 2005, p. *ii*). In fact, we have seen how Web 2.0 tools have the ability to yield benefits at every stage of Nonaka's knowledge creation cycle, from socialization to

externalization, and from combination to internalization.

Conclusion

Snowden (2007) has remarked that if Web 2.0 technologies had been available a decade ago, KM would have been more effective and would have been adopted more fully by a greater number of organizations. The close relationship between Nonaka's (1994) SECI model and Web 2.0 tools supports this claim. Nonaka proposed a model based on collaboration, in which "the interactions between tacit knowledge and explicit knowledge will tend to become larger in scale and faster in speed as more actors in and around the organization become involved" (p. 20). Web 2.0 technology is similarly built on collaboration, starting from the idea that "when a large number of users participate, the collection of their judgments and knowledge can significantly increase the overall value of knowledge" (Shimazu & Koike, 2007, p. 50). The flexible, collaborative and conversational nature of Web 2.0 technology is so well suited to KM, in fact, that it may start "to seem odd that companies and technologists ever proposed highly structured KM systems to capture highly unstructured knowledge work" in the first place (McAfee, 2006, p. 26).

The use of Web 2.0 tools in organizations, then, should be understood as a natural extension of KM theory, not a dramatic shift or revolution of any kind. If we are going to call the application of Web 2.0 technology to organizational work Enterprise 2.0, then E2.0 can be understood as a method that will help to achieve the goals laid out in some of the most fundamental KM theories, like Nonaka's tacit to explicit knowledge conversion cycle. Davenport (2008) has acknowledged that E2.0 may provide a "mid-life" kicker to KM, and this is exactly what it can do. Rather than making KM obsolete, E2.0 and Web 2.0 tools can make KM more viable and more important than ever before.

References

Chatti, M.A., Klamma, R., Jarke, M., & Naeve, A. (2007). The Web 2.0 driven SECI model based learning process. *Proceedings of the 7th International Conference on Advanced Learning Technologies.*

Davenport, T.H. (2007, March 21). Why enterprise 2.0 won't transform organizations. Message posted at, http://discussionleader.hbsp.com/davenport/2007/03/why_enterprise_20_wont_transfo.html

Davenport, T.H. (2008, February 18). Enterprise 2.0: The new, new knowledge management. Message posted at, http://discussionleader.hbsp.com/davenport/2008/02/enterprise_20_the_new_new_know_1.html.

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

Dye, J. (2007). Collaboration 2.0: Make the web your workspace. *E-Content, 30*(1).

Farber, D. (2007, June 18). McAfee and Davenport debate the value of enterprise 2.0. Message posted at, http://blogs.zdnet.com/BTL/?p=5409.

Flynn, L.J. (2008, April 9). MySpace mind-set finally shows up at the office. *New York Times.* Retrieved April 20, 2008 from http://www.nytimes.com/2008/04/09/technology/techspecial/09socialprise.html

Gonzalez-Reinhart, J. (2005). Wiki and the wiki way: Beyond a knowledge management solution. Retrieved April 10, 2008 from, http://www.uhisrc.com/FTB/Wiki/wiki_way_brief%5B1%5D-Jennifer%2005.pdf.

Husband, J. (2008, April 11). Retrospective on KM and the impact of web 2.0. Message posted at, http://www.fastforwardblog.com/2008/04/11/retrospective-on-km-and-the-impact-of-web-20/

Kikoski, C.K. & Kikoski, J. (2004). *The inquiring organization: Tacit knowledge, conversation and knowledge creation.* Westport, CT: Praeger.

Lopresti, M. (2008). Smarter, better, stronger, together: A closer look at how collaboration is transforming the enterprise. *E-Content, 31*(1).

McAfee, A.P. (2006). Enterprise 2.0: The dawn of emergent collaboration. *MIT Sloan Management Review, 47*(3), 21–28.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*(1), 14–37.

Reid, M. & Gray, C. (2007). Online social networks, virtual communities, enterprises, and information professionals: Part 1. Past and present. *Searcher, 15*(7), 32–45.

Shimazu, H. & Koike, S. (2007). KM2.0: Business knowledge sharing in the Web 2.0 age. *NEC Technical Journal, 2*(2), 50–54.

Snowden, D. (1999). Storytelling: An old skill in a new context. *Business Information Review, 16*(1), 30–37.

Snowden, D. & Husband, J. (2007). The impact of Web 2.0 on knowledge work and knowledge management [Audio recording]. Retrieved April 12, 2008 from http://blog.wirearchy.com/blog/_archives/2007/10/24/3312528.html.

Totty, M. (2007, June 18). Social studies. *The Wall Street Journal,* p. R10.

Wagner, C. (2006). Breaking the knowledge acquisition bottleneck through conversational knowledge management. *Information Resources Management Journal, 19*(1), 70–83.

Wagner, C. & Bolloju, N. (2005). Supporting knowledge management in organizations with conversational technologies: Discussion forums, weblogs, and wikis. *Journal of Database Management, 13*(1), 71–89.

Watson, K. & Harper, C. (2007). Supporting knowledge creation: Using wikis for group collaboration. *Educause Australia Conference Proceedings.* Retrieved April 10, 2008 from, http://www.caudit.edu.au/educauseaustralasia07/authors_papers/Watson-112.pdf.

Social Capital and Knowledge Exchange: A Business Perspective

Kelly Bergman
Master of Library and Information Science

Abstract

The purpose of this paper is to define and assess the role of social capital in knowledge exchange. This concept is discussed in the context of a business environment. Facets of social capital include making connections, establishing trust, and utilizing computer-mediated communication. This paper proposes a direct relationship between social capital and knowledge exchange, in which an increase in social capital results in a higher likelihood of sharing knowledge. Examples of how companies can effectively utilize social capital to facilitate knowledge sharing are presented. Techniques for leveraging social capital to ultimately create a competitive advantage are also analyzed. Finally, the implication of social capital as a facilitator of knowledge exchange is considered in terms of the role of the information professional.

Introduction

Historically, the term "social capital" has been used in the context of social communities and family relationships (Nahapiet & Ghoshal, 1998). Social capital was defined by Putnam (1993) as "features of social organizations, such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit" (p. 1). Social capital not only benefits the connecting individuals, but also positively affects the community as a whole. These concepts are transferable to the business environment. In this context, social capital facilitates the accumulation of valuable resources such as explicit and tacit knowledge. These resources can be used to make informed decisions and acquire information that can benefit the company. The dynamic nature of social relationships, combined with the challenges of effectively transferring knowledge, adds complexity to this process. Social capital is a multi-dimensional concept which requires continuous attention and maintenance. This type of commodity is strengthened with interaction and quickly diminishes if relationships are not preserved (Nahapiet & Ghoshal, 1998).

It is important to promote and sustain the flow of interaction required to generate social capital. This task is not achieved without effort. The objective of this paper is to break down the steps involved in this process and identify challenges and techniques for building social capital. First, the primary elements needed to facilitate social exchange, including making connections and establishing trust, are addressed. This paper then explores the interwoven relationship between social capital and knowledge exchange from a business perspective. An interesting aspect of social capital is the reasoning employed by organizations as to whether they should invest in making social connections. Despite case studies that depict companies reaping the benefits derived from social capital, there are numerous reasons why companies choose not to make this investment. These reasons are discussed in this paper. Even though face-to-face communication is the most effective means of establishing trusting relationships, the use of computer-mediated communication should not be dismissed. The potential role of this type of medium in social exchange is considered. Finally, the implications for information professionals in terms of utilizing social

capital as a means of knowledge exchange are addressed.

Connecting

Individuals make meaningful connections in various ways. Nardi (2005) refers to the concept of "affinity" which represents the "feelings of connection between people" (p. 99). Social engagement is the means by which affinity is generated and preserved. There are various social activities which promote connecting. These activities include eating and drinking together, sharing space and informal dialogue (Nardi, 2005). Having a common area such as a coffee room or lounge encourages informal meetings and social interaction. Promoting company sports teams or creating a directory of employee's personal interests are also ways to facilitate this connection. An essential element of these encounters is that they take place in an inviting environment where employees can interact in a non-judgmental, respectful manner. Encouraging this interaction, by developing a sense of togetherness, not only benefits the employees but also the entire corporation. Creating a community setting within the organization can encourage employees to build social capital while investing in the company. The togetherness generated from a communal setting enables employees to identify not only with other workers but also with the company itself. As a result, the company may experience high employee retention which can facilitate rich and dense social capital. These communal characteristics will ideally spill over into relationships with vendors and customers. Ultimately, the organization will benefit from the effects of social capital.

It is essential that companies provide a place for social exchange to occur. It is equally important to allot time for connecting. Companies can promote social engagement by creating shared spaces but without encouraging employees to take the time to participate in relationship building activities, their effort is fruitless. Also, it sends a mixed message if a company claims it wants employees to take time to socialize and then only promotes workers who keep their heads buried in paper work and neglect social engagement. Companies successful in this endeavor must realize that "in a knowledge-driven economy, talk is real work" (Davenport & Prusak, 1998, p. 90). Dedicating time to developing external relationships is also important. Encouraging associations outside the company by motivating employees to network at conferences and viewing customers and vendors as alliances can expedite social connections and promote knowledge exchange.

Prusak and Cohen (2001) cite "volatility" and "virtuality" (p. 87) as the main inhibitors to building social capital. In this economic environment of frequent buy-outs and mergers, volatility creates a real dilemma for many companies. Since social capital is founded in social exchange, and relationships take time to development, unstable companies can experience a negative effect on the density of their social capital. Similarly, off-site workers and employees choosing to communicate virtually rather than face-to-face can further erode social capital. There is a place for computer-mediated communication in building social capital, which will be discussed later in this paper. However, the richness of physical encounters can never be fully replicated through computer interaction. In some cases, the challenges resulting from volatility and virtuality are unavoidable. What managers have control over is how they react to these obstacles. Leading the organization toward a common purpose or goal, believing in the employees and communicating a shared vision for the organization can facilitate feelings of connectedness to help overcome these barriers to social exchange.

Building social capital creates strong bonds that can lead to knowledge exchange. This can ultimately create a competitive advantage for the company. However, it is also important to be realistic as to how much time can be dedicated to making social connections in a profit driven business. According to Cohen (2007), "Efficiency and productivity trump conversation" (p. 245). He argues that brief interactions that occur daily can be just as valuable as lengthy conversations. As long as the employees are committed to maintaining relationships, social capital will not suffer. Promoting a healthy balance between developing social relationships and getting the work done is the optimal situation.

Trust

Cohen (2007) nicely summarizes the role of trust in building social capital as, "Trust is the bedrock of social capital" (p. 245). Without a foundation of trust, social capital cannot thrive. This notion is especially important in a business environment when confidential or costly information is transferred. Social exchange that takes place in a trusting environment creates a richer and more meaningful encounter. In addition, a framework of trust enables transactions to be made without hesitation as to the intent of the other party. In this environment, individuals can share openly without fear that the exchanged information will be used inappropriately (Nahapiet & Ghoshal, 1998). For example, pretend you are a salesperson who is given a lead on a potential new customer during lunch with a colleague. If this colleague is known for using sly business tactics, you may question his intentions. As a result of this exchange being based on distrust, the salesperson may never act on this information and become even more wary of this colleague. In the end, there is a complete absence of effective social exchange and no one wins, especially not the company.

Since trust is not a condition which can be fabricated, it is fruitless to attempt to mandate trust relationships (Cohen, 2007). The act of creating a team of employees with shared interests does not guarantee that trusting relationships will be established. It takes time, effort and attention to develop effective trusting relationships. As opposed to attempting to manufacture this relationship, there are ways that companies can promote trustworthiness. These include trusting the judgment of the employees, not rewarding business tactics based on dishonest practices and most importantly leading by example (Prusak & Cohen, 2001). Establishing business operations based on integrity sets a standard which employees can emulate. This foundation of honesty can pervade all aspects of the organization. Trusting employees' judgment and encouraging them to make decisions creates a sense of ownership and a willingness to return the offering of trust. If the behavior of all levels of management is rooted in moral principles, it is more likely that these characteristics will permeate the company.

Social Capital Facilitating Knowledge Exchange

Making social connections based on trust is the necessary framework for effective social exchange. Once those elements are established, social interaction can be a vehicle by which knowledge is exchanged. There is a strong, direct relationship between social capital and knowledge. As one's stock in social capital increases, so does the probability that knowledge will be successfully transferred. Social capital can be considered a lubricant to knowledge interchange. Without it, knowledge exchange will occur, but not at the same rate. To illustrate this, consider the study by Bhandar, Pan, and Tan (2007) which describes the effect of social capital on a

collaborative technology project. The goal of this project was to design and implement a Web-based collaborative platform. In this case study, colleagues with a seven year relationship utilized their social capital and realized the advantages it can offer in knowledge exchange. Specific benefits to this project include less time needed to achieve unanimity, an ease in combining knowledge and "curbed opportunistic behaviors" (Bhandar, Pan & Tan, 2007, p. 264). The success of this project can partially be attributed to the internal team dynamic which created a climate receptive to knowledge exchange. This example clearly indicates how relationships can be leveraged to benefit organizations. Companies that acknowledge the power of social capital and its role as an expeditor of knowledge transfer can experience its rewards.

One of the most valuable attributes social relationships offer is the potential to transfer tacit knowledge. Since tacit knowledge exists within an individual, it is difficult to extrapolate in its true form. As a result, attempts to share this knowledge with another person are challenging. However, social relationships offer the unique opportunity to overcome these obstacles. Whereas explicit knowledge can be codified and re-used more easily without making social connections, transferring tacit knowledge can benefit from the common understanding and shared context characteristic of social relationships (Athanassiou & Maznevski, 2007). The reason it is critical to make this exchange is because tacit knowledge can contain rich, contextual and valuable knowledge. Tacit knowledge is enveloped in behaviors, norms, know-how and intuition (Leonard, 2007). Personal relationships based on uninhibited dialogue can overcome knowledge "stickiness." For example, if a team member publishes an article on how to develop an engineering theory, this form of explicit knowledge may not be suitable for effectively transferring information. Consider the advantage of using your social capital with this team member to enhance the richness of this exchange by discussing and observing the process described in the article.

In addition to being an instrument in facilitating tacit knowledge exchange, social capital facilitates the process of identifying individuals who possess certain knowledge (Athanassiou & Maznevski, 2007, p. 71). Building a rolodex of contacts and their expertise can benefit both the individual and the company. It is common in organizations to have a go-to person who seems to know or be able to find out any type of information. This employee usually retains a dense network of social capital which is called upon to collaborate on business affairs. In order to maintain this status, these individuals tend to engage in reciprocal relationships where both parties benefit. Another aspect of this exchange is the possibility of discovering information not publicly available (Athanassiou & Maznevski, 2007, p. 72). For example, you may be a writer finishing a book on "Honesty in Government." You call your contact at the newspaper to see if any new information is available on a certain politician. Imagine your interest in becoming privy to information such as a looming scandal or questionable campaign practices that have not yet been made public.

In a business environment, utilizing social capital to improve information exchange ultimately benefits the company by creating a competitive advantage. Enhancing one's knowledge through social interaction can result in innovation, creativity and added value to projects and services. Nonaka and Toyama (2007) describe this as a "knowledge-creating process where individuals interact with each other to transcend their own boundaries" (p. 16). New discoveries, unique approaches to research, expansion of viewpoints and unexpected sources are all possible

outcomes of transferring knowledge through social capital.

Investment in Social Capital

Davenport and Prusak (1998) propose that knowledge be viewed as a valuable asset to a company. It is the one asset that is unique, constantly evolving, and able to employ logic, emotion and innovation. If knowledge is recognized as an asset, what deters companies from investing in its exchange through building social relationships? A major impediment to making this commitment is that "[s]ocial capital is difficult to measure" (Widen-Wulff & Ginman, 2004, p. 452). It can be challenging to promote a concept without concrete data associated with its value. In a non-profit organization, it may be easier to foster support for building social capital based on the ideology that it can benefit the community and enhance an individual's realm of knowledge. However, it may be difficult to convince a profit-driven business to invest time and money into an intangible and non-measurable initiative. In addition to the difficulty of measuring social capital, it also requires a long-term investment (Cohen, 2007, p. 251). As mentioned above, relationships take time to build and develop. The richer the connection, the more receptive parties are to knowledge exchange. The decision to make this long-term investment can be challenging in an economically driven business environment. Companies may be concerned about investing in capital that may suddenly leave or be "bought" by a competitor. It may be considered safer to invest in concrete capital such as databases and repositories rather than potentially unstable or unpredictable relational capital. It would be idealistic to propose that all types of organizations are equally adaptable to investing in social capital. For example, companies whose revenues are generated through billing clients for services may find it difficult to promote activities that may distract from this function (Hall & Goody, 2007). Corporate culture also plays a factor in the extent to which companies are willing to invest in social capital. Communicating the value of social capital from top management down through the rest of the company is an effective way to establish a culture conducive to social exchange. In the absence of this common objective, connections made tend to be weak and poorly maintained.

Despite these constraints, defining the advantages offered to companies that make this long-term investment is an effective means by which to gain support. Wu (2008) proposes that a firm's competitiveness can directly be improved through socially-generated information sharing. In Wu's (2008) model, there are three main social capital contributors to information sharing which include repeated transactions, network ties and trust (p. 128). As the frequency of transacting with business partners increases, the willingness to share knowledge also increases. Similarly, strong, dynamic network connections, existing in a trusting environment, expedite information sharing. As a result of improved information sharing through social exchange, the following benefits can enhance a company's competitiveness. These include better cooperation and facilitation of joint ventures comparable to the competition, improved products and services in response to feedback, and a reduced knowledge exchange transaction cost through shared language and context (Wu, 2008, p. 131). This model effectively summarizes how social capital can improve competitiveness and provides potential outcomes that can be translated into financial gains for a company.

Computer-Mediated Communication (CMC)

Nardi (2005) argues that computer-mediated communication (CMC) is more directed "toward renewal than creation of bonds" (p. 111). CMC can help maintain interaction between individuals with an established social relationship. However, it is not the most effective way to create social bonds. Since nonverbal cues act as meaningful instruments in social relationships, interactions that lack them can fail to develop. The richness of the media, in terms of interactivity and relational attributes, directly affects the success of CMC in enhancing social relationships. For example, email and instant messaging offer a dynamic medium in which individuals can connect socially in order to sustain and intensify relationships. In the business environment, these types of CMC enable users to connect in an informal manner and also support playfulness and humor, which can help relieve tension in high stress business situations.

One major area of debate is whether trust can be established in CMC. As mentioned above, trust is a necessary element for building social capital. Since virtual workgroups are common, the ability to establish trust in this environment is an important topic. Groups exhibiting high levels of trust employ similar tactics in which members "exchanged intensely frequent messages, showed interest in other member's responses, provided substantial feedback to one another, and notified others of their expected participation periods or absences" (Walther & Bunz, 2005, p. 831). Although these tactics are useful, purely virtual business endeavors are plagued with other limitations. These include misinterpretation of messages, questioning the virtual presence of team members and differences in work styles, behaviors and norms. It is difficult to manage these inhibitors in a virtual environment. Due to these constraints, virtual interaction will never expedite the building of social capital at the same rate as face-to-face interaction. However, in this day and age it would be naïve to think that CMC will not play a significant role in a business environment. The ideal corporate environment integrates both forms of communication. CMC can be used for its flexibility, timeliness and ease of use while face-to-face interaction is most effective for creating and developing trust-based relationships.

So far, the concept of CMC has been discussed in terms of its ability to facilitate social exchange. Since there is a direct relationship between social capital and knowledge exchange, developing CMC that integrates both these concepts can benefit an organization. Many computer systems manage social communication separately from knowledge management systems. Combining these two features could enhance the value of each. For example, one aspect of knowledge management is the codification and storage of data in repositories. Consider the advantages of integrating a social aspect to this hard data. This could include the ability to post and reply to comments, identify a list of individuals who recently used the information or enable a user to schedule a meeting to discuss a record. This type of system could effectively interweave social exchange, knowledge transfer and CMC.

Implications for Information Professionals

There is substantial research discussing the connection between social capital and knowledge exchange. Little research was found, however, regarding the implications of this relationship on the information professional. In other words, how does the social dimension of knowledge exchange affect the role of the information professional? Furthermore, what techniques should be employed to draw out, capture and document the knowledge transferred in social encounters? This is an area where future research would be useful. One of the first objectives of the information

professional should be to immerse oneself in the culture, practices and relationships of the organization. This promotes an understanding of the established behaviors and norms. It also helps identify social dynamics and undeveloped pockets of knowledge. It is difficult, if not impossible, to significantly change a corporate culture.

Recognizing the types of systems which would most readily fit into the existing structure could help expedite the process. Implementing initiatives, such as creating a "yellow pages" of employee backgrounds and interests, developing an interactive data repository, or recording video conference meetings are effective ways to create knowledge artifacts that result from social exchange.

Hall and Goody (2007) observed that information professionals with a library and information science background tend to be more focused on the codification of information for re-use purposes as opposed to innovation (p. 186). As a student working toward a Masters in Library and Information Science, I agree with this statement. Individuals in this profession are usually attracted to highly organized, structured systems. The objective of these systems is to use categorized data to assist users in finding information. This paper discusses a social facet of knowledge exchange which can be daunting for some librarians. Despite reservations, it is essential that attention be paid to an organization's network of social relationships. This acknowledgement can enable the company to realize the benefits of group creation and innovation. On the other hand, individuals with a communications background could invest too heavily in promoting social interactions and fall short on documenting the information exchanged. The ideal scenario is one in which there is a balance between organizing knowledge artifacts and promoting social engagement. As long as information professionals recognize their strengths and weaknesses and acknowledge the significance of social capital, they are one step closer to designing a comprehensive knowledge management system.

Conclusion

This paper describes the process by which social capital influences and enhances knowledge exchange. The successful integration of these two concepts is not effortless. One aspect of its complexity relates to the challenge of managing two intangible entities, relationships and knowledge. To invest in social capital, organizations must establish and maintain a means by which employees can connect and develop trusting relationships. It is a long term investment which needs nurturing and attention. The lack of short term economic rewards deters many companies from making this commitment. If companies have the foresight to recognize the benefits of promoting social interactions to foster knowledge exchange, they can experience the reward of a sustained competitive advantage.

References

Athanassiou, N., & Maznevski, M. (2007). Bringing the outside in. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers.* (pp. 69–82). Oxford, New York: Oxford University Press.

Bhandar, M., Pan, S. L., & Tan, B. C. Y. (2007). Towards understanding the roles of social capital in knowledge integration: A case study of a collaborative information systems project. *Journal of the American Society for Information Science and Technology, 58*(2), 263–274.

Cohen, D. (2007). Enhancing social capital for knowledge effectiveness. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers.* (pp. 240–253). Oxford, New York: Oxford University Press.

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

Hall, H., & Goody, M. (2007). KM, culture and compromise: Interventions to promote knowledge sharing supported by technology in corporate environments. *Journal of Information Science, 33*(2), 181–188.

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

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review, 23*(2), 242–266.

Nardi, B. A. (2005). Beyond bandwidth: Dimensions of connection in interpersonal communication. *Computer Supported Cooperative Work (CSCW), 14*(2), 91–130.

Nonaka, I., & Toyama, R. (2007). Why do firms differ. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management : New challenges for managers.* (pp. 13–31). Oxford, New York: Oxford University Press.

Prusak, L., & Cohen, D. (2001). How to invest in social capital. *Harvard Business Review, 79*(6), 86–93.

Putnam, R. D. (1993, Spring). The prosperous community ; social capital and public life. *The American Prospect,* 35.

Walther, J. B., & Bunz, U. (2005). The rules of virtual groups: Trust, liking, and performance in computer-mediated communication. *Journal of Communication, 55*(4), 828–846.

Widen-Wulff, G., & Ginman, M. (2004). Explaining knowledge sharing in organizations through the dimensions of social capital. *Journal of Information Science, 30*(5), 448–458.

Wu, W. P. (2008). Dimensions of social capital and firm competitiveness improvement: The mediating role of information sharing. *Journal of Management Studies, 45*(1), 122–146.

Cultural Variations and Knowledge Management: Diversity's Impact and Successful Ways to Handle Differences

Katalin Bergou
Master of Communication and Information Studies

Abstract

This paper will begin with a review of the various definitions of culture, ranging from national identity to organizational elements. It will then explore how these cultural elements affect a workplace and how they hinder the knowledge management process. This discussion of difficulties will lead into the various ways in which organizations can overcome cultural differences and create an open environment. Managerial skills, communication, an open climate and trust building will be highlighted as important solutions. Finally, the paper will conclude with implications for the future and an analysis of culture's impact on knowledge management.

Introduction

Culture has a wide range of meanings and elements, which can be found in virtually every organization. It can be the basic definition of having members with different national identities, including languages and vocabularies (Davenport & Prusak, 2000). On the other hand, it can also be the organizational culture that is found within a workplace. This refers to the meanings shared by organizational members that have been established and are common among everybody (Ajmal & Koskinen, 2008). Cultural differences are apparent in today's organizations because they are becoming increasingly virtual; one aspect of virtuality is physical distance between group members (Gibson & Gibbs, 2006). While cultural differences create a diverse workplace, they also hinder the knowledge management process by giving different members varying frames of reference. However, open communication and trust building can overcome these negative implications. It is especially useful if management is the group to realize the impacts of cultural diversity and takes steps to help its employees deal with any difficulties.

Culture and the Workplace

Workplaces are diversifying even if they are not located across country borders. According to Ajaml and Koskinen (2008), an organization's culture is founded in management and the practices that have been created by employees. The scholars say that organizational culture is apparent in many aspects, such as the customs, images, and presumptions of an organization; it is socially developed. When employees are faced with a choice, they sometimes base their decision on their job culture. Since it determines the correct way to accomplish a task, it stabilizes an organization. Additionally, "Culture is latent, a hypothetical construct, and most definitions refer to culture as a pattern," (Tsui, Nifadkar, & Ou, 2007, p. 462). This shows that it exists deep within an organization and has been created over a long time. Because of the time element, culture is a part of a workplace that is not subject to any major changes; it can only be shaped into a different form of itself with new ideas and technologies.

Organizational culture is an intrinsic part of a workplace and has been developed through past experiences (Hackbarth & Grover, 1999). It also envelops the way that members think and experience in a certain setting. Because the culture

created is repeatedly reiterated, transforming it is very complicated (Hackbarth & Grover, 1999). The "invisible infrastructures underpinning work practices" are the different parts of an organization that are often overlooked (Haythornthwaite, 2006, p. 776). Ultimately, the culture of an organization resides within its members and is passed on through each new generation of workers. For this reason, it is common among those working close together and it upholds certain beliefs that members feel. Another aspect of culture in the workplace is the external influences that they are faced with (Ajmal & Koskinen, 2008). These are the influences that are based on national identity and traditions and which seep into the organizations. Ultimately, the location of an organization will cause the members to uphold various beliefs. Because of this, an organization that has members in many countries might find that their employees have different values and this might complicate some collaborations.

Culture and Knowledge Management

Knowledge management occurs when an organization uses its collective resources to direct the knowledge process, helping members find the tools they have to successfully complete their jobs and assisting with knowledge exchange (Davenport & Prusak, 2000; McInerney, 2002). Knowledge management does not only look at the rigid structures of an organization; instead, it focuses on cognition (Heinz, 2006). This means that the processes by which people think about knowledge are extremely important and this is embedded within cultural elements of a workplace. Additionally, this process relies on the interaction between people (McInerney, 2002). It is through informal communication that members can really work together and develop an understanding of all the knowledge that resides within a specific organization (Davenport & Prusak, 2000). Informal interactions especially occur when people work in a face-to-face environment, where they can have such exchanges.

According to Leonard (2007), "Knowledge can also be culturally sticky," (p. 60). This means that while some custom or habit is completely normal in one workplace, it is improper in another. Also, something that may be seen as an important piece of knowledge in one location can be seen as futile in another. This is usually applied to those working across national boundaries, but can also be found within organizations where varying cultures are developed in different fields. If a manager simply discusses these differences, it is usually not sufficient to overcome the differences imposed by these differing cultural norms. According to Eskerod and Skriver's study (2007), the basic notions of an organization's culture can be an impediment to the transmission of knowledge. Consequently, the very structure of an organization can be one of the biggest obstacles to successfully implementing a knowledge management system. Structural change is difficult to achieve and so other solutions need to be created to overcome these difficulties.

Competition between organizations has caused many to become more virtual on the continuum of virtuality (Gibson & Gibbs, 2006). Organizations are looking to be more innovative and produce the newest products, so they are relying on interactions among a diverse group of people. According to Van den Hoof and Schipper (2005), a highly competitive culture has a negative impact on both knowledge sharing and receiving, which are basic factors in the knowledge management process. By having an internal culture that is competitive, employees will be less likely to help others because they do not want someone else to take their idea. This competition discourages collaboration. However, collaboration is often an

essential component of creating new innovations. Knowledge is also shaped by cultural standards (Heinz, 2006). This implies that some knowledge might only have significance in one culture and be completely irrelevant in another. Differing cultures might also find it complicated to understand the knowledge that resides somewhere else.

Ways to Overcome Negative Effects

While cultural differences in a workplace can be a major hindrance to the knowledge management process, there are effective ways to overcome the obstacles that employees are confronted with. Organizational culture must be reflected upon in any knowledge process (Hackbarth & Grover, 1999). Davenport and Prusak (2000) advise people to establish a shared basis for the employees by educating them and also through the creation of teams and job variations. Freedom is also essential to organizations (Faldetta, 2002). This means that giving people the liberty to not have strict surveillance will have a positive impact on the knowledge management process. Additionally, there needs to be a focus on the social culture of learning that arises during the knowledge management process (Engelhard & Nagele, 2003). Employees understand new ideas through learning, and this needs to become a part of any organization.

Communication is one of the essential ways to overcome cultural differences in the knowledge management process. McInerney (2002) states, "Knowledge sharing must rely on the human intelligence, energy, and the will to cooperate and use knowledge in collaborative endeavors," (p. 1013). Because knowledge relies on humans, it is a clear conclusion that knowledge relies on the ways in which humans communicate. Leonard (2007) said that one of the key factors in knowledge transfer is changing things into explicit forms that are accessible to others. This can be facilitated in an environment with an open communication system because people will be more willing to turn to this explicit artifact for knowledge if they are comfortable in their workplace. The communication processes that occur within an organization need to focus on understanding the organization in its entirety (Engelhard & Nagele, 2003). By creating a common background for everybody through communication, employees will be aware of each other's roles which will enable them to go to the appropriate source when they wish to learn about a new process or have questions that relate to their work.

While cultural differences are deep-rooted in an organization, by creating an organizational culture that is open the knowledge management process will be facilitated. For example, one of Ajmal and Koskinen's (2008) key conclusions is that knowledge management is helped by a culture that is open to taking on and using innovative knowledge-transfer initiatives. This can only be accomplished through an environment where people feel safe, without fear of being reprimanded for a new initiative. A psychologically safe communication climate can overcome many of the negative effects of virtuality, and many of the negative effects have a relation to those of cultural differences. This environment is "characterized by support, openness, trust, mutual respect, and risk taking," (Gibson & Gibbs, 2006, p. 462). Together, these five characteristics are more influential than any one alone.

Davenport and Prusak (2000) also focus on trust as being crucial to the knowledge management process. In their analysis, Engelhard and Nagele (2003) found that a lack of trust is one of the biggest barriers to learning. Without trust, individuals will not share their knowledge and will not be able to learn from each

other. For this reason, having trust-building exercises at the beginning of a new team's development may help assist with future transfers of knowledge.

Knowledge transfer might also sometimes only happen if employees of different cultural backgrounds are at the same location (Davenport & Prusak, 2000). According to McInerney (2002), knowledge management is the way to turn implicit knowledge into explicit knowledge. However, implicit knowledge is extremely difficult to communicate to organizational members when they are in different locations. Therefore, "The closer people are to the culture of the knowledge being transferred, the easier it is to share and exchange," (Davenport & Prusak, 2000, p. 100). Trust building can also take place when people meet face-to-face and this can help them to be more willing to work together. Leonard (2007) agrees that one of the key factors that helps in knowledge transfer is the physical closeness between the receiver and the sender. Even if this physical closeness only lasts briefly and occurs infrequently, members will be able to learn from each other more easily. An initial face-to-face meeting will have positive long-lasting effects for an organization.

Management plays a crucial role in knowledge transfer in a culturally diverse organization. According to Engelhard and Nagele (2003), management needs to understand that the many obstacles to learning are culturally fixed ways of sharing knowledge. They suggest that management should be conscious of these different forms of learning. Additionally, Eskerod and Skriver (2007) conclude that managers who wish to help with knowledge transfer should not only focus on the transfer itself, but on the basic environment of the organizational culture. Such a manager needs to recognize the key parts of this atmosphere before beginning the knowledge management process. This idea extends to managers needing to understand every aspect of their organization, from its employees to the consumers (Lorsch, 2007). In Rifkin, Fineman and Ruhnke's study (1999), the managers they spoke with were able to connect the organizational culture of the management with the organizational culture of the knowledge employees. Management clearly has an important role in cross-cultural organizations and it is important for them to fully understand the variety of knowledge that exists within their organization before beginning to manage it.

Case Studies on Culture and Knowledge Management

With such complex situations that involve so many aspects, it is important to analyze case studies that involve cultural differences and knowledge management. This helps managers and employees better understand how others have effectively overcome cross-cultural or organizational differences when implementing a knowledge management system. Learning through the example of others has always been fundamental to people and it is also essential to organizations.

One important case study that combines both knowledge management and cultural impediments is Xerox in the 1990s (Frahmann, 1999). According to Frahmann, Xerox had an organizational culture that was not expert in marketing. This became a major problem when companies started to become more digital in the 1990s and most people, even the employees at Xerox, still viewed it as the company which made copiers. Another major problem was that Xerox was not centralized; instead, different marketing branches existed which publicized the company in different ways.

Frahmann (1999) then discussed that the solution to this problem was to build a culture that had a common vision for each marketing branch and also one

where knowledge sharing was fundamental. Management advanced knowledge transmissions between the various branches of the organization. After locating the appropriate people to facilitate this process and interviewing them, brochures and information were made available on a web system that was also translated into various languages. This library of information had the same design in every location and it also helped people understand how to represent Xerox. Compatibility was also a key factor (Frahmann, 1999). Here, the various cultures, both organizational and national, were used to create one cohesive group. This group was able to successfully change its image through creation of a shared background and understanding of the goals for the future.

Davenport and Prusak (2000) also focused on a case study of a successful example of overcoming cross-cultural differences. When a big contracting firm had a contract for a project in Boston, as well as a similar project in New Zealand, they found an obstacle in communication. In both places, the project entailed a tunnel with similar aspects. The workers in New Zealand had created advances in a drilling process which some of the managers wanted to use for the Boston project as well. They tried implementing it by using a variety of methods; this included the formation of documents about the process and also hiring consultants to discuss the benefits. While the expense of this new advancement caused the Boston workers to be hesitant, it was because of their engineering culture that they thought that there needed to be some sort of technological aspect to the knowledge transfer.

For this reason, some employees were brought to Boston from New Zealand, which allowed the groups to work together. According to Davenport and Prusak (2000), it was over informal meetings, drinking beer, that the New Zealand employees were able to discuss the benefits of this new initiative and the Boston team decided to use it. Here, informal communication also played a key role in this innovation process. Through this open, face-to-face communication climate, knowledge was shared and eventually a common understanding of the process was achieved (Davenport & Prusak, 2000). Leonard (2007) also agrees that being close together is important to the knowledge transfer process. Therefore, when cultural barriers exist, bringing employees together can have a beneficial impact on the knowledge transfer process which is a clear element of knowledge management.

Implications for the Future

According to Gibson and Gibbs (2006), there are a growing number of virtual organizations today. Although the different aspects of virtuality are found on a continuum, all organizations can benefit from a psychologically safe communication climate. In the future, such organizations will become even more widespread and be increasingly reliant on mediated communication. This will result in an environment that is culturally diverse, both in relation to the organization and its members' nationalities. For this reason, it is extremely important to continue to research how culture can impact a workplace both positively and negatively.

In the future, there needs to be more research on specific communication practices that impact knowledge management in a culturally diverse workplace. This will be fundamental because communication will be an important tool to help employees overcome the obstacles that arise in their workplace. Even in the current research, communication is highlighted as a solution (Heaton & Taylor, 2002). However, in the future, studying the communication among members that share a diverse background will add to the growing literature on this topic.

Additionally, future research can focus much more on the collaboration between management and employees. Specifically, researchers can study ways to overcome problems due to cultural differences and ways to successfully manage knowledge. Organizational structures are dynamic, especially in virtual organizations (Gibson & Gibbs, 2006). This means that the roles of manager and employer will tend to become blurred so everybody in an organization should have the tools necessary to help with the knowledge management process. By providing all employees with the same background to create a better workplace, organizations can be much more productive in accomplishing their goals.

Conclusion

While organizational and cross-cultural differences can have a negative influence on knowledge management, communication can help overcome these issues (Engelhard & Nagele, 2003). The notion that cultural differences can be major impediments to the knowledge process needs to be illuminated, but what needs to be highlighted more is that organizations can overcome these difficulties and embrace the positive elements that cultural differences offer. Having a wide variety of people in an organization can create innovative ideas and this is a key reason why virtual teams are becoming so prevalent (Gibson & Gibbs, 2006). As the differences bring about these new ideas, it is important to see that this does not need to undermine knowledge management but can work in conjunction with it.

Much of the literature on knowledge management mentions the idea that human interaction is a very important part of the process (Davenport & Prusak, 2000; McInerney, 2002). It is through this interaction that people can actively learn from others the knowledge that they possess. However, when people are located in different places or have a different frame of reference, it becomes difficult to communicate and so the knowledge process is hindered. A clear focus needs to be on creating an environment where people can communicate in other ways and also learn about the differences that organizational members have (Davenport & Prusak, 2000). Through learning, organizational members can have a similar background and the knowledge process will be easier to complete (Engelhard & Nagele, 2003). Therefore, while many organizations will continue to be made up of members from a variety of nations and with different organizational cultures, the knowledge management process can still flourish.

References

Ajmal, M.M., & Koskinen, K.U. (2008). Knowledge transfer in project-based organizations: An organizational culture perspective. *Project Management Journal, 39*(1), 7–15.

Davenport, T.H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Engelhard, J., & Nagele, J. (2003). Organizational learning in subsidiaries of multinational companies in Russia. *Journal of World Business, 38*(3), 262–277.

Eskerod, P., & Skriver, H.J. (2007). Organizational culture restraining in-house knowledge transfer between project managers—A case study. *Project Management Journal, 38*(1), 110–122.

Faldetta, G. (2002). The content of freedom in resources: The open source model.

Journal of Business Ethics, 39(1/2), 179–188.
Frahmann, D. (1999). Transformation through knowledge sharing: Integrated marketing learns lessons from knowledge management. *Strategic Communication Management, 3*(4), 16–19.
Gibson, C.B., & Gibbs, J.L. (2006). Unpacking the concept of virtuality: The effect of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative Science Quarterly, 51*(3), 451–495.
Hackbarth, G., & Grover, V. (1999). The knowledge repository: organizational memory information systems. *Information Systems Management, 16*(3), 21–30.
Haythornthwaite, C. (2006). Articulated divides in distributed knowledge practice. *Information, Communication & Society,* 9(6), 761–780.
Heaton, L. & Taylor J.R. (2002). Knowledge management and professional work: A communication perspective on the knowledge-based organization. *Management Communication Quarterly, 16*(2), 210–236.
Heinz, M. (2006). Exploring the boundary conditions of "knowledge" in knowledge management. *Conference Papers—International Communication Association,* 1–24.
Leonard, D. (2007). Knowledge transfer within organizations. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge Creation and Management* (pp. 57–68). New York: Oxford University Press.
Lorsch, J.W. (2007). Governance information in knowledge-based companies. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge Creation and Management* (pp. 229–239). New York: Oxford University Press.
McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science and Technology, 53*(12), 1009–1018.
Rifkin, K. I., Fineman, M., & Ruhnke. C.H. (1999). Developing technical managers —first you need a competency model. *Research Technology Management, 42*(2), 53–57.
Slater, S.F., & Narver, J.C. (1995). Market orientations and the learning organization. *Journal of Marketing,* 59(3), 63–74.
Tsui, A.S., Nifadkar, S.S., Ou, A.Y. (2007). Cross-national, cross-cultural organizational behavior research: Advances, gaps, and recommendations. *Journal of Management, 33*(3), 426–478.
Van den Hoof, B., & Schipper, S. (2005).Competitive organizational cultures and knowledge sharing. *Conference Papers—International Communication Association,* 1–20.

Knowledge Management in University Athletic Communications: A Study of the Princeton University OAC

Andrew Borders
Master of Communication and Information Studies

Abstract

This paper will discuss codification of knowledge in an athletic media relations office. Challenges in meeting this goal include the number of different sports covered and the particular sets of knowledge tied to each, the innumerable array of specific situations that could arise requiring the knowledge and experience of a communication professional, and the overarching difficulty of retaining this information in a field that sees a substantial amount of turnover. Because of that last fact, the hypothesis in this paper is that a written repository of this information in manual form would be best.

Introduction

The Princeton University Office of Athletic Communications (OAC) has been in existence for decades. It serves an athletic program that is rich in history, one that began competition in intercollegiate athletics in the mid-nineteenth century and holds the distinction of having played in the first intercollegiate football game, against Rutgers, in 1869. Just as the sports themselves have evolved over time, so have the practices of the athletic communications office.

Though the OAC has not been in place as long as there has been intercollegiate athletics at Princeton, it grew in staffing and technology over the last half of the twentieth century. While the OAC's members today would likely cringe at the difficulty of performing tasks such as statistical record keeping that are done so easily today, the "Athletic News" staff of yesteryear would be taken aback by the variety of obligations today's OAC has.

Unfortunately, despite the rich history of Princeton athletics, the OAC of decades past did not do an exemplary job of record keeping, especially when examined over the breadth of all sports. Although what is lost belongs to history, the OAC can do a better job of making sure that, even with online archiving of the results of every athletic event since around the beginning of the 2000s, meticulous records are kept so that those in the OAC decades into the future can retrieve records and arrive at statistical conclusions.

It is important to draw the distinction between "data," which is represented by statistics, and the "information," how the OAC performs its duties.

The proposed knowledge management system will serve both needs by codifying that knowledge as efficiently as possible. While at first glance it may seem irrelevant to know how OAC staff performed its media relations duties before the Internet age, when newspapers ruled, lessons learned can be related to the present day and situation if present minds are willing to adapt them. That said, today's function of the OAC revolves around the Internet. Just as people half a century ago had no idea how computers would relate to sports, OAC staff members today cannot imagine doing their work without them. Computers and the Internet are here to stay, and developing practices to adapt to new technology will also be part of a knowledge management

program going forward.

How It Works

The new Princeton OAC knowledge management program would require a major undertaking from today's staff members. Currently, when a staff member leaves, knowledge is relayed to the new staff member through colleagues who may not have expertise in that sport. Questions are handled on an as-asked basis; there is no manual to refer to or to read upon acceptance of the job.

This program would seek to change that. Since it is difficult to recite on command every aspect of one's duties in a short amount of time, office members would be given one week during each season of the intercollegiate athletic year—fall, winter and spring—to write down everything they do, in general terms. A possible opposition to this approach is that it could be taken by some staff members as a way to monitor (and later scrutinize) how that individual's time is used. That would be a departure from the current tone of the office, which is very much a results-oriented approach. Simply stated, it is not important to the office's superiors how much time is spent on a project, only the result and whether it is available on time. No one is disciplined for arriving at a time other than 9 a.m., nor is anyone cited for leaving before 5 p.m. The documentation of one's work would serve only to organize thoughts. At the end of the week, each individual would list categories of general tasks performed and submit them for inclusion as topics in the manual.

This list would be put aside until after the academic year, when the writing of the manual would begin. The simple guideline would be to write about each task as if the person reading it has little idea of what the OAC does.

Due to the variance of tasks that the OAC performs, it is likely that this manual would be very lengthy and would require strong organization, synthesis and a concerted editing effort to be effective. The manual would be divided into general sections of the job, including statistics, web site maintenance, publication design, athletic department hierarchy and stylistic aspects of writing for the OAC, along with other topics. The goal of this organization is that the user with a question about baseball statistics, for example, would be able to open to the "statistics" section and then look for the subheading "baseball" and read a page or so with salient points to know about keeping baseball statistics.

Building Research

The topic of knowledge management is a broad one, and the discussion of managing knowledge in a collegiate athletic communications office is not a topic written about often. However, there are several important areas within knowledge management that apply here, with adaptation. These include, on a general level, the difficulty in putting tacit knowledge on paper compared to doing the same with explicit knowledge, as well as the debate between codification—managing knowledge through writing it down—and personalization—exchanging knowledge through conversation and personal interaction.

Certainly, both apply in the attempt to capture the vast knowledge in the OAC. On an average day, for example, this difficulty manifests itself in the preference of staff members to do all of their duties themselves rather than getting assistance from a student worker. This would allow staff members to free up time for other matters, but it would also take explaining to the student worker what is wanted

and how to do it. In that time, the staff member may feel, one might as well perform the task personally and save time. Meanwhile, the student worker is faced with the most menial and tedious of tasks, the relegation of which does not encourage the student to seek out more of the same. Nor does it empower an ably bright student to apply his or her own creativity to the task.

Literature Review

Hansen, Nohria, and Tierney (1999) set out the two basic approaches to preserving and relaying knowledge over time:

> Knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the company. We call this the codification strategy. In other companies, knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts. The chief purpose of computers at such companies is to help people communicate knowledge, not to store it. We call this the personalization strategy (Hansen, Nohria & Tierney, 1999, p. 2).

Both approaches are at work in many companies, and the Princeton OAC is no different. Plenty can be written down and codified. Examples include how to keep statistics on various sports and the contact information for important media members in the area. Other key knowledge more easily lends itself to a personalization approach. This would include such aspects as what makes an attractive media guide, in specific terms, or how best to achieve desired results from interactions with those media members whose contact information can be listed.

Especially with regard to artistic and creative qualities like designing media guides and writing press releases, such knowledge is closely tied to each individual, as Hansen, et al, suggest. However, this does not mean it cannot and should not be codified. There are basic rules to follow that can be listed. Publication designers know that leaving too much white space on a page is not desirable. Neither, however, is overloading a page with too much text. These publications are judged by a national organization, and highly rated points on Princeton's publications can be recorded and used again after they were deemed especially effective. The same goes for writing. While one could assume that those who would take such a job would have basic journalistic skills, spelling these out would help all involved stick to what is most important about the numerous press releases the office generates. Rules like making sure the first "score-looking" number is, in fact, the final score is an important rule to list. It might give a poor example of writing such as, "The Princeton softball team rebounded from a 5–2 deficit Wednesday to defeat Cornell 8–5." At first glance, a reader could think the final score was 5–2. Other basic writing rules could also be codified.

Hansen et al. also provide examples of companies that follow each of the two strategies and why their respective strategies work for that company. Companies that codify benefit from the economics of reuse (Hansen et al. 1999, p. 5). Instead of "reinventing the wheel," as the saying goes, employees can look at how the wheel was invented and go forth from there. This saves time for other projects. In an office with five people and 38 sports to serve as in the Princeton OAC, time is valuable. A major reason for personalization is that companies that use it can sell highly specialized advice for an increased sum and derive a profit (Hansen et al. 1999, p. 5). Since profit is not the OAC's goal, saving time is a more important objective.

Caroli (2007) offers important cautions to consider before employing a

strategy of codification. Tacit knowledge, which is more difficult to put on paper than explicit knowledge, is highly individual (Caroli, 2007, p. 7). Points that one person thinks are important might not translate to someone else reading the tacit knowledge someone else has tried to codify. This would apply particularly with regard to matters such as interacting with specific personalities on coaching staffs or individual writing and design styles. However, general points can still be useful, and the reader is free to use them at his or her own choosing. Where there is room for one person's individual style in writing, design, or dealing with different personalities, there is room for that person's successor to apply his or her own technique. This is true despite another caution Caroli offers, that codification encourages reproduction (Caroli, 2007, p. 11). Even though there tends to be general credence given to something that is written, as though it were an absolute rule, those who are in a creativity-driven business know that individual talents are what helped land a job and will help further that individual once in the position.

Zack (1999) explains three types of knowledge that can be codified, including knowledge that can go beyond explicit into tacit. This includes procedural knowledge, explaining how something works; descriptive knowledge, or describing something; and causal knowledge, about why something occurs (Zack, 1999, p. 46). Causal knowledge can include thoughts on why a particular situation happened the way it did. This knowledge would be useful to future OAC members if a similar situation arises. Procedural and descriptive knowledge, which are generally more explicit, are also key in understanding the basics of the many obligations the OAC has and the conditions under which it functions.

Knowledge management articles also offer points to consider on how to codify knowledge, once that tack has been decided upon. McMahon, Lowe, and Culley (2004) suggest that having some sort of information retrieval assistance would be more effective in finding the searcher's targeted information in an electronic repository (McMahon, Lowe & Culley, 2004, p. 8). While this would no doubt be a help to searchers of the proposed OAC manual, a high-tech solution might not be available when trying to put the document together. When constructing the manual, having future users avoid sifting through useless information can be achieved by employing an effective table of contents, organized first by general categories (statistics, writing, design, etc.) and then by specific topics within those areas. Additionally, having an electronic repository for the OAC manual is important compared to a hard copy because it can be used by more than one person at once. However, it should be on a shared space so that when it is edited by one person, it is consistent for all users so that outdated versions do not exist.

Davenport and Prusak (1998) also discuss how such an information repository should be constructed. A knowledge map (Davenport and Prusak, 1998, p. 72) tells users where areas of knowledge can be located in terms of people who possess that knowledge. This also, as shown through the Microsoft "SPUD" example the authors use (Davenport and Prusak, 1998, p. 75), holds those on the knowledge map accountable for what is listed as expected of them. In its current construct, the OAC has people who are informally known as experts in certain areas, such as publication design or the use of Adobe PhotoShop, despite that expertise not being articulated in that person's initial job description. A knowledge map would either define that person as the source for publication design knowledge or hold each person equally accountable in that area.

Haesli and Boxall (2005) discuss one major reason for the need for

knowledge management at all: the departure of workers and the need to transition knowledge to those who fill those roles. The authors give examples of one tech company that lost knowledge when workers moved on because it was not interested in spending the time to document knowledge as it was happening (Haesli and Boxall, 2005, p. 7). A second company, while documenting the knowledge, acknowledged that codified information is not the same as having someone there to explain it (Haesli and Boxall, 2005, p. 11). While the second example might benefit more from a personalization strategy, codifying the knowledge worked better than having no knowledge management program at all. This reason for a knowledge management program is particularly important because of the high turnover rate in the profession. Current Princeton OAC director Jerry Price said that in his fourteen years in the office, the three years that the present staff of five has remained intact is the longest span of continuing with the same personnel in his tenure in the office (personal communication, April 18, 2008).

Barriers to Knowledge Management Implementation

The proposed knowledge management system for the OAC is not without its hurdles to creation and implementation. Otherwise, it probably would have been in use already. The most worrisome obstacle to beginning the knowledge management program is convincing the current OAC employees of the immediate benefits of creating such a system.

There are steps to ameliorate and answer these concerns. Aside from keeping a rough draft of a list of categories for each person to cover when the KM manual is to be written, most of the initial work of creating the manual will be done in the summer when the office's pace of work is slower and reserved for longer-term projects.

While that will lessen the concern that working on the KM manual would take away from more urgent projects during the academic year, selling employees on how creating a KM manual will benefit them will be difficult but not impossible. Each answer hinges on employees believing in a "work now, paid later" philosophy. Creating a detailed manual now will cut down dramatically on calls from their successors looking for answers after the each present employee has left. By creating the manual now, it will speed the process of each employee closing that chapter in his professional life.

Creating a KM manual could also begin a trend of better record keeping in the office. While we depend on the Internet to store most of the archived information such as statistics and other newsworthy documentation, the online solution has not been infallible. In the summer of 2006, the Princeton OAC switched providers for its Web site. The previous company had been losing a significant amount of business to the new company and, understandably for them, didn't want to ease the process of letting go of its customers. Instead of an easy process of transferring data from one company to another, the new company had to copy and paste the thousands of articles posted over several years by hand. Not all information was converted, and some of the items that were did not get archived in as cleanly accessible a way as they were on the first provider's site. If the OAC chooses to change Web site providers again, much of its information is at the mercy of the new company.

While, by itself, the information on the OAC Web site is data, it becomes knowledge when it is studied over the course of a season and of several seasons as the current members of the OAC have done. If that information is not available to be

studied by future members, it becomes lost knowledge.

Just as the Internet-age information could have been lost, much of the pre-Internet era information is nowhere to be found. Since each member of the office knows of the frustration of not being able to find the answer to a historical question, motivation to be a good steward of the business could be enough to convince current OAC members to take time to codify their knowledge.

In some offices, financial rewards or avoiding some manner of demerit for not participating in a KM project might be expected. Neither, however, fall in line with the OAC's current culture. There are no such things as bonuses and, likely because of the self-suited manner in which office members are allowed to complete their work, disciplinary actions are unheard of. When there is a new project, the current OAC members devise a way to tackle it. No financial bonuses are expected because none are ever offered for other tasks. Similarly, because it is never meted out, disciplinary actions for not partaking in the KM project would hurt office morale and would not likely be taken seriously. Convincing office members of the longer-term benefits of the project is the likeliest way to achieve success.

Benefits of a Knowledge Management Program

Creating a culture of information retention and strengthening the OAC office's work through including the lessons learned from past events are major overall benefits of beginning a knowledge management program.

Throughout the OAC's history, as evidenced by the office's current collection of historical materials, keeping complete statistics has not been a priority. With statistics holding such a basic, essential place in the documentation of sport, it is no surprise, seeing the lack of retention of those statistics, that the OAC of previous decades did not also take the next step and codify a log of lessons learned from salient experiences. With the rise of the Internet, keeping statistics has become easier. Handwritten statistical sheets are a relic from a bygone era before a company called StatCrew computerized the entire process. Knowing how to compute a baseball or softball pitcher's earned-run average went from being a necessity to an impressive extra skill. The computer program takes care of it.

With that portion of record-keeping easier, the office can move toward retaining subjective and tacit knowledge. With thirty-eight varsity sports at Princeton come a similar number of coaches. Add assistant coaches and student-athletes, and each person in the office interacts with hundreds of people—and their varying personalities—each year. Retaining those experiences, and how they were handled, could prove valuable knowledge when a similar situation arises. Examinations of situations could lead to determinations of specific OAC policies. For example, at an NCAA softball tournament a few years ago, Princeton's top pitcher refused to speak with the media following a game, as requested. How was this situation handled? How should the OAC handle similar situations in the future? Developing a stated policy would help the OAC member involved enforce a decision when that situation arises.

A potential barrier to this benefit is the sensitivity surrounding particulars about the situation, especially since the purpose of the manual is for it to last into the foreseeable future. To answer that concern, situations could be generalized. The above story about the softball pitcher could be titled, "When a student-athlete declines a media invitation." Or it could be stated as a policy, such as, "The OAC will make every attempt to honor all reasonable media requests." A lesson learned from interacting with a difficult coach could result in a similarly general discussion

rather than putting down names and other particulars in a permanent manual.

While those benefits point toward the future, the manual has a potential present-day use for the people who write it. Because there are so many events going on during the academic year at Princeton, it is occasionally necessary for someone to cover an event in a sport about which he is not familiar. Codifying this knowledge would have a high likelihood of answering questions about how to run that sport's statistical program or where to take the statistics following the game. If detailed enough, the goal of the manual is to answer any potential question that arises, avoiding the unfortunate situation of leaving the employee covering the event in a position where he is unable to contact the person with the knowledge.

Having a manual would encourage future generations of OAC members to add to it as technologies grow. Thirty years ago, there was no Adobe Photoshop about which to write a section on using the program. There was no public-use Internet to update after each athletic event, and there was no StatCrew to know how to use in order to keep all the statistics that were previously kept by hand. Encouraging future generations to update the manual as needed would allow them to add sections on technologies not currently in use or even invented.

The Manual and Steps to Implementation

The Princeton OAC knowledge management manual would require a major undertaking to create. The first step would be to require documentation of every type of task each employee does. The purpose of this is to ensure that the manual is complete in its ability to guide future OAC employees in every area of their jobs.

This documentation would be done three times during the academic year in which the manual is designed, in order to ensure that all sports are covered in detail. Employees would also be encouraged to document any situations or interactions they feel would be useful to future OAC employees to know about, at least in general terms.

Following that academic year, the OAC members would combine to make a table of contents for the manual. Following listing of all the topics each OAC member documented during the year, the individual topics would be organized into sections. These sections would include a portion on using the two design programs currently in use—Adobe Photoshop and Adobe InDesign—as well as a section on each sport that discusses both the use of that sport's statistical programs and its game-day duties.

There would then be a discussion of the unique situations encountered during that year and whether an OAC policy can be derived from them. Any policies that are determined would be codified in the manual.

A possible area of inclusion is a section on expectations that each office member is to meet. For example, the section could include expectations like, "The OAC will write a preview story and a game recap for each event by every Princeton athletic team." Other similar standards could be added along those lines.

Once the sections of the manual are determined, each office member would be assigned a section of the manual to write, along with the sections specifically covering their designated sports. The manual would be available on a shared server space for electronic access and consistent updating to avoid possession of outdated editions.

Conclusion

The proposed Princeton OAC manual would have tremendous benefit for future generations of the office's employees, both in terms of relaying lessons and information as well as by creating a culture of record keeping for those future employees to follow. While it would require a significant amount of work for present-day employees to codify their entire jobs—the same problem encountered in some of the published articles on codification that found employees who did not want to take such time away from other important tasks—the benefits of creating an ongoing program could be explained to the current employees in hopes that the legacy of creating a lasting aspect of the OAC would be appealing enough to spend the time on the project.

Implications

The time needed to create the manual is likely the most significant current implication of undertaking the program. Summer in the OAC is viewed as a time to recharge from nine months of traveling with sports teams and working nights when most 9-to-5 employees are at home or pursuing leisure activities. Once created, the manual would have the effect of recommending that the OAC adhere to the policies it created after the year of self-study leading up to the codification of the office's collective work. The long-term goal of the manual is not only to assist future OAC employees in learning the how-to of their work when they begin their tenure as employees in the office, but also to encourage additions to the manual and an interest in maintaining other records to benefit the office going forward.

References

Caroli, E. (2007). Internal versus external labour flexibility: the role of knowledge codification. *National Institute Economic Review, (201),* 107–118.

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

Haesli, A., & Boxall, P. (2005). When knowledge management meets HR strategy: an exploration of personalization-retention and codification-recruitment configurations. *International Journal of Human Resource Management, 16*(11)*,* 1955–1975.

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

McMahon, C., Lowe, A., & Culley, S. (2004). Knowledge management in engineering design: personalization and codification. *Journal of Engineering Design, 15*(4), 307–325.

Zack, M.H. (1999). Managing codified knowledge. *Sloan Management Review.* 45–58.

Storytelling as Knowledge Transfer in Medical Contexts

Marilyn Campbell
Master of Library and Information Science

Abstract

Storytelling is a way to exchange tacit knowledge in organizations. A crucial area for the transfer of knowledge is between a medical caregiver and a patient. In order to diagnose and treat someone, a doctor or nurse must find out a patient's tacit experience of illness as well as the explicit knowledge laboratory tests and observation can give. When there are cultural or gender or class differences, communication can be difficult. That is why caregivers should listen to patients' stories.

Patients should also listen to doctors' and nurses' stories. Some patients respond well to explicit instructions on treatment; some to emotional reassurance; others respond best to information given in the form of stories; and others a combination of these communication techniques. Narratives can be "healing;" if a patient takes control of the narrative she can feel she is taking control of her illness.

Introduction

Before discussing the specifics of knowledge transfer in medical contexts, this paper briefly outlines the difficulties of transferring tacit rather than explicit knowledge in organizations in general, and how storytelling has been used in corporate contexts.

Storytelling in medical contexts should supplement the taking of a history and doing diagnostic tests; nursing and medical schools have begun to train students in the techniques of eliciting stories from patients. Stories can give the caregiver clues to the attitudes and life circumstances of a patient that are very important in making a diagnosis and especially in deciding on a course of treatment. In a chronic disease, for example, the patient must be a partner in treatment (Charon, 2006; Groleau, Young, & Kirmayer, 2006; Ostermann et al., 1999).

Knowledge transfer is more difficult when there is a lack of common ground or trust between the caregiver and the patients; those discussed are differences of gender, class, and culture.

A successful story can transfer knowledge from patient to doctor, and also from doctor to patient. Stories are easier to remember and to understand than statistics and confusing instructions. When a disease is chronic or life-threatening, it undermines a patient's very sense of self. Stories can help heal by making the disease a part of the person's life, a part of her identity, and not a disruption.

The Transfer of Tacit Knowledge

Conventional views of knowledge management often confuse it with data management or information management. Solutions to the problems of data transfer, or even information transfer, concentrate on technology: databases, repositories of best practices, telecommunications equipment. Transferring knowledge can be more difficult, because knowledge is more than data and information. Thomas H. Davenport and Lawrence Prusak give this definition: "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It

originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms" (1998, p. 5). They further say, "Tacit, complex knowledge, developed and internalized by the knower over a long period of time, is almost impossible to reproduce in a document or a database" (1998, p. 70). David Snowden, an early proponent of storytelling in business culture, adds, "You cannot conscript tacit knowledge; it can only be volunteered" (1999, p. 36).

How then, to transfer tacit knowledge? The medical profession has a particularly demanding training regimen: many years of study in premedical and medical school classes, hours in laboratories, and tons of rote memorization to instill explicit knowledge, followed by years of apprenticeship as third-year students, interns, and residents working very long hours where young doctors "learn by doing." That covers the intellectual and practical aspects of doctoring very well. And yet, medical care in the United States has come under criticism for ignoring the human side of healing. Although not abandoning scientific medicine, many people are turning to "alternative" or "holistic" practitioners to supplement orthodox treatment.

Davenport and Prusak list the cultural factors that inhibit knowledge transfer: "Lack of trust; Different cultures, vocabularies, frames of reference; Lack of time an meeting places, narrow idea of productive work; . . . Belief that knowledge is prerogative of particular groups, not-invented-here syndrome; Intolerance for mistakes or need for help" (1998, p. 97). In the discussion below, several of these "frictions" are illustrated by particular case studies, but in general, we all recognize these as problems in medical culture. The profession is a very hierarchical one. Rigorous training separates doctors from people following less demanding and life-and-death careers. The beginning of diagnosis and treatment, however, is listening to the patient; in fact, getting the patient to open up in a situation where many feel frightened and powerless is the first hurdle a doctor or other healthcare professional will face. And how to communicate, transfer knowledge, to the patient? The vocabulary of science, into which doctors often retreat these days for fear of lawsuits, is not always effective. Would storytelling help?

The Use of Storytelling for Knowledge Transfer

Why have knowledge managers turned to storytelling to codify and transfer tacit knowledge? David Snowden argues that "[s]tory telling has many purposes, entertaining, teaching, understanding and cultural bonding to name a few. Stories can also convey complex meanings across culture and language barriers, in a way linguistic statements cannot" (1999, p. 30). By linguistic statements Snowden means the common, factual style of regular business communication. "The neat (as in tidy) way of creating a common culture is through the linear process of structured mission statements, strategy, tactics, etc. The neat (as in wise) way uses metaphors and stories to create an environment in which understanding will percolate the entire organization in a self-sustaining manner" (Snowden, 1999, p. 35; see also Currie & Brown, 2003, for a case study of organizational storytelling in a hospital setting).

Another advantage of stories is that they can change, adapt to circumstances as they are retold by different people and to different audiences, in a way a fixed written document or text cannot. Snowden uses the metaphor of ecology for the way in which successful stories are built up from their context, and when the context changes, the story must change, too.

Snowden is very emphatic in believing that although storytelling can be

encouraged by management, it is an organic process and cannot be coerced. These artificial products will die out (Snowden, 1999; 2000). To be self-sustaining, a story must have a purpose, but the ostensible purpose, the "moral," may not be the only message a fable conveys. Other messages are conveyed between the lines. "Stories . . . have three characteristics that make them the only medium for real learning. They carry a high resonance factor, they are used for displacement—by which I mean they offer us a way to confess without blame—and they are full of ambiguity" (qtd. in *Irish Times,* 2005, p. 16).

Stories, unlike other linguistic statements, do not tell the hearer what to think. They allow the hearer to be an active learner, a part of the process. Here we see the opposite of the hierarchical model of the medical encounter—the doctor telling the patient what is wrong and what the treatment must be. The "doctor as god" stereotype is overturned as the doctor and patient try to find common ground (resonance); the doctor admits imperfection (confession), and the science, the enemy of ambiguity, allows ambiguity (Frank, 1999).

Storytelling and Knowledge Management in Medicine

The conventional medical interview, the taking of the patient's "history," consists of a list of factual questions and checkboxes. We have all filled these out multiple times. This sort of a questionnaire conveys lots of data, but very little information and no knowledge of the patient's lived experience. American medicine is also heavily dependent on physical tests; we have developed the most sophisticated and expensive equipment in the world for seeing into the body, even down to the level of DNA. The less quantitative aspects of medicine, true knowledge, have been shortchanged in traditional medical training. "[Q]uantitative methods tend to ignore the social and discursive contexts in which individual and collective understandings of illness emerge" (Groleau, Young, & Kirmayer, 2006, p. 672). In other words, a blood pressure reading does not tell anything about the causes behind the numbers: genetics, diet, stress? The roots of orthodox medicine are in Cartesian dualism of mind and body; "holistic" medicine seeks to reintegrate the two (Hardey, 1998, p. 11).

Training to Listen for Stories. The problem of the conventional medical interview is that it asks closed-ended questions that produce mere data; medical testing adds more data. Both concentrate on the physical evidence as if it were separable from the whole person, and even the historical and social context in which the ill person exists (Charon, 2006. pp. viii–ix; Groleau, Young, & Kirmayer, 2006). Many of those responsible for medical training are trying to put the whole person back together and humanize the medical interview.

The McGill Illness Narrative Interview attempts to mix the structured and unstructured interview in a "guided conversation." And since it is a conversation, an exchange, interviewers should acknowledge their own social identities to build trust. Besides the usual history, interviewers ask for a temporal narrative of symptoms and illness experience, problems related to the health problem, and the patient's explanatory model for the illness, including causes, expectations, and outcome. "The MINI . . . aims to capture personal knowledge and experience in its complexity, allowing for the internal contradictions and inconsistencies often present in everyday life" (Groleau, Young, & Kirmayer, 2006, p. 678).

Some teachers in medical and nursing schools offer training in empathy

and listening skills. Kevin Fiscella recalls the example of one of his teachers, George Engel, who used videotapes of encounters with patients to demonstrate open interviewing techniques. Engel believed that, "[i]f allowed, [patients] would tell their physicians about themselves, their families, and their lives, often providing important clues relevant to diagnosis or treatment" (2005, p. 411). Fiscella calls this the "biosocial model."

W. Clay Jackson and Pat Cunningham (2002), a doctor-and-nurse team, train caregivers in an end-of-life facility by reading a patient's story and then having their students role-play the narrative as doctor, nurse, family members, and patient. Using a story not only helps students to understand the issues better, but also to remember the lesson better. Two nursing teachers, Jill Koenig and CeCelia Zorn, believe that stories are a good way of learning because they link theory and practice, the personal and the empirical, and bring students into a relationship with the storyteller. "Stories of illness, crisis, or transition represent clients' efforts to explain life's events, come to terms with illness, or find meaning within the health response. Stories provide clues to behavioral patterns of coping, as well as insight into and understanding of clients' ways of viewing situations" (Koenig & Zorn, 2002, p. 395). "Knowledge is . . . generated through the retelling of the story and enables the students to transfer this knowledge and knowing into practice" (Hunter & Hunter, 2006, p. 274).

Caregivers also benefit from hearing one another's stories. In teaching midwifery to a diverse group of students, including Native Americans and African Americans, Lauren Hunter and Linda Hunter found that the storytelling tradition of these cultures helped build trusting relations among the students and their teachers. "Storytelling provides a powerful tool for collective reflection on the 'inside' aspects of practice that a textbook cannot teach them [student nurse-midwives]" (Hunter & Hunter, 2006, p. 277). Many researchers, the authors say, have begun to use stories to transform tacit knowledge of complex experiences into explicit knowledge (see also Steiner, 2005).

What Do Stories Tell? Corporations have learned that the data stored in their document repositories may be valuable, but it is not sufficient to create a learning environment. Analogously, the information collected on a patient's chart is not sufficient to understand a patient's illness experience. The experience of illness is a complex one. If we reject the Cartesian dualism, separating mind and body, the body, with its senses and emotions, must be put back into the medical narrative. "Storytelling is a powerful way of conveying knowledge that is heavily mixed with feelings, images, and sentiments" (Talisayon, 2002, p. 17). That would certainly describe the knowledge of illness.

Stories of illness are not always easy to listen to, nor are they easy to tell. Sometimes what isn't said is as revealing as what is.

> Thus, anyone's present story—patient or clinician—is a strategic compromise between what the teller needs to say, what she or he fears to say or cannot imagine saying, and what the teller lacks the narrative resources to get into words. The foreground of what is said is always heard against the background of what is left unsaid, and the story's silence is often its most neglected aspect. Most important, what is told is a story, not a clear window through which real life is observable. How the story is told—including what makes the final edit and what is left out, what emotions are shown or contained, who or what is

> blessed, and who is blamed—is always a response to the perceived attitude of the listener(s), including the listener's interests, patience and time commitment, emotional and practical involvement, shared frame of reference, and narrative competence. Stories are told differently in different relationships, and each telling is one aspect of a greater truth. (Frank, 2006, p. 346)

It takes a trusting relationship between teller and hearer to tell any part of the truth. And as Jurate Sakalys says, the hearer must suspend judgment. "When listening for story, nurses do not listen as experts listening for diagnostic information. Rather, they listen by privileging the patient's voice, by relinquishing judgmental interpretation, and by listening for the patient's meaning rather than the facts" (Sakalys, 2003, p. 235).

For example, Scott Presnell (2006) recounts the story of a young man living with HIV. According to his medical tests (T-cell levels and so on), his condition is stable and if he stays on his medications, he should be able to return to work. However, his test scores do not give the complete picture. He discovered he was HIV positive upon the death of his partner from AIDS, losing a loved one and finding out he had a serious illness simultaneously. On top of that trauma, his medications cause numbness in his extremities. He is a pianist and teaches piano. If he stays on the medications that are keeping him alive, he cannot play, which he loves, or teach, which is his livelihood. A doctor looking at his medical chart might say, "This man is fit to go back to work," without understanding how his life, in fact his core identity, has been disrupted. "It is narrative, or storytelling, that explains human reaction, or illness experience, to the biological phenomena of disease" (Young & Rodriguez, 2006, p. 57).

Frictions

Among the "frictions" interfering with knowledge transfer, mentioned above, are "different cultures, vocabularies, frames of reference" (Davenport and Prusak, 1998, p. 97). Storytelling as knowledge transfer must also overcome those frictions. "Storytelling is . . . seen as a seamless part of the social relationships which exist or *are being formed* between the narrator(s) and the audience. Rather than viewing the interlocutors simply as individuals occupying distinct speaker–listener roles, partners enact roles which are marked by differences in gender, race, status and class" (Loewe et al., 1998, p. 1269). Doctors are trained in a culture that values rationality and detachment. It was also until recently a very male profession, as nursing was a very female one. How can stories bridge differences in gender, class, and culture?

Gender differences. Although the demographics of the medical profession are changing, it is almost a cliché to complain about the "asymmetrical interactions between (largely male) health care providers and (largely female) patients" (Ostermann et al., 1999, p. 145). Gender power relations reinforce the doctor-patient, expert-layperson asymmetry. Specifically, Ana Cristina Ostermann and her colleagues criticize the formal history taken in the doctor's office or hospital room, which does not allow patients "to shape their discourse, because both content and form are highly dependent on the questions asked" (1999, p. 129). They are in fact criticizing doctors for limiting themselves to finding out *data* about their patients. No knowledge is transferred. In letters to a TMD (temporomandibular disorders) support group, women with this type of severe facial pain, sometimes considered imaginary by doctors and insurance companies, write to ask for information or support, but

since these communications are voluntary and "less constrained in terms of content and form" (Ostermann et al., 1999, p. 129), other experiences, frustrations, and feelings surface. If their story is heard, they can feel more in control of their illness.

By contrast, doctors find it hard to get male patients to acknowledge illness. Shapiro and Ross (2002) present the case of a male patient with diabetes who is not managing his chronic illness well. He tells his doctor it's no use to try to monitor his diet and exercise: to do so, he would have to be as "obsessive" as Mary Tyler Moore, a celebrity with diabetes who is a spokesperson for diabetes awareness. In further conversation, the patient reveals that he thinks to be so concerned with his health and his body is somehow vain and "not manly." The doctor carefully questions him about times when he doesn't feel hopeless about controlling his disease, how he feels and thinks on those times. From some clues, the doctor helps the patient construct a new story, one in which he has mastery over his glucose levels.

In both these examples, we see that men and women need space and time to construct an effective story, one that transfers tacit knowledge—how to live with a chronic illness, or even how to die. "As demonstrated in this study [of end-of-life care], listening to people's stories gives us insight into their values, the mental constructs that drive their decision making, and the goals that they have for their own health care. Even the shortest stories (4 or 5 lines in a transcript) help us understand the respondents' beliefs by connecting them to their life experiences—a crucial understanding for health care providers who want patients to function as partners in their health care" (Young & Rodriguez, 2006, p. 58).

Class differences. In middle class urban or suburban America, in general expectations for medical care are very high. Those in poverty or underserved rural areas, based on experience, have less confidence that effective treatment will be available. The storytelling tradition of Appalachia is a cultural treasure. Unfortunately, the stories told of cancer do not turn out well. "Metaphorically, the mountains . . . seem to hold in culturally bound stories about the ubiquitous nature of cancer and, especially, the causes of cancer" (Hutson et al., 2007, p. 1135). Rather than environmental factors, the people of Appalachia see in cancer clusters evidence of family inheritance, something that cannot be escaped. Medical care, as in other isolated and poor areas, is sparse and a last resort for the desperately ill. How can we change this story? Outsiders are distrusted. Hutson and colleagues suggest using "cultural insiders" (see also Greenhalgh, Collard, & Begum, 2005).

Lorenzo (2003) discusses a familiar scenario from Cape Town, South Africa, where doctors use scare tactics while "educating the patient" about diabetes. In an analysis of the stories doctors tell *about* patients, the study found that the doctors turned patients into adversaries that they had to control, rather than partners in health care. They communicated the need to follow a regimen by citing statistics of amputations, blindness, and death. Management of diabetes—indeed of any chronic illness that demands changes in a patient's lifestyle—is difficult and frustrating. The fact that diabetes patients were often poor and female in this study made it easier for the doctors to dismiss their ability to "learn" in a more collaborative way.

The problem of regaining trust of the poor is a bigger one. The people of Appalachia have been treated with the same disregard as their environment has by strip miners. Frank (2002) retells some now-familiar stories of sick or disabled persons given the run-around by insurance companies and then interrogates that very familiarity: "The strategy—and the plea—of illness narratives is to think about

'health care' from the standpoint of the person who is sick, suffering, and in need. Narrative holds policy accountable to the questions of what decisions mean for specific people—how is his or her life affected? Then we must go on to ask, and only then can we ask, how the consequences of that effect spread through society, recreating society in the image of the decision to treat someone that way" (p. 176).

Cultural differences. "Knowledge is based on personal experiences and cultural inheritance and is fundamentally tacit. . . . The more overlapping the cultural background . . . , the easier information is understood" (Stenmark, 2002). Conversely, the less overlapping the cultural background, the less easily information is understood. Many medical anthropologists have tried to understand the clash between Western practice and what is condescendingly called folk medicine. Arthur Frank, in *The Renewal of Generosity: Illness, Medicine, and How to Live* (2004), found someone who embodies the clash within her own experience: Lori Alvord, the first Navaho woman surgeon.

Dr. Alvord is torn between her training and her traditions by the case of a young Navaho girl brought to the hospital with the symptoms of severe appendicitis. The conventional medical procedure would be emergency surgery. But the mother and grandmother are reluctant to authorize it. Alvord "reflects on the violence white culture has perpetuated on the Navaho, and the good reasons these women have to be suspicious of white medicine" (Frank, 2004, p. 97). "From a Navaho standpoint, illness can be caused by an imbalance or lack of harmony in any area of a patient's life" (Alvord, qtd. in Frank, 2004, p. 96). Surgery disrupts the body's harmony.

Alvord decides to allow the family time to consider the decision, even though there is a risk of perforation. Frank concludes, "Alvord's writing about harmony, poetic as it is, can lull us into thinking that something can be achieved without risk Her story . . . reminds us that it can't. Dialogue neither creates nor diminishes risk. It allows us open recognition of all the values that deserve to be considered when responding to the risk that is inherent in being human" (Frank, 2004, p. 98).

Deborah Gordon and Eugenio Paci (1997) examined a more familiar cultural or perhaps generational clash in Tuscany, Italy. There the cultural difference is not whether or not to pursue treatment, but whether or not the doctor discloses to the patient that the patient has cancer. The authors derive two cultural models: the autonomy-control model of the United States (now circling the globe, the authors say); and the social-embeddedness model of Tuscany. Dr. Alvord would recognize the social-embeddedness model. Society is hierarchical; authority figures are trusted; the individual has no expectation of control; the family and the community will provide support. The sick person may not have *information* we Americans would consider a basic right, but she has tacit *knowledge* that she will be cared for by her familial and social networks. This knowledge, Gordon & Paci's interviewees believe, will give the patient "serenity." That is quite a cultural difference to digest.

Storytelling as Healing Narrative

People who have studied illness narratives believe stories can convey important information about the ill person's experience of illness, and can help the caregiver diagnose and treat the patient. Many also believe that since stories are easier to remember, the doctor can convey medical knowledge to the patient that way (Bergner, 2007). Ever since Sigmund Freud's "talking cure," psychoanalysts have

believed in the healing power of telling stories, and some other medical practitioners agree that the act of composing and telling a story can itself be part of the healing process.

In *The Wounded Storyteller,* Arthur Frank, who is both a doctor and a cancer survivor, describes three kinds of narratives told about illness. The first, which he calls the restitution narrative, is the model that institutions encourage: "I was healthy; I am sick; I will be healthy again." This story elides the present experience of illness and focuses on making the connection between the healthy past and the triumph over illness in a healthy future. Naturally, this is the story medical professionals and even support groups like to hear (Frank, 1995, chap. 4).

The second type of story, the chaos narrative, is the opposite of the restitution narrative; the narrator cannot imagine getting better. There is only the contingent present with no past or future: "consciousness has given up the struggle for sovereignty over its own experience" (Frank, 1995, p. 104). This story provokes anxiety in listeners and medical professionals often see it as clinical depression. Frank, however, argues that it is a necessary stage in the development of a more controlled narrative that accepts and transforms the experience of chaos.

The stories Frank calls quest narratives "meet suffering head on; they accept illness and seek to *use* it" (Frank, 1995, p. 115). The idea of the quest is familiar from mythology. Frank cites Joseph Campbell's typology of the quest—departure, initiation, return—as the basis of many memoirs of illness. But what he sees as the highest evolution of this story is "testimony," when the narrator seeks to be a witness to experience to help others who are suffering. "Becoming a witness assumes responsibility for telling what happened" (Frank, 1995, p. 197). This is a much more poetic way of describing knowledge transfer by those who have survived. "In the wounds of their resistances, they gain a power to tell, and even to heal" (Frank, 1995, p. 182).

Especially in critical or chronic illness, a patient may feel his or her identity has been usurped by an outside force. "Patienthood is experienced as a disintegration of self, as an interruption of one's biography, and as a silencing of one's voice" (Sakalys, 2003, p. 228). Out of the bewildering maze of information, a person constructs a narrative to make sense of the experience. "Reflective and insightful autobiographical accounts of illness not only illuminate fundamental disruptions in selfhood and continuity of life that accompanies illness, but authors of such accounts also maintain that narration is an important way to make sense of an illness episode, to restore personhood and connectedness, and to reclaim the illness experience from the medical metanarrative" (Sakalys, 2003, p. 228).

Jean Shinoda Bolen's *Close to the Bone* (1996) uses the many mythic narratives of suffering, death, and rebirth to find narrative models for the experience of life-threatening illness. Amanda Young and Keri Rodriguez, in a study of patients in hospice care, paid attention not only to the text, but also to the subtext and context of the stories their patients told. The subtext was the patients' goals and values; the context was their life experiences. Taken together, Young and Rodriguez could interpret the patient's ideas about quality of life versus quantity of life, control versus lack of control, and benefits versus costs, in deciding on their care. Besides communicating with their caregivers, however, Young and Rodriguez noticed that the act of storytelling itself was healing: "Storytelling seemed to become a safety zone for some of our patients" (2006, p. 58).

Arthur Frank (2004) calls making space for storytelling "generosity."

Narrative is both a mode of clinical reasoning and therapeutic intervention. In face-to-face dialogue, the teller and the listener have a relationship, and the standpoint of the storyteller is both personal and communal. The ill person, who feels that her relationship with the healthy world has been severed, uses story to heal the breach and return to the community. Trust, as we found in all areas of effective knowledge management, is the necessary prerequisite.

Conclusion

We have seen that transfer of tacit knowledge—knowledge that is not stored in data repositories or lists of procedures—is very important in all organizations. How much more important is it in medical contexts, where the stakes could literally be life or death. Yet, the difficulties of knowledge transfer are even more daunting when emotions and values are involved. There are often also wide cultural differences, and many would say power relations, between medical caregivers and patients. To overcome those difficulties, opening up a space for the patient to tell the story can begin the dialogue necessary for effective communication and knowledge transfer.

Medical and nursing schools have recognized the importance of making medicine more "humanistic" and "ethical" by giving the patient a voice. In formal courses or informal mentoring, students learn how to ask open-ended questions, encourage storytelling, and develop listening skills. From stories the caregiver can gain knowledge about the attitudes and life circumstances of a patient that are very important in making a diagnosis and especially on deciding on a course of treatment.

Patients can learn from doctors and nurses by way of stories, too. Stories are easier to remember and to understand than statistics and confusing instructions. When a disease is chronic or life-threatening, it undermines a patient's very sense of self. Stories can help heal by making sense of the disease as a part of life, a part of identity, and not a disruption.

Implications

In this election year, health care and especially health insurance is a centerpiece of public discourse. Technology has changed the dialogue about medicine. On the one hand, people are much better informed about health care. The Internet has made available not only lots of information, but also many, many support groups for any illness you can name. On the other hand, people seem more alienated from the medical establishment and anxious about their health. "We live in a paradoxical moment when people fear both that managed care will prevent them from receiving the medical care they need *and* that they risk becoming prisoners of more medical treatments than they want (one motivation for the right-to-die movement)" (Frank, 2000, p. 363). Various drug scandals have fueled fears that the health establishment is more interested in profit than in healing. Although individual nurses and doctors still score high on national measures of trustworthiness, they have less power over the care they provide than they used to. Trust is definitely lacking overall. We need not knowledge, but wisdom, to solve this problem.

References

Bergner, R. M. (2007). Therapeutic storytelling revisited. *American Journal of Psychotherapy, 61* (2), 149–162.

Bolen, J. S. (1996). *Close to the bone: Life-threatening illness and the search for meaning.* New York: Scribner.
Charon, R. (2006). *Narrative medicine: Honoring the stories of illness.* Oxford: Oxford University Press.
Currie, G., & Brown, A. (2003, May). A narratological approach to understanding processes of organizing in a UK hospital. *Human Relations, 56* (5), 563–586.
Davenport, T. H. & Prusak, L. (1998). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.
Fiscella, K. (2005). George Engel storytelling. *Families, Systems, and Health, 23* (4), 410–412.
Frank, A. W. (1995). *The wounded storyteller: Body, illness, and ethics.* Chicago: University of Chicago Press.
Frank, A. W. (2000). The standpoint of storyteller. *Qualitative Heath Research, 10* (3), 354–365.
Frank, A. W. (2002). The extrospection of suffering: Strategies of first-person illness narrative. In Patterson, W. (ed.), *Strategic narrative: new perspectives on the power of personal and cultural stories* (pp. 165–178). Lanham, MD: Lexington Books.
Frank, A. W. (2004). *The renewal of generosity: Illness, medicine, and how to live.* Chicago: University of Chicago Press.
Frank, A. W. (2006). Generosity in medical story making. *Families, Systems, and Health, 24* (3), 345–349.
Gordon, D. R., & Paci, E. (1997). Disclosure practices and cultural narratives: Understanding concealment and silence around cancer in Tuscany, Italy. *Social Science and Medicine, 44* (10), 1433–1452.
Greenhalgh, T., Collard, A., & Begum, N. (2005, May). Narrative based medicine: An action research project to develop group education and support for bilingual health advocates and elderly South Asian patients with diabetes. *Practical Diabetes International, 22* (4), 125–129.
Groleau, D., Young, A., & Kirmayer, L. (2006, December). The McGill Illness Narrative Interview (MINI): An interview schedule to elicit meanings and modes of reasoning related to illness experience. *Transcultural Psychiatry, 43* (4), 671–671.
Hardey, M. (1998). *The social context of health.* Buckingham: Open University Press.
Hunter, L., & Hunter, L. (2006, July). Storytelling as an educational strategy for midwifery students. *Journal of Midwifery & Women's Health, 51* (4), 273–278.
Hutson, S. P., Dorgan, K. A., Phillips, A. N. & Behringer, B. (2007). The mountains hold things in: The use of community research review work groups to address cancer disparities in Appalachia. *Oncology Nursing Forum, 34* (6), 1133–1139.
Irish Times. (2005, December 7). Telling tales at work. Retrieved from LexisNexis Academic.
Jackson, W. C., & Cunningham, P. (2002, September). "Mercy"-narrative, role-play, and attitudes concerning antemortem care. *Family Medicine, 34* (8), 572–573.
Koenig, J. M., & Zorn, C. R. (2002, September). Using storytelling as an approach to

teaching and learning with diverse students. *Journal of Nursing Education, 41* (9), 393–399.
Loewe, R., Schwartzman, J., Freeman, J., Quinn, L., & Zuckerman, S. (1998). Doctor talk and diabetes: Towards an analysis of the clinical construction of chronic illness. *Social Science & Medicine, 47* (9), 1267–1276.
Lorenzo, T. (2003, October). No African Renaissance without disabled women: A communal approach to human development in Cape Town, South Africa. *Disability & Society, 18* (6), 759–778.
Ostermann, A. C., Dowdy, J. D., Lindemann, S., Turp, J. C. & Swales, J. M. (1999). Patterns in self-reported illness experiences: Letters to a TMJ support group. *Language & Communication, 19,* 127–147.
Presnel, S. (2008). Return to work for individuals with Human Immunodeficiency Virus (HIV) disease: Dichotomous outcome variable or personally constructed narrative challenge? *Work, 27,* 305–312.
Sakalys, J. A. (2003). Restoring the patient's voice: The therapeutics of illness narratives. *Journal of Holistic Nursing, 21* (3), 228–241.
Shapiro, J., & Ross, V. (2002, February). Applications of narrative theory and therapy to the practice of family medicine. *Family Medicine, 34* (2), 96–100.
Snowden, D. (1999). Story telling: An old skill in a new context. *Business Information Review, 16* (1), 30–37. Retrieved from Cognitive Edge http://www.cognitive-edge.com/articlesbydavesnowden.php.
Snowden, D. (2000). The art and science or story or "Are you sitting uncomfortably?": Part 2: The warp and the weft of purposeful story. *Business Information Review, 17* (4). Retrieved from Cognitive Edge http://www.cognitive-edge.com/articlesbydavesnowden.php.
Steiner, J. F. (2005). The use of stories in clinical research and health policy. *JAMA, 294* (22), 2901–2904.
Stenmark, D. (2002). Information vs. knowledge: The role of intranets in knowledge management. *Proceedings of the 35th Hawaii International Conference on System Sciences.*
Talisayon, S. D. (2002, November 19). Knowledge and people; the human side 4: Tacit knowledge. *Business World.* Retrieved from LexisNexis Academic.
Young, A. J., & Rodriguez, K. L. (2006). The role of narrative in discussing end-of-life care: Eliciting values and goals from text, context, and subtext. *Health Communication, 19* (1), 49–59.

Implementing Knowledge Management within Market Research for Advertising

James Caverly
Master of Communication and Information Studies

431 Media, LLC is a global media company that creates and maintains various types of websites, including online magazines, communication tools and online communities. 431 Media has 57 employees located mostly in the company headquarters in Princeton, N.J. However, 15 percent of employees work from home around the world. The marketing, advertising and promotion team consists of 15 employees who create marketing campaigns, advertising and other forms of promotion for the websites.

Abstract

The following essay is a knowledge management plan for the advertising department of 431 Media, LLC. This is a promised follow-up to the letter from the company's CEO discussing the importance of establishing a knowledge culture and it will discuss how this department can organize the knowledge we generate, transfer, and acquire from market research to benefit the end product that is the promotional material. It argues that approaching research from a knowledge management standpoint will benefit the results. Marketing, advertising, and market research are dynamic fields. All market research projects will include various and possibly new factors and scenarios. Each may require an innovative way to harness the knowledge available to be gained.

Introduction

During the process of market research, 431 Media market research teams must gain knowledge that will guarantee a successful advertising campaign from brand creation to its delivery. The sample selected from the target audience must provide the key to persuading the target audience that a 431 Media product is necessary in their lives and better than the competition. During the market research process, a team must work with the consumers to acquire, generate, and/or transfer knowledge of the consumer's individual behavior. The knowledge gained from the individuals becomes information about the target audience as a whole, which must be analyzed to generate knowledge. There are multiple qualitative market research techniques that this paper will discuss along with the implications of knowledge management within these techniques. This paper argues that without an energy to maintain knowledge management prior to, during, and after the market research process, the researcher will not take full advantage of the knowledge squeezed from the consumer and the target market. Taking the extra step of managing knowledge will help 431 Media beat its competitors. One can wring out a wet towel with one hand, but with two, the task comes much closer to completion.

Why Market Research Is Important

One might find it strange to explain to a research professional why market research is so important. However, within advertising, market research has become so second nature that research professionals may forget the energy required for generating

accurate and useful information and knowledge from market research. Leonard (2007) states it well: “It falls to marketing professionals to blend the experience base of the user with the experience base of the creators” (p. 146). It is the experience of the user, the 431 media consumer and potential consumer, market research must access.

Emic analysis during ethnographic methods is the style most often employed by 431 Media. *Emic analysis* is the analysis of a culture from within the culture and ethnography is the study of people and the cultures they create (Morrison et al., 2002). Emic analysis allows a researcher to understand the participant’s culture the way he or she understands it. Emic analysis brings a researcher close to the behavior and thought process of a consumer. Etic analysis is occasionally employed. *Etic analysis* is a researcher’s view of a culture from the outside (Morrison et al., 2002); for example, watching a consumer shop without the consumer knowing. The consumer shares no insight. Etic provides information that can be given meaning and transformed into knowledge. However, emic analysis captures the knowledge of the consumer directly.

Emic analysis can be difficult to conduct because consumers cannot always identify reasons for their behavior (Ichijo & Nonaka, 2007; Morrison et al., 2002; Postoaca, 2006). Another limitation is that most highly sophisticated, statistics-based research has limits in deciphering consumer behavior or the development of new products and services in response to such behavior (Leonard, 2007). The science of market research is much more qualitative, which this paper will focus on. This qualitative research is challenging: “It is far easier to deliver information and data about market segments than knowledge about what customers really need, what they are thinking, or what unconscious motives are driving their behavior” (Leonard, 2007, p. 146).

Market research is important because it connects 431 Media to its buying public. How would we know how to support the 431 Media online community at ReelCritics.com without understanding the user’s experience during the initial launch? Market research also keeps an organization informed of the changes in the dynamic market. All aspects of the world are in constant flux; strategic market research techniques will allow 431 Media to keep pace with the market’s speed of change. A knowledge management perspective and approach is the strategy the rest of this paper will propose.

How Knowledge Management Is Involved with Market Research

In its simplistic form, knowledge management is associated with market research through the notion that market research is a process of acquiring and generating knowledge. However, knowledge management plays a role in three important areas of the market research and advertising department of 431 Media. Knowledge management plays a role internally within the advertising department and each sub-team, within the market research techniques and acquisition of knowledge from the consumer, and after market research is complete when knowledge must be stored in a repository with a user-friendly retrieval system to allow all members of the advertising creative team to have successful access (Davenport & Prusak, 2000). These three areas will now be discussed at length.

The Role of Knowledge Management within the Advertising Department

Within the advertising department, there are many forces driving the knowledge that must be harnessed. Today's market is more dynamic than ever. The speed of the "changing times" is increasing. It is essential to understand what forces may keep the advertising department from acquiring, generating, or transferring knowledge. This is true in almost any office; however, it is especially true within advertising campaigns because they attempt to engage the most up to date consumer market.

The next paragraph will include a theory and literature review to provide background information on knowledge management. This information will also display how all employees must play a role. For example, every employee is at times a knowledge *buyer, seller* or *broker* (Davenport & Prusak, 2000). A knowledge buyer is an individual who is "looking for insights, judgments, and understanding" (Davenport & Prusak, 2000, p. 28). A buyer wants to know, for example, "Is the use of Product A currently in an upswing in a particular target market?" Or, "How can I determine if a sample enjoys the use of Product A?" Both these questions have varying levels of complexity and affect how one acquires this knowledge possibly to conduct a market research plan, as in the first question, or to contact a knowledge seller as in the second question (Davenport & Prusak, 2000). Knowledge sellers are "people in an organization with an internal market reputation for having substantial knowledge about a process or subject" (Davenport & Prusak, 2000, p. 28). A knowledge seller must often transfer tacit knowledge to explicit knowledge, which can be difficult. For example, how can a seller, in this case an experienced market researcher, instruct an inexperienced employee on how to develop a research project around the second question? There are multiple approaches to this task. It may require a verbal discussion or a demonstration. Knowledge brokers (Davenport & Prusak, 2000) are "gatekeepers" who connect buyers and sellers. An individual may not be knowledgeable about the upswing of Product A, but he or she may know where to find the knowledge needed.

There are knowledge buyers, sellers, and brokers throughout the department. It is likely that every member of a market research team will act as one of these characters. However, knowledge enters the team as a whole on a different scale. Working so closely together, all members should ensure that knowledge is shared as much as possible (Timmerman & Scott, 2006). This sharing of knowledge tends to occur naturally: "Transactive memory theory argues that project teams and cross-functional teams distribute and share knowledge much like a virtual brain" (Child & Shumate, 2007, p. 31). To ensure a transactive memory, a team should engage in four knowledge management processes. First, each member of a team must specialize in a type of information (Davenport & Prusak, 2000). Second, the team must develop a cognitive map displaying who possesses what knowledge; who are the buyers, sellers, and brokers (Davenport & Prusak, 2000). Third, team members should actively retrieve knowledge from and allocate information to these specialized experts (Child and Shumate, 2007). And fourth, a team must coordinate to allow all members to gain and enhance their knowledge (Child and Shumate, 2007).

These four processes require transfer of knowledge: transferring knowledge from one person to another person. There are many strategies for knowledge transfer. It is a team's duty to figure out which technique works best for them at the right time (Child and Shumate, 2007). Techniques most often stress personal contact. Some techniques include: transferring qualified employees in and out of a position,

conversing to generate creative solutions, conversing to attract employees away from their desk of solitude, seeking out constant personal contact among sellers, developing a shared language among a team, and creating locations and occasions for workers to interact informally which will generate conversations (Davenport & Prusak, 2000). Timmerman & Scott (2000) state that a team cannot function without individual members feeling trust, team unity, identification with the group, and satisfaction with interaction. Without personal contact, these social outcomes will be heavily stunted, and team cohesion will cease to exist. Defining knowledge roles and sharing knowledge is key to market research because it is key carrying out the market research task.

The Role of Knowledge Management within Market Research Techniques

Personal contact is one ingredient in successful market research. The best way to understand the effectiveness of a product is to conduct research directly with the source: the consumer (Postoaca, 2006). The research participant is the knowledge seller and the researcher is the knowledge buyer. When a participant is given incentive to participate, this individual, in some ways, becomes part of the team. One can take the techniques of knowledge transfer discussed in the last paragraph and apply them to interview and focus group market research sessions: have personal contact, converse to generate creative solutions, and more. This essay will now discuss knowledge management among many market research techniques.

Focus groups and interviews. During focus groups, one must harness the knowledge discussed, shared, or argued among a group of participants. Focus groups arouse conversations, which allow "the researcher to capture participants' more spontaneous ideas and comments (Keyton, 2006, p. 279). With the emic analyses from the researcher, questions can guide participants to spontaneous ideas and comments they may not otherwise develop on their own during a survey or individual interview (Morrison, et al., 2002). Natural setting is important. If one parallels focus group sessions with working with a team, one will see that in any group setting, "getting people to talk about what things mean to them is more easily accomplished in a natural setting" (Morrison, et al., 2002, p. 46).

Relationships become a central role during focus groups and interviews. Maznevski and Athanassiou (2007) discuss the concept of bringing outside knowledge into an organization. Their discussion focuses on organization members forming relationships with other organization members and sharing best practices. This approach can be applied to the relationship a researcher forms with his/her participant. One should "leverage relationships" (Maznevski & Athanassiou, 2007, p. 70) and build on "social capital" (Maznevski & Athanassiou, 2007, p. 72). Social capital is traditionally based on a network of business associates; however during focus group and interview research, a researcher is only as good as his or her network of participants. Recruitment becomes a key factor here, and much like traditional social capital techniques, a participant can ask lead users for referrals of other users of a particular product (Maznevski & Athanassiou, 2007).

During a one-on-one interview, participants will discuss experiences and researchers must "allow for the interaction so essential to learning a respondent's viewpoint" (Leonard, 2007, p. 147). One-on-one interviews, like focus groups, arouse tacit knowledge. At times this tacit knowledge is immediately discussed in explicit

terms; however it is often the researcher's duty to code the tacit knowledge into explicit knowledge after the interview. This will be discussed later in the paper.

Ethnography. Ethnography is the study and representation of people and their interaction (Keyton, 2006). Emic and etic ethnography was discussed earlier. In market research, an ethnographer seeks to identify consumer behavior that is impossible to simulate. At 431 Media, ethnographers conduct etic analyses by deciphering the experience of participants by watching them through a one-way mirror as they use websites. During emic analyses, an ethnographer will discuss with the participant his or her experience. Both ways will produce various types of knowledge (Morrison, et al., 2002). The etic analyses will acquire information about the behavior of participants. This can be translated into knowledge after much research is gathered. Emic analyses will transfer knowledge from the participant to the researcher regarding his or her experience. Emic analyses can also generate knowledge when projective techniques are employed (Morrison, et al., 2002).

Projective techniques. "Consumers sometimes just aren't sure why they buy a product or choose one brand over another because the reason is buried deep in their consciousness" (Morrison et al., 2002, p. 62). This quote is often true with research participants (Keyton, 2006; Postoaca, 2006). Projective techniques seek out the knowledge of consumer behavior on a subconscious level through stimulus. A researcher will present a stimulus, like a photograph or a group of words, to a participant, and the participant will then answer a set of questions about the stimulus. These questions are based on what the researcher is attempting to uncover, which is often an emotion, preference, or feeling towards the stimulus. Projective techniques "uncover a person's innermost thoughts and feelings and are based on the idea that unconscious desires and feelings can be explored by presenting a participant with an unthreatening situation in which the participant is free to interpret and respond to the stimuli" (Morrison et al., 2002, p. 63).

In an example supplied by Morrison et al. (2002), a participant is asked why she bought a local brand of paper towel over a national brand. Her reason was that the local brand was cheaper. However, after the use of projective techniques, it was determined that another factor, if not the only factor, was that the image of an angel on the paper towel packaging aroused a sense of protection and security over her family and home, which persuaded her subconscious to buy that particular brand. These techniques often generate knowledge because it is knowledge the participant does not know exists.

The projective technique used in this example was "visual stimulus." After showing the participant images often found on paper towel packaging (random images were also displayed so as not to be obvious as to the intentions of the study), the floodgates were opened to information leading to the knowledge about the influence of packaging on her purchase decision. The participant gravitated towards images of angels over the other images because of their protective quality.

Other techniques include word associations, metaphors, construction, completion, expressive, and choice ordering (Morrison, et al., 2002; Postoaca, 2006; Ichijo & Nonaka, 2007). The research teams of 431 Media often use visual stimuli and word association because websites function on visual and text stimuli. With word association, knowledge can be developed regarding a participant's vocabulary around a particular product or brand (Morrison, et al., 2002). For the online community

ReelCritics.com, word association can be used to help determine the names that should be given to new features.

Projective techniques generate knowledge. Davenport and Prusak (2006) say, "All healthy organizations generate and use knowledge. As organizations interact with their environments, they absorb information, turn it into knowledge, and take action based on it in combination with their experiences, values, and internal rules" (p. 52). Within 431 Media's market research projects, the team's interaction with its environment (the consumer's use of the product) becomes a generator of knowledge. Knowledge generation is conscious and intentional and includes acquisition, fusion and knowledge networking (Davenport & Prusak, 2006).

Unconventional market research techniques. Leonard (2007) discusses some unconventional market research techniques that may be useful when the dynamics of the market make current, traditional, and/or formulaic forms of market research obsolete.

Conversing with lead product users is one way get educated consumers to test the product or seek out what the participants want from a product. Defining a "lead user" is a subjective task and may cause difficulty. The web industry has its fair share of lead users. Lead users are innovators and think ahead of most consumers, allowing them to understand consumer trends before most others in the target market (Leonard, 2007).

Metaphors and consensus mapping (Leonard, 2007) are forms of projective technique. This technique entails having a participant create situations, draw pictures, or bring in objects or photographs that come to mind when presented a product. In the case of 431 Media, having a participant describe a verbal metaphor when faced with online imagery will elicit knowledge that is deep in the subconscious. The knowledge generated from this technique is highly tacit and requires much post-coding.

Online marketing techniques. Even though 431 Media is an online publishing company, it is suggested that the market research team use traditional, face-to-face research techniques when online techniques do not enhance the research method. Online research has many pitfalls, and it has not been researched enough for any near-flawless techniques to have been published (Lipner, 2007; Postoaca, 2006). Pitfalls include misinterpretation, lack of synchronous communication, lack of control of context, and more. Pitfalls are derived from the fact that online communication lacks non-textual cues and is limited in capabilities to create near-flawless visual cues. Relationship building, as suggested earlier, is nonexistent during online market research.

An online survey or product test may become useful when computer use in the home is the only natural setting and when etic analysis is required. In this case, the survey must be pre-tested thoroughly, as researchers are not present to witness a participant's reaction. Their product test and survey-taking displeasure is only shown through a lack of participation (Lipner, 2007). Acquiring or generating knowledge online has so many pitfalls it is suggested that online research be kept simple because this will "enhance the respondent experience" (Lipner, 2007, p. 142).

While Texas Instruments has created a "Not Invented Here, but I Did It Anyway" award (Davenport & Prusak, 2006), a market research team could hand out a similar award because the market research team is gaining knowledge straight from the source: the consumer. However, while a research team acquires knowledge from

individual participants during interviews and focus groups, and generates knowledge with the use of projective techniques, this knowledge becomes information when applied to the entire market. This information must then be analyzed and generated into knowledge concerning the market. This is discussed in the next section.

The Role of Knowledge Management in Post-Market Research

A great percentage of the act of market research is the acquisition, generation, and/or transfer of knowledge. The last step to the market research process is to turn the knowledge from the individual that reveals information about the market into knowledge about the market. In terms of knowledge management, what does a researcher do once he or she has a binder full of transcripts filled with knowledge? A researcher must code the knowledge in such a way that this knowledge is accessible to the creative team that requires the knowledge to create the advertising and marketing materials.

Codification "is to put organizational knowledge into a form that makes it accessible to those who need it" (Davenport & Prusak, 2006, p. 68). The form must be organized, explicit and portable. The 431 Media creative team must be able to access the market research knowledge at any time without a knowledge broker.

One must "codify knowledge without losing its distinctive properties and turning it into less vibrant information or data" (Davenport & Prusak, 2006, p. 68). The market research knowledge must be coded in such a way that the creative team can understand it. Members of the creative team are not researchers; they are writers, graphic designers, and cinematographers. For 431 Media purposes, it is the account planner's job to ensure the coded knowledge is translated and available for the creative team (Morrison et al., 2002). The account planner studies the market research and creates a marketing plan around it. This process of coding is often conducted in a PowerPoint presentation (Morrison et al, 2002). Not only must the account planner code the knowledge to inform, but he or she must also code the knowledge to excite the creative team about the marketing approach to motivate their creative skills (Morrison et al., 2002).

The account planner must also make sure the market research is available to the team whenever it is needed (Morrison et al., 2002). The market research must be organized in a database. The database allows for the coded knowledge to be transferred successfully through the use of a large repository with an effective retrieval system. This is essential for successful codification (Davenport & Prusak, 2006). An effective repository also creates perceived team effectiveness among the marketing team because it helps to add to the cognitive map (Child & Shumate, 2007). Their research is based on perception; however it is common sense to believe that if there is a successful repository and retrieval system of knowledge available to all members of a team, the team has a better chance of completing its tasks and reaching its goal.

Implications and Conclusions

The process of market research requires procedure and intuition. The procedure required is sitting down with consumers during focus groups; intuition is required to create successful relationships that open the floodgates to knowledge. Knowledge is based on experiences (Davenport & Prusak, 2006). Experiences are a blend of the procedural and intuitive aspects of life. As we go through the commonalities of life, various unique experiences may occur. This parallel displays the necessity of

knowledge management. Knowledge management is the procedure of acquiring, generating, and transferring knowledge from the intuitive aspects of individual consumers and consumer markets. Market research teams must manage the knowledge they receive from the consumer markets in such a way that it is used to its full potential.

To ignore the procedure of knowledge management would be like wringing out a wet towel with one hand. Ignoring the procedure of knowledge management would be to ignore the distinct role of the participant and would cause an avoidance of knowledge of new market research techniques. Ignoring knowledge management would be to ignore the coding, storing, and distribution of the knowledge and information gained from the market research process.

Knowledge management in market research is a way of thinking. It's an approach to gaining as much knowledge from the participants as possible. Knowledge management techniques combined with a knowledge culture thriving within the market research team is a combination of success for determining the best way to tell the target market of 431 Media why its products are necessary in their lives and better than the competition.

References

Child, J.T., & Shumate, M. (2007). The impact of communal knowledge repositories and people-based knowledge management on perceptions of team effectiveness. *Management Communication Quarterly, 21*, 29–54.

Davenport, T. H., & Prusak, L. (2000). *Working Knowledge: How Organizations Manage What They know.* Boston. Harvard Business School Press.

Keyton, J. (2006). *Communication Research: Asking Questions, Finding Answers.* New York. McGraw-Hill.

Leonard, D. (2007). Market Research in Product Development. In Ichijo, K., & Nonaka, I. *Knowledge Creation and Management: New Challenges for Managers.* New York. Oxford University Press. 146–157.

Lipner, W. E. (2007). The future of online market research. *Journal of Advertising Research, 6*, 142–146.

Maznevski, M., & Athanassiou, N. (2007). Bringing the Outside In. In Ichijo, K., & Nonaka, I. *Knowledge Creation and Management: New Challenges for Managers.* New York. Oxford University Press. 69–82.

Morrison, M. A., Haley, E., Sheehan, B. K., & Taylor, R. E. (2002). *Qualitative Research Advertising: Strategies, Techniques, and Applications.* Thousand Oaks, Calif. Sage Publications.

Postoaca, A. (2006). *The Anonymous Elect: Market Research Through Online Access Panels.* Berlin. Springer.

Timmerman, C. E., & Scott, C. R. (2006). Virtually working: communicative and structural predictors of media use and key outcomes in virtual work teams. *Communication Monograp*h.

E-learning Systems:
Promises for the Future and Obstacles to Success

Beth Csider
Master of Communication and Information Studies

Abstract

E-learning, described as education via the network- or Internet-enabled transfer of skills and knowledge, has gained an incredible amount of attention in recent years. This paper will provide a general overview of e-learning by discussing its origins and current literature regarding pedagogical approaches to its use in university environments. Additionally, the benefits offered by and possible impediments to creating and implementing successful e-learning systems will be discussed. Finally, this paper will discuss the future of e-learning as it relates to the academic environment.

What Is E-learning?

The academic environment has seen tremendous growth in e-learning initiatives over the last two decades. Defined as the network- or internet-enabled transfer of skills and knowledge, e-learning is a planned teaching and learning experience that uses a wide spectrum of technologies to reach learners at a distance (Govindasamy, 2002). E-learning has its origins in distance learning, which can be traced back to England during the 1840s. During that time, shorthand classes were offered by correspondence courses through the mail, supported by improvements to the British postal service. This was followed by the exchange of classes recorded on tapes, CDs and DVDs. The advent of the computer, and then the Internet, made learning easier, faster, and more productive. It is important to note that, although similar, e-learning and distance learning are not the same. Distance learning is characterized only by the physical separation of the student from the instructor and can use a variety of non-computer related methods for the exchange of information. E-learning, however, is defined by the use of electronic media and computers (Aranda, 2007).

According to Khan (2000), e-learning can include any web-based learning, internet-based learning, advanced distributed learning, and online learning. The concept has gained increasing popularity in both academic and corporate environments. Used as a supplement to traditional classroom learning, or entirely on its own, e-learning allows for students and professionals alike to gain knowledge and education practically anywhere in the world. While e-learning can be implemented in a number of different contexts and much literature has been written on its use in organizations and corporations, this paper will focus on its use in academic or university settings.

Today, most universities have some sort of e-learning program set up within their curriculum. While most still rely on traditional classroom learning, there are usually a number of online courses available through programs such as Blackboard, Sakai, eCompanion, Scholar 360 and CyberExtension, among others. Additionally, some academic programs are based entirely on the Internet, like the United Kingdom's Open University and the United States' University of Phoenix. While all e-learning programs have some things in common, like being computer-mediated and internet-based, there is an incredible amount of variance in how each program is designed to function. We begin our discussion of e-learning systems by

looking at different pedagogical approaches to implementing an e-learning program.

Pedagogical Approaches to E-learning

Instructional design is a traditional pedagogy that is curriculum-focused and developed by a centralized educating group or a single teacher. As most courses are taken to fulfill some sort of requirement, it assumed that the majority of e-learning courses follow an instructional design pedagogy. The key to creating a successful e-learning program is to integrate additional pedagogies along with more traditional modes of thinking.

The constructivist approach, according to Jonassen (1995) posits that all new knowledge is formed on the foundation of prior knowledge. E-learning programs benefit from this type of pedagogy because it allows for a collaborative approach that opens educational content creation to a wider group of people. This can be illustrated with the use of discussion forums, blogs, wikis and other online collaborative activities. E-learning that fosters a constructivist or self-constructivist approach encourages students to construct knowledge from a vast repository of information, bringing their own experiences and knowledge to the table (Hamid, 2002).

The Laurillard Conversational Model, which is particularly relevant to e-learning, was developed to help explain the use of technology in higher education. According to Laurillard (1996), the Conversational Model recognizes the importance of the dialogue that occurs between the teacher and student in learning situations. It is not just enough to observe and experience; one must also examine other people's experiences and arguments. Additionally, Laurillard's model touches on four different views: discursive, adaptive, interactive, and reflective. The discursive view suggests that teachers and students should make their ideas about the learning experience accessible to the other; agree upon learning and task goals; and teachers must provide an environment in which students can act on, generate and receive feedback appropriate to the learning goals. The adaptive view posits that teachers must use feedback from students to revise the focus of the 'dialogue' taking place; the interactive and reflective views suggest that teachers must provide feedback to students based on their tasks and that teachers should support the process where students relate tasks and experiences to the topic goals of the course, respectively (Laurillard, 1996).

Another pedagogical approach to e-learning can be found in Salmon's (2002) Five-Stage Model for computer-mediated communication. The first stage, access and motivation, involves exploring the technology and motivation for learning so the instructor, or e-moderator, can help people learn the environment. Second, in the socialization stage, social processing and community building are the focus, as the moderator facilitates bridge building among the participants. Information exchange, the third stage, involves participant interactions so that cooperative tasks can be achieved. The fourth stage, knowledge construction, is where participants start recognizing the value of test-based, asynchronous interaction as they take control of discussion activities. During the last stage, development, participants become responsible for their own learning as ideas are applied to individual contexts through reflections and assessment (Salmon, 2002, 2003).

Other pedagogical approaches to e-learning include the cognitive perspective, which focuses on the cognitive processes involved in learning and how the brain works (Bloom & Krathwohl, 1956) and the emotional perspective, which looks at the emotional aspects of learning like motivation and engagement (Bååth,

1982). Additionally, the behavioral perspective focuses on the skills and outcomes of the learning process, as well as applications to real-world settings, while the contextual perspective looks at the environmental and social aspects that can stimulate learning (Black & McClintock, 1995). These last two perspectives focus on interactions with other people and look at collaborative discovery and the importance of peer support.

There is also research in e-learning literature that looks at a self-directed pedagogy. According to Hamid (2002), getting a student to take responsibility for his or her own learning experience is key to the success of e-learning programs. Likewise, learning in a mediated environment should be a response to a tension (positive and negative, internal and external) created as a motivation for students (Pintrich & Schunk, 1996). It is the flexible nature of online classrooms that allow students to customize their experience to their own needs and learning styles. Additionally, it is important to note that learning is both a private and a social activity and e-learning has the ability to support both of these situations by integrating reading or writing assignments and reflection activities with class discussions and open forums (Hamid, 2002).

Measuring the Results of E-learning

According to Strother (2002), both traditional learning and e-learning can be evaluated using Kirkpatrick's (1979) classical model of four progressive levels. The four levels measure a learner's reactions to a course, what was learned, changes in behavior after the course, and what outcomes occur because of the behavior change. The first level looks at how students in a course feel about their experience and how well the course was received. In a recent ecollege.com survey, the majority of students who chose an e-learning course did so because of the flexibility and convenience it allowed, and were not disappointed with the results (Strother, 2002). Additionally, the same survey reported that 85 percent of instructors felt the learning experience yielded the same, or comparable, results as those associated with traditional, classroom-based learning. The second level of Kirkpatrick's model looks at what was learned in educational programs. Typically, when teachers measure learning, they look at how much the skill, knowledge or attitudes of students have changed. Kirkpatrick argues that an additional measure should also involve a pretest and posttest given to students to assess how much they learned as a direct result of the course.

The third level of Kirkpatrick's model suggests that a student's behavior after the course should also be measured. Additionally, the fourth level looks at results that stem directly from the course. While these measures may seem more closely related to e-learning in business and organizations, they would also be useful in academic programs, especially those in higher education where students are also professionals (Strother, 2002).

Another way to look at measuring the success of e-learning programs is by applying Bloom's Taxonomy (Bloom, 1956). Developed in the 1950s, the taxonomy describes the learning progressing though a set of concepts that take the learner through lower order thinking skills in order to build higher order thinking skills. Containing six levels, the taxonomy begins with knowledge, and then moves through comprehension, application, analysis, synthesis, and finally evaluation.

The first level of Bloom's Taxonomy, knowledge, focuses on the retrieval of information with acts of remembering, recognizing, listing, describing, naming and

locating. Comprehension, the second level, asks students to interpret, summarize, infer, compare and explain the knowledge they have gained. Moving up Bloom's ladder, the next level is the application of knowledge with the implementation of ideas and execution of tasks. The fourth level, analysis, focuses on comparing, organizing, structuring and integrating new knowledge with what is already known as a way to validate knowledge. Synthesis, the fifth level, refers to putting all the pieces together to form a new whole by combining, rearranging and substituting knowledge. Finally, evaluation involves forming and presenting an idea supported by sound reasoning by deciding, judging, justifying and selecting (Bloom, 1956; Krathwohl, 2002). Looking at how an e-learning program helps transition students through each level of Bloom's taxonomy would be a good assessment as to the success of such a program.

E-learning Benefits and Possibilities

There has been a lot of literature written about the benefits of implementing e-learning programs. Previous research has shown that e-learning can provide more opportunities for improving problem solving skills, enhancing higher-order thinking, and achieving more learning effectiveness (Rosenberg, 2001; Chen, Lee & Chen, 2005; Liaw, 2004; Liaw, Huang & Chen, 2007). Additionally, studies have noted reduced overall cost (Kruse, 2002; Strother, 2002; Zhang & Nunamaker, 2003), as well as reduced learning times, increased interactivity, confidence and self-pacing capabilities (Strother, 2002). Students can also select the learning activities that best fit their learning style and needs, as opposed to being passive receptors of information (Zhang & Nunamaker, 2003).

Research has also suggested the ability to shift teaching and learning schedules to better fit individual schedules is a key benefit of e-learning (Chan & Robbins, 2006; O'Donoghue & Singh, 2001). This allows for a more collaborative learning environment, where students and teachers can devote their undivided attention without ignoring other parts of their schedule. Additionally, e-learning programs can provide better access to the instructors, as there are usually more opportunities for communication than those in traditional classrooms (Hiltz & Wellman, 1997; McCloskey, Antonucci & Schug, 1998).

While these benefits are especially helpful, the real profit from e-learning programs can be found in research that has shown there to be no significant difference in the amount of content learned between traditional and e-learning based education (Strother, 2002; Wegner, Holloway & Garton, 1999; Nettles, Dziuban, Cioffe, & Moskel, 2000). In fact, some research has shown that e-learning produces better results than traditional learning (Maki, Maki, Patterson, & Whittaker, 2000; Navarro & Shoemaker, 1999; Nelson, 2001; Redding & Rotzein, 1999). Additionally, literature also suggests that e-learning can empower students to actively engage in their learning experience and better develop high-order critical thinking, visualization, and literacy skills (Jonassen, 2001; White, 1997; Bates, 1996; Serrano & Alford, 2000).

E-learning Drawbacks and Impediments

While the benefits of e-learning programs are immense, it is also important to look at the drawbacks with such programs and impediments to implementing a successful e-learning initiative. Research has found e-learning systems that rely heavily on only text-based materials lead to less student engagement during the course (Caswell,

1998). Additionally, there is often not enough content available on e-learning courses to provide sufficient understanding on a subject matter (Kohsaka, Hashimoto, Shibata & Katsumoto, 1999; Zhang & Nunamaker, 2003).
Issues also include the high up-front investment costs and inability to obtain the proper technology to take advantage of the full spectrum of e-learning systems. According to Chan and Robbins (2006), setting up a successful e-learning program can be both labor- and time-intensive, with an end result that is usually a constantly changing work in progress.

Kruse (2002) makes note of the possibility of having reduced social and cultural interaction, which can be detrimental to the overall learning experience. Likewise, O'Neill, Singh and O'Donoghue (2004) suggest that the implementation of e-learning systems can destroy other processes, like in-person contact, that offer support to students. For example, many students do not have the skills to learn independently and will not be successful in an e-learning environment (Cooper, 1999; Knight, 1996; Hawkes & Cambre, 2000; Kershaw, 1996; O'Neill et al., 2004). According to Pollack & Conford (2000), while virtual universities may work in theory, they do not work in actual practice. This could be due to the issues of isolation that arise from a lack of human contact. Many researchers have stressed the importance of including modes for increased human contact as technological advancements make virtual learning more popular (Cooper, 1999; Bourner & Flowers, 1997; Moore, 2000).

Other impediments to building successful e-learning programs include a lack of quality assurance in programs (Goddard, 2000; Copeland, 2001; Caudron, 2001); an increased workload for teachers; and instructors lacking the knowledge to design and teach online classes (Moore, 2000; Vrasidas, 2004; Berge, 1998; McKenzie, Mims, Bennett, & Waugh, 2000). As noted earlier, it is important that benchmarks, or a measurement system, be put in place to monitor the success of e-learning programs. Likewise, teachers and instructors should be given the proper tools to design and teach such programs, with an appropriate workload to support e-learning initiatives.

The Future of E-learning and Conclusion

As stated earlier, e-learning systems have certainly gained a lot of attention in recent years. Because of their ability to bring educational material to those who may not otherwise have access to such resources, e-learning systems have grown exponentially as computer-mediated communication and the Internet rise in popularity. While there are some key impediments to such programs that should be carefully examined, the benefits of e-learning programs will continue to make them irresistible to the academic field.

There are a number of considerations to be made when implementing a successful e-learning system within academic settings, but most research suggests that e-learning will continue to grow as an efficient and preferable solution to remote learning (Zhang & Nunamaker, 2003; Guri-Rosenblit, 2005; Bates, 2001; Collis & Monnen, 2001). The benefits of e-learning systems often outweigh the drawbacks, and most impediments to such programs can be limited with careful and thoughtful planning. Furthermore, by blending both e-learning and traditional learning, academic institutions will be able to offer a richer learning experience. E-learning does not have to be about replacing traditional learning, but rather should be about enhancing it (Chan & Robbins, 2006; Strother, 2002; Copeland, 2001; Wilson, 2001;

Manning, Cohen & DeMicheill, 2003).

As we move towards the future, teaching styles of instructors charged with leading e-learning courses will need to change in order to get the maximum benefits from such programs (McFadzean, 2001; Moore, 2001; O'Neill et al., 2004). Additionally, because e-learning programs typically require a higher level of maturity and discipline than traditional classroom-based learning (Guri-Rosenblit, 2005; Zhang, Zhao, Zhou & Nunamaker, 2004), it is posited that undergraduate curricula will use e-learning systems on a limited basis, while graduate courses and higher-level learning will integrate e-learning into their curricula more frequently.

The future of e-learning lies in the ability of teachers and students to successfully integrate it with traditional classroom-based learning so that the two work off each other, each supplementing the other's strengths and weaknesses. Aside from a few specialized cases, like Open University or the University of Phoenix, e-learning will not replace traditional learning on a large scale. This is because too much knowledge, both tacit and explicit, is gained through face-to-face, non-mediated communication.

Additionally, the cultural experience of "going to college," whether a student is a campus resident or a commuter, is extremely valuable in terms of teaching young adults how to live on their own, manage their schedules or finances, and interact with other students and professionals. A college education is about more than attending classes and can help students understand how to enter adulthood. This type of knowledge cannot be transferred via remote, computer mediated lessons, but must be experienced and internalized over and over again.

So while e-learning has its benefits, and can be a useful tool in a number of situations, it is important to remember that it really is just a tool. And like all tools, it works best as a collection of many, each contributing its own value and worth to a project. Obviously, there will be cases when e-learning will be the only way to transfer knowledge, like in remote areas or for true distance education, and it will continue to act a great alternative to traditional, face-to-face communication in these situations. However, in order to get the most value out of an e-learning program, it should be treated as one part of the 'learning puzzle' and designed to work alongside other learning experiences.

References

Aranda, N. (2007). *An elearning walkthrough.* Accessed April 20, 2008 at http://www.scribd.com/doc/2168843/An-Elearning-Walkthrough

Bååth, J. A. (1982). Distance students' learning—Empirical findings and theoretical deliberations. *Distance Education, 3*(1), 6–27.

Bates, A. W. (1996). *The impact of technological change on open and distance learning.* Keynote address at Open Learning: Your future depends on it. Queensland Open Learning Network, Brisbane, Queensland, Australia.

Berge, Z.L. (1998). Barriers to online teaching in post-secondary institutions: Can policy changes fix it? *Online Journal of Distance Learning Administration, 1*(2). Retrieved April 13, 2008 from http://www.westga.edu/~distance/Berge12.html

Black, J. & McClintock, R. (1995). An interpretation construction approach to constructivist design. In B. Wilson (Ed.) *Constructivist Learning Environments.* Englewood Cliffs, NJ: Educational Technology

Publications.
Bloom, B. (1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals.*
Upper Saddle River, NJ: Longman Higher Education
Bloom, B., and Krathwohl, D. (1956). *Taxonomy of Educational Objectives, Handbook I: Cognitive Domain.* New York, NY: McKay.
Bourner, T. & Flowers, S. (1997). Teaching and learning methods in higher education: A glimpse of the future. *Reflections on Higher Education, 9,* 77–102.
Carswell, L. (1998). The 'virtual university': Toward an internet paradigm? In *Proceedings of 6th Annual Conference on the Teaching of Computing/3rd Annual Conference on Integrating Technology into Computer Science Education on Changing the Delivery of Computer Science Education.*
Caudron, S. (2001). Evaluating e-degrees. *Workforce, 80*(2), 44.
Chan, C. & Robbins, L. (2006). E-learning systems: promises and pitfalls. *Academic Psychiatry, 30*, 491–497.
Chen, C., Lee, H., & Chen, Y. (2005). Personalized e-learning system using item response theory. *Computers & Education, 44,* 237–255.
Collis, B. & Moonen, J. (2001). *Flexible learning in a digital age world: Experiences and expectations.* London, UK: Kogan Page.
Cooper, T. (1999). Whose academy is it? *New Statesman, 128* (4460), xxvi
Copeland, R. (2001, May 18). The usual rules apply online. *Times Higher Education Supplement.*
Goddard, A. (2000, June 16). Big brands key to e-university. *Times Higher Education Supplement.*
Govindasamy, T (2002). Successful implementation of e-learning pedagogical considerations. *The Internet and Higher Education, 4*(3–4), 287–299.
Guri-Rosenblit, S. (2005). 'Distance education' and 'e-learning': Not the same thing. *Higher Education, 49*(4), 467–493.
Hamid, A. A. (2002). E-learning: Is it the "e" or the learning that matters? *The Internet and Higher Education, 4,* 311–316.
Hawkes, M. & Cambre, M. (2000). The cost factor. *Technological Horizons in Education, 28*(1).
Hiltz, S. & Wellman, B. (1997). Asynchronous learning networks as a virtual classroom. *Communication of the ACM, 40*(9), 44–49.
Jonassen, D. (1995). *Constructivism: implication for designs and delivery of instruction.* New York, NY: Scholastic.
Jonassen, D. (2001) Objectivism versus constructivism: Do we need a new philosophical paradigm? In Ely, D & Plomp, T. *Classic Writings on Instructional Technology: Volume 2.* Englewood, Colorado: Libraries Unlimited, Inc.
Kershaw, A. (1996). People, planning, and process: The acceptance of technological innovation in post-secondary organizations. *Educational Technology,* 44–48.
Khan, B. (2000). *A framework for web-based learning.* Englewood Cliffs, NJ: Educational Technology Publications.
Kirkpatrick, D. (1979). Techniques for evaluating training programs. *Training and Development Journal,* 33(6),78–92.
Knight, P. (Ed). (1996). *Assessment for learning in higher education.* London,

England: Kogan Page, SEDA Series.
Kohsaka, Y., Hashimoto, K., & Katsumoto, M. (1999). Flexible multimedia lecture supporting system based on extended virtual reality space. In *Proceedings of 1999 International Workshops on Parallel Processing,* Aizu-Wakamatsu, Japan.
Krathwohl, D (2002), A revision of Bloom's taxonomy: An overview. *Theory into Practice, 41*(4), 212–218
Kruse, K. (2002). *The benefits and drawbacks of e-learning.* Retrieved April 10, 2008 from http:/e-learningguru.com
Laurillard, D. (1996). *The educational challenges for teachers and learners.* Paper presented at Virtual University Conference, 24 May 1996, University of London, England.
Liaw, S. (2004). Considerations for developing constructivist web-based learning. *International Journal of Instructional Media, 31*(3), 309–321.
Liaw, S., Huang, H., & Chen, G. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education, 49,* 1066–1080.
Maki, R. H., Maki, W. S., Patterson, M., and Whittaker, P. D. (2000). Evaluation of a web-based introductory psychology course: Learning and satisfaction in on-line versus lecture courses. *Behavior Research Methods, Instruments, and Computer, 32*, 230 -239.
Manning, R., Cohen, M., & DeMichiell, R. (2003). Distance learning: Step by step. *Journal of Information Technology Education, 2,* 115–130, Retrieved April 14, 2008 from http://jite.org/documents/V012/v2p115–130–96.pdf
McCloskey, Antonucci, & Schug (1998). Web-based vs. traditional based course development: Identifying differences in user characteristics and performance outcomes. In *Proceedings of the International Business Schools Computing Associations Annual Conference.* Denver, Colorado.
McFadzean, E. (2001). Supporting virtual learning groups. Part 1: A pedagogical perspective. *Team Performance Management, 7* (3/4), 53–62
McKenzie, B. K., Mims, N., Bennett, E., & Waugh, M. (2002) Needs, concerns, and practices of online instructors. *Online Journal of Distance Learning Administration, 3*(3). Retrieved April 14, 2008 from http://www.westga.edu/~distance/ojdla/fa1133/mckenzie33.html.
Moore, M. (2000). Is distance teaching more work or less? *The American Journal of Distance Education, 14* (3).
Moore, M. (2001). Surviving as a distance teacher. *The American Journal of Distance Education, 15* (2).
Navarro, P., and Shoemaker, J. (1999). *Economics in Cyberspace: A comparison study discussion paper.* University of California—Irvine, Graduate School of Management.
Nelson, G. (2001). Do no harm: A first measure of effectiveness in small distance education programs. *Proceedings of ED-MEDIA 2001: World Conference on Educational Multimedia, Hypermedia, and Telecommunications.* June, Tampere, Finland.
Nettles, K., Dziuban C., Cioffe, D., Moskal, P., and Moskal, P. (2000). Technology and learning: The 'no significant difference' phenomenon: A structural analysis of research on technology enhanced instruction. In Dziuban and Moskal (Eds.) *Distributed Learning Impact Evaluation.* Orlando, FL: University of Central Florida.

Nichols, M. (2003). A theory for elearning. *Educational Technology & Society, 6*(2), 1–10.

O'Donoghue, J. & Singh, G. (2001). *A study of social-learning networks of students studying an on-line programme.* International Conference on Advanced Learning Technologies (ICALT). Madison, Wisconsin USA.

O'Neill, K., Singh, G., & O'Donoghue, J. (2004). Implementing elearning programmes for higher education: A review of the literature. *Journal of Information Technology Education,* 313–324.

Pintrich, P. & Schunk, D. (1996). *Motivation in learning.* New Jersey: Prentice-Hall.

Pollock, N. & Cornford, J. (2000). Theory and practice of the virtual university. *Ariadne,* 24. Retrieved April 13, 2008 from www.ariadne.ac.uk/issue24/virtual-universities/

Redding, T. R., and Rotzien, J. (1999). *Comparative analysis of SDL online training with traditional classroom instruction.* Presented at the 14th International Symposium on Self-Directed Learning.

Rosenberg, M. (2001). *E-learning, strategies for delivering knowledge in the digital age.* New York, NY: McGraw-Hill.

Salmon, G. (2002). *E-tivities. The Key to Active Online Learning.* London, England: Taylor & Francis.

Salmon, G. (2003). *E-moderating: The Key to Teaching and Learning Online.* (2nd edition). London, England: Taylor & Francis.

Serrano, C., and Alford, R. L. (2000). Virtual Languages: An innovative approach to teaching EFL/ESL English as a foreign language on the World Wide Web. In L. Lloyd. (Ed.) *Teaching With Technology: Rethinking Tradition.* Less Lloyd Medford, NJ: Information Today, Inc.

Strother, J. (2002). An assessment of the effectiveness of e-learning in corporate training programs. *International Review of Research in Open and Distance Learning,* 3(1). Retrieved April 12, 2008 from http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160

Vrasidas, C. (2004). Issues of pedagogy and design in e-learning systems. ACM Symposium on Applied Computing.

Wegner, S. B., Holloway, K. C., & Garton, E. M. (1999). The effects of internet-based instruction on student learning. *Journal of Asynchronous Learning Networks 3*(2).

White, C. J. (1997). Effects of mode of study on foreign language learning. *Distance Education 18*(1), 178—196.

Wilson, G. (2001). The promise of online education: El Dorado or fool's gold? *The Educational Technology Journal, 11* (1).

Zhang, D., & Nunamaker, J. F. (2003). Powering e-learning in the new millennium: An overview of e-learning and enabling technology. *Information Systems Frontiers, 5*(2), 207–218.

Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker, J. F., Jr. (2004). Can e-learning replace classroom learning? *Communications of the ACM, 47*(5), 75–79.

Librarians and the Knowledge Artifact

Amy Di Dario
Master of Library and Information Science

Abstract

This paper will explore the creation and use of knowledge artifacts in the library setting. It will offer a definition of the knowledge artifact. It will describe the theoretical need for knowledge artifacts as well as their practical applications. Special attention will be given to understanding what unique characteristics a knowledge artifact should have (if any) to be effective in general and in the library organization. It will also explore the roles those in the library community are playing in the knowledge management field.

Introduction

In the past twenty years those in both the public and private sector have begun to see that the implementation of knowledge artifacts as part of a knowledge management program can be very effective in helping the organization retain and share knowledge. We will begin by defining the terms, and understanding general knowledge management concepts.

Traditionally, knowledge has been thought of something that is more sophisticated than data and information. In their influential book, Davenport and Prusak (1998) claim that "Knowledge derives from information as information derives from data" (p. 6). They go on to say that for information to become knowledge the human mind must do the work of synthesizing the information into the larger context of understanding. But, as Angela Abel and Nigel Oxbrow (2001) describe in their book, "this hierarchal approach . . . does not allow for subtleties or complexities for the data that is one man's information, and for the information that is knowledge when transferred to another" (p. 71). In other words, the thoughts are playing different roles in the minds of different people contemporaneously, so thoughts can never be designated.

While it may be difficult to define knowledge and describe the process of how it came to be, managing the organizational knowledge is important. Having a knowledge management program in one's organization can increase effectiveness, innovation, creativity, and user support, while reducing operating costs, duplication of effort, missed opportunities, and wasted time (Abel & Oxbrow, 2001, p. 39). It can help unite members of the organization and be a specialized tool for the accomplishment of a goal.

Knowledge management programs generally use knowledge artifacts to store, organize and disseminate knowledge. The challenge in creating good knowledge artifacts is that they must convey to the user more than sensory understanding (Ondari-Okemwa & Minishi-Majanja, 2007, p. 136). It's the complexity and the inherent difficulty of sharing knowledge between individuals that makes having knowledge artifacts so important. The knowledge artifact seeks to record both the process and outcome of the knowledge, so that the user can know the context behind that record. But all knowledge is not the same.

Can Tacit Knowledge Be Shared?

Some scholars hold that what is known as tacit knowledge is not at all able to be captured, and that those who do claim it can be captured misunderstand what Polanyi meant by it when he coined the term. In his article, "The Nonsense of Knowledge Management," (2002) T.D. Wilson argues that the tacit nature of knowledge, according to Polanyi, is misunderstood: ". . . the key point about Polanyi's concept [is that] tacit means "hidden," tacit knowledge means hidden knowledge, hidden even from the consciousness of the knower." Therefore, those who have tacit knowledge are not conscious of having it, and are certainly not able to express it in any way that it can be captured. Furthermore, any type of knowledge that is able to be expressed through language will become information again to the receiver. In other words, knowledge is only present in the individual knower, and thus can never be expressed or managed outside the mind of the knower (Wilson, 2002).

Suliman Al-Hawamdeh takes a different approach to whether or not tacit knowledge can be transformed into anything other than tacit. He claims that it could be that scholars have misunderstood the term "tacit knowledge" to mean "know-how" or implicit knowledge, a type of knowledge that can be expressed. He says,

> ". . . in my opinion, [know-how] is what Nonaka and Takeuchi (1995) referred to when they talked about tacit knowledge to explicit knowledge conversion. . . . Unlike skills and competencies, know-how can be documented and knowledge can be transferred through an independent learning process" (Al-Hawamdeh, 2002).

With this, implicit knowledge (or know-how) and explicit knowledge can be codified, but tacit knowledge still cannot.

In Davenport and Prusak's *Working Knowledge* (1998), there is a section called "capturing tacit knowledge." In that section they say that representing tacit knowledge is often the most difficult task in creating the knowledge artifact, but it is worth the effort. Some tacit knowledge may be lost, but the artifact will help by representing some of it. Interactive computer multimedia programs are helping to record narratives, visualizations, and all the other nuances that "have created the possibility of effectively capturing at least some meaningful fraction of an expert's knowledge, making the tacit explicit" (p. 81). Author Sheila Corral (1998) also holds that some applications of knowledge artifacts (those being face-to-face contacts, electronic interactions, chat facilities, chat rooms, learning groups, and best practice sessions) can capture tacit knowledge by facilitating user interaction (Corral, 1998).

Definition of a Knowledge Artifact

For the purposes of this paper I will define a knowledge artifact to be something that codifies, stores, and shares explicit and implicit ("know-how") knowledge, and endeavors to somehow represent tacit knowledge (without guarantee that it will be effective). Tacit knowledge is such that it cannot be made explicit; however we may attempt to represent tacit knowledge in a knowledge artifact in the hopes that a user may see it represented and at least be aware of its existence, even if the user does not have a full appreciation for it. A knowledge artifact can take many forms, but the most robust systems are electronic. This is so that they are searchable and able to be accessed by multiple users at the same time, and users can easily contribute.

Amy Di Dario

How Knowledge Artifacts Manage Knowledge

A knowledge artifact can act as a guide and a cohesive tool. It bridges gaps between sectors of the organization by providing a shared context. There must be some shared context in order to share tacit knowledge (Hislop, 2002, p.167). It also strengthens established communities of practice by allowing them to record knowledge and guard against loss.

Knowledge artifacts can use different types of software applications. Applications that are very good at capturing explicit knowledge are databases and repositories. Other types of applications are knowledge route maps, those that connect people within the organization (like yellow pages) and datasets that are grouped together to help users with a particular subject area or problem. These mostly serve the user by pointing to the right person or database. Third types of applications are those that facilitate interaction between users in the hopes that tacit knowledge may be exchanged (Corrall, 1998).

In his article, Duffy (2001) argues that the real knowledge artifact is only what is completely distinct from information management systems. An example of this application is groupware, which supports the collaboration needed. This can help bridge the gap created by different time and locations. Data warehousing infrastructure can also be useful in a knowledge management system. That encompasses tools and software that extract data from different software applications and organize and bundle it in a way that helps the user. They must show the means of creating, and the reason and intent for creating it. Put another way, the knowledge artifact must put the document in the knowledge artifact in organizational context for the user.

Additionally, knowledge artifacts should take into account the users' input during their creation. This can be accomplished if the creators of the artifact listen to the users, and constantly seek their feedback during the creation process (Weber, 2007, p. 340). Also important is that it be designed in such a way that it can evolve. The knowledge artifact should begin as "a seed," rather than a complete system, so that users can add to it and change it to adapt to different situations (Arias, Eden, Fischer, Gorman, & Sharff, 2000, p. 91). It is also important that the knowledge artifact has a specific aim or function, and it is very important that the designer of the artifact have this in mind (Ichijo & Nonaka, 1998, p. 70).

How Knowledge Artifacts Differ from Information Databases

In their article, "How to Put Context in the Knowledge Base" (2004), authors Desouza and Awazu explain that most artifacts fail to relay contextual information, the very thing that differentiates them from information artifacts. This can be challenging for designers to overcome. Some things that the authors suggest could help an artifact contain knowledge rather than information is to represent the context of the entry. This is because when users are not aware of the context, they are hesitant to use the system, and it is not used (p. 8). They suggest several ways to add context to the entry. They suggest a system that identifies the user that created the document, explains the long-term effectiveness of the document, and has a space for other users to comment on the entry. Another possibility would be to have a set of questions to the user that would draw out the context (p. 9).

Libraries Need Knowledge Artifacts

Libraries are very prone to knowledge decay, where knowledge is lost due to high turnover of staff (in whose minds the knowledge is borne and stored) so the use of knowledge artifacts would be beneficial to the library organization. Additionally the library is a service-based organization. For service providers, knowledge becomes part of the outgoing product, and if members of the organization have knowledge that is incorrect or lacking, it affects the service (Townley, 2001, p. 48).

The skills necessary for using knowledge artifacts effectively can be found in librarians. They are good users of knowledge artifacts because they are accustomed to using reference sources and catalogs to access scholarly information. Collecting and categorizing scholarly information and then systematically retrieving it is a similar process to that of collecting organizational knowledge and representing it in a retrievable way in a knowledge artifact (Townley, 2001, p. 45).

Furthermore, the knowledge artifact is more effective and successful in organizations where management supports its creation and use. Organization leaders should be involved in the creation process, and should see it as an investment. Particularly relevant to libraries is that knowledge artifacts fare better when the management scheme is flattened hierarchy, where the manager's leadership is not too far from the users of the artifact (Weber, 2007, p. 337).

Librarians Are Well Suited to Make Knowledge Artifacts

Sheila Corrall, in her article, argues that librarians should be involved in knowledge management because selecting organizational priority issues, making explicit knowledge more visible, and attempting to represent tacit knowledge are all things that a knowledge artifact must do, and in which librarians are skilled. Additionally, many librarians are accustomed to using knowledge artifacts such as web-based catalog access systems, which allow them to combine published and internal (informal, non-published) information (Corrall, 1998).

In order to assert themselves as competent and robust knowledge managers, librarians should communicate the fact that they are as equally skillful at organizing and disseminating organization knowledge as they are at organizing and disseminating library collections of public works. This is because librarians are known for their expertise in handling information taken from external sources (information taken from print and electronic sources and brought into the library for users), but their skill in taking organizational knowledge and handling it so that it can be used by organizational users is not understood or appreciated (Pantry, 2003, p. 106). However, despite the fact that librarians are not generally recognized as knowledge managers, the skills behind traditional librarianship and the knowledge manager are the same.

> "It's the ability to describe accurately and unambiguously, and to retrieve all the relevant information of value using labels that have been consistently applied, that marks out a successful knowledge management system as well as a library . . . [to] use the techniques of librarianship such as the reference interview in order to capture and record knowledge which ensures that knowledge systems are complete and as accurate as possible" (Pantry & Griffiths, 2003, p. 107).

The knowledge-creation skills that are used in the reference interview build skills for creating and using a knowledge artifact because questions in a reference interview seek to create the shared context between librarian and patron; the

knowledge artifact requires the same shared context (Townley, 2001). Creating the shared context between users of knowledge artifact is a determining factor in whether or not the artifact will be a success, and can be the most difficult aspect of the knowledge artifact; but librarians can use their professional skills to create that shared context (Townley, 2001).

Carolyn Haythornthwaite, in her article "Articulating Divides in Distributed Knowledge Practice" (2006), says that information specialists (librarians) can be particularly good at overcoming domain specificity. She defines domain specificity as the extent an organization is locked into certain ways of doing work based on what, how, with what, and with whom work gets done. Examples of domain specificity are the number of people that work with the object of research, or the size of the location in which work gets done (p. 765). Librarians are very well equipped to notice the differences in domains. Haythornthwaite, quoting from Hjørland says that

> "[I]nformation scientists, more than users, should know about possibilities and limitations in search engines, citation indexes, thesauri, controlled vocabulary, etc. and should advise users on how to use the possibilities. . . . [I]nformation scientists can be instrumental in identifying knowledge-based asset specificities in the process of enabling different domains to work together, and building intervening social and technical infrastructure" (p. 773).

Any type of asset specificity is invisible and this is the trouble that is usually encountered when creating the shared context that is necessary for knowledge management (and an effective knowledge artifact), but librarians can see what is invisible better than other professionals as they are accustomed to creating a shared context between users and the information they seek, and they are routinely exposed to and called upon to synthesize that which is unfamiliar as part of their job.

Jabulani Sithole, a Communications and Knowledge Management Analyst for the United Nations Development Program, argues that libraries are indeed already institutions of knowledge management. In his article, "The Challenges Faced by African Libraries and Information Centers in Documenting and Preserving Indigenous Knowledge" (2007), he says, "the [concept of recording and disseminating information] developed gradually from library science to information science and to knowledge management" (p. 119). He says that the shift came as a result of the shift from libraries using the traditional written and printed word to incorporate communication media and digital technologies. This is because libraries, museums, archives, and other memory institutions were players in creating the applications to preserve their indigenous knowledge.

Librarians Face Challenges in Creating Knowledge Artifacts

There challenges that librarians encounter when creating knowledge artifacts. Knowledge artifacts are very goal-oriented. They should help the user complete some specific task. Townley (2001) says that librarians are accustomed to not making any judgment calls because they must regard each document in their collection as important. This type of mindset can lead to difficulties when creating a knowledge artifact, as the designer must be selective about what is included in the artifact (p. 50).

This sentiment is echoed in Cathie Koina's (2002) article that any knowledge management program and resulting artifact must work to accomplish corporate goals, so its creators must understand those goals and be able to develop a

strategy or strategies to accomplish them. She goes onto say that librarians are not suited to creating knowledge artifacts for clients because they do not have the necessary understanding of the business.

Also, librarians are criticized for their "lack of systematic approach to organizing the knowledge of their enterprise and making it available" (Martin, Hazeri, & Sarrafzadeh, 2006, p.18). The authors use the example of the catalog as being a poor knowledge artifact as it could improve in the areas of personalization and richness of experience. However, it is not understood whether the creator of the catalog desired it to be a knowledge artifact, and have all those qualities of collaboration, or if the creator wanted the catalog to be an information database.

Implications

The fact that the library community has a spotty relationship with the knowledge management industry could be due to the fact that librarians do not promote themselves enough. Their involvement may not only be hindered by the stereotypes and attitudes from those outside the field but also stifled from within. Martin, Hazeri, and Sarrafzadeh, in their article, "Knowledge Management and the LIS Professions: Investigating the Implications for Practice and for Educational Provision" (2006), claim that librarians may themselves be reluctant to tout their skills for knowledge management and establish themselves within the field of knowledge management because they prefer to facilitate the storage of information rather than interpret and analyze the information contained therein.

Knowledge management, although not contained in any one particular academic field, should be gaining in popularity as an area of interest for the library and information science community. Many international and national professional associations like the International Federation of Library Associations (IFLA), the Association for Library and Information Science Education (ALISE), Australian Library and Information Science Association (ALIA), and the Special Libraries Association (SLA) have an interest in knowledge management, showing that the library community has a viable interest (Ondari-Okemwa & Minishi-Majanja, 2007).

Such interest is rightly so, as job openings for LIS graduates now call for skills outside the realm of a very traditional LIS program. Examples include content management and the development of metadata, seen in both the private and public sector (Ondari-Okemwa & Minishi-Majanja, 2007, p. 138). Library and Information Science programs should take into account the changing demands of employers and seek to include knowledge management education into their circle. Meeting these demands could mean more course offerings that address knowledge management.

Conclusion

In conclusion, the library and information science community has a lot to offer the knowledge management industry. Although there are some theoretical differences between the creation and use of information databases, and the creation and use of knowledge artifacts, librarians can create focused, strategic knowledge artifacts for libraries, or any other organization of which they are members.

References

Abel, A., & Oxbrow, N. (2001). *Competing with knowledge.* London: Library

Association Publishing.
Al-Hawamdeh, S. (2002). Knowledge management: re-thinking information management and facing the challenge of managing tacit knowledge. *Information Research [Online], 8* (1).
Arias, E., Eden, H., Fischer, G., Gorman, A., & Sharff, E. (2000). Transcending the individual human mind: Creating shared understanding through collaborative design. *ACM Transactions on Computer-Human Interaction, 7* (1), 84–113.
Corrall, S. (1998). Knowledge management: Are we in the knowledge management business? *Ariadne [Online], 18.*
Davenport. T., & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Boston: Harvard Business School Press.
Desouza, K., & Awazu, Y. (2004). How to put context in the knowledge base. *KM Review, 7*(2), 8–9.
Duffy, J. (2001). The tools and technologies needed for knowledge management. *Information Management Journal, 35* (1), 64–67.
Haythornthwaite, C. (2006). Articulating divides in distributed knowledge practice. *Information, Communication, & Society, 9* (6), 761–780.
Hislop, D. (2002). Mission impossible: Communication and sharing knowledge via information technology. *Journal of Information Technology, 17*, 165–177.
Ichijo, K., & Nonaka, I. (2007). *Knowledge creation and management.* New York: Oxford University Press.
Koina, C. (2002). Librarians are the ultimate knowledge managers? *Australian Library Journal, 55*(3), 269–272.
Martin, B., Hazeri, A., & Sarrafzadeh, M. (2006). Knowledge management and the LIS professions: investigating the implications for practice and for educational provision. *Australian Library Journal, 55*(1), 12–29.
Norris, D. (2003). A revolution in knowledge sharing. *Educause Review,28*(5), 15–26.
Ondari-Okemwa, E., & Minishi-Majanja, M. (2007). Knowledge management education in the departments of library/information science in South Africa. *South African Journal of Library and Information Science, 73* (2), 136–146.
Pantry, S., Griffiths, P. (2003). Librarians or knowledge managers? What's in a name, or is there a real difference? *Business Information Review, 20,* 102–109.
Schiltz, M. (2007). Cutting the trees of knowledge: social software, information architecture and their epistemic consequences. *Thesis Eleven, 89,* 94–114.
Sithole, J. (2007). The challenges faced by African libraries and information centers in documenting and preserving indigenous knowledge. *IFLA Journal, 33,* 117–123.
Townley, C. (January 2001). Knowledge management and academic libraries. *College and Research Libraries, 62*(1), 44–55.
Weber, R. (2007). Addressing failure factors in knowledge management. *Electronic Journal of Knowledge Management, 5* (3), 330–34.
Wilson, T. (2002). The nonsense of knowledge management. *Information Research [Online], 8* (1).

Mitigating Bounded Rationality: The Role of Decision Support Systems and Group Support Systems in Achieving Optimal Group Decision Quality

Crystal DeCotiis
Master of Communication and Information Studies

Abstract

Organizational group decision making is subjected to constraints of time, memory, information, and attention all having the ability to result in a decision that is suboptimal. In addition, group decision quality can be further affected negatively by members strategically choosing to disclose or keep private tacit knowledge that could aid in the development of a cohesive decision that reflects the true intellectual potential of all members. However, with the employment of Decision Support Systems (DSS) and Group Support Systems (GSS), organizational decision making has a greater opportunity to achieve optimal quality because of the expert knowledge DSS and GSS provide to decision makers that would otherwise not be available due to information constraints and/or the absence of tacit knowledge. The purpose of this paper is to explore decision-making literature and attempt to postulate the positive influence computerized support systems could have on decision outcomes for face-to-face (FtF) synchronous group decision making.

Introduction

Organizations are increasingly relying on groups not just to make decisions by reaching a consensus, but to make *superior* decisions which can be reached by taking advantage of the unique knowledge that resides in group members. A major advantage of group versus individual decision making is that groups are often composed of members who are believed to have unshared information (Stasser & Titus, 1985). Organizational group decision making is subjected to constraints of time, memory, information, and attention all having the ability to result in a decision that is suboptimal. In addition, group decision quality can be further affected negatively by members strategically choosing to disclose or keep private tacit knowledge that could aid in the development of a cohesive decision that reflects the true intellectual potential of all members. However, with the employment of Decision Support Systems (DSS) and Group Support Systems (GSS), organizational decision making has a greater opportunity to achieve optimal quality because of the expert knowledge DSS and GSS provide to decision makers that would otherwise not be available due to information constraints and/or the absence of tacit knowledge (See Table 1 for a complete listing of computerized support systems and corresponding acronyms). The purpose of this paper is to explore decision-making literature and attempt to postulate the positive influence computerized support systems can have on decision outcomes in face-to-face (FtF) synchronous group decision-making tasks.

Organizational Groups as Knowledge Networks

Organizational groups, as well as the media they choose to use, are dynamic *knowledge networks.* A network is made up of a set of nodes and the relationships between those nodes. The “nodes that contain the knowledge can be people, databases, computer files, or other forms of repositories. The relations are the

communication relations (that is, publishing, retrieving, allocating) among the nodes" (Hollingshead & Contractor, 2002, p. 232). Knowledge in this organizational network can be found in one individual or distributed among other group members, and the links between group members are fluid depending on the group task at hand and/or changes in any one individual's personal knowledge base. Similar to Hollingshead and Contractor's (2002) knowledge network concept, Davenport and Prusak (1998) used the term *knowledge market* to describe the sharing of tacit knowledge and externalizing of that knowledge. Collaboration among group members of both knowledge markets and knowledge networks involves the transmission and storage of various kinds of knowledge from each other as well as outside sources. Decision makers in these groups can be considered repositories and interpreters of organizational histories, "acting as media through which decisions are linked over time. As people remember, justify and anticipate decisions, they bring past, present, and future when making decisions" (Langley, Mintzberg, Pitcher, Posada, & Saint-Macary, 1995, p. 269). In addition to group members being human knowledge "repositories and interpreters of organizational histories," (Langley et. al, 1995, p. 269), groups can use new media "such as group decision support systems as a knowledge network of human and non human agents" (Hollingshead & Contractor, 2002).

Table 1: Key Terms

Term and Acronym	Definition and Examples
Computer-mediated communication (CMC)	Any human communication in which digital hardware is used as a medium (e.g., email, web pages)
Communication technology (CT) and information communication technology (ICT)	Any device, tool, machine, or technique/process used to help accomplish exchange of messages (e.g., Internet, paper and pencil)
New communication technology (NCT)	Electronic, and usually digital, communication technologies that provide greater interactivity and control than mass media (e.g., videoconferencing, instant messaging)
Group communication technology (GCT)	Any communication technology used by a group/team, but especially those technologies designed with group use in mind (e.g., audio conferencing system)
Computer-supported collaborative work (CSCW)	A broad movement and interdisciplinary field concerned with how groups of people use computing technology in their work
Groupware	Term for technologies used in computer-supported collaborative work to provide communication, collaboration, and coordination (e.g., Lotus Notes)
Electronic meeting system (EMS)	A specific type of groupware providing support for mediated group meetings (e.g., videoconferencing)
Group decision support system (GDSS)	A specific type of electronic meeting

and group support system (GSS)	system that combines communication, decision, and computer technologies to assist teams in problem solving (GDSS) or varied group activities (GSS; e.g., GroupSystems or Vision Quest)
Group information support system (GISS)	Allows group members to have access to many repositories of information and knowledge (e.g., databases, intranets, archives)
Face-to-face (FtF)	A label for traditional person(s)–to-person(s) non-electronically mediated interaction that usually serves as a point of comparison for technology-supported interaction

Computerized Decision Support Systems (DSS) and Derivative Theories

Development of DSS Concept. Decision support systems (DSS) are computer technology solutions that can be used to support complex group decision making and problem solving (Shim, Warkentin, Courtney, Power, Sharda, & Carlsson, 2002). DSS were designed to provide structure in decision-making processes where at least some stage was semi-structured or unstructured (Shim et al., 2002). Shim et al. (2002) outlined classic DSS tool design as comprised of components for (1) sophisticated database management capabilities with access to internal and external data, information, and knowledge, (2) powerful modeling functions accessed by a model management system, and (3) powerful yet simple user interface designs that enable interactive queries, reporting, and graphing functions. It is important to note that Shim et al. (2002) differentiate between "data," "information," and "knowledge" functionality of DSS because this exhibits the versatility of DSS as systems that not only support tangible documents, facts, audible or visual communication, which is the case with information and data, but also knowledge which is "broader, deeper, and richer than data or information. . . . Knowledge exists within people" (Davenport & Prusak, 1998, p. 5) and develops over time and as a result of life experiences. Shim et al. (2002) asserted that DSS have evolved from "the theoretical studies of organizational decision making [developed by] Simon, Cyert, March, and others" (p. 111) and a large amount of research has focused on how information technology can improve the efficiency with which a user makes a decision and can improve the effectiveness of that decision.

Simon's Theories as Framework for DSS Development. Gorry and Scott Morton's (1971) DSS design was partly based on Simon's description of decision problems as existing on a continuum from programmed – routine, repetitive, well structured, easily solved – to nonprogrammed – new, novel, ill-structured, difficult to solve (Simon, 1955, 1956, 1987). Langley et al. (1995) credited Simon with establishing the dominant line of research in organizational theory with his decision-making model that dissected decision making into three phases: intelligence-design-choice (Simon, 1960). This three-phase model exemplified Simon's insistence that decision making is a cognitive process comprised of a sequence of programmed steps. The

model of decision making in DSS environments is indicative of the programmed steps outlined by Simon in that first the problem has to be recognized, then alternative solutions are created, and finally alternatives are analyzed (Shim et al., 2002).

March's Influence on DSS Development. March's (1962, 1978, 1994) view of organizations and decision making within organizations differed greatly from the sequential, programmed processes suggested by Simon. March viewed organizations as *organized anarchies* "characterized by problematic preferences, unclear technology, and fluid participation" (Cohen, March, & Olsen, 1972, p. 1). To elaborate further on March's ideology, the three properties of organized anarchies are:

1. *Problematic preferences:* In an organization, it is difficult to impute a set of preferences to the decision situation that satisfies the standard consistency requirements for a theory of choice. An organization is described as a loose collection of ideas rather than as a coherent structure.
2. *Unclear technology:* Although the organization manages to survive, its own processes are not understood by its members. It operates on the basis of trial and error and learning comes from accidents of past experiences.
3. *Fluid participation:* Participants vary in the amount of time and effort they devote to different domains; involvement varies (Cohen et al., 1972).

Cohen et al.'s (1972) *garbage can* model of organizational decision making coincides with the scholars' anarchistic view of organizations. Cohen et al. (1972) viewed organizational decision making as a "chaotic process where problems and solutions became linked in random ways driven by the hazards of participation in choices" (Langley et al., 1995, p. 262). In the garbage can model, a decision is an outcome or interpretation of four independent streams within an organization: (1) problems and concerns of people inside and outside of an organization, (2) solutions to these problems, (3) participants in the decision making, and (4) choice opportunities which are occasions when organizations are expected to make decisions. To understand processes within organizations, one can view a choice opportunity as a "garbage can into which various kinds of problems and solutions are dumped by participants as they are generated" (Cohen et. al, 1972, p. 2). This model does not resolve problems *well,* but it does enable choices to be made even amidst the chaos of organized anarchies.

Decision Making as Rational Choice

One of the most common portrayals of decision making is one that interprets action as rational choice. When people are asked to explain a certain behavior, they explain their own action in terms of alternatives and the consequences for those alternatives, i.e. rationalization. The concept of rationality is ambiguous; however, for the purposes of this paper, rationality is defined as a "particular and very familiar class of procedures for making choices . . . [A] rational procedure may or may not lead to good outcomes" (March, 1994, p. 2). Mintzberg and Westley (2001) viewed rational decision making as a clearly identified process: "define→diagnose→design→decide" (p. 89). A rational choice involves two guesses that could fall under Mintzberg and Westley's (2001) "diagnose" and "design" steps: (1) a guess about uncertain future consequences as a result of the decision, and (2) a guess about uncertain future

preferences and how the results of the decision will be personally evaluated (March, 1978; Simon, 1955). Simon (1955) also highlighted the vital role that information acquisition plays in rational behavior models by proposing that the decision maker needs to consider information as to which outcomes will actually occur if a particular alternative is chosen, and information as to the probability that a particular outcome will ensue if a particular behavior alternative is chosen (Simon, 1955). Reasoning a decision out in a rational and linear order takes a significant amount of time (Mintzberg & Westley, 2001).

Limited Rationality and Concept of Satisficing versus Maximizing

The observation by Mintzberg and Westley (2001) that reasoning out a decision in rational order takes a lot of time segues into the concept of *limited rationality.* In reality, decision makers do not consider all the consequences that are connected to their alternatives. Relevant information about consequences is not sought, and available information is often not used. Instead of calculating the best possible action, decision makers search for an action that is "good enough" (March, 1994, p. 9). March (1994) and Simon (1956) referred to a "good enough" decision as *satisficing.* Satisficing requires only a comparison of alternatives with a target until one that is good enough is found. In opposition, *maximizing* is linked to rational decision making models because it involves the comparison of all possible alternatives and the preferences among alternatives must meet strong consistency requirements. Despite the satisficing characteristics of limited rationality, the core notion behind the concept is that individuals are purposefully rational, but are constrained by limited cognitive capabilities and incomplete information which might make their actions less than rational in spite of good intentions (March, 1978, 1994).

Adaptive Rationality

Closely linked with the limited cognitive constraints involved in limited rationality is the notion of *adaptive rationality* in decision making. Adaptive rationality emphasizes experiential learning by individuals or collectivities. Most adaptive models propose "that if the world and preferences are stable and the experience prolonged enough, behavior will approach the behavior that would be chosen rationally on the basis of perfect knowledge" (March, 1978, p. 592). By storing information on past experiences in a personally preferential manner, adaptive rationality permits the management of a large amount of experiential information; however, this information *is not* explicitly retrievable. This implicit experiential knowledge is the core asset for organizations that depend "on smart people and [their] flow of ideas" (Hansen, Nohria, & Tierney, 1999, p. 107). Knowledge from these "smart people" can be coded and stored in databases "where it can be accessed and used easily by anyone in the company," (Hansen et al., 1999, p. 107), thus sharing a knowledgeable individual's unique and valuable adaptive rationale with the group.

Constraints in Decision Making

Problems of attention, time, and information management are all persistent obstacles for individuals involved in decision making. March (1994) elaborated on constraints:

1. *Problems of attention:* Time and capabilities for attention are limited because not everything can be attended to at once.

2. *Problems of memory:* The capabilities of individuals and organizations to store information are limited. Memories are faulty. Records are not kept. Histories are not recorded. Knowledge stored in one part of an organization cannot be used easily by another part.

3. *Problems of comprehension:* Decision makers can have difficulty organizing, summarizing, and using information to form inferences about the connections between events and about relevant features of the world. They often have relevant information but fail to see its relevance. They make unwarranted inferences from information, or fail to connect different parts of the information available to them to form a coherent interpretation.

4. *Problems of communication:* There are limited capacities for communicating information. Different groups of people use different frameworks for simplifying the world (p. 10).

These limitations in memory, information retrieval, comprehension and communication can affect information processing about decision consequences as well as preferences, thus resulting in an uninformed and potentially risky decision.

Role of Risk in Decision Making

The exact consequences that will result from any decision are always uncertain but the consequences are known. Uncertainty is often the source of the difficulty decision makers have when faced with a decision (Simon, 1987). Decision makers typically attribute uncertainty about decision outcomes to (1) inherently unpredictable worlds, (2) incomplete knowledge where unavoidable uncertainties are seen as a result of ignorance or lack of information, and (3) incomplete contracting which is the failure to establish understandings with critical people in the environment (Simon, 1987). An increase in the decision maker's or decision group's knowledge increases the mean performance in a decision situation. At the same time, knowledge also increases the reliability of the outcome (that is, decreases risk in the situation). Thus as decision makers become more knowledgeable, they improve their average performance and reduce their risk taking (March, 1994).

Hidden Profiles and Group Information Sharing

Even when there is knowledge within a decision maker or an individual involved in a decision situation that could aid in risk reduction and/or decision quality in general, this knowledge might remain tacit. Wittenbaum, Hollingshead, and Botero (2004) chose to research this phenomenon by conducting group decision-making experiments using a *hidden profile* schema. A hidden profile "distributes information so that unshared information supports the best alternative and shared information supports a less attractive alternative" (Wittenbaum et al., 2004, p. 302). Wittenbaum et al. (2004) constructed their experiment using a *collective information-sharing paradigm* which asks group members to read information about decision alternatives with an understanding that they may have some information that other members do not have. Information is distributed so that some information is known to all members and other information is known by a single member. Often information is distributed among members as a hidden profile such that information supporting the best alternative is largely unshared. Members enter discussion preferring a

suboptimal alternative and determination of the best decision alternative is possible only if members pool their unique knowledge. After members read the information, the experimenter takes the information from them. Then members discuss the information and alternatives from memory. Wittenbaum et al. (2004) found that groups rarely discover the hidden profile and discuss proportionally more shared than unshared information. Members are more likely to repeat shared information than unshared information after it is mentioned; however, increases in the discussion of unshared information improve the chances of groups choosing the optimal decision alternative in a hidden profile. Likewise, Stasser and Titus (1985) found that groups often make suboptimal decisions on tasks structured as hidden profiles because they tend to discuss and incorporate into their decisions information that is shared at the expense of information that is unshared.

Information Sharing Bias and Effects on Decision Making

Individuals come into decision groups with personal information preferences, as well as personal goals. Member goals include maintaining good relations with the supervisor or peers, attaining status in the group, getting a preferred decision alternative adopted by the group, avoiding conflict, acting in a manner consistent with organizational norms, not being labeled a trouble maker, etc. (Wittenbaum et al., 2004). The pursuit of these various goals can lead to members deliberately selecting or withholding tacit knowledge. Goal-congruent information is more likely to be mentioned than incongruent, which works to highlight the fact that information exchange in decision-making is a *deliberate* and *strategic* process. The knowledge to make an optimal decision could reside in a group, however that does not mean that that knowledge will actually be used in the decision process. *Information bias* occurs when individual group members are given "partial sets of information that do not reflect the balance of available supporting arguments for the various decision alternatives" (Stasser & Titus, 1985, p. 1467). These biased sets of information result in members' preferring alternatives at the beginning of a decision-making session that would not occur if they had complete information.

Importance of Pooling in Group Decision Making

Decision-making groups can benefit from the pooling of members' shared and unshared knowledge. Pooling information results in a decision that is more informed than the decisions of individual members. Groups benefit "particularly when members individually have partial and biased information but collectively can compose an unbiased characterization of the decision alternatives" (Stasser & Titus, 1985, p. 1467). Group discussion can perform a corrective function on members' biased information by allowing the "group to piece together an unbiased picture of the relative merits of the decision alternatives" (Stasser & Titus, 1985, p. 1467).

Computerized Expert Systems' Effects on Unshared and Shared Information Exchange

Computer-Mediated Communication (CMC). Computer-mediated communication (CMC) is any human communication in which digital hardware is used as a medium (Browning, Steiner Saetre, Stephens, & Sornes, 2004). Commonly used CMC includes e-mail, web pages, and instant messaging. The effects of CMC on group

decision making have shown mixed results in empirical studies. Straus (1996) found that CMC groups relied less on shared information than those using face-to-face (FtF) communication. Similarly, Lam and Schaubroeck (2000) found that CMC increased mentions of unshared information and improved hidden profile solution when compared FtF communication. However, Hollingshead's (1996) study found that groups using CMC discussed less shared *and* unshared information than face-to-face communication groups.

Group Communication Technology (GCT), Group Support Systems (GSS), Group Decision Support Systems (GDSS), Group Information Support Systems (GISS), and Electronic Meeting Systems (EMS). Group communication technology (GCT) is any communication technology used by a group that is designed with group use in mind (e.g., videoconferencing, instant messaging). Group support systems (GSS), group decision support systems (GDSS), group information support systems (GISS), and electronic meeting systems (EMS) all fall under the umbrella of GCT in that they all seek to enhance and assist groups in communication-related activities of team members and "are utilized to overcome space and time constraints that burden FtF meetings, to increase the range and depth of information access, and to improve group task performance effectiveness" (Shim et al., 2002, p. 117). The general consensus in studies of organizational group decision making is that groups employing some type of GCT yield a stronger group performance than groups that do not use GCT at all (Scott, 1999). Several laboratory studies found that GCT improved some aspect of group performance as compared to FtF groups. Hightower, Sayeed, Warkentin, and McHaney (1998), Chidambaram and Jones (1993) and Daily, Whatley, Ash, and Steiner (1996) found that GSS-supported groups proposed more high-quality solutions and considered more alternatives in group decision tasks. On a brainstorming task, Hightower, et al. (1998) found that electronic meeting systems (EMS) groups outperformed FtF groups for both unique and high-quality contributions.

In terms of time constraints in group decision making, GCT does not result in users sacrificing decision quality for speed. Daily et al. (1996) reported that GDSS groups produced more ideas on several timed campus-problem brainstorming tasks. Dennis, Hilmer, and Taylor (1998) and Karan, Kerr, Murthy, and Vinze (1996) also found that under time pressure, decision quality was greater in GSS groups. Thus, GCT can greatly aid in the management of organizational knowledge and consequently allow group members to make higher quality decisions in less time.

Implications and Conclusion

Given the demands of an increasingly diverse workplace, members of work groups must learn how to effectively pool resources and knowledge from members with heterogeneous expertise and experience in order to produce decisions that reflect the combined potential of the group (Wittenbaum et al., 2004). No rational decision maker will obtain all possible information surrounding decision alternatives, but "[is] expected to invest in information up to a point at which the marginal expected cost equals the marginal expected return" (March, 1994, p. 25). The proliferation of CMC and various types of GDSS have dramatically changed the nature of group decision making and "have the potential to provide many benefits to groups by linking people who have common goals and interests" (Hollingshead & Contractor, 2002, p. 231). In

addition to linking people with common goals and interests, the knowledge management functions and capacities for knowledge storage and organization that are embedded within GDSS of all types have the ability to supply decision makers with knowledge that either they do not hold or that is left strategically unshared by group members, resulting in a maximized decision that rises above the agendas of group members and the traditional satisficing decision constraints of time, memory, and information capacity.

References

Anthony, R.N. (1965). *Planning and control systems: A framework for analysis.* Cambridge, MA: Harvard University Graduate School of Business Administration.

Bikson, T.K. (1996). Groupware at the World Bank. In C.U. Ciborra (Ed.), *Groupware and teamwork: Invisible aid or technical hindrance?* (pp. 145–183). Chichester, UK: JohnWiley & Sons.

Browning, L.D., Steiner Saetre, A., Stephens, K.K., & Oddvar Sornes, J. (2004). Information *& communication: Linking theory and narratives of practice.* Herndon, VA: Copenhagen Business School Press.

Chidambaram, L. & Jones, B. (1993). Impact of communication medium and computer supporton group perceptions and performance: A comparison of face-to-face and dispersed meetings. *MIS Quarterly, 17*, 465–492.

Cohen, M.D., March, J.G., & Olsen, J.P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly, 17*, 1–25.

Daily, B., Whatley, A., Ash, S.R., & Steiner, R.L. (1996). The effects of group decision support system on culturally diverse and culturally homogeneous group decision making. *Information & Management, 30*, 281–289.

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

Dennis, A.R., Hilmer, K.M., & Taylor, N.J. (1998). Information exchange and use in group decision making: Effects of minority influence. *Journal of Management Information Systems, 14*, 61–88.

Franz, T.M., & Larson, J.R. (2002). The impact of experts on information sharing during group discussion. *Small Group Research, 33*, 383–411.

Gorry, G.A., & Scott Morton, M.S. (1971). A framework for management information systems. *Sloan Management Review, 13*, 50–70.

Hansen, M.T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review,* March-April, 106–116.

Hightower, R.T., Sayeed, L., Warkentin, M.E., & McHaney, R. (1998). Information exchange in virtual work groups. In M. Igbaria & M. Tan (Eds.), *The virtual workplace* (pp. 199–216). Hershey, PA: Idea Group.

Hollingshead, A.B. (1996). The rank-order effect in group decision making. *Organizational Behavior and Human Decision Processes, 68*, 181–193.

Hollingshead, A.B., & Contractor, N.S. (2002). New media and organizing at the group level. In L.A. Lievrouw & S.M. Livingstone (Eds.), *Handbook of new media: Social shaping and consequences of ICTs* (pp. 221–235). Thousand Oaks, CA: Sage Publications.

Karan, V., Kerr, D.S., Murthy, U.S., & Vinze, A.S. (1996). Information technology support for collaborative decision making in auditing: An experimental

investigation. *Decision Support Systems, 16*, 301–306.
Lam, S.S.K., & Schaubroeck, J. (2000). Improving group decisions by better pooling information: A comparative advantage of group decision support systems. *Journal of Applied Psychology, 85*, 565–573.
Langley, A., Mintzberg, H., Pitcher, P., Posada, E., & Saint-Macary, J. (1995). Opening up decision making: The view from the black stool. *Organization Science, 6*, 260–279.
March, J.G. (1962). The business firm as a political coalition. *Journal of Politics, 24*, 662–678.
March, J.G. (1978). Bounded rationality, ambiguity, and the engineering of choice. *The Bell Journal of Economics, 9*, 587–608.
March, J. G. (1994). *Primer on decision making: How decisions happen.* New York: Free Press.
McGrath, J.E., & Hollingshead, A.B. (1994). *Groups interacting with technology.* Thousand Oaks, CA: Sage.
Mintzberg, H., & Westley, F. (2001). Decision making: It's not what you think. *MIT Sloan Management Review,* Spring, 89–93.
Scott, C.R. (1999). Communication technology and group communication. In L.R. Frey, D.S. Gouran, & M.S. Poole (Eds.), *The handbook of group communication, theory, and research* (pp. 432–472). Thousand Oaks, CA: Sage Publications.
Shim, J.P., Warkentin, M., Courtney, J.F., Power, D.J., Sharda, R., & Carlsson, C. (2002). Past, present, and future of decision support technology. *Decision Support Systems, 33*, 111–126.
Simon, H.A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69*, 99–118.
Simon, H.A. (1956). Rational choice and the structure of the environment. *Psychology Review, 63*, 129–138.
Simon, H.A. (1960). *The new science of managerial decision.* Englewood Cliffs, NJ: Prentice-Hall.
Simon, H.A. (1987). Making management decisions: The role of intuition and emotion. *.Academy of Management Executive, 1*, 57–64.
Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. *Journal of Personality and Social Psychology, 48*, 48–1476.
Strauss, S.G. (1996). Getting a clue: The effects of communication media and information distribution on participation and performance in computer-mediated and face-to-face groups. *Small Group Research, 27*, 27–115.
Strauss, S.G. (1997). Technology, group process, and group outcomes: Testing the connections in computer-mediated and face-to-face groups. *Human-Computer Interactions, 12*, 227–266.Wittenbaum, G.M., Hollingshead, A.B., & Botero, I.S. (2004). From cooperative to motivated information sharing in groups: Moving beyond the hidden profile paradigm. *Communication Monographs, 71*, 286–310.

Codifying Your Corporation's Knowledge

Joe Donnelly
Master of Library and Information Science

Abstract

Microsoft developed a project called Skills Planning "und" Development (SPUD) in order to create a map of their "yellow pages." SPUD helps management to quickly put together experts from different fields into project teams. This Microsoft initiative is a good reference point to illustrate how elaborate and successful codification can be in corporations. In addition to the mapping of employees, this paper will discuss the benefits and pitfalls of codification with a general focus on technology's role. Moreover, when we look at how corporations like Microsoft codified their knowledge we will be able draw some conclusions about the difficulties of trying to codify knowledge and accessing knowledge objects. Two aspects will be the impetus to our discussion: 1) the paper will explore how codification should include personalization aspects, and 2) the role of technology in codification schemes and what benefits and problems come with them.

Introduction

In 1995 Microsoft developed a knowledge mapping/decision support system called Skills Planning "und" Development (SPUD). Essentially, it mapped out Microsoft's "yellow pages" of experts in order to provide a more efficient way of locating workers who have a great deal of knowledge on a particular subject (Davenport & Prusak, 1998). SPUD is one example of how complex codification can be in organizations and illustrates the main focus to this paper: the role of technology in codification. First, we will begin by defining codification through scholarly literature and interpretations. Then, we can move into the discussion of particular instances within the business world where technological codification was implemented, and the variations between these examples. Also, benefits, challenges, and pitfalls can be identified while we examine these different scenarios and extract some of the salient qualities of technological codification and codification in general.

Codification Defined

Codification definitions vary but generally focus around structure, reusability, collection, control, and formulation. According to Davenport, "The aim of codification is to put organizational knowledge into a form that makes it accessible to those who need it," (Davenport & Prusak, 1998, p. 68). Emmanuelle Vaast and Natalia Levina's case study on ServCo analyzed a codification schema that attempted to control, coordinate, and deliver services more cost-effectively to clients (Vaast & Levina, 2006). Some scholars see codification as an impersonal approach; normally it is when codification is being compared to personalization. Chris McMahon, Alistair Lowe, and Steve Culley state that "Knowledge management approaches may be divided into personalization approaches that emphasize human resources and communication, and codification approaches that emphasize the collection and organization of knowledge," (McMahon, Lowe, & Culley, 2004, p.307). Sourav Mukherji discusses a similar idea by stating:

> While codification follows a people-to-document approach where knowledge is extracted from the person who developed it, documented and

stored in databases and reused for various purposes, personalization follows a people-to-people approach where the focus is on dialogue between individuals, as opposed to knowledge artifacts in a database. (Mukherji, 2005).

Other scholars focus on the codification of tacit knowledge. "Codification strategies involve the transformation of tacit knowledge into explicit knowledge in order to facilitate flows of organizational knowledge," (Schulz & Jobe, 2000). Sorensen and Lundh-Snis take codification a step further by examining how organizing and structuring knowledge helps to facilitate innovation (Sorensen & Lundh-Snis, 2001). Clearly codification can be defined in a variety of ways which is a good indication of its dynamic nature.

The above definitions are good places to start since they can be seen as metaphors towards business. Most companies share common general characteristics and needs such as competitiveness, efficiency in knowledge sharing, and/or management. However, each company differs in certain qualities that call for unique knowledge management and therefore unique codification schemas and technology. In order to further our understanding of the connections between technology and codification let us now examine different cases of knowledge codification in organizations.

ServCo

Vaast and Levina's study looks at a reorganization that took place within the Information Technology (IT) department of a European insurance company called ServCo. During the reorganization the chief information officer (CIO) named Peter pushed to define employee roles, streamline relationships, and spearhead ServCo's technological infrastructure decisions (Vaast & Levina, 2006). The definition of employee roles acted as "yellow pages" for their expertise; task responsibilities were documented in order to quickly find who knows what and where (Vaast & Levina, 2006). Clients' relationships were streamlined as a means of leveling the amount of attention and customization each client received from the department. Technological decisions were made by the IT department because Peter felt that clients did not understand the technology as well as his department, therefore the department should control what products best fit the clients' needs (Vaast & Levina, 2006). Technology played a crucial but basic role in ServCo's codification. First, the employee "yellow pages" needed to be documented and stored for [re]usability. Although it is not mentioned, given the nature of Peter's reorganization, we can assume that these employee roles were stored on an application like Microsoft Word, Excel, Access, or a variation of these applications. Again these types of applications helped in creating procedural templates or organizational charts which were used after client relationships were streamlined (Vaast & Levina, 2006). Moreover, knowledge artifacts were made available to particular projects which happened in part by storing written communications on the company's intranet. Also, most communications between Peter and the project managers was conducted via e-mail memos (Vaast & Levina, 2006). Technology is used to facilitate codification on a very basic level but still acts as a crucial element to structuring the organization's knowledge. Other organizations go through more complex codification schemes which bring about more complicated technological roles.

XYZ Corp

One of India's largest software solutions and service organizations is XYZ Corp. They are a global business that deals with a variety of clients. In regard to codification XYZ Corp has three aspects of their knowledge-managing structure: Databank, Yellowpages, and Forum (Mukherji, 2005).

Databank is a document repository. It includes case studies, white papers, approach notes, and best practice documents prepared by employees who base them on their personal experience with clients (Mukherji, 2005). Documents are divided into two groups: Techbank which are documents related to technology, and Salesbank, the documents related to sales and marketing. Techbank documents provide information on technical problems since similar problems can crop up when dealing with software, such as computer bugs. On the other hand, Salesbank supplies employees with information to help support customer-related problems; documents include sales collaterals, proposals, letters of appreciation, etc. (Mukherji, 2005). Databank can be viewed as a Decision Support System since it does codify documents created by experts within the organization and makes them available to employees when they are solving a particular problem.

XYZ Corp Yellowpages focuses on the codification of employees. Experts can be located through these pages in order to transfer tacit knowledge that is not found within the repository. Face-to-face interactions appear to be the most comfortable and confident way problems are resolved since Mukherji points out that "This is one of the most frequently used features of the KM system. Close to 3000 questions are posed in one year, and 75% of these are usually resolved satisfactorily through the Yellowpages," (Mukherji, 2005, p. 35).

According to Mukherji, "Forum creates a virtual platform for many-to-many communication among a group of people with similar interests," (Mukherji, 2005, p. 35). XYZ Corp's forum is similar to Nonaka and Ichijo's "ba" since it is a space where knowledge can be created and transferred (Nonaka & Ichijo, 2007). The Forum helps in creating communities of practice and learning groups, while at the same time provides a comfortable platform to exchange information and documents (Mukherji, 2005).

These three entities show the greater role technology can play in codification. Each entity relies heavily upon the creation of strong technological resources to help facilitate knowledge management and the codification of employee information. In comparison to ServCo, we see that there are different levels of technological codification, i.e. from email to online forums. Moreover, Chris McMahon, Alistair Lowe, and Steve Culley's article touches on a few more instances of technology and codification, and acts as a good summary to these different levels (McMahon, Lowe, & Culley, 2004).

Codification in Engineering Firms

Computer-supported collaborative work (CSCW) refers to computer-based systems that help connect and codify group work. These applications include Lotus Notes, Microsoft Exchange, email systems and message boards. According to the authors, "The key issue in the successful application of these CSCW technologies is the extent to which they provide a satisfactory alternative to direct, face-to-face communications," (McMahon, Lowe, & Culley, 2004, p. 312). This statement brings up another aspect of codification and technology, voice and video conferences.

Even though one could argue that voice and video technology is not

codification because it is a medium to communicate to clients or group members and it does not exactly codify the communication, voice and video conference do allow the communication to be recorded and stored. The message itself might not contain any structure; one can structure the final product and deposit it into a repository. The authors state, " . . . very often the information that an engineer will require in the course of his or her work will be available in an organization, but using traditional paper-based documentation methods it may be difficult to find it or the information may be in an inaccessible form," (McMahon, Lowe, & Culley, 2004, p. 313).

Technology plays the role of transferring traditional paper-based documents into electronic knowledge artifacts. Moreover, as we discussed in the above case studies, databases help to create one area that holds lots of information. Virtual Project Rooms is another example of technologically-advanced work space that fosters the transfer and creation of information between engineers who would normally store their documents in a personal space (McMahon, Lowe, & Culley, 2004, p. 312). Technology enhances our ability to store, retrieve, and organize knowledge artifacts.

Finally, the authors discuss technologies for the "identification and exploitation of relationships among data" (McMahon, Lowe, & Culley, 2004 p. 317). These include technologies that help visualize networks or generally large abstract data sets. By enacting this type of codification organizations can identify clusters of data, discover relationships, and find patterns (McMahon, Lowe, & Culley, 2004, p. 312).

Pitfalls

One major dichotomy in knowledge management is between codification and personalization. Should organizations focus more on human resources which prove to be costly and foster unequal distribution of resources? On the other hand, should codification be implemented which decreases the human factor? When discussing the pitfalls of codification one needs to keep in mind that the alternative to codification is personalization. However, the best knowledge management structures develop a codification plan that includes personalization. As we will see when looking at codification pitfalls, most problems that occur are related to personalization.

ServCo's reorganization moved some of the more seasoned workers into earlier retirement. Many employees who had been at ServCo for 20 to 25 years rejected the new ordering of their information (Vaast & Levina, 2006). What is important with regard to these particular instances is that radical codification, or completely restructuring work procedures, can push workers and their knowledge out of the door for no other reason than their dislike of a new system.

Another problem that ServCo points out is that the streamlining of client relationships leveled all resources for each particular client. Therefore, the department could not customize solutions to specific problems. Also, their new codification systems did not include client input which decreased the level of personalization and client-company relations. Clients began to see that ServCo could only fix basic problems, and although the company had a very competitive price, clients left in order to find more personalized IT support (Vaast & Levina, 2006).

Codification tends to cost a considerable amount of resources. Once a repository is created, additional funds are needed to maintain and constantly update the information found within the database (Schulz & Jobe, 2001). Similarly, if an employee directory is started, new employees have to be added as well as employees

who change from the status of novice to expert. In general, an organization needs to weigh the value of creating such systems and how much it will cost to maintain, while at the same time considering the value of structuring their knowledge.

One major issue that presents itself in a few different articles is information overload. Repositories that store everything automatically tend to be useless since users will have to wade through large amounts of junk data to discover what they need. Moreover, as a company's business environment changes, old documents become redundant, and if they remain in the system they simply cause clutter (Schulz & Jobe, 2001; Mukherji, 2005; McMahon, Lowe, & Culley, 2004).

Schulz and Jobe cite a more abstract problem with codification. They discuss the functionality of tacit knowledge within an organization and the risks and benefits of codifying it.

> Keeping knowledge tacit also means keeping it in a state of fluid gestation. Tacit knowledge (unlike codified knowledge, which tends to be exterior and "objective") depends on sense making of participants. Tacit knowledge stimulates creativity, "creative chaos," and innovative forms of response and coordination (Schulz & Jobe, 2001, 144).

Keeping knowledge tacit allows for creativity and more organic solutions to problems since workers do not have to deal with barriers such as protocols or specific situational procedures.

Benefits

On the other hand, one could argue that tacit knowledge is much more of a risk since an expert employee could leave the company and neglect to transfer any of their knowledge to the rest of the organization. Schulz and Jobe also go on to say, "The most important benefit of focused approaches to codification, however, stems from the differential ability of codification forms to facilitate knowledge flows" (Schulz & Jobe, 2001, p. 161). By codifying knowledge artifacts workers from different departments can access knowledge on any subject where problems could occur. For example, an HR department might deal with a problem in the same manner that the sales department dealt with it in the past. Mukherji's case study also points to some of the major benefits that their technological codification systems produce.

First, Salesbank reduced the amount of response time and therefore increased efficiency; Mukherji uses an example of the speed in which complex proposals were produced (Mukherji, 2005). Again, we can point to the 75 percent solution rate when XYZ Corp employees used their Yellowpages. Moreover, this also touches on the need for codification and personalization since technologically codified information, the Yellowpages, helped to locate personal employee information and foster a working relationship.

Mukherji's article also discusses how codifying procedural documents helps to catch up new employees and creates a basis for training (Mukherji, 2005). New employees have the ability to dig through company information in order to familiarize themselves with procedures or document formats. However, this practice would be best if these trainees also received a mentor to show some of the more interpersonal aspects of their company. The final benefit of technological codification is more complex in its description.

The learning pyramid was developed out of Edgar Dale's Cone of Experience. Dale categorized eleven different levels of how people experience information. Verbal symbols or text can be found at the top (least effective toward

learning) where as the bottom contains real-world experience or direct experience (most effective toward learning). Moreover, after text we get to visual symbols and then audio/photo/recording (San Jose University, "Dale's Cone of Experience," 2004). The purpose behind looking at Dale's Cone is that technology has the ability to enhance textual materials. Thus, investing resources into the visualization of materials or the storage of recorded conversation could have a greater impact on their usage within a company and the more organic growth of knowledge. Also, since experience is located at the bottom of the cone, one could argue that codification should foster more real-time experience between employees and problems.

Implications

Davenport points to four principles of codification with an emphasis on the role of the manager. First, he states how managers need to decide the business goals that the codified knowledge will serve. Secondly, they have to identify and locate different forms of knowledge in order to reach these goals. For example, if a company wants to build a Decision Support System the managers should know whose knowledge will be included into the system and where they need to fill in the gaps. Third, managers have to evaluate their organization's knowledge for its usefulness and whether or not it is appropriate to codify it. Finally, it is also the job of managers to find the medium in which the codified knowledge will be placed (Davenport & Prusak, 1998). These four points are crucial to follow when thinking about codifying a company's knowledge. They fall back on the basic saying, "look before you leap," or do not rush into codification. Davenport and Prusak make clear that in order to have a successful codification scheme, one needs to place a lot of time and care into planning.

Conclusion

Davenport and Prusak's principles are echoed in other forms within the cited scholarly articles. For example, McMahon, Lowe, and Culley discuss the need for organizations to understand their environments in order to avoid losing interpersonal communication with clients (McMahon, Lowe, & Culley, 2004). It is no surprise that we see their suggestions emulated by other scholars since they illustrate the benefit of planning a codification system so that it will work toward long-term benefits.

Technology's role in codification ranges from simple email and word processing systems to large virtual project environments. Organizations that embark on codification need to keep in mind that technology can only assist in the codification scheme; the other work needs to come from managers. Managers should survey their situation in order to implement the right amount of codification in order to attain maximum benefits. They need to discover what technologies to implement and what knowledge should be included in their systems. If conducted properly, codification has the ability to cultivate innovative solutions to complex problems while at the same time save your organization the cost of completely personalized solutions.

References

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

Duffy, J. (2001). The tools and technologies needed for knowledge management. *The Information Management Journal, 35*(1), 64–67.

Ewing, M. T. & West, D. C. (2000). Advertising knowledge management: strategies and implications. *International Journal of Advertising, 19* (2), 225–243.
Frappaolo, C. & Capshaw, S. (1999). Knowledge management software: Capturing the essence of know-how and innovation. *The Information Management Journal,* 44- 48.
Gibson, C. (2003). A healthy divide: Subgroups as a stimulus for team learning behavior. *Administrative Science Quarterly, 48* (2), 202–239.
Ichijo, K. & Nonaka, I. (Eds.) (2007). Knowledge creation and management: New challenges for managers. NY: Oxford University Press.
Koshinen K. (2004). Knowledge management to improve project communication and implementation. *Project Management Journal, 35* (2), 13–19.
Lehr, J. K. & Rice, R. E. Organizational measures as a form of knowledge management: A multitheoretic, communication-based exploration. *Journal of the American Society for Information Science & Technology, 53* (12), 1060–1073.
Mukherji, A. S. (2005). Knowledge management strategy in software services organisations: Straddling codification and personalisation. *IIMB Management Review, 17* (3), 33–39.
Mukherjee, A. S., Lapre, M. A. & Wassenhove, L. N.(1998). Knowledge Driven Quality Improvement. *Management Science, 44* (11), 35–49.
Schulz, M. & Lloyd A. J.(2001). Codification and tactiness as knowledge management strategies: An empirical exploration. *Journal of High Technology Management Research, 12* (1)139–166.
San Jose State University. (2004). "Dale's Cone of Experience," http://www.sjsu.edu/depts/it/itcdpdf/dale.pdf. Retrieved April, 25 2008.
Sørensen, C. & Lundh-Snis, U. (2001). Innovation through knowledge codification. *Journal of Information Technology, 16* (2), 83–97.
Vaast, E. & Levina, N. (2006). Multiple faces of codification: Organizational redesign in an IT organization. *Organization Science, 17* (2), 190–201.
Wijnhoven, F. (1999). Development scenarios for organizational memory information systems. *Journal of Management Information Systems, 16* (1), 121–146.
Yao-Sheng, L. (2007). The Effects of knowledge management strategy and organization structure on innovation. *International Journal of Management, 24* (1), 53–60.

Tacit-Explicit Knowledge: Is It Possible to Separate One from the Other?

Mohamed Rashad Elbanna
Master of Communication and Information Studies

Abstract

Knowledge (K) has largely been recognized as one of the most vital components of corporate competitiveness, and there has been a sudden increase in IS/IT solutions alleging to assist knowledge management (KM). A pertinent inquiry to invite, nonetheless, is how systems and technology developed for information such as the intranet is capable of supporting knowledge management. To realize this, the relationship between information and knowledge must be investigated. Building on Polanyi's theories, Stenmark (2002) proposes that all knowledge is tacit, and what can be articulated and made tangible outside the human mind is merely information. However, information and knowledge affect one another. Stenmark adopts a multi-perspective of the intranet where information, awareness, and communication are all considered, this interaction can best be sustained and the intranet can become a valuable and people-inclusive environment for KM.

Introduction

In recent years, K has enjoyed an increased attention among many fields; organization theorists, information system developers, and economists have all been affected by the boost in KM (Stenmark, 2002). In particular, the IS/IT community appears to have the strongest interest in KM, where new and favorable opportunities to a larger demand in computer systems have evolved. A reasonable question to address is how does information technology (IT) affect K and whether it can be used to manage it, and if that is possible what kind of knowledge and what are the source, nature, and types of K? From the IS/IT community prospective, an approach to investigating knowledge must stem from a knowledge-based theory rooted in a pragmatic interest in being able to manage organizational K (Alavi & Leidner, 2001).

Accordingly, addressing K from an IS/IT perspective is appropriate in attempting to respond to two dominant questions: "What is the relationship between information and knowledge?" and "What role does an intranet play in this relationship?" In order to clarify the relationships between information and knowledge that commonly and implicitly are assumed within the IS/IT community, the contemporary KM literature must be critically reviewed. Epistemologically, the difference between tacit and explicit knowledge shall be addressed taking into account views commonly found in the KM literature. Some reservations will be raised against the prevailing assumption that tacit and explicit are two forms of knowledge and it shall be criticized in light of Polanyi's original work. The tacit side of knowledge is the aspect of knowledge that is omnipresent, taken for granted, and affecting our understanding without us being aware of it (Stenmark, 2002). Ontology-wise, knowledge is thought of as existing on various levels: individual, group, organizational and inter-organizational (Nonaka, & Takeuchi, 1995). Although the primary interest is placed on the group and organizational levels, these two levels are made up of individuals and thus the personal aspect of knowledge has to be examined as well, from a macro perspective.

Two separate views are recognized in the knowledge literature: the

commodity view and the community view (Stenmark, 2002; Swan et al., 1999). The commodity or objective school approaches knowledge as some absolute and universal truth and has long since been the overarching perspective within science. Grounded in the positivism of the mid-19th century, the commodity tradition is still especially strong in the natural sciences. Adherents to this tradition identify knowledge as an artifact that can be managed in discrete units and that people may acquire or own. Knowledge is an object for which one can gain evidence, and knowledge as such is separated from the knower (Spender, 1998; Stenmark, 2002). There is also another tradition that can be labeled the community view or the constructivist approach. This view is grounded in the critique of the established quantitative approach to science that emerged amongst social scientists during the 1960's, and recorded in the publication of Garfinkel, Bourdieu, Habermas, Berger and Luckmann, and Glaser and Strauss. These authors argued that reality (and also knowledge) should be understood as socially constructed. According to this tradition, it is impossible to define knowledge universally; it can only be defined in practice, in the activities of and interactions between individuals (Stenmark, 2002). As such, some conceive knowledge as universal and context-independent while others understand it to be situated and based on individual experiences. Stenmark (2002) believes it is possible that it is a little bit of both. He contends that knowing how to do something exceptionally well resides within the individual and is, in this sense, context-independent. However, his or her knowledge cannot be manifested unless the audience is able to recognize and even appreciate this K. To make sense, the knowledge of how to do certain things well requires the context of a knowledgeable audience in order to define it as K. Thus, Stenmark argues that there are aspects of knowledge that are held by the individual and others that are more socially constructed. This inter-relationship between individual knowledge and tradition is discussed by Polanyi when he defines "personal knowledge" as something not entirely subjective and yet not fully objective (Polanyi, 1962).

Defining the Relationship among Data, Information, and Knowledge

Information is tangible and is in the form of objects outside the human mind. Knowledge, on the other hand, is a much less definable entity. Add data, and we have a both intricate and challenging situation of intertwined and interrelated concepts (Stenmark, 2002). In spite of the fact that data, information, and knowledge are distinct terms, efforts to define them have been hampered by researchers' tendencies to use these terms carelessly. The terms "knowledge" and "information" are often used interchangeably (Stenmark, 2002). Kogut and Zander, for example, define information as "knowledge which can be transmitted without loss of integrity" (Kogut, & Zander, 1992; Kuhn, 1962), suggesting that information is an aspect of knowledge. This is common in early texts on knowledge management. Even Nonaka, who is widely quoted in the KM literature, has too been criticized for such neglect (Baumard, 1999, pp.133–134). Nonaka correctly argues knowledge and information are similar in some aspects, but different in some; while information is more factual, knowledge is about beliefs and commitment.

Not only are the definitions of the three entities vague and imprecise, the relationships between them, although non-trivial, are not addressed adequately. Part of the confusion is trying to define these entities in terms of each other. A model that represents relationships between these entities suggests that data is placed at the

bottom of the scale followed by information which is placed higher on the scale because it has higher value, and finally knowledge is placed the highest denoting its highest value (Ackoff, 1997; Bellinger, Castro, & Mills, 1997; Choo, Detlor, & Turnbull, 2000; Davenport, & Prusak, 1998). The problem with the oversimplified model is that it holds three questionable tacit assumptions. First, the model suggests that the relationship between data, information, and knowledge is linear. The distance between data and information is the same as the distance between information and knowledge, implying that the effort required moving from one entity to another is the same. Second, the description implies that the relationship is asymmetrical, suggesting that data may be transformed into information, which may be transformed into knowledge, but it does not go in the opposite direction. It is common for someone to use his or her knowledge to derive information, and to create data out of information. Third, the model implies the assessment that knowledge is more valuable than information, which in turn is superior to data, an assumption that has been challenged.

Tuomi (1999) contends that data emerges as a result of adding value to information, which in turn is knowledge that has been structured and verbalized. According to his view, there is no "raw" data, since every measurable or collectable piece of fact has already been affected by the very knowledge process that made it measurable and collectable in the first place. Knowledge, embedded in our minds, is thus a prerequisite. People can instantiate some of this knowledge as information, which is explicit and process-able. By examining the structure of this information, one may finally codify it into pure data, since only data can effectively be processed by computers. Data is from an IS/IT perspective the most valuable of the three, and the value hierarchy should thus be turned upside down (Tuomi, 1999). Tuomi makes a serious argument, yet he is not correct—he merely errs in the opposite direction. It is not the one way or the other.

Stenmark (2002) suggests instead that data, information, and knowledge are interwoven and interrelated in more complicated ways than either of these two models. The three entities influence each other and the value of any of them depends on the purpose for which it is to be used. Both data and information require knowledge in order to be interpretable, but at the same time, data and information are useful building blocks for constructing new knowledge (Nonaka, & Takeuchi, 1995). When the information is used, i.e. interpreted in the light of the user's previous knowledge and experiences, or as Kidd (1994) puts it, when new facts inform us, the information does not "become" knowledge but it alters the existing knowledge by increasing or shifting the individual's knowledge state, thereby opening new possibilities to act (Choo, 1998; Kidd, 1994). This coupling between knowledge and acting is a recurring theme in the KM literature. Stenmark argues that data and information are only two opposite ends on a continuum (2002). Individuals can concentrate their attention on certain aspects of knowledge, making it focal. The focal knowledge can, sometimes and partially, be articulated and furnished with words and thus referred to as information. If the information becomes too decontextualized, i.e. too distant from the knowledge required to interpret it, it is called data. Since a piece of text itself is not sufficient to exhaustively describe the knowledge to which it refers, the reader's tacit knowledge must be compatible with that of the writer in order to interpret and fully comprehend the implications of the information. Hence, the same entity could be perceived as information by someone and as data to another (Stenmark, 2002).

Employing an IS/IT System

From an IS/IT perspective, analyzing data/information/knowledge relationships, computers seem to perform well at handling and processing data. Since computers lend themselves well to information systems, they transform data management into information management rather smoothly. However, when one attempts to go into knowledge management the job becomes more difficult.

As most people perceive that data and information may exist outside humans, advocates of the community tradition of knowledge would contend that knowledge is inseparable from the knower and thus never stored digitally (Galliers, & Newell, 2001). Computer support for knowledge management is thus unattainable. Supporters of the commodity view of knowledge would claim that knowledge can be explicated and turned into information, which can be managed by computer. Thus, having information systems would render computer support for knowledge management unnecessary. However, Alavi and Leidner (2001) suggest that although information systems and knowledge systems are essentially not different, there is a fine but important difference in the attitude towards and the purpose of the systems. Information systems process information without engaging the users.

By contrast a system for KM must lend itself towards helping the users to comprehend and assign meaning to the information, thereby including the user perspective. By taking an interest in the user perspective, one acknowledges that though a document may be seen to carry its own information representation, the user wraps this content in an interpretive envelope, thereby giving the information a subjective meaning. This combination of content and interpretation is what the user finds valuable (Choo, 1998). The value of any given piece of information does thus exist in the relationship between the information and the user's knowledge. On its own, the information is useless. Consequently, the same objective information may result in different subjective meanings and values. An IS researcher with a user perspective would thus examine both the information and the user's cognitive and psychological needs and preferences (Choo, 1998). This means that design of KM-systems must be created with an understanding of information architecture and structure, the context of where the user develops the information need, and analysis of the usage of this information once it has been obtained and interpreted by the user.

Advocates of the community tradition of knowledge may thus understand a KM "system" not as an IT artifact but as an environment of people, organizational processes, business strategies, and IT, where the objective is to influence and improve the knowledge of those people (Galliers, & Newell, 2001). Supporters of the commodity view may think of KM systems as computer applications used by knowledgeable humans. Hence, regardless of knowledge perspective, IT may successfully be employed to facilitate KM as long as the user perspective is included.

Various Facets to Knowledge

The division of philosophy that investigates the source and nature of K is called epistemology, and its goal is to establish the basics upon which human K resides. By investigating and justifying various aspects of knowledge and making explicit the relationships and interactions between them, one can develop knowledge systems or schemata able to respond to inquiries regarding the result of such interactions (Spender, 1998).

Following a constructivist approach, there will be several such knowledge

schemata. Spender speaks in favor of a pluralist epistemology, acknowledging that no single reference system is capable of establishing the "universal truth" (Spender, 1998). Spender further argues that in a world of bounded rationality and imperfect knowledge, where personal experiences are our principal source of learning, dissensus is a natural state. Efforts to arrive at a view shared by all humans are destined to fail. One can reflect upon his or her beliefs and state these so that others may appreciate sources to our different understandings.

It is conceivable that different knowledge schemata are appropriate for different contexts and it is therefore essential to inquire how a certain perspective is useful in a specific situation. A pluralist epistemology is thus inherently pragmatic and situated (Spender, 1998). Indeed, a variety of knowledge systems have been presented: Nonaka (1994) distinguishes between tacit and explicit knowledge; Boisot (1995) advocates a typology consisting of proprietary, public, personal, and commonsense knowledge; (Choo, 1998; Choo, Detlor, & Turnbull, 2000), building on Boisot, suggest a differentiation between tacit, explicit, and cultural knowledge; Blackler (1995), elaborating on Collins (1993), speaks of embodied, embedded, embrained, encultured, and encoded knowledge; Spender(1998) separates knowledge into explicit, implicit, individual, and collective. However, these views are all built on the assumption that some knowledge is difficult to articulate through language and only exists in the form of experiences of which one is not always aware. This form of knowledge was first conferred by Polanyi, who coined the phrase "tacit" knowledge (Polanyi, 1962).

Another assumption implicitly present in much of the KM literature is that some knowledge can be expressed verbally, collected in books and manuals, and distributed electronically. This is referred to as "explicit" knowledge. Stenmark (2002) questions the phrase "explicit knowledge" and claims that all knowledge is tacit, and explicit knowledge is in fact information. Tsoukas (1996) acknowledges that the dichotomy between tacit and explicit knowledge and the taxonomies derived from this duality by several authors have advanced our understanding of organizational knowledge by showing its multifaceted nature. However, such typologies also limit our understanding by the inherent formalism that accompanies them. Building on Pepper, Tsoukas observes that "[t]he conceptual categories along which the phenomena are classified must be assumed to be discrete, separate, and stable. The problem is that they hardly ever are" (Tsoukas, 1996; Cook & Brown, 1999).

Latterly, the discourse within the European Knowledge Management discipline seems to abandon the tacit-explicit distinction, possibly because it is not perceived to add to the debate any more. The KM community seems to think that the topic has been exhausted and that it is time to move forward. However, moving away from the distinction between tacit and explicit knowledge is maybe not the best decision, especially since most analytic work on KM has been organizational theory-informed research and not IT-pertinent studies. Stenmark (2001) contends that some components in organizations are tacitly expressed, but not outside the reach of IT support. He goes on to say that one should therefore look deeper into the tacit side of knowledge.

Tacit Background in Relation to Knowledge

The notion of tacit knowledge was introduced by Polanyi, a philosopher made known to a larger audience by being quoted in the writings of Kuhn in 1962; it since has had

a renaissance due to the writing of Nonaka (1994) and Nonaka and Takeuchi (1995). As Polanyi observed, "we can know more than we can tell" (Polanyi, 1997, p. 136). Unfortunately, Nonaka uses Polanyi's term somewhat differently from Polanyi himself. Due to the strong influence of Nonaka's writings on the knowledge management literature, this misconception has been widely adopted. While Polanyi speaks of tacit knowledge as a backdrop against which all actions are understood, Nonaka uses the term to denote particular knowledge that is difficult to express. There would perhaps have been less confusion had Nonaka used the term "implicit knowledge" instead of tacit knowledge.

Whilst referring to and building on the arguments of Polanyi, different scholars come to contradictory conclusions. Cook and Brown argue, in what they claim is agreement with Polanyi, that "explicit and tacit are two distinct forms of knowledge (i.e., neither is a variant of the other) . . . , and that one form cannot be made out of or changed into the other" (Cook & Brown, 1999, p. 384). In contrast, Tsoukas, also building on Polanyi, claims that tacit and explicit knowledge are mutually constituted and should not be viewed as two separate types of knowledge (Tsoukas, 1996). In a critique of Nonaka, Tsoukas further argues that tacit knowledge is not explicit knowledge internalized. In fact, tacit knowledge is inseparable from explicit knowledge since "[t]acit knowledge is the necessary component of all knowledge" (Tsoukas, 1996; Cook & Brown, 1999). Tsoukas believes that the two are so inseparable that to even try to separate the two is to fail to understand them. All articulated knowledge is built on an unarticulated and tacitly accepted background of social practices. One becomes aware of the unarticulated background by being socialized into a practice and thereby internalizing an understanding that is both cognitive and embodied (Tsoukas, 1996).

Most scholars share the opinion of Tsoukas that it is useful to treat tacit knowledge separately from explicit knowledge only as long as the two are seen as two separate aspects of knowledge and not as different entities. In Polanyi's understanding of tacit knowledge, it is related both to the society in which one acts and to individual personal interests and commitments (Polanyi, 1962). People are socialized into a knowledge tradition that forms what Tsoukas (1996) calls an "unarticulated background" for our understanding (Tsoukas, 1996; Cook & Brown, 1999). Individuals' experiences in this environment are interpreted in light of their tradition. When tradition is merged with personal interests and experiences, Polanyi refers to this tacit understanding as personal knowledge (Polanyi, 1962).

The cultural inheritance we carry is transferred from generation to generation through a social interplay that both utilizes and transcends language. Via socio-semiotic cues and verbal manifestations, we learn not only from the individuals we interact with directly, but also from generations before them. Although experiences cannot be accumulated in a strict sense, language enables people to be part of a process where individuals and tradition interact. Individuals and tradition shape each other. Without being aware of or able to express the knowledge that is tacitly embedded in tradition and culture, people use it as an unarticulated background against which we distinguish the specifics to which we currently attend. There is a difference between the description and the object being described. When one says, "I cannot describe how to do it," one often means that one cannot describe it sufficiently for someone else to fully understand it or be able to do it, since understanding requires familiarity with both the concepts themselves and the context to which they normally belong. Thus, knowledge is always tacit. The question

remaining is what does the phrase “explicit knowledge” mean?

Definition of Explicit Knowledge

Defining the difference between explicit knowledge and information seems to be an important task and fundamental to our understanding of knowledge management from an IS/IT perspective. It is therefore astonishing to see that they are lacking good definitions.

Looking back at literature, we find that Nonaka and Takeuchi (1995) define explicit knowledge or codified knowledge as knowledge that can be articulated in formal language including grammatical statements, mathematical expressions, specifications, and manuals. Such explicit knowledge, they conclude, can diffuse easily and formally across individuals. Choo (1998) suggests that explicit knowledge is knowledge that is made manifest through language, symbols, objects, and artifacts. Explicit knowledge can further be object-based, i.e. found as patents, software code, databases, technical drawings and blueprints, chemical and mathematical formulas, business plans, and statistical reports, or rule-based, i.e. expressed as rules, routines, and procedures. Organizations tend to depend primarily on this type of explicit and articulated knowledge, recorded in memos and demonstrated with graphs and used in decision-making processes, or institutionalized as operating procedures, Choo observes. Blackler (1995), elaborating on the categories defined by Collins (1993), describes various forms of explicit knowledge. One is referred to as embedded knowledge, i.e. knowledge that resides in systemic routines such as organizational procedures, rules, and regulations. Another form is encoded knowledge, which contains anything that uses signs and symbols to convey meaning. All the examples of explicit knowledge given above are such that they easily can be disseminated within and across organizational borders. However, Choo admits that it does not follow that listeners immediately can comprehend and correctly value the knowledge due to different languages, different levels of maturity, or lack of required capabilities (Choo, Detlor, & Turnbull, 2000).

Stenmark (200) argues that all of these examples of explicit K are in fact information, not knowledge. He illustrates his view using the example which states that one may not be able to fully describe the face of someone with whom he or she is familiar, and also unable able to give more than a mediocre description of what really happens when one rides a bike. From a scientific perspective, the information provided may still be helpful. Words are thus often needed, even if they cannot fully transfer knowledge. The narrative in itself is not enough for the other party to gain a complete understanding, but there are always various means to describe and express feelings and actions. In support of this view, Tsoukas (1996) proposes that a practitioner’s ability to follow rules is grounded in such unarticulated background knowledge, which results in that the rules postulated by an observer differs from the rules actually operating (Tsoukas, 1996; Galliers, & Newell, 2001). In general, people from the same tradition and culture have more tacit knowledge in common than have people from different traditions. Likewise, groups within the same profession or company have more tacit knowledge in common than have mixed groups. Tuomi, building on the work of Fleck, refers to “communities of thought” to describe the required shared understanding and pragmatic nature of professional knowledge (Tuomi, 1999). Only individuals who have a requisite level of shared background can therefore truly exchange knowledge (Alavi & Leidner, 2001).

Tradition, profession, and organizational belonging all carry their own

assumptions, and the more overlapping these tacit assumptions and experiences—i.e. the personal knowledge—are, the better from a knowledge-sharing perspective. If all three realms overlap, the likelihood that two persons (e.g., two North American software developers working for Microsoft) will be able to understand each other increases, and the discrepancy between the information provider's intended meaning and the recipient's interpretation will be small. In contrast, a Scandinavian microwave expert working for Ericsson might not understand the text, since she, being from another culture, having a different profession, and working for another company, would not have the required common knowledge base (Alavi & Leidner, 2001). In her case, additional information would have to be provided or she would have to spend time with software developers and Microsoft employees to acquire the relevant knowledge through socialization (Nonaka, 1994). Information therefore requires knowledge both to be created and to be understood.

Although information and knowledge are related, information per se contains no knowledge. Alavi & Leidner (2001) posit that "information is converted to knowledge once it is processed in the minds of individuals and knowledge becomes information once it is articulated" (Alavi & Leidner, 2001, p.109). The fact that routines, procedures, rules, manuals, books, blueprints, and all the other examples given above are useful do not make them knowledge. They all need knowledge to be decoded and are therefore not knowledge but information, albeit interwoven with the knowledge required to create them. Knowledge, which remains tacit, is also needed to interpret the information. Although some argue that "knowledge" may be embedded in a text (e.g., a balance sheet where columns and totals have predefined meanings), the reader cannot appreciate it without bringing the required personal knowledge. Knowledge is understood as the tacit part of our traditions and experiences while information is the small part we are able to articulate.

The Dynamics of Knowledge

Schön, who elaborates on the relationship between the tacitly implied and the reflected, admits that it is often hard to say what one knows (Schön, 1983). In attempting, we come up with descriptions that are obviously inadequate, and there must always be a gap between the description and the actual image to which it refers. A practitioner's tacit knowledge is always richer in information than any description of it, and his knowledge is implicitly found in the patterns of his actions. According to Schön, our knowledge is in our actions (Schön, 1983, p. 49). Although actions in themselves are rather transient in character, they often leave a tangible result, such as when building an engine, painting a masterpiece, or implementing a software system. There are also actions that do not result in new objects but yet change the state of things, such as flying a plane from A to B, and actions that are totally brief, such as the playing of an instrument. Regardless of which, actions are the only way through which knowledge can manifest itself.

This does not mean, however, that knowledge must result in action in order to exist. The ability to take action is sufficient, but in order for it to be of organizational value K must remain active (Choo, Detlor, & Turnbull, 2000). One action often seen in offices is the creation of information artifacts such as text, in the form of documents, email, or web pages. In a corporate setting, not only information creation but also information seeking and information interpretation are actions that describe the interaction between knowledge and information. By observing these

actions, the organization can learn where certain kinds of knowledge reside and thereby manage the tacit knowledge of its members. Individuals benefit both by being able to find knowledgeable colleagues and by being themselves identified as knowledgeable (Stenmark, 2001).

As discussed above, texts are not understood equally by all. Baumard (1999) comments that when the search takes place in a specific organization seeking knowledge it becomes far more contextual than a search for some absolute or universal truth. In organizations, knowledge is generated by those beliefs to which the members are most committed (Baumard, 1999, p. 53). Commitment and beliefs vary from organization to organization, and even within the same tradition, organizations have their own culture, their own vocabulary, and their own (tacit) assumptions. This means that organizational members in general can share knowledge more easily among themselves than with people outside the organization.

However, in large organizations where it is impossible to know every fellow employee, people tend to gravitate towards those who are similar in a professional sense. Such groupings may occur on two levels. One level is the loosely coupled network of employees sharing a practice but yet being unknown to each other. These "networks of practice" may reach far but have little reciprocity, since the members do not interact to any significant degree (Brown & Duguid, 2000). Within these networks of practice, there is also a second level of tighter clusters, referred to as communities of practice (Boisot, 1995; Orr, 1990; Orr, 1996; Wenger, 1998). In these latter subgroups, people typically know each other and work together, at least occasionally.

When reciprocity dominates reach, as it does in communities of practice, an environment with enough coherence to allow perspective making emerges (Boland &Tenkasi, 1995; Brown & Duguid, 2000). By sharing war stories, narratives that to an outsider might seem commonplace and banal, these members exchange knowledge tacitly understood only within the community. Members sometimes bond more strongly to their community than to their company, which makes it possible for communities to transcend the boundaries of the organization as in the case of the open source movement.

Schön (1983) claims that a new understanding comes from reflection. Reflection can occur in action, but this requires the practitioner to mentally "step back" while observing one's own actions. Such reflection, however, can only take place when the practitioner is not fully preoccupied by the action itself. Reflection in action thus requires a certain level of experience that enables the practitioner to shift attention from doing the action to how the action is done. Reflection can benefit greatly from being done in dialogue, either with colleagues within a community of practice or with oneself, but dialogue means articulating and making tacit understanding explicit. Reflection in dialogue with others thus requires an arena that allows a multitude of formats and interactions. This is best achieved in face-to-face situations but when physical meetings are impossible or impractical, virtual meetings on an intranet may provide a viable substitute.

Intranets as Environments for KM

The prevailing image of an intranet is that of an information silo or a repository of unstructured information. This illustrates the often-used information-centric perspective of intranets. As proposed earlier, for KM systems to succeed they must

include users and provide mechanisms for these users to find and interact with one another. One important goal for an intranet is to provide a context where dialogue, reflection, and perspective making could take place. Nonaka and Konno (1998) use the Japanese word *ba* to describe a shared space of physical, virtual, and/or mental nature, which could be seen as an example of such an environment. However, Nonaka and Konno (1998) primarily see IS/IT as a facilitator of the *Cyber ba,* an environment for supporting the combinational phase of knowledge creation where new explicit knowledge emerges by mixing and merging old explicit knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995). Even though such support facilitates access to and interaction with information, knowledge creation still needs tacit knowledge or humans for it to take place. One suggestion is to view the intranet as a shared information space for content, communication, and collaboration (Choo, Detlor, & Turnbull, 2000). The merit of such a model is that it acknowledges that the information-centric view of the intranet is not sufficient. However, the distinction between communication and collaboration has been criticized by the Computer Support Collaborative Work (CSCW) community, where it has been convincingly argued that though there is a clear pragmatic difference between the two, the distinction is useless from a theoretical/analytical perspective (Carstensen & Sorensen, 1996; Schmidt & Bannon, 1992; Scmidt & Simone, 1996). Stenmark instead suggests a model where the intranet as a KM environment is seen from three different perspectives; the information perspective, the awareness perspective, and the communication perspective (2002).

The information perspective is the most observable view of the intranet, since information provision is a fundamental part of the infrastructure. Seen from this perspective the intranet gives the organizational members access to both structured and unstructured information in the form of databases and documents. Access to rich and diverse sets of information is important for organizational knowledge creation since it provides rich stimuli and requisite variety (Nonaka & Takeuchi, 1995). The intranet thus facilitates the interaction between information and knowledge in today's organizations by increasing the consumer's access to information and the opportunities for producers to reach a larger audience. To merely read the text is not enough, though. The reader must also reflect upon her assumptions, her actions, her experiences, and what consequences changing the rules will have on her future actions. Reflection therefore enables us to learn how to learn. Information plays an important role as a catalyst for reflection and an information perspective on the intranet is thus highly relevant for work that requires knowledge. On top of the infrastructure, applications must be built to complement the information perspective by providing awareness and facilitating communication (Stenmark 2002).

The awareness perspective suggests that not only explicit information links but also tacitly expressed connections should be exploited to hook up organizational members with information and people they might otherwise have missed. The large amount of information available can result in information overload, and to avoid such a situation and maintain the awareness perspective, tools to assist the organizational member by prompting when new and relevant information is added must be developed. By making users aware of peers who not only share an official job description but also have accessed the same information or authored similar documents, the networks of practice discussed earlier can be established. Such a network is a prerequisite for community building, and increases the likelihood for successful communication and collaboration (Stenmark 2002).

The communication perspective, finally, enables the organizational members to collectively interpret the available information by supporting various forms of channels for conversations and negotiations. The intranet communication perspective promotes reflection by making salient different interpretations and viewpoints. By offering workflows and cocoordinating routines as well as support for more informal collaboration such as shared whiteboards and project areas, the intranet provides a means for organizational members to work together. When engaged in collaborative work with peers that share your objectives and understand your vocabulary, the common context necessary for knowledge sharing exists. From a communication perspective, one can act upon his or her new understanding, thereby transforming his or her knowledge to organizational benefit. A major objective for the intranet must therefore be to enable people to actively work together based on the information available to them, and to facilitate the documentation of their experiences. The intranet would thereby leverage the knowledge of the organizational members. The communication perspective must not be isolated from the information and the awareness perspectives. Only as a holistic whole are the potentials for successful knowledge management fully utilized (Stenmark 2002).

Conclusions

In an attempt to manage organizational knowledge a range of IT-based systems exist, without much concern for the nature of knowledge or how knowledge is different from information. In this essay a broad range of relevant literature has been examined identifying differences in perspective. The relationship between information and knowledge has been defined. Furthermore, IT has been positioned in relation to a multi-perspective view of the intranet. Based on Polanyi, a claim can be made that knowledge is based on personal experiences and cultural inheritance, and fundamentally tacit. People use their knowledge to perform actions such as creating information. Although the knowledge required to create the information is interwoven with the information, the reader must still have a similar knowledge compared to that of the creator to be able to interpret the information. The closer the cultural background is between the two, the easier the information is understood. Information is thus a vehicle for reflection that may, by informing the reader, expand or relocate his or her knowledge state. Information and knowledge are different but they affect one another. When facilitating KM initiatives, information technology environments such as intranets may be utilized to establish virtual meeting places where communities of practice can engage in dialogue and collaboration. Actions such as information creation, information seeking, and information interpretation can successfully be performed in these environments. To facilitate this, intranets must be designed to support not only the informational aspects but also including people by making salient networks of users with similar interests and allowing these to communicate and collaborate. The intranet must be viewed from an information perspective, an awareness perspective, and a communication perspective.

References

Ackoff, R. L. (1997). Transformational consulting. *Management Consulting Times. 28,* 6.

Alavi, M. & Leidner, D. E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS*

Quarterly, 25, 107–136.
Baumard, P. (1999).*Tacit Knowledge in Organizations* (Organisations Déconcertées: La gestion stratégique de la connaissance). London, UK: SAGE.
Bellinger, G., Castro, D. & Mills, A. (1997). *Data , information, knowledge, and wisdom*. Available at http://www.outsights. com/systems/dikw/dikw.htm.
Blackler, F. (1995). Knowledge, knowledge work and organizations: An overview and interpretation. *Organization Studies. 16,* 1021–1046.
Boisot, M. H. (1995). *Information space: A framework for learning in organizations, institutions and culture.* London, UK: Routledge.
Boland, R. J. & Tenkasi, R. V. (1995). Perspective making and perspective taking in communities of knowing. *Organizational Science. 6,* 350–372.
Brown, J. S. & Duguid, P. (1991). Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation. *Organization Science. 2,* 40–57.
Brown, J. S. & Duguid, P. (2000).*The social life of information.* Boston, MA: Harvard Business School Press.
Carstensen, P. H. & Sørensen, C. (1996). From the social to the systematic: Mechanisms supporting coordination in design. *Computer Supported Collaborative Work, 6,* 387–413.
Choo, C. W. (1998).*The knowing organization.* New York, NY: Oxford University Press.
Choo, C. W., Detlor, B., & Turnbull, D. (2000). *Web work: Information seeking and knowledge work on the World Wide Web.* Dordrecht: Kluwer Academic Publishers.
Collins, H. (1993). The structure of knowledge. *Social Research, 60,* 95–116.
Cook, S. D. N. & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science, 10,* 381–400.
Davenport, T. H. (1997). *Information ecology.* New York, NY: Oxford University Press.
Davenport, T. H. & Prusak, L. (1998).*Working knowledge.* Boston: Harvard Business School Press.
Galliers, R. D. & Newell, S. (2001). Back to the future: From knowledge management to data management. In *Proceedings of ECIS 2001* (pp. 609–615). Bled, Slovenia.
Kidd, A. (1994). The marks are on the knowledge worker. In *Proceedings of CHI '94* (pp. 186–191). Boston, MA: ACM Press.
Kogut, B. & Zander, U. (1992). Knowledge of the firm. Combinative capabilities, and the replication of technology. *Organization Science,* 3, 383–397.
Kuhn, T. S. (1962).*The structure of scientific revolutions.* Chicago: University of Chicago Press,
Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science. 5,* 14–37.
Nonaka, I. & Konno, N. (1998). The concept of "ba": Building a foundation for knowledge creation. *California Management Review. 40,* 40–55.
Nonaka, I. & Takeuchi, H. (1995). *The knowledge-creating company.* New York, NY: Oxford University Press.
Orr, J. (1990). Sharing knowledge, celebrating identity: War stories and community memory in a service culture. In Middleton and Edwards' (Eds.) *Collective*

remembering: Memory in society. Beverly Hills, CA: Sage Publications.
Orr, J. (1996).*Talking about machines: An ethnography of a modern job.* Ithaca, NY: Cornell University Press.
Polanyi, M. (1962). *Personal knowledge.* London: Routledge.
Polanyi, M. (1997). The tacit dimension. In Prusak, L. (Ed.) *Knowledge in organizations* (pp. 135–146). Newton, MA: Butterworth-Heinemann.
Quigley, E. J. & Debons, A. (1999). Interrogative theory of information and knowledge. In *Proceedings of SIGCPR '99* (pp. 4–10). New Orleans, LA: ACM Press.
Schmidt, K. & Bannon, L. (1992). Taking CSCW seriously: Supporting articulation work. *Computer Supported Collaborative Work, 1,* 7–40.
Schmidt, K. & Simone, C. (1996). Coordination mechanisms: Toward a conceptual foundation of CSCW systems design. *Computer Supported Collaborative Work,* 5, 155–200.
Schön, D. A. (1983). *The reflective practitioner,* Basic Books.
Spek, R. v.d. & Spijkervet, A. (1997). *Knowledge mManagement: Dealing intelligently with knowledge.* CIBIT, Utrecht.
Spender, J.-C. (1998). Pluralist epistemology and the knowledge-based theory of the firm. *Organization,* 5, 233–256.
Stenmark, D. (2001). Leverage tacit organizational knowledge. *Journal of Management Information Systems, 17*, 9–24.
Swan, J., Newell, S., Scarbrough, H., & Hislop, D. (1999). Knowledge management and innovation: Networks and networking. *Journal of Knowledge Management,* 3, 262–275.
Swan, J., Scarbrough, H., & Preston, J. (1999). Knowledge management—The next fad to forget people? In *Proceedings of ECIS '99* (pp. 668–678). Copenhagen: Denmark.
Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal,* 17, 11–25.
Tuomi, I. (1999). Data is more than knowledge: Implications of the reversed knowledge hierarchy for knowledge management and organizational memory. *Journal of Management Information Systems. 16,* 107–121.
Tuomi, I. (1999).*Corporate knowledge,* Metaxis, Helsinki: Finland.
Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity.* Cambridge, UK: Cambridge University Press.
Wiig, K. M. (1993). *Knowledge management foundations: Thinking about thinking—how people and organizations create, represent, and use knowledge.* Arlington, TX: Schema Press.

Online Communities of Practice

Marguerite Estephan
Master of Communication and Information Studies

Abstract

Since the early 1990s, communities of practice have found some success in traditional, offline environments; but what is the future of such communities as online, virtual knowledge-sharing and -creating bodies? This paper attempts to consider the viability of online communities of practice by synthesizing management, communication, and information technology literature on communication richness, membership and anonymity, and motivation to participate in the context of virtual communities of practice. From this analysis, a more thorough understanding of the advantages and challenges that online communities of practice present, as well as implications for further research, will be offered.

Introduction

The concept of communities of practice is said to have been first widely introduced in the early 1990s by Lave and Wegner (1991), but such communities existed as early as the fourth or fifth century when craftsmen in classical Greece gathered together to engage in both social and business events (Wegner & Snyder, 2000). Today, communities of practice are defined by Wegner (2004, p. 2) as "groups of people who share a passion for something that they know how to do, and who interact regularly in order to learn how to do it better." Davenport and Prusak (1998) more specifically define these communities as self-organized groups of employees who share common professional interests or goals (p. 38). Despite slight differences in definition, the general expectation of communities of practice in the organizational context is that they enable professionals to share or build relevant knowledge that becomes an organizational asset (Lesser & Storck, 2001).

Contemporary communities of practice exist in a variety of forms. They include professionals from across multiple organizations or within one organization. They convene weekly, monthly, or at some other interval. They meet over drinks, online, at a conference, or on company time, but one defining characteristic of them is that they are generally most successful when they are created organically and spontaneously (Wegner & Snyder, 2000). Unlike formal work groups and project teams, communities of practice are not usually mandated by management, and they do not focus on delivering a specific product or service. Instead, they are created by members who have "passion, commitment, and identification with the group's expertise" (Wegner & Snyder, p. 142) and who personally wish to build and exchange knowledge.

More than fifteen years after the community of practice concept was widely introduced into business vernacular, its value is still questioned and challenged (Roberts, 2006), but at the same time there is discussion about whether the growth of the internet as a forum for networking and collaboration presents new opportunities for communities of practice to proliferate. While collaborative technologies such as listservs, electronic discussion groups, electronic bulletin boards, and chat facilities are certainly considered potential tools for online communities of practice, "Web 2.0" also presents social networking sites such as Facebook and MySpace as possible forums for communities of practice to grow.

Communities of Practice and Knowledge Management

To understand the relationship between communities of practice and knowledge management (KM), it is important to first consider that scholars and practitioners alike offer a variety of definitions of KM. Davenport and Prusak (1998, p. 5) describe it as a combination of "framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information," while DiMattia and Oder (1997, p. 33) say that KM "involves blending a company's internal and external information and turning it into actionable knowledge via a technology platform." Despite differences in how it is defined, KM is essentially concerned with tapping into and building upon knowledge in a way that enables individuals to contribute more thoughtfully and more efficiently to their organizations' efforts.

With this understanding of KM, the relevance of communities of practice becomes clearer. As communities of practice discuss challenges, solutions, ideas, and trends in their respective domains, their members ideally gain knowledge that can help to drive strategy, start new lines of business, solve problems more quickly, and transfer best practices, among other activities (Wegner & Snyder, 2000). In this way, the "practice" aspect of the concept is put into action. At the same time, the "community" aspect of the concept is important to KM because it implies the sharing of knowledge among multiple individuals, even though the word "community" itself has attracted criticism because it is sometimes associated with warmth and coziness that are not necessarily characteristic of its members (Roberts, 2006). In fact, it is the "community" aspect of communities of practice that perhaps elicits the most questions about whether such communities can flourish in an online environment where members may not know one another as they do in traditional, offline communities.

The Tacit Nature of Communities of Practice

A major aspect of KM literature and discussion focuses on the differences between explicit knowledge and tacit, or implicit, knowledge, which is valuable to understand even though the tacit-explicit dichotomy may categorize knowledge too simplistically. Explicit knowledge is described as being easily articulated and codified in tangible knowledge artifacts such as memos, reports, databases, and manuals (Stenmark, 2002). On the other hand, tacit knowledge is generally described as existing within people, and among people the transfer of such knowledge "requires close interaction and the buildup of shared understanding and trust" (Lam, 200, p. 489). In other words, tacit knowledge is subjective, highly cognitive, and not easily explained or shared.

Which kind of knowledge do traditional, offline communities of practice typically involve, and are there advantages or disadvantages to sharing it online? Clearly, this depends on the domain in which any given community practices, but Roberts (2006) summarizes Wegner's key characteristics of a community of practice that reflect a combination of explicit and tacit knowledge, with a strong emphasis on the latter. For instance, characteristics include "specific tools, representations, and other artifacts," "knowing what others know, what they can do, and how they can contribute to an enterprise," "mutually defining identities," "jargon and shortcuts to communication as well as the ease of producing new ones," and "a shared discourse

reflecting a certain perspective on the world" (Wegner, 1998, p.125–6). Such characteristics are based upon shared meanings that reflect the highly tacit knowledge that members gain from the experience of practicing in a particular domain.

At the same time, these characteristics simply describe the community of a practice as an entity and do not even fully address the type of knowledge that such a community generates, which is often tacit as well. Take, for example, Wegner and Snyder's (2000) example of a community of practice consisting of consultants in the retail marketing domain of the banking industry (p. 140). This community met regularly at O'Hare International Airport in between business meetings to discuss new business opportunities for clients. Four years after its initial meeting, the community created a new range of marketing approaches for financial services companies that reflected the entrepreneurial insights and expertise of the number of consultants who participated in the community throughout its existence. This demonstrates the highly contextual, cognitive, and socially embedded characteristics of the knowledge that communities of practice often create or synthesize.

Consequently, it is worthwhile to consider whether the highly tacit nature of communities of practice and the knowledge they generate can easily transition or take shape in an online environment.

Richness of Communication

In the field of communication, it is perhaps the golden rule that face-to-face communication is the most "rich" form of communication, meaning that it provides a range of nonverbal and verbal cues and the opportunity for immediate feedback. Daft and Lengel (1984) provide the basis for this concept in their media (or information) richness theory, which says that the greater the ability of a communication medium to promote understanding, prevent or clarify ambiguities, and convey the intended information to a receiver in a timely manner, the greater the richness of that communication medium. On the surface, it seems, then, that online communities of practice could not compete with traditional, offline counterparts in richly and productively sharing knowledge among members. Considering that communities of practice typically share implicit knowledge that is embedded in the social norms and contexts of their respective domains, it appears challenging to communicate this knowledge without much ambiguity in a virtual environment that perhaps lacks the intimacy and immediacy afforded by face-to-face communication. However, as computer-mediated communication becomes more sophisticated and professionals in the workplace generally become more accustomed to communicating online, it is important to consider whether virtual communities of practice have begun to offer advantages that challenge the golden rule.

While many reviews about online communities of practice have focused on those that communicate via listservs, electronic discussion groups, electronic bulletin boards, and chat facilities, there are perhaps more dynamic and interactive opportunities for communication that need to be explored as viable forums for communities of practice. "Web 2.0" is a term that has many definitions, but generally, is used in the context of O'Reilly's (2005) explanation of it as the current trend in World Wide Web technology and design that allows users to more easily contribute, share, and create knowledge on the internet. From social networking sites to blogs to wikis, Web 2.0 enables users to have an increasingly rich online experience by downloading and uploading their own content—text, video, animation, audio, and more—for one another and from one another. This progression extends the

possibilities of online communities of practice well beyond the limitations of more lean communication media such as listservs and electronic discussion groups because it allows knowledge to be shared, discussed, and clarified through a variety of channels that retain some semblance of the social cues and context that are typically found in face-to-face communication.

Consider, for instance, the online group called "Hoteliers on Facebook." Taking advantage of the social networking site's "group" feature that allows users to create a community—public or private—that focuses on a specific topic or interest, this group for individuals practicing in or simply interested in the hospitality industry offers members the opportunity to network and share best practices and knowledge about the industry. Members can post and view comments that are accompanied by their profile photographs which may or may not be images of themselves, videos that showcase marketing and advertising efforts in their organizations, photographs that demonstrate architectural design and services in their hotels, and links to relevant podcasts, websites, and other media. In this way, this group showcases the ability of certain online media to provide a richer communication environment in which communities of practice can take shape or share knowledge in addition to face-to-face contexts. At the same time, it is also important to make note that this particular group may not technically be considered a community of practice because it includes members who are not professionals in the hospitality field. While there is the ability for the "owner" or creator of a group to control membership, the topic of membership and anonymity in online communities of practice is one that deserves attention.

Membership and Anonymity in Online Communities of Practice

One of the defining characteristics of a community of practice, according to Wegner and Snyder (2000) is that its members identify with the group's expertise. In other words, members are knowledgeable about and familiar with the practice that is the basis of the community. In a traditional, offline community of practice, members often learn about one another's background and level of expertise through conversations and the amount of input that they contribute to discussions. In an online community of practice, however, it may be more challenging to determine a person's status, knowledge, and identity, especially if the community has no face-to-face contact at all. This characteristic presents several obstacles that online communities of practice will need to overcome or address, but it has the potential to present some advantages as well.

Wasko and Faraj (2005) state that in online communities of practice, "knowledge seekers have no control over who responds to their questions or the quality of the responses" (p. 37). This is not entirely accurate, especially as a more user-oriented World Wide Web provides more options for creators of blogs, communities on social networking sites, and other media to limit membership to individuals who are invited or who meet certain criteria. In the case of a community of practice that exists within an organization—perhaps one that is considerably large or that has multiple locations—the identity of members can possibly be confirmed more easily through an employee directory.

At the same time, an online community of practice that intends to build knowledge across organizations or that is looking to grow beyond organizational boundaries may need to solicit membership from a variety of sources, and the identity and expertise of new members may have a much wider range that is difficult to gauge. This can present a few problems for communities of practice. For one, it

challenges the feeling of trust among members that Lesser and Storck (2001) say is critical for members to develop a sense of community and a desire to share information. Without really knowing who is participating or lurking in a community, members may be reluctant to share knowledge or even communicate at all. In addition, it may be difficult to evaluate the quality of knowledge offered if the status and level of expertise of members are not obvious. For instance, if a new member to a particular field who lacks substantial work experience contributes "knowledge" on a particular topic, what is the value of that knowledge compared to that of a seasoned manager in the field, and how will other members recognize the difference in an anonymous setting? Additionally, can newcomers in a field truly contribute to the knowledge sharing and knowledge creation aspects of a community of practice? According to Gray (2004), there is value in assimilating "newbies" into communities of practice, and good coordinators of such communities should strive to orient and support newcomers to "pass on important knowledge and confer legitimacy on the practices under discussion" (p. 27).

A review of literature on the use of computer-mediated communication (CMC) to generate ideas among individuals reveals that both benefits and disadvantages come with anonymous CMC, which can include online communities of practice. While such literature does not specifically address such communities, it is certainly applicable, especially since idea generation is an important aspect of the knowledge that the communities intend to develop. For instance, Flannigan, Tiyaamornwong, O'Connor, and Seibold (2002) claim that CMC allows group members to escape "traditional social constraints that occur in face-to-face interactions" (p.67) by eliminating static cues like appearance and gesticulation. At the same time, Spears and Lea (1994) caution against "viewing CMC as a virtual reality where individuals can escape constraints of ordinary identity and interaction" because they insist that even in an anonymous CMC environment, social cues still exist and are implied in the social context.

Clearly, research on the benefits of anonymous CMC as compared to those of face-to-face communication is inconclusive, but perhaps the more pressing point to consider in relation to online communities of practice is whether anonymity and a lack of face-to-face communication allows for individuals to even act as true communities of practice. To illustrate this point, consider that Wegner and Snyder (2000) make the distinction between communities of practice and informal networks by defining the purpose of each. They say that the former's purpose is "to develop members' capabilities, to build and exchange knowledge," while the latter tends "to collect and pass on business information" (p. 142). Experience using social networking sites like Facebook shows that there are opportunities for professionals in an array of fields to connect and share knowledge, but the unknown factor is whether that sharing of knowledge leads to more knowledge building and is used to take action in the same way that it often is in traditional, offline communities of practice. What do members do with the knowledge that they gain from online communities of practice? Is it just shared among them, or does it become actionable knowledge that they use to develop ideas or solutions to problems? It seems that the interpersonal collaboration, benefits, and outcomes of online communities of practice would be more difficult to gauge in an anonymous environment, which makes it equally challenging to determine whether a group of individuals can truly consider themselves a community of practice or whether they are simply passing along information as an informal network.

Of course, online communities of practice do not have to, by nature, be anonymous. They can exist among individuals who are familiar with one another, and that can present its own set of challenges that will not be addressed here. However, to fully consider the potential of online communities of practice, especially in a global economy, anonymity is surely a factor that will need to be addressed and researched more thoroughly if communities of practice are to thrive in an online environment. Another equally important factor in such a context is the motivation of individuals to participate in an online community of practice.

Motivation to Participate in Online Communities of Practice

Davenport and Prusak (1998) discuss numerous factors, such as lack of trust and reciprocity, that have the ability to impede or prevent knowledge transfer in or among organizations. They say that groupware—one form of mediated communication —"does not create the same confidence in the quality of knowledge that personal acquaintance and reputation can inspire" (p. 36). They also go on to say that the feeling of reciprocity or obligation to offer knowledge in exchange for knowledge is also weak without some means of moderation. In an online community of practice, building trust, relationships, and reciprocity may be an even greater challenge without face-to-face contact. So, then, how can participation in online communities be encouraged?

This question may be better answered with an understanding of why individuals who participate do so. Wasko and Faraj (2000) surveyed three established online communities to reveal their motivating factors for exchanging knowledge. They found that some people participate because of "tangible returns," or knowledge that is useful and valuable in that it is actionable. For example, some of their respondents indicated that online communities provide knowledge and resources that would otherwise be extremely difficult to find because they are so new or complex (p. 163). They also found that others participate for "intangible returns," such as intrinsic satisfaction and self-actualization. Some respondents additionally indicated that they value exchanging knowledge within a community of members who share a common interest, and online communities of practice are invaluable when individuals are geographically isolated or do not have access to other members of practice at their location (p. 167). These reasons provide insight and support for areas that should be strengthened as an online community of practice is established and develops.

At the same time, Wasko and Faraj's (2000) research highlights barriers to community that should also be addressed in order to encourage participation. Their respondents indicated that they sometimes felt that they did not have the level of expertise needed to offer solutions to others' problems, or they were not willing to offer knowledge if the person seeking it had not already tried to figure out the problem him or herself. They found that several of the difficulties that occur in face-to-face communities also presented themselves in online communities. Two examples are dealing with members who believe that their knowledge is better than that of other members, and dealing with personal attacks on individual members. While Wasko and Faraj do not offer any solution to these problems specifically, they do conclude that members largely participate because they want to be part of a "community" and they are behaving "prosocially and out of a sense of moral duty" (p. 169). Consequently, they suggest that organizations need to encourage members to treat knowledge as a public good rather than a private good if they are to benefit from the reciprocal nature of communities of practice.

Similarly, Koh, Kim, Butler, and Bock (2007), based on prior studies, propose four stimulation factors to encourage participation in online communities: leader involvement, offline interaction, usefulness, and IT infrastructure quality. They explain that strong leaders are necessary to promote a clear vision for the communities as well as collaboration and trust among members. Additionally, they suggest that online interaction may be complemented by face-to-face meetings that help to establish trust and identity among members. They also emphasize that online communities must involve content that members perceive as valuable or useful, and the IT infrastructure that is used for the communities must be user-friendly and reliable.

The literature on this topic of participation in online communities of practice clearly offers a range of factors that play a role in either encouraging or discouraging participation, but it seems that one of the most important factors is whether or not members view the information or knowledge as valuable. This particular factor is interrelated to others discussed here, such as the characteristics and identities of the members who contribute to the knowledge, and it is one that deserves considerable attention in determining how online communities can best grow.

Conclusions and Implications for Further Research

While extant literature examines factors such as richness of communication, anonymity, and participation in the context of online courses for students, there is relatively little research that provides insight specifically about how successfully or unsuccessfully knowledge has been shared or created in truly professional online communities of practice. As computer-mediated communication, technologies, and trends become more sophisticated and popular, there is the potential for communities of practice to grow in online environments. However, there are many questions that beg for further research to more fully evaluate whether online communities of practice are viable and how they may be able to overcome inevitable obstacles that come with computer-mediated communication in general.

Even though online communication has undoubtedly become more sophisticated and user-oriented, it is significant to find out whether it is indeed rich enough to fully and effectively convey the type of knowledge that communities of practice share and discuss. In making available knowledge through a range of media, online communities of practice may offer benefits that traditional, offline communities of practice lack, but in other ways, they may not be conducive to discussion of highly technical or complicated tacit knowledge. Further research may compare online of communities to those that meet face-to-face to suggest obstacles of each in sharing and understanding knowledge. Such research may also offer insight about how certain professions or fields may be better suited to online communities than others because of the nature of the knowledge that they share.

Also, issues of membership and anonymity are highly important to communities of practice because they speak directly to the “community” aspect of the entire concept. As Wasko and Faraj’s (2007) research suggests, members tend to participate and exchange knowledge when they feel a sense of community among other individuals who share the same interests. So, then, membership and anonymity should be studied in relation to participation to further analyze the roles that they play —good and bad—in online communities. Further research can also provide support for other factors that members feel help to build a sense of community in a virtual

environment, such as multimedia and moderators.

Finally, in situations in which it is feasible for members of an online community of practice to meet in a face-to-face context, additional research should provide insight about whether a combination of virtual and in-person communication offers any increased benefits over exclusively communicating in one environment or the other. Because trust and reciprocity among members are critical to successful communities of practice, online communities may benefit from periodic face-to-face meetings that would help to establish a stronger sense of community and familiarity among members, which in turn could help to develop trust and reciprocity.

References

Daft, R.L. & Lengel, R.H. (1984). Information richness: a new approach to managerial behavior and organizational design. In Cummings, L.L. & Staw, B.M. (Eds.), *Research in organizational behavior 6, (191–233).* Homewood, IL: JAI Press.

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

DiMattia, S. & Oder, N. (1997). Knowledge management: Hope, hype, or harbinger? *Library Journal, 122,* 33.

Flannigan, A., Tiyaamornwong, V., O'Connor, J., & Seibold, D.R. (2002). Computer-mediated group work: The interaction of member sex and anonymity. *Communication Research, 29,* 66- 93.

Gray, B. Informal learning in an online community of practice. *Journal of Distance Education, 19*(1), 20–35.

Koh, J., Kim, Y.G., Butler, B., & Bock, G.W. (2007). Encouraging participation in virtual communities. In *Communications of the American Computing Machinery.* Retrieved February 18, 2008 from http://doi.acm.org/10.1145/1216016.1216023.

Lam, A. (2002). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies, 21,* 487–513.

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

Lesser, E.L. & Storck, J. (2001). Communities of practice and organizational performance. *IBM Systems Journal, 40*(4), 831- 841.

O'Reilly, T. (2005, September 30). *What is Web 2.0: Design patterns and business models for the next generation of software* .Retrieved April 26, 2008 from http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html.

Roberts, J. (2006). Limits to communities of practice. *Journal of Management Studies, 43*(3), 623–639.

Spears, R. & Lea, M. (1994) Panacea or panopticon? The hidden power in computer-mediated communication. *Communication Research, 21,* 427–459.

Stenmark, D. (2002). Information vs. knowledge: The role of intranets in knowledge management. In *Proceedings of the Thirty-Fifth Annual Hawaii International Conference on System Sciences.* Retrieved February 29, 2008, from http://www.viktoria.se/dixi/publ/ddom102.pdf.

Wasko, M.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.
Wasko, M.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.
Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal.* Retrieved April 18, 2008 from http://www.iveybusinessjournal.com/view_article.asp?intArticle_ID=465.
Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity.* Cambridge: Cambridge University Press.
Wenger, E. & Snyder, W.M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review,* 139–145.

Knowledge Management in Small Decentralized Organizations: A Case study

Joshua Gelles
Master of Communication and Information Studies

Abstract

Small decentralized organizations are prime targets for knowledge management systems. Knowledge management will allow such organizations to operate more efficiently by streamlining the interaction and knowledge retrieval within organizational groups and teams. This case study will examine a small decentralized organization that currently does not have a working knowledge management system. Knowledge management issues will be identified, and solutions will be proposed based on the available literature.

Introduction

The Center for Communication and Health Issues (CHI) is a non-profit health-media organization whose primary goal is to curb dangerous alcohol-related behavior on the Rutgers University campus through their award-winning RU Sure campaign. RU Sure uses a social norms strategy to increase awareness of actual alcohol-related norms throughout the university (Lederman & Stewart, 2005). The organization is a consortium of university faculty, health educators, enforcement personnel, residence life staff, graduate and undergraduate students. The organization is very widespread with teams in the New Brunswick/Piscataway area as well as Boston, North Carolina, Arizona, California, the United Kingdom, and Moldova.

Since 1998, CHI has been the recipient of over $640,000 in government grants specifically for use in dangerous drinking prevention (not including $410,000 for other projects and $6M in collaboration with the Rutgers Transdisciplinary Research Center). The co-directors of the center have published a book detailing the campaign processes and activities. This book is currently in use as a text for numerous university-level health communication classes. The campaign has also been nationally recognized as a model campaign for dangerous drinking prevention.

This study will examine CHI's current knowledge management structure as well as recommend strategies for implementation of a knowledge management system. In order to propose a knowledge plan, this paper will begin by constructing a working definition of knowledge and knowledge management as it would apply to a small decentralized organization. After an explanation is reached, knowledge management issues will be highlighted, strategies will be suggested, and future implications will be illustrated.

Knowledge Management Definition

McInerney (2002) explains, "knowledge is acquired actively and dynamically though sensory stimulation, listening to and observing others, reading, being aware of feeling, life experience, and all the processes related to learning" (p.1010-1011). One aspect of knowledge management is the recording and cataloguing of such knowledge objects. Knowledge is separated into two distinct types: tacit and explicit. Tacit knowledge is "the expertise and assumptions that individuals develop over the years that may never have been recorded or documented" (McInerney 2002, p. 1011). Explicit knowledge however is facts and expertise that have been recorded, or is in a

format which can be documented (Davenport & Prusak, 1998; McInerney, 2002).

Knowledge is different than fact. Knowledge contains key elements that facts, data, and information do not. Information and data are useful tools for disseminating information, yet they do not provide detail and explanation of knowledge. Davenport and Prusak (1998) define data as "a set of discrete objective facts about events" (p. 2). However data will say nothing about the reasons behind the data, nor predictions about further outcomes that may occur as a result of said data (Davenport & Prusak, 1998). Information is data that has been analyzed to a certain degree. Davenport and Prusak (1998) identify four ways in which data is translated into information. Data can be contextualized, categorized, calculated, corrected, or condensed. When data is contextualized, it is assigned a purpose for which it was gathered. Categorizing explains the units of measure used to collect and codify the data. Calculating analyzes raw data mathematically or statistically in order to reach a conclusion. Correcting removes errors, and condensing summarizes the data (Davenport & Prusak, 1998). Knowledge is a derivative of information, such as information derives from the analyzation of data. Davenport and Prusak (1998) assert four processes through which information becomes knowledge: comparison, consequences, connections, and conversation. Comparing information involves exploring how different information sets relate either to each other or to other experiences. Evaluating consequences requires forethought into the implications the information will have upon future decisions. In order to become knowledge, information must be connected to other available sets and analyzed to determine what others think of such information (Davenport & Prusak, 1998).

Knowledge Management Issues

CHI's central office is well connected and knowledge is managed efficiently. Due to the small size and physical closeness of its employees, CHI is able to manage knowledge objects through email, centralized hard drives, face-to-face contact, and frequent creative thought techniques (e.g. brainstorming, nominal group technique). Furthermore, due to the open nature of the office setting, employees are able to develop strong trust, thus strengthening the knowledge transfer (Davenport & Prusak, 2000).

However, the challenge is realized when trying to manage knowledge with those who are separated from the main office. Health educators, law enforcement, other faculty, and undergraduate students are not prone to be in contact more than absolutely necessary. Thus the employees at CHI become avid knowledge buyers without the ability to spend resources on contacting the sellers, thus relying on gathered data without any explicit explanation (Davenport & Prusak, 2000). If CHI is to pursue its knowledge acquisition, it is imperative to either hire or create knowledge brokers to make connections between the organization and those who have information and knowledge.

Davenport and Prusak (2000) identify three key factors that cause inefficiency in knowledge markets in organizations: "incompleteness of information," "asymmetry of knowledge," and "localness of knowledge." CHI suffers from all three of these afflictions. Due to the lack of categorization of knowledge sources, CHI must struggle to find the right resource for the appropriate information. Furthermore, since CHI is a multidisciplinary organization, there is a blatant asymmetry in the amount of knowledge each member or employee has in relation to certain topics. For example, those in the law enforcement division may

either have appropriate knowledge, training, or resources (in the form of technology, time, or relationships) to obtain or ascertain knowledge that would be difficult for someone in the main office (with a communication background) to attain or understand.

Most of the knowledge in the firm is localized. There are extensive efforts put into place in order to catalogue and store knowledge objects and descriptive qualitative analyses of artifacts, events, and relationships. However, there are struggles with knowledge transfer with distant knowledge sources. While there is an inherent trust established in the relationships between members and employees, when the knowledge needed extends further than those special and logistical boundaries, any sort of knowledge can be difficult to acquire.

CHI has an essential task of creating knowledge. The organization performs research and creates media artifacts in order to elicit behavior change. However it is important to recognize that knowledge begets knowledge. Knowledge is created through dynamic interactions with the environment (Ichijo & Nonaka, 2007). Having access to trustworthy sources and steady streams of knowledge creates an atmosphere in which new knowledge is easily created and disseminated. As CHI strives to create and innovate, the implementation of successful knowledge management will be instrumental in its success.

Proposed Solutions

Wiki. Leuf and Cunningham (2001) explain that a wiki is "a freely expandable collection of interlinked web pages, a hypertext system for storing and modifying information – a database where each page is easily editable by any user with a forms-capable web browser client" (p. 14). Thus, a wiki can be edited and updated by anyone with access. Large sites such as Wikipedia allow global access to most wiki pages; however an internal wiki system that allows different levels of access to different organizational groups will serve to alleviate some of the inter-departmental tensions created by a decentralized organization. A wiki system will not only create a new communication channel and knowledgebase, rather open the door to new innovative collaboration techniques.

Raman (2006) posits that wikis have two distinct organizational benefits. Wikis enhance communication by allowing project teams to communicate over a common platform. In addition, the wiki provides a central information base with reference to important information salient to tasks, thus eliminating communication slowdown caused by incomplete information. Wikis also support a knowledge sharing culture within an organization. Winder (2007) explains that wiki technology thrives on being an open system. Anyone with access can edit any wiki page and share information with others. Davenport and Prusak (1998) posit three factors that contribute to inefficiency in knowledge markets. A lack of centrality and incompleteness of information can impede the process through which both brokers unite buyers and sellers and ease of access and availability of information. Wikis create the centrality necessary to unite those who seek and those who have knowledge. An asymmetry of knowledge between different groups or teams may exist and may create a roadblock to efficient knowledge management and sharing. By creating a wiki knowledge base with organizational access, any group in the organization will have the ability to access information thus limiting the asymmetry associated with poor knowledge sharing. Lastly, localness of knowledge can hinder the ability of local groups to obtain knowledge from distant sources. A catalogue of

sources, such as a wiki, can be helpful to identify where or with whom the knowledge in the organization resides.

CHI is a perfect candidate for wiki use. Winder (2007) states that a wiki is appropriate in an organization with high levels of trust, where collaboration is thought of as advantageous, and where every employee is valued for their input. CHI embodies these three characteristics and, therefore serves as a model organization for wiki implementation. Based on the structure of CHI, a wiki system would take careful thought and consideration for implementation. Entries in the wiki would be both tacit and explicit, explaining the how-to for many of the events and organizational tasks required of members, as well as qualitative data outlining situational discrepancies and likely outcomes. Unlike larger and more open wiki systems, the CHI wiki will not be completely open to the public. While there will be a section for anyone to create pages or comment, access to the important organizational material will be restricted.

Content of the wiki will originate from the main office of CHI. Knowledge that this office has will be input to the knowledgebase. This knowledge will be editable by any of the organizational teams. For example, if the main office writes that there is only one way to run a certain event, another satellite group may edit the page to indicate that there are indeed many other viable options for implementation or superior tactics for message dissemination. In order to keep the wiki "clean" and up to date, there must be constant monitoring of information. However, it is not the task of the monitor to censor input, rather one who oversees this wiki will make sure that information is neatly displayed, grammatically correct, and categorized efficiently.

E-learning. In conjunction with wikis, e-learning can be a useful training tool for teaching both student health advocates and health services employees new methods for message dissemination and event implementation. E-learning is the process by which knowledge is transferred over the internet to facilitate an educational experience for the user. Rodgers and Negash (2007) explain that web portals represent an extension of knowledge transfer for users, and further assert that "individuals can use tutorials to gain deeper knowledge and FAQs provide a quick links for previously known issues and problems" (p. 118).

Student health advocates are given long training sessions that take time and effort from the organization. Many times different instructors from different sectors of the organization must be called in to train the new employees. An e-learning system can be implemented to train students online, without the need for the many training sessions and group meetings previously necessary for effective training. While traditional e-learning does not allow for rich face-to-face communication, student health advocates and health services employees will have supplemental meetings as needed to facilitate an educational experience. Clarke et al. (2005) posit that e-learning takes time, however, it can save time wasted on face-to-face meetings. By saving time on training, CHI can ultimately be more efficient in implementing programs, streamlining the process through which organizational tasks are performed.

Web 2.0. Utilizing the social networking functions of Web 2.0, CHI will be able to increase efficiency of communication between dispersed organizational groups. Currently, the only web-based communication tool used by CHI is email.

While email serves as a satisfactory communication technique for conveying limited messages, it is asynchronous and thus does not prove useful for many communication and knowledge management tasks. Boulus and Wheeler (2007) explain that Web 2.0 is called the social web since content can be easily generated and published by users. They further posit that Web 2.0 adds flexibility and greater levels of participation from users. CHI can benefit from utilization of certain aspects inherent in Web 2.0. As an e-learning, knowledge sharing and communication service, podcasting can be used by instructors to teach advocates, as add-ons to wikis for additional rich, tacit explanations, or as distributable aural briefs before meetings. These audible briefs would save time, as a member of an organizational group could listen to the brief on the way to the meeting, rather than take the time to read all the necessary discussion points. Furthermore, these meetings can be held entirely online using computer-mediated technologies. Utilizing instant messaging and video conferencing hardware and software, remote groups can participate in meetings that would otherwise be held without their direct input.

For these three online services Rutgers University has a system in place to accommodate wikis, e-learning, and social networking. This platform, Sakai, is free to use for Rutgers University faculty and can facilitate these operations with little programming knowledge or effort.

Communities of practice. Davenport and Prusak (2000) define communities of practice as "self organized groups…generally initiated by employees who communicate with one another because they share common work practices, interests or aims" (p.38). The development of communities of practice in the CHI organization could aid in the development of many of the computer-mediated solutions listed above. Besides their inherent advantages, communities of practice could serve to organize the wiki knowledge base, develop e-learning techniques, or create online knowledge sharing environments using Web 2.0.

Limitations

Due to the nature of the proposed solutions, a major barrier in the implementation of knowledge management systems in the Center for Communication and Health Issues is upkeep. Currently, the main office employs a graduate student as project manager to oversee the day-to-day operations of the organization. Any knowledge management system would be managed by this student to ensure operation and efficiency. However, it is not always feasible to have a graduate student in this position. If there is no funding for an assistant, the position will temporarily be vacant. Furthermore, it is imperative that the assistant is trained properly in the organizational structure and required tasks. Traditionally, graduate assistants for CHI have been selected based on undergraduate merits and experience with the organization. However, if there is a lapse in student enrollment or interest, the position could remain unfilled. In another scenario, an assistant is brought in who does not have the knowledge to operate the functions of the organization. A possible feasibility solution would be to set up a wiki or e-learning training session written by the previous assistant informing the new employee of the intricacies of the duties.

Implications

By instituting a knowledge management system within the organization, the Center for Communication and Health Issues can overcome some of the limitations that

create inefficient communication and incomplete knowledge sharing networks. Utilizing web-based technologies creates virtual communities of practice, allowing for a rich knowledge market. If CHI is able to implement any permutation of the proposed practices, then knowledge sharing and management will yield an environment of knowledge creation.

References

Boulos-Kamel, M. & Wheeler, S. (2007). The emerging web 2.0 social software: An enabling suite of sociable technologies in heath and health care education. *Health Information and Libraries Journal, 24,* 2-23.

Clarke, A, Lewis, D., Cole, I., & Ringrose, L. (2005). A strategic approach to developing e-learning capability of healthcare. *Health Information and Libraries Journal, 22,* 33-41.

Davenport, T. H., & Prusak, L. (1998, 2000). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.

Hansen, M., Nohria, N., & Tierney, T. (March-April, 1999). What's your strategy for managing knowledge? *Harvard Business Review,* 106-116.

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

Lederman, L. C., & Stewart, L. P. (2005). *Changing the culture of college drinking: A socially situated health communication campaign*. Creeskill, New Jersey: Hampton.

Leuf, B., & Cunningham, W. (2001). *The wiki way: Quick collaboration on the web*. New York: Addison-Wesely.

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53(12),*
1009-1018.

Raman, M. (2006, Fall). Wiki technology as a "free" collaborative tool within an organizational setting. *Information Systems Management,* 59-66.

Rodgers W., & Negash, S. (2007). The effects of web-based technologies on knowledge transfer: Does using web-based services increase problem-solving skills. *Communications of the ACM, 50,* 117-122.

Winder, D. (2007, December). Back to basics: The wiki. *Information World Review*, 32-35.

E-learning: What We Need to Know

Beth Gard
Master of Communication and Information Studies

Abstract

In the 21st century, e-learning systems have been increasing in popularity and success. Currently, many organizations and educational institutions have implemented e-learning systems into the learning structure. Like traditional learning styles, e-learning has benefits and drawbacks. This paper presents background information about e-learning, including the advantages and disadvantages, theories that are related to the concept of e-learning, and the connection between e-learning and knowledge management. This paper further provides suggestions for creating a successful e-learning system and shows an example of a current successful system. Finally, the paper ends with implications for the future and conclusions drawn from the published research.

Introduction

Technology can offer many advantages to users. It is seen as a way to complete tasks more quickly, as a way to do multiple things at one time, and as a way to connect to others more easily. As technology continues to be strengthened in what it offers to people, variations of traditional ways of doing things have been created. E-learning is a product of the increase in technology's capabilities. As opposed to only having the option of learning in a classroom setting, technological advancements have made it possible for individuals to learn from any location. The same information presented in a traditional setting can also be presented virtually. Organizations and educational institutions have been implementing e-learning into their learning structures hoping to provide additional ways of learning. In essence, e-learning serves as a way to increase knowledge spreading throughout the world by connecting people globally.

E-learning provides the ability to learn, share, and create knowledge with individuals in any location in the world. Because it is becoming a very commonly used tool, it is necessary for individuals to understand what e-learning is and the benefits and drawbacks that come along with such a tool. In addition, the relationship between e-learning and knowledge management is important to explore because knowledge management is a part of every organization and educational institution. A theoretical explanation, guidelines for a successful e-learning system, and an example of such a system will be given. All together, this information will give the reader a strong background and understanding of e-learning and the impact it will inevitably have on everyone's lives.

Background

There are a variety of definitions of e-learning, a term in which the "e" refers to electronic, but they all generally come to the same conclusion. According to Rosenberg (2001), e-learning is "the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance" (Bannan-Ritland, 2002, p. 162). Rosenberg (2001) also defines e-learning based on three criteria. E-learning is networked, delivered to the end-user via a computer using standard Internet technology, and focuses on the broadest view of learning that exceeds beyond traditional paradigms of training (Liaw, Huang, & Chen, 2007). DeRouin, Fritzsche,

and Salas (2005) rely on the American Society for Training and Development (ASTD) for their definition of e-learning. The ASTD defines e-learning as "a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and video-tape, satellite broadcast, interactive TV, and CD-ROM" (Kaplan-Leiserson, 2002, as cited in DeRouin et al., 2005, p. 920). To generalize, e-learning is a form of learning using technologies such as the Internet to generate and share knowledge.

Unlike traditional classroom learning, which is typically synchronous, meaning occurring at the same time, e-learning can be both synchronous and asynchronous, meaning occurring at different times. In a synchronous e-learning situation, users all agree to meet online at the exact same time and interact with one another. This would require all users and instructors of the course to simultaneously participate in the learning situation and can be seen as scheduled learning (Zhang & Nunamaker, 2003). However, in an asynchronous situation, users and instructors can participate at any time they choose to, creating an "on-demand" experience (Zhang & Nunamaker, 2003). While synchronous learning can make users feel more connected and part of a team, asynchronous learning provides flexibility to its users, making it very favorable. Currently, most e-learning systems are asynchronous due to cost and simplicity (Zhang & Nunamaker, 2003).

Sometimes e-learning and distance education are used interchangeably, but Guri-Rosenblit (2005) cites three differences between the two terms based on remoteness and proximity, target clienteles, and cost considerations. Distance learning relies on the main component of distance in both time and space. However, distance is not a requirement in e-learning and many systems incorporate face-to-face aspects of learning and an electronic component. Distance education tends to be targeted to specialized groups, including those with other commitments that prevent them from attending school, whereas e-learning is designed for everyone. It is expensive to create and design a distance education system, but once it is designed, costs for students are dependent on the number of students who use the system. The more students that use the system, the lower the cost per student. According to Guri-Rosenblit (2005), e-learning is more expensive than traditional learning, a point that will be addressed later in this paper.

Barker (2005) introduces two types of e-learning environments. Virtual learning environments "attempt to provide online learners with learning activities relevant to the courses they are studying" (Barker, 2005, p. 118). However, a virtual university (VU) system is somewhat different than a virtual learning environment, which is more course-focused. In a virtual university, students, especially those using distance education, are provided with online support in a more sophisticated fashion (Barker, 2005). Virtual universities try to emulate the positive learning aspects of traditional learning environments.

Benefits

E-learning offers many benefits to its users. Because content can be easily updated and revised, e-learning ensures that all information being provided to the student is current ("E-learning responds to fast-paced environment," 2008). Unlike traditional learning, which relies on textbooks that may contain information irrelevant to the current situation of the world, e-learning allows the creator to consistently update information providing a more up-to-date knowledge base. In e-learning, users can set

their own pace and only need to advance as quickly as they choose to ("E-learning responds to fast-paced environment," 2008; Strother, 2002; Zhang & Nunamaker, 2003; Zhang, Zhao, Zhou, & Nunamaker, Jr., 2004). This allows individuals to tailor their education to their own needs. For example, if one student needs more time to read articles while another student feels traditional learning environments are slowing him or her down due to other students' abilities, each can progress at his or her own speed. Both of these students will be learning the same information, but it will be more effective because he or she will not be rushed or slowed down. In a SkillSoft survey conducted in March 2004, survey respondents found the self-paced abilities of e-learning to be very appealing (Shepherd, 2004).

Another benefit of e-learning is the increase in confidence that can result in users. For individuals that tend to be shy, e-learning allows them to participate without having to see the way their fellow students react. A major cause of concern for shy students is the way others will view what they say in class, making them afraid to participate. In e-learning systems without a web-cam requirement, students cannot physically see other students, making them feel more at ease to express themselves, which results in lower frustration levels for users. The interactive features on an e-learning system may create more motivation to learn as well (Bruckman, 2002). Another benefit to e-learning is the sense of community it can create for geographically dispersed users (Bannan-Ritland, 2003; Ubell, 2000; Zhang & Nunamaker, 2003). An e-learning system bridges the gap between individuals in different locations and can give users the ability to interact with people from different cultures and areas.

A commonly cited benefit of e-learning is the convenience it provides users. Students can access e-learning systems from any location and at any time they choose (Shepherd, 2004; Strother, 2002; Zhang et al., 2004). Cost effectiveness is a debated benefit and/or drawback of e-learning with some sources citing it as a benefit (Zhang & Nunamaker, 2003; Zhang et al., 2004). In regards to knowledge management, e-learning provides unlimited access to knowledge with everyone having the opportunity to receive the same information at the same time and has an archival capability for knowledge reuse and knowledge sharing (Zahner, 2002; Zhang et al., 2004).

Compared to traditional learning environments, studies have found that students do just as well in an online environment as they do in a traditional environment. Thomas L. Russell, Director Emeritus of Instructional Telecommunications at North Carolina State University, found there to be no significant difference in learning between an electronic medium and a traditional learning setting. This is commonly known as *The No Significant Difference Phenomenon* (Strother, 2002; Ubell, 2000). Further, in a study conducted by Zhang et al. (2004), students did better on a test after taking an online class in comparison with those taking the traditional class.

Drawbacks

Although there are many benefits to e-learning, there are drawbacks as well. In asynchronous e-learning, a lack of immediate feedback can be seen as a drawback (Zhang et al., 2004). If a question is posed to the group and the student that posted the question requires feedback immediately, he or she most likely will not receive that feedback as quickly as required. In addition to the time it may take another student or the instructor to respond, some questions may go unanswered. The lack of face-to-

face communication in an e-learning environment takes away the pressure of someone waiting on an individual. It does not seem as real because individuals do not physically see another student looking at them. Although e-learning systems can increase confidence, some students may be unfamiliar with using computers and fear the technology, which can result in frustration, anxiety, and confusion for users (Shepherd, 2004; Zhang et al., 2004).

Another drawback of e-learning systems is the lack of nonverbal cues provided by the system. Nonverbal cues help individuals' development in interacting with other students. E-learning does promote interaction between students and tends to rely on the interactive function as a basis for success, but those interactions cannot be fully explored without the nonverbal cues only present in face-to-face interactions (Ubell, 2000). According to Moore (2002), "one of the most common complaints by those participating in e-learning environments is a lack of shared learning environment and connections with their peers (Johnson, Hornik, & Salas, 2007, p. 357). Due to the format of an e-learning system, students need to be more mature and self-disciplined (Ubell, 2000). Because class exists online, students may end up visiting other websites or playing computer games as opposed to "attending" class. There are a lot of stimuli being presented to a computer user, which makes focusing sometimes difficult. Also, issues of trust, authorization, confidentiality, and individual responsibility come up when dealing with online environments (Zhang et al., 2004). There is no set policing force on the Internet so there is always a chance that someone can access any of a user's information.

E-learning systems can be costly as well (Ubell, 2000). They require increased preparation time on the part of the instructor because not only do instructors need to design a lesson plan, but they will also need to spend time putting that lesson plan and any additional materials online for the students to access. Compensation will need to be reflective of the additional tasks instructors need to do. More staff may need to be hired, including computer technicians that would need to solve any technical issues that may arise. There are also additional costs such as software licenses, e-commerce applications, web design tools, and the upkeep of the infrastructure. Also, certain topics may be too in depth to be taught online, making the system not open to everyone.

Regarding the previous studies mentioned, some scholars might find fault with accepting e-learning to be as beneficial as traditional learning. Due to the many amenities offered by e-learning, these scholars can argue that e-learning should produce better results than traditional learning, not comparable results. Thus, until that time comes, the comparable results can be seen as a slight drawback, depending upon interpretation.

Relevant Theories

Theory of Multiple Representations. According to the theory of multiple representations, presenting material in different ways is effective in enhancing the way people understand the material (Huang & Liaw, 2004). Thus, because e-learning has the capabilities of self-pacing and implements the use of multimedia, it creates different ways of learning. The user can take advantage of certain aspects of an e-learning system while ignoring others, thus giving that user control over their own learning. By providing different ways to interpret the information, an e-learning system is an example of this theory in practice.

Moore's Theory of Transactional Distance. Moore's theory of transactional distance (Moore, 1990, 1991, 1994; Moore & Kearsley, 1996, as cited in Huang & Liaw, 2004) is a theory that is often applied in e-learning and distance education. According to Moore (1991), interaction, course structure, and learner autonomy affect teaching in a distance learning environment. "Interaction refers to when the instructor gives instruction and the learner responds" (Huang & Liaw, 2004, p. 128). Interaction can be further broken down into learner-to-instructor interaction, learner-to-content interaction, and learner-to-learner interaction. Learner-to-instructor interaction involves the instructor interacting with the learner and providing support and feedback to the learner. Learner-to-content interaction refers to the process of learners obtaining information, which in turn causes them to understand the content. Learner-to-learner interaction is when learners share information and knowledge with one another. Course structure refers to the ability of an education program to respond to learners' needs (Huang & Liaw, 2004). Learner autonomy refers to the learners' ability to gain knowledge from their own individual experiences.

Constructivist Theory. According to constructivist theory (Jonassen, 1995), "all new knowledge is constructed on a foundation of prior knowledge and this new knowledge, once interlinked and referenced to the prior knowledge, forms a foundation of new prior knowledge" (Hamid, 2002). In other words, learners actively construct their own knowledge based on prior knowledge and experience that they use on learning tasks. Constructivist theory places a strong emphasis on active participation and reflection (Zhang & Nunamaker, 2003). "E-learning provides many opportunities for constructivist learning by supporting resource-rich, student-centered, and interactive learning" (Zhang et al., 2004).

Behaviorism Theory. "Behaviorism theory focuses on behavioral changes as a result of learning in which a new behavioral pattern is repeated until it becomes automatic" (Zhang & Nunamaker, 2003, p. 208). This theory relates to e-learning because although students may have difficulty at first adjusting to e-learning, after continued use, the student may become more comfortable and used to using the system, resulting in a better experience.

Cognitive Theory. "Cognitive theory is concerned with changes in a student's understanding that result from learning" (Zhang & Nunamaker, 2003, p. 208). Because e-learning is different than traditional learning, students are bound to find differences in the way they learn in each situation. This theory recognizes that differences will exist in learning between an e-learning environment and a traditional learning environment.

Connection to Knowledge Management

Knowledge management is a crucial part of an e-learning system. "Knowledge management promotes practices and technologies that facilitate the efficient creation and exchange of knowledge within communities of practice" (Aczel, Peake, & Hardy, 2007, p. 506). "In an e-learning system, there is a need to collect, store, sort, index, retrieve, update, and reuse knowledge" (Zhang & Nunamaker, 2003, p. 213). In essence, the main problem an e-learning system is trying to solve is "a lack of sharing knowledge among members of the organization" (Schmidt, 2005, p. 203). Knowledge is a commodity that individuals tend to want to keep to themselves.

Knowledge can create power and lead to advancement in one's career or education. Thus, it is somewhat difficult to get individuals to share their knowledge with others. In an e-learning system, users are sharing knowledge, but it does not always feel as though they are. When a user posts a comment or provides a link of information they have found valuable, that user is sharing knowledge. However, it does not feel as direct. An e-learning system serves as a way for users to share knowledge with one another without feeling the pressure to do so.

According to Barron (2000), in mature e-learning and knowledge management implementation, workers will end up tapping into the same knowledge well, thus sharing knowledge (Zahner, 2002). As mentioned previously, e-learning systems are reliant on interactivity. The process of acquiring knowledge is supported by e-learning systems, which are "often called 'interactive learning environments'" (Barker, 2005, p. 116). Because knowledge acquisition is an interactive process, e-learning systems are appropriate tools for promoting knowledge acquisition (Barker, 2005). E-learning systems support knowledge sharing through the use of multimedia. For example, videos of experts sharing their knowledge with students spreads that expert's knowledge and makes it possible for individuals to access that knowledge regardless of where the expert is located (Zhang & Nunamaker, 2003).

E-learning systems serve as a repository for all the knowledge that is collected (Johnson et al., 2008). According to Davenport and Prusak (2000), "technology is common in the domain of knowledge distribution" (p. 142). Because e-learning systems have archiving capabilities, students can return back to the system and find knowledge that was previously placed there. Anything put online remains online until someone deletes it so knowledge that is shared in an e-learning system will remain on the system unless it is deleted. This promotes knowledge acquisition and knowledge sharing. Therefore, an e-learning system can be very beneficial when managing knowledge.

According to Zhang and Nunamaker (2003), three factors are driving the convergence between e-learning and knowledge management. First, both e-learning and knowledge management focus on knowledge acquisition and sharing. Second, e-learning and knowledge management "require efficiently organizing, manipulating, and maintaining knowledge for better use" (Zhang & Nunamaker, 2003, p. 213). Last, both allow users to access knowledge and contribute their own knowledge. According to Schmidt (2005), the "blending of e-learning and knowledge management functionality can help to improve workplace learning" (p.212). According to Zwart and Resnick (2000), gathering knowledge, organizing knowledge, distributing knowledge, converting knowledge into action, training ourselves continuously, and repeating the cycle are knowledge management abilities that allow for personal growth and organizational effectiveness (Zahner, 2002). "With better technology, better education, and better management, the key tasks that knowledge workers perform within organizations could be done with greater speed and quality, and at a lower cost" (Davenport, as cited in Ichijo & Nonaka, 2007, p. 110). Thus, e-learning systems manage knowledge, which in turn benefits individuals and organizations that use these systems.

Successful E-learning

An e-learning system alone does not guarantee effective learning, but what makes up a successful system can increase the possibilities of effectiveness. According to Clark (2008), individuals need to pay attention to the accreditation, transferability, and

reputation of a system. The schedule the system follows (asynchronous versus synchronous), the course design, the level of technological knowledge required, the way information is delivered, the student community, and the response rate of professors are also important aspects to focus on (Clark, 2008).

According to McGraw (2001), an e-learning system should address five components (as cited in Ismail, 2002). First, a common language needs to be established. Second, governing and organization-wide policies need to be enacted. Third, the content needs to be compelling, engaging, and relevant. Fourth, there needs to be a support function for users. Last, a new e-learning system needs to be linkable to past systems. An example of a successful e-learning system is MIT's Open CourseWare, which provides knowledge to both students of MIT and others globally (Guri-Rosenblit, 2005; Zhang & Nunamaker, 2003).

Future Implications

There are many articles written about e-learning, but more research needs to be done on the topic. As referenced by the articles mentioned in this paper, e-learning provides benefits for its users. E-learning will continue to grow in popularity and will be implemented in many organizations. Because globalization is an ever-increasing part of this world, e-learning is a way to connect with individuals all over the world. Without e-learning, students would not have the opportunity to take part in knowledge sharing with other students located in various parts of the world. For the organizational side, e-learning allows members of an organization to work together, share knowledge, and generate knowledge with other members of an organization that are working out of a different location. According to Guri-Rosenblit (2005), "e-learning will unquestionably enhance globalization trends" (p. 490).

Although e-learning offers a multitude of benefits, the drawbacks serve as a statement of caution. Face-to-face learning provides an experience that cannot be recreated using a computer. Therefore, solely relying on e-learning would be a mistake. At the same time, solely relying on traditional learning would be a mistake as well. Education developers should look towards creating both an electronic and a traditional form of each learning endeavor. For example, students should be given the option of choosing to take a course online or in a traditional setting. The same should be offered for organizational members. This alternative may become expensive and time-consuming, but it seems to offer choices to the learners. For an individual to gain knowledge successfully, he or she should be given the option of which learning method he or she prefers to use. A possible way to combat these limitations can be to create courses with both components so all students are using the systems consistently. This also allows for individuals to utilize both methods so that those students that enjoy one method over the other can use the preferred method, but also experience the other method.

E-learning should be regarded in a more social way as well (Bruckman, 2002). For certain people, an e-learning system provides more opportunity to create relationships. As mentioned, e-learning relies on interactivity. Thus, it should be seen as both a learning tool and a social tool. By viewing e-learning in such a framework, individuals can see e-learning as an alternative to traditional learning. One of the main reasons e-learning is seen negatively in comparison to traditional learning is the lack of face-to-face contact which creates a social atmosphere. However, e-learning creates its own social atmosphere because if individuals do not participate in the system, it will not be successful. The system depends on interactivity, which in turn

forces a social atmosphere without feeling forced. E-learning should be explored in such a way to increase future success and sustainability.

Conclusion

E-learning is an important and unique tool in today's society. By understanding the background of the topic, the benefits and drawbacks, and the theories that relate to the field, an individual can be more knowledgeable about this necessary tool. In addition, it is crucial to understand the connection between knowledge management and e-learning. Knowledge management is in every educational and organizational setting and e-learning is quickly becoming a commodity in all organizations. By finding the connection, an individual will be able to use the information learned in this paper and apply it to their educational or organizational environment. E-learning will continue to spread and without understanding the tool, individuals may have future difficulty. Thus, embracing changes, such as e-learning, in the learning field can only provide benefits for future organizational success.

References

Aczel, J. C., Peake, S. R., & Hardy, P. (2008). Designing capacity-building in e-learning expertise: Challenges and strategies. *Computers & Education, 50*(2), 499–510.

Bannan-Ritland, B. (2002). Computer-mediated communication, elearning, and interactivity: A review of the research. *The Quarterly Review of Distance Education, 3*(2), 161–179.

Barker, P. (2005). Knowledge management for e-learning. *Innovations in Education and Teaching International, 42*(2), 111–121.

Bruckman, A. (2002, April). The future of e-learning communities. *Communications of the ACM, 45*(4), 60–63.

Clark, K. (2008, January 21). New answers for e-learning. *U.S. News & World Report, 144*(2), 46–49.

Davenport, T. H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Davenport, T.H. (2007). Information technologies for knowledge management. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 97–117). New York: Oxford University Press.

DeRouin, R. E., Fritzsche, B. A., & Salas, E. (2005). E-learning in organizations. *Journal of Management, 31*(6), 920–940.

E-learning responds to fast-paced environment. (2008, February). *Critical Care Nurse, 28,* 58–63.

Guri-Rosenblit, S. (2005). 'Distance education' and 'e-learning': Not the same thing. *Higher Education, 49*(4), 467–493.

Hamid, A. A. (2002). E-learning: Is it the "e" or the learning that matters? *The Internet and Higher Education, 4,* 311–316.

Huang, H.-M., & Liaw, S.-S. (2004). Guiding distance educators in building web-based instructions. *International Journal of Instructional Media, 3*(2), 125–137.

Ismail, J. (2002). The design of an e-learning system: Beyond the hype. *The Internet*

and Higher Education, 4, 329–336.
Johnson, R. D., Hornik, S., & Salas, E. (2008). An empirical examination of factors contributing to the creation of successful e-learning environments. *International Journal of Human-Computer Studies, 66*(5), 356–369.
Liaw, S.-S., Huang, H.-M., & Chen, G.-D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education, 49,* 1066–1080.
Schmidt, A. (2005). Bridging the gap between knowledge management and e-learning with context-aware corporate learning. *Professional Knowledge Management, 3782,* 203–212.
Shepherd, C. (2004, June). E-learning has more fans than we thought. *ITTraining,* 29.
Strother, J. B. (2002, April). An assessment of the effectiveness of e-learning in corporate training programs. *The International Review of Research in Open and Distance Learning, 3*(1). Retrieved April 11, 2008, from http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160
Ubell, R. (2000, October). Engineers turn to e-learning. *IEEE Spectrum, 37*(10), 59–63.
Zahner, J. (2002, May/June). Teachers explore knowledge management and e-learning as models for professional development. *TechTrends, 46*(3), 11–16.
Zhang, D., & Nunamaker, J. F. (2003). Powering e-learning in the new millennium: An overview of e-learning and enabling technology. *Information Systems Frontiers, 5*(2), 207–218.
Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker, J. F., Jr. (2004, May). Can e-learning replace classroom learning? *Communications of the ACM, 47*(5), 75–79.

Knowledge Management Implementation for Personalization and Codification Strategies: Influencing Fidelity and Uniformity in Outcomes

Christine Goldthwaite
Master of Communication and Information Studies

Abstract

The initiation of a knowledge management (KM) program requires specific implementation strategies and tactics based on the type of KM plan proposed. Experts suggest that organizations should choose between two strategies for managing knowledge in the workplace—codification and personalization. This paper explores the implementation of a KM initiative from the communication professional's perspective, seeking to answer the following question, "How would a communication strategy differ for a personalization versus a codification strategy?" Relying on change management and communication research, this paper will explore the concepts of fidelity and uniformity and ultimately suggest that implementers encourage high-fidelity/high-uniformity outcomes when implementing a codification-based KM program, and conversely, encourage moderate-fidelity and low-uniformity when implementing a personalization-based KM program.

Introduction

KM is considered a valuable business activity for today's organizations. The subject has been widely debated and supporters concur that effective KM is a key competitive advantage. Hansen, Nohria and Tierney (1999) suggest there are two distinct knowledge management strategies—codification and personalization. Organizations using a codification strategy focus efforts on the organization, storage and retrieval of information, while those employing a personalization strategy focus on sharing knowledge among its members. Both types of KM plans can be effective if aligned with an organization's business strategy.

The success of either type of KM program is reliant on a sound implementation plan. In their study of planned change initiatives, Lewis and Seibold (1993) introduced the concepts of fidelity and uniformity. Fidelity refers to how closely the implementer's vision of how a change should be used aligns with the actual use of the change. Uniformity relates to the number of unique ways organizational members put the proposed change to use. The authors suggest there are instances where high-fidelity/high-uniformity would be more suitable and instances where high-fidelity/low-uniformity would be preferable.

The following paper presents a summary of findings that support the assertion that implementers should encourage high-fidelity/high-uniformity outcomes when attempting to introduce a codification-based KM program, and conversely, encourage moderate-fidelity and low-uniformity when implementing a personalization-based KM program. To make this case, the paper will present a brief review of knowledge management basics; highlight factors that have been shown to facilitate the successful implementation of a KM program; and review the concepts of fidelity and uniformity, demonstrating why they are relevant for KM implementation. Finally, the paper will propose specific strategies that can encourage different degrees of fidelity and uniformity in implementation outcomes.

Knowledge Management Basics

While opinions abound regarding the nature of knowledge, for the purpose of this paper knowledge is explained using Davenport and Prusak's (2000) concise and thoughtful definition:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experience and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms (p. 5).

It is clear from the above text that knowledge is much more than the data and information organizations collect, store, transmit and produce daily. Experts agree knowledge has two distinct dimensions—explicit and tacit—each residing at opposite ends of the knowledge spectrum. Explicit describes knowledge that is more easily articulated, captured, stored and shared. In organizations, this type of knowledge is found in documents, manuals and procedures, and is managed through the use of information technologies such as databases and intranets. In contrast, tacit knowledge has a much more ethereal quality that is shaped and reshaped through the personal experiences of the "knowers." This type of knowledge is context-bound and can easily become meaningless or useless when formally codified.

Hansen, Nohria and Tierney (1999) suggest that organizations choose between a KM strategy focused on explicit knowledge—"codification strategy"– or one focused on the management of tacit knowledge—"personalization strategy" (p. 107). The authors contend that to manage both equally will lead to ineffective outcomes. While they do not suggest abandoning one knowledge dimension for the sake of the other, they suggest that efforts should focus 80 percent on one and 20 percent on the other. Using case studies of consulting firms, the authors illustrate how the codification strategy works well for organizations that rely on the modification and reuse of existing knowledge. Conversely, they demonstrate how the personalization strategy works best for organizations that provide customers with highly customized business solutions. Both types of KM initiatives can be effective as long as they align with the business strategy. Organizations employing a codification strategy typically focus efforts on the organization, storage and retrieval of information, while organizations employing the personalization strategy focus on sharing knowledge among its members. Hansen et al. suggest that an organization must be aware of the knowledge it possesses, what knowledge competitors possess and how KM can benefit the organization before considering a strategy.

Critical Success Factors for Knowledge Management Initiatives

Experts have explored the many factors that lead to successful KM implementation and common themes do emerge. Davenport and Prusak (2000) identify nine factors that contribute to success. These include "a knowledge-oriented culture; technical and organizational infrastructure; senior management support; a link to economics or industry value; a modicum of process orientation; clarity of vision and language; non-trivial motivational aids; some level of knowledge structure; and multiple channels for knowledge transfer" (p. 153). Similarly, Al-Mabrouk (2006) found many of the same factors to be key. This author's review of KM research highlights factors that contribute to successful KM implementation including leadership, culture,

information technology, strategy, measurement, organizational infrastructure, processes, motivation, resources, training and education and human resources management. For Al-Mabrouk, leadership, culture, information technology and strategy were the most frequently identified factors contributing to successful outcomes. *Leadership* factors include: "steering the change effort, conveying the importance of KM to employees, maintaining employees' morale, and creating a culture that encourages knowledge sharing and use" (Al-Mabrouk, 2006, p. 2).

Organizational culture factors include the development of an organization "that highly values knowledge and encourages its creation, sharing and application" (p. 2). *Information technology* factors include the technology to support the KM initiative. *Strategy* factors include the alignment of business and KM strategy and the effective communication of such strategy to organizational members.

Factors shown to be less influential but that still emerge as having an effect on KM implementation include: *measurement*—a way for organizations to evaluate the effectiveness of the initiative; *motivation*—encouraging and rewarding employees for adopting KM behaviors; *resources*—providing the necessary time, technological, financial and human resources to support the initiative; *training and education*—providing organizational members with a "common language" and skills needed to participate in the initiative (p. 4); and *human resources*—supporting and managing organizational members.

Implementation Strategy and Tactics: Lessons from Innovation Research

Understanding the critical success factors previously mentioned is key for the development of effective implementation strategies and tactics. Reviewing research on planned change and innovation adoption is also useful in understanding how organizational members accept or reject new initiatives. Essentially the introduction of a new KM program is an attempt to introduce an innovation within an organization. When organizations introduce innovations, implementers take deliberate action in the form of "structured implementation activities" to encourage the adoption of the proposed change (Lewis & Seibold, 1993, p. 331). Structured implementation activities include setting goals, instituting performance measures, educating and training individuals, measuring outcomes, etc. (Lewis & Seibold, 1998). Implementation strategy refers to the overall objectives and plan for executing a change while tactics refer to "more specific actions, messages, and events constructed and carried out in service of some general strategy or goal." Tactics include the "announcement and articulation of innovations and their goals, training activities, development and communication of performance criteria, identification and selection of users" (Lewis & Seibold, 1998, p. 101).

Fidelity and Uniformity. Fidelity and uniformity are dimensions of change outcomes and as suggested earlier, personalization and codification strategies can benefit from different degrees of each dimension. Lewis and Seibold (1998) state that outcomes of change initiatives are unique for each organization. While implementers attempt to influence results by presenting a vision for a new initiative, organizational members may accept the vision or reject it all together. Or, organizational members may adopt the vision but then use the innovation in many unique ways across the organization. They describe these dimensions of planned change outcomes in terms of *fidelity*—how closely the actual use of the change aligns with the implementer's

envisioned use of the change – and *uniformity*—the number of unique ways organizational members put the proposed change to use.

While research on fidelity and uniformity relates specifically to organizational innovation, the findings shed light on the implementation of a KM initiative. Lewis (2007) proposed that the "implementers' views of the goals of change programs to produce high uniformity and/or fidelity in the outcomes of the change initiative will influence their strategy choices in implementation communication" (p. 185). Looking at fidelity and uniformity on a spectrum with high fidelity and high uniformity to one end, and low fidelity and low uniformity to the other, one would see robust adherence and standardization related to the former and multiple perspectives, personalization and reinvention related to the latter.

Organizations seeking a high degree of fidelity to the vision often take a "programmed approach" to implementation (Lewis & Seibold, 1998, p. 99). Lewis and Seibold (1998) refer to the work of Roberts-Gray and Gray (1983) and Zaltman and Duncan (1977) when they suggest that a high-fidelity strategy includes training, rules and authority, feedback to monitor innovation use, and persuasion. In contrast, implementers using an "adaptive approach" allow for a more organic, bottom-up versus top-down adoption of an innovation. (Lewis & Seibold, 1998, p. 99). Bourgeois and Brodwin's (1984) "cultural model" for the strategic management of innovation is useful for understanding the adaptive approach. The authors describe how the cultural model operates from the perspective of the CEO.

> The CEO guides his organization by communicating and instilling his vision the overarching mission for the firm, and then allowing each individual to participate in designing his or her work procedures in concert with that mission. So, once the game plan is set, the CEO plays the role of 'coach' in giving general direction, but encourages individual decision-making to determine the operating details of executing the plan (p. 250).

The adaptive approach does not necessarily promote low fidelity—the rejection of the vision altogether—but rather it promotes a broad, flexible vision that allows organizational members to make it individually meaningful. A low-fidelity outcome indicates that organizational members are free to develop customized and innovative solutions. Research on creativity and innovation suggests that leaders can also encourage innovative behavior by making creativity an imperative, broadly defining tasks, encouraging divergent thinking, and facilitating dialogue to enhance idea generation (Mumford, Scott, Gaddis & Strange, 2002). The vision therefore must communicate the leadership's support of these behaviors.

In contrast, a vision designed to support high uniformity will be different. For example, a vision that is too ambiguous and open to many interpretations can confuse employees and dilute efforts to encourage uniform adoption of a KM initiative. Gallivan's (2001) research found that "well-defined and clearly communicated objectives" had a positive effect on attempts to convince employees to adopt new technologies (p. 248). A change initiative that requires stakeholders to uniformly adopt a change (high uniformity) requires clear and concise objectives to help employees understand expectations.

Uniformity relates to the number of unique ways organizational members ultimately make use of a proposed change. Because there is no specific research on uniformity, it is useful to look at innovation reinvention to understand the concept. Rogers (1995) defines the process of reinvention as the "degree to which an innovation is changed or modified by a user in the process of its adoption and

implementation" (p. 217). The more organizational members choose to reinvent an innovation the less uniform the implementation will be. There are times when organizations prefer high uniformity and times when low uniformity is more desirable. For example, Lewis (2007) used the example of an organization implementing a new sexual harassment policy. Logically, the implementer would expect organizational members to resolutely and uniformly adopt the policy. In contrast, an organization introducing technologies to encourage knowledge creation and sharing would benefit from a diversity of uses such as creating wikis, using listservs and Intranets.

Critical Components of Knowledge Management Implementation Strategy

After a review of the critical success factors of KM along side the concepts of fidelity and uniformity, the following sections will explore the essential components of KM implementation. This paper suggests that the following are important for both a personalization and codification strategy, but some dimensions will be of primary importance for one strategy and secondary for the other. For example, a strong vision is an essential element of both strategies, but the approaches differ. Socialization and participation will be shown to be more important in the personalization strategy, while performance measures, rewards, and roles and training more important in the codification strategy. In the case of either strategy, it is important to note that if other fundamentals of the KM initiative are not in place—technology infrastructure and resources as in time and money—then no amount of implementation strategy will be effective. Experts agree that organizations are large complex systems with a multitude of factors that can influence any attempt to introduce a new KM initiative.

Implementation strategy and supporting communication tactics are the backbone of any new initiative. Organizational members need information that is "timely, useful, answer[s]questions, and conveyed by an appropriate medium" in order for a change to the organization's existing practices to occur (Miller, Johnson & Grau, 1994, p. 73). Implementers must provide appropriate information to inform organizational members regarding expectations to encourage them to act in ways that support the initiative. While the strategies for encouraging high uniformity and low uniformity outcomes are different, the general types of information are the same. Each strategy must include information that introduces employees to the new initiative, explains the vision, goals, and objectives, explains the actions required to realize the vision, clarifies organizational member roles, and explains the process for monitoring and measuring progress

Vision and fidelity. To review, fidelity refers to how closely the actual use of the change aligns with the implementer's originally intended vision for the change. A leader's vision for a KM program is the foundation of an implementation strategy. Ichijo and Nonaka (2007) consider the "knowledge vision" to be one of the most critical factors in establishing a successful KM culture (p. 85). The authors state, "When managers instill an effective knowledge vision, an organization will have a better understanding of the organization's core values or justification criteria for KM" (p. 86). Senge (2006) also asserts that the vision is a fundamental tenet of organizational development and therefore critical to the success of any new initiative. The author emphasizes the importance of transforming the leader's vision into to one that is embraced by all organizational members.

The personalization strategy should theoretically benefit from an implementation plan designed to encourage lower fidelity, allowing organizational members to personalize and internalize the vision. Davenport and Prusak's (2000) case study of British Petroleum (BP) illustrates this point. The authors report on a division of BP, BP Exploration (BPX), which implemented a knowledge sharing initiative enabling individual divisions to "develop processes and solutions appropriate to their particular problems." The vision for the project was intentionally broad; elements included the importance of knowledge sharing, the role of communication, building networks of people, and using information technology as support for, not the basis of, the initiative. As Davenport and Prusak report, "Discussions between the Change Management team and . . . the Knowledge Management team kept the focus on the broad goal" (p. 20). BPX employees were given tools such as "desktop videoconferencing equipment, multimedia email, application sharing, shared chalk boards, a document scanner, tools to record video clips, groupware and a Web browser to facilitate knowledge sharing but were not told how and when they should use them" (p. 20). Instead, organizational members were "coached" to discover how communication and IT could be used in their unique situations. Anecdotal evidence of the success of BPX's initiative was revealed when employees spontaneously used a video camera and a virtual workstation to enable an expert in a distant location to virtually diagnose a problem. Davenport and Prusak report that this incident saved BPX valuable time and money. In this example, moderate fidelity to the vision also encouraged low-uniformity of outcomes.

While the development and dissemination of a vision statement is critical, this alone will not influence action. For a vision to be effective it must be communicated consistently. Fairhurst (1993) suggests the failure of the vision to influence action occurs over time when opportunities to make the vision relevant for employees go unrecognized or disregarded. Furthermore, even when organizations develop well-thought-out visions, commitment to communicating the message long term often waivers (Fairhurst, 1993). Senge (2006) suggests the problem with most visions or "vision statements" is that they never become shared visions. He states the vision is "not a 'cookbook' but a set of principles and guiding practices" (p. 9).

In contrast, the vision statement for a codification strategy should encourage organizational members to faithfully adopt the vision. Unlike the personalization strategy where employees are encouraged to share knowledge in whatever way works for them, a codification strategy is reliant on more exacting standards. Knowledge must be organized and stored in tightly controlled ways so employees can access it easily. This requires a high level of formalization and specific steps employees must follow. Maier (2007) recommends the use of "exact visions," because

> Terms such as knowledge, information, learning, knowledge base, and organizational learning are subject to interpretation. A KM initiative should define these terms with respect to the organization's knowledge-related goals so that the perspective on what is and what is not KM is clearly communicable within the organization (p. 133).

For example, Zack (1999) reports on the case of Technology Research, Inc. (TRI), an organization that provides industry research and analysis. TRI requires all information to be organized in a formal structure made up of "a standard set of knowledge units" consisting of executive summaries, abstracts, main text, graphics, tables and charts. This standardization aids in the efficient reuse of knowledge (p.

51).

Socialization and participation: encouraging low uniformity. To review, uniformity refers to the number of unique ways organizational members put a proposed change to use. Socialization and participation tactics can encourage low-uniformity outcomes that in theory will lead to a successful implementation of a personalization strategy. Ichijo and Nonaka (2007) define socialization as a process of sharing experiences and thereby creating tacit knowledge such as shared mental models and technical skills (p. 296). Through the processes of socialization, organizational members come to internalize the values, norms, attitudes and beliefs of the organizational culture. These processes can potentially influence employee behaviors and decision-making practices (Myers & Kassing, 1998). Employees who closely identify with the organization are more likely to perform in ways that support the organization's efforts. Communicative messages including internal and external communications, meetings, interpersonal communication, and formal and informal recognition of employee achievements theoretically improve identification (Conrad & Poole, 2005). Ford and Ford (1995) state, "Conversations, both written and verbal, and the artifacts and practices associated with those conversations, create the organization's culture" (p. 563).

Davenport and Prusak's (2000) case study of 3M illustrates this point. 3M is a well-known innovative company with a culture of knowledge development and sharing encouraged through socialization tactics. The values of innovativeness and knowledge sharing have been effectively internalized. Organizational members are expected to spend fifteen percent of their time working on personal research interests. In addition, employees are expected to share knowledge in regular meetings and knowledge fairs. The results of this strong knowledge-sharing culture are well known in management circles. In 1997, 30 percent of 3M's revenue was derived from products on the market for less than four years.

Participation also plays an important role in a KM implementation strategy. Osterloh (2007) suggests that giving organizational members opportunities to voice opinions can "lead to perceived procedural fairness" which can influence "a person's willingness to contribute to common goods" including sharing knowledge (p. 169). Employee participation can also be encouraged through communities of practice. Implementers can take steps to encourage groups of individuals with common interests and concerns to share ideas and information. For example implementing an apprentice system is a formal community of practice (Ichijo and Nonaka, 2007). Nonaka and Konno (1999) introduced the concept *ba*, which they describe as "a shared space for emerging relationships" (p. 37). The authors discuss two types of *ba* —originating *ba* and interacting *ba*, which closely reflect the socialization process in action—face-to-face communication, culture, dialogue and sharing mental models.

Roles, learning and training: encouraging high uniformity. As earlier noted, higher uniformity will theoretically lead to a more effective codification strategy. Zack (1999) asserts that problems with codification arise when KM roles are not clearly defined. Organizations that want members to uniformly adopt a new KM initiative must assign roles and make responsibilities clear. Specific KM responsibilities include, "championing KM, educating the organization, knowledge mapping, and integrating the organizational and technical resources comprising the KM architecture" (p. 49).

Although Davenport and Prusak or Al-Mabrouk did not indicate learning or training was a critical success factor, organizations that introduce new roles, technologies, tools and procedures must provide training or learning opportunities for employees. Hung, Huang, Lin and Tsai's (2005) quantitative study of the pharmaceutical industry found training to have a positive affect on the adoption of a KM system. Jablin (2001) suggests training may serve to "socialize" stakeholders, encouraging them to adopt "the organization's vision, values and strategy" (p. 766). He suggests that when organizations offer training, in effect it is communicating concern for its members. "Those who receive training to help them more effectively function in the organization most likely interpret that to mean the organization values their membership and wants to help them succeed" (p. 766).

Learning as it relates to a codification strategy means learning new tools and procedures, because it is heavily reliant on the use of information technologies. Employees must be trained in how the technologies work and given opportunities to learn how the technologies can help them specifically. Sugarman's (2001) case study analysis of change management and the role of learning found evidence of "improved business results" as a result of the implementation of learning programs. (p. 74). He uses the term "practice field" to describe a system of learning where teams are coached on aspects of learning and collaboration in the context of an actual project (p. 74).

When Buckman Laboratories (BL) launched its KM initiative, K'Netix, it provided employees with a full day of intensive training. Today, the company reuses new knowledge it acquires, incorporating it into additional training materials and distance-learning applications (Zack, 1999, p. 57). Hansen et al. (1999) support the use of training for organizations using a codification strategy. They suggest employees should be trained in groups using "computer-based distance learning" (p. 109).

Performance measures and rewards. Performance measures and rewards are critical in both high- and low-uniformity strategies. As previously stated, Al-Mabrouk (2006) found that rewards encourage employees to adopt KM behaviors and measurement enables organizations to evaluate the effectiveness of an initiative. George, Sleeth and Siders (1999) stated, "members, once committed to the new vision, may require changes in structure . . . to accommodate a new set of behaviors consistent with the new vision" (p. 556). Introducing new performance measures and rewards are formal attempts to change behaviors by altering existing structures. The legitimacy of these new structures is reliant on organizational members with the authority to implement them. Nutt's (1986) research suggests using tactics to demonstrate authority to manage the implementation process, justify and support activities, and monitor performance. However, the use of legitimate power is only effective if the organization's norms support the authority. Kerr and Slocum (2005) assert an organization's reward system—"who gets rewarded and why [—] is an unequivocal statement of the corporation's values and beliefs" (p. 130). Angle (2000) found "Individualized rewards tend to increase idea generation and radical innovations, whereas group rewards tend to increase innovation implementation and incremental innovations" (p. 668). This suggests that organizations seeking low uniformity focus on rewarding individuals and that those seeking high uniformity focus on group rewards. However, since sharing is the foundation of the personalization strategy, rewards must not discourage group interaction. Al-Mabrouk

(2006) stated knowledge sharing incentives should be "based on goals that they [employees] can influence, but are not able to achieve on their own" (p. 4).

The important factor in the administration of a rewards program is the alignment of goals, performance measures and rewards. Researchers have found that when organizations communicate one set of objectives but reward a different one, the legitimacy of the organization's performance and reward program loses credibility and becomes ineffective (Broeding, 1999). For example, Broeding (1999) cited a case where an organization claimed that its objective was to promote teamwork, but instead rewarded individual achievement. Cardinal's (2001) research on innovation in the pharmaceutical industry also supports the need for goal/reward alignment, finding positive outcomes resulted when goals were "clearly defined, and provided unambiguous criteria," aligned performance reviews with outputs, and publicly rewarded employee achievement (p. 28). Davenport and Prusak (2000) state, "Motivational approaches for knowledge behaviors should be long-term incentives tied in with the rest of the evaluation and compensation structure" (p. 158). Zack (1999) writing about the codification strategy discusses KM at Buckman Laboratories (BL). The success of BL's KM initiative is derived from the strong expectations for employees to participate in knowledge sharing by reading and posting to forums and sharing problems and offering solutions.

Hansen, Nohria and Tierney's (1999) case study of Ernst & Young presents the case of an Ernst & Young employee that used the "electronic knowledge repository" to find relevant information that was ultimately used to close a business deal in two months. The use of the codification strategy shaved months off the process. For this strategy to work, Hansen et al. suggests that organizations hire workers that fit well with a knowledge reuse culture, provide group training and "reward people for using and contributing to document databases" (p. 109). The authors state, "real incentives—not small enticements are required" to get people to document their knowledge and add to the knowledge repository (p. 113). BL also publicly rewards employees for knowledge-sharing behaviors. Once a year the leading "knowledge sharers" are honored at a conference held at a resort (Davenport & Prusak, p. 158). In 1994 when BL honored its 150 top knowledge sharers at a convention, "participation on K'Netix forums immediately and dramatically increased" (Fulmer, 1999, p. 8).

Conclusion

As previously illustrated, vision, socialization and participation, performance measures, rewards, and training are the cornerstones of a KM implementation strategy. While personalization and codification will use some aspects of each of the previously mentioned dimensions, they will be employed differently for each. The vision will always remain a foundational element of both strategies, but as earlier noted, the vision in the personalization strategy will be intentionally broad, and under the codification strategy it will offer more specifics. Socialization and participation are also important for both strategies but are particularly essential for the personalization strategy. This paper has merely explored and summarized some aspects of KM implementation and in no way presents an exhaustive analysis. Rather, the goal has been to make implementers aware of major differences between the two knowledge management strategies and demonstrate how fidelity and uniformity outcomes can be shaped and the relative importance of each.

The implications of this paper are that implementation strategies are quite

complex, therefore further empirical research needs to be conducted to determine the validity of these assertions. Factors such as organizational type, size and local versus global could have significant affects on the effectiveness of the strategy proposed. Using snippets of case study findings is not sufficient to verify the validity of the ideas presented, but case studies do reveal recurring themes that need to be explored further. The contribution this paper makes is to provide a simple framework for the planning and development of implementation strategies. Organizations seeking to introduce a significant change in an organization—such as a knowledge management program—can design a strategy informed by the material presented.

References

Al-Mabrouk, K. (2006). Critical success factors affecting knowledge management adoption: A review of the literature. *Innovations in Information Technology,* 1–6. Retrieved April 15, 2008 from http://ieeexplore.ieee.org.

Angle, H. A. & Van de Ven, A. (2000). Suggestions for managing the innovation journey, in Van de Ven, A., Angle, H., Poole, M. (Eds), *Research on the Management of Innovation* (pp. 663–698). New York: Oxford University Press.

Bourgeois, L. J. III, & Brodwin, D. R. (1984). Strategic implementation: Five approaches to an elusive phenomenon. *Strategic Management Journal, 5*(3), 241–264.

Cardinal, L.B. (2001). Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organizational Science, 12*(1), 19–36.

Conrad, C. & Poole, M. S. (2005). *Strategic organizational communication.* Belmont: Thomson Wadsworth.

Davenport, T. H. & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Fairhurst, G. T. (1993). Echoes of the vision: When the rest of the organization talks Total Quality. *Management Communication Quarterly, 6,* 331–371.

Ford, J. D. & Ford, L. W. (1995). The role of conversations in producing intentional change in organizations. *The Academy of Management Review, 20*(3), 541–570.

Fulmer, W. E. (1999). Buckman Laboratories. Harvard Business School Publishing, N9–899–175, 1–16.

Gallivan, M. J. (2001). Meaning to change: How diverse stakeholders interpret organizational communication about change initiatives. *IEEE Transactions on Professional Communication, 44*(4), 243–266.

George, G., Sleeth, R. G. & Siders, M. A. (1999). Organizing culture: Leader roles, behaviors, and reinforcement mechanisms, *Journal of Business and Psychology, 13*(4), 545–560.

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

Hung, Y., Huang, S., Lin, Q. & Tsai, M. (2005). Critical factors in adopting a knowledge management system for the pharmaceutical industry. *Industrial Management & Data Systems, 105*(2), 164–183.

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

Jablin, F. M. (2001). Organizational entry, assimilation, and disengagement/exit. In F. M. Jablin & L. L. Putnam (Eds.), *The new handbook of organizational communication* (pp. 732–818). Thousand Oaks: Sage Publications, Inc.
Kerr, J. & Slocum, J. W. (2005). Managing corporate culture through reward systems. *Academy of Management Executive, 19*(4), 130–138.
Lewis, L. (2007). An organizational stakeholder model of change implementation communication. *Communication Theory, 17,* 176–204.
Lewis, L. K. (2006). Employee perspectives on implementation communication as predictors of perceptions of success and resistance. *Western Journal of Communication, 70*(1), 23–46.
Lewis, L. K., & Seibold, D. R. (1998*).* Reconceptualizing organizational change implementation as a communication problem: A review of literature and research agenda. In *Communication Yearbook, 21* (pp. 93–151). Thousand Oaks, CA: Sage.
Lewis, L. K., & Seibold, D. R. (1993). Innovation modification during intraorganizational adoption. *Academy of Management Review, 18,* 322–354.
Maier, R. (2007). *Knowledge management systems: Information and communication technologies for knowledge management.* Berlin: Springer.
Miller, V. D., Johnson, J. R. & Grau, J. (1994), Antecedents to willingness to participate in a planned organizational change. *Journal of Applied Communication Research, 22,* 59–80.
Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *The Leadership Quarterly, 13,* 705–750.
Myers, S. A. & Kassing, J. W. (1998). The relationship between perceived supervisory communication behaviors and subordinate organizational identification. *Communication Research Reports 15*(1), 71–81.
Nonaka, I. & Konno, N. (1999–2000). The concept of Ba building a foundation for knowledge creation. In Cortada, J. W. and Woods, J. A. (Eds), *The Knowledge Management Yearbook* (pp. 37–51). Woburn, MA: Butterworth-Heinemann.
Osterloh, M. (2007). Human resources management and knowledge creation. In K. Ichijo & I. Nonaka (Eds.), *Knowledge Creation and Management* (pp. 158–175). New York: Oxford University Press.
Pan, S. & Scarborough, H. (1999) Knowledge management in practice: an exploratory case study. *Technology Analysis and Strategic Management, 11(3),* 359–74.
Roberts-Gray, C. & Gray, T. (1983). Implementing innovations: A model to bridge the gap between diffusion and utilization. *Knowledge: Creation, Diffusion, Utilization, 4,* 213–232.
Rogers, E. M. (1995). *Diffusion of Innovations.* New York: The Free Press.
Senge, P. M. (2006). The Fifth Discipline. New York: Doubleday Business.
Sugarman, B. (2001). A learning based approach to organizational change: Some results and guidelines. *Organizational Dynamics, 30*(1), 62–76.
Sussman, S. W. & Siegal, W. S. (2003). Informational influence in organizations: An integrated approach to knowledge adoption. *Information Systems Research, 14*(10), 47–65.
Zack, M. H. (1999). Managing codified knowledge. *Sloan Management Review,*

40(4), 45–58.
Zaltman, G. & Duncan, R. (1977). *Strategies for planned change.* New York: John Wiley.

E-learning Systems:
Taking Over Face-to-Face Learning?

Paige Grosnick
Master of Communication and Information Studies

Abstract

This paper will discuss what face-to-face learning and e-learning is and the differences between them. Then it will address the asynchronous and synchronous aspects of e-learning. I will look at the interaction and collaboration benefits of e-learning. This paper will also discuss the research on e-learning systems and analyze the experts' views on e-learning versus face-to-face. Lastly, there will be an analysis of all the findings from previous research and conclusions on whether e-learning will overtake face-to-face learning in the near future.

Introduction

Virtual learning or e-learning systems such as e-companion and WebCT are becoming more prevalent in universities around the world. But face-to-face learning is still preferred in elementary schools and early childhood education. This situation seems to be changing since e-learning systems are being developed for children and toddlers. The differences between the two learning environments may help determine if e-learning systems are taking over face-to-face learning.

What Are the Differences between Face-to-Face and E-learning?

E-learning is defined in this paper as the use of various technological tools that are web-based, web-distributed, or web-capable for the purposes of education (Nichols, 2003). There has been an upturn in e-learning systems in both classrooms and organizations in the last six years due to the advances in technology (Strother, 2002). The traditional and most familiar learning style is face-to-face, where a teacher or trainer is providing a lesson to the students in a classroom setting. Face-to-face learning is assumed to lead to greater interaction than computer based training, leading to greater success. Thomas L. Russell, the director of instructional telecommunications at North Carolina State University, does not agree with this statement. Russell found there to be no significant difference in learning between an electronic medium and a traditional learning setting (Strother, 2002). In addition, there has been some research showing that online students did better on tests then traditional students (Britt, 2008).

Currently, face-to-face learning is the most common form of learning in classrooms according to Shaban and Head (2003). Learning in a classroom begins sometime around the age of five and continues through high school and college. The classroom allows students to interact with other children their age and learn valuable life lessons. Especially in elementary school, children learn sharing, respect for elders, and how to communicate with their peers in a classroom setting. These critical tools for life are essential in the education process and would be hard to recreate in a virtual world. There will be further analysis of interaction and collaboration in this paper.

E-learning has many positive aspects that entice educational and

organizational groups to adopt it. Collaboration of ideas from many different people is a huge benefit of e-learning (Huang & Liaw, 2004). Professors, students, and experts can come together and share knowledge with each other. The logistical issues such as multiple offices or researchers from all over the world are solved with e-learning sites. The virtual learning communities that these systems provide allow individuals to connect with mentors, experts, and learning peers from both inside and outside their organization or typical classroom.

One drawback to e-learning systems is the cost (Blair, 2002). E-learning systems require increased time for the instructor in terms of preparation. The instructor needs to plan the lesson or training material, just as they would in a face-to-face setting, along with uploading each piece to the site. The technology for uploading materials is getting easier and easier but if the instructor has limited knowledge, an expert may have to be brought in for support. Compensation will need to be made for additional time taken, and for multiple experts if the case requires it. The additional costs could arise with the purchasing of software, web design, and just general maintenance of the site.

Knowledge management is essential in e-learning systems. "In an e-learning system, there is a need to collect, store, sort, index, retrieve, update, and reuse knowledge" (Zhang & Nunamaker, 2003, p. 213). An e-learning system allows users to share knowledge with one another and acquire knowledge from others. Knowledge is not shared very freely since knowledge represents power. Since e-learning systems rely on interactivity, sharing knowledge in virtual spaces makes the process easier. According to Zhang and Nunamaker (2003), there are three factors that are bringing the e-learning and knowledge management together. E-learning and knowledge management are both focused on knowledge acquisition and sharing. Second, e-learning and knowledge management require efficient organization, manipulation, and maintenance of knowledge to get the best results (Zhang & Nunamaker, 2003). Last, both allow users to access knowledge and to contribute their own knowledge.

Synchronous and Asynchronous Aspects of E-learning

The interaction and communication in e-learning systems can be both synchronous and asynchronous. Synchronous communication tools such as chat rooms, instant messaging, and web-conferencing allows students to communicate in real time with others about the lesson. This communication has the ability for members to establish what Nonaka and Toyama (2007) refer to as *ba* or "shared context in motion, in which knowledge is shared, created, and utilized" (p.23). Some e-learning systems even have links that allow the student to engage with the professor or trainer if they have a question**.** For example, in systems like JotSpace and Erudix, there is a whiteboard where the instructor can make annotations to a diagram or explanations while the class looks on. If one student needs more clarification they can meet outside of the web chat in either a private chat room or another web conference. Also in e-learning systems, users can set their own pace. This allows the user to advance with the class at the pace set by an instructor or as they choose (Strother 2002). In terms of synchronous communication the students can work on the time scheduled by the instructor has set and move along with the rest of the group at specific times. By moving along all at the same time the learning is done in a structured manner which is preferred by some learners.

Asynchronous communication is unique to e-learning systems because the

members can log-in at their own convenience and not be restricted by time. The flexibility allows for a more diverse group of people, like in other time zones, to join discussions. When individuals work in an asynchronous workspace, there is more time to think about what they are going to contribute. Being able to meet in an online space without having to schedule a specific time also gives each member to learn and work at the time they prefer. For example, if there are students who work full time, they can get online early in the morning or later in the evening. Every person works better in different environments as well. Some students learn better in the morning and some at night, so being able to work when you want to and without having to match your schedule to others' is a major advantage to e-learning systems.

A lack of immediate feedback could be considered a drawback in asynchronous learning (Zhang, Zhao, Zhou, & Nunamaker, 2004). Questions posed to the instructor or peers in an asynchronous learning environment will encounter a time delay when it comes to responses. The time delay could be in minutes, hours, or even days. Also, the instructor or classmates could miss a posed question entirely. If questions are posed and not responded to, that may lead learners to participate less since they have been essentially ignored in the past. Although e-learning systems can increase confidence due to the distance, others may fear the technology (Zhang, Zhao, Zhou, & Nunamaker, 2004). The unfamiliarity with the technology, the e-learning site, or the protocols for distance learning may scare students away from participating in the knowledge transfer (Zhang, Zhao, Zhou, & Nunamaker, 2004).

Interaction and Collaboration

As mentioned in the previous sections, e-learning systems can enhance collaboration and interaction among colleagues and researchers from all over the world. Face-to-face learning and virtual systems should both create an environment for collaboration and interaction to optimize learning (Nichols, 2003). It seems that e-learning systems are gaining on face-to-face learning in both of these areas. There is a difference between collaboration and interaction, and it is specific in web-based learning.

Interaction in a general sense is when two things have an effect on each other, and in terms of communication usually refers to a conversation. The typical conversation is pictured with two individuals face-to-face discussing a topic. E-learning systems have developed a form of interaction which can be very similar to typical face-to-face interactions. Informal and formal communication can be discussed in chat rooms, instant messaging, and email on an e-learning site. These areas are designed for individuals to communicate and interact with each other in a structured setting allowing the exchange of ideas and knowledge. An added bonus to online interaction in these spaces is that the conversations can be recorded and saved for future use. The theory of transactional distance from Moore (1994, as cited in Huang & Liaw, 2004) applies well to e-learning interaction. Moore states that interaction, the structure of the course and autonomy affect the teaching in virtual learning systems. Moore's (1994) definition of interaction is when "the instructor gives instruction and the learner responds" (Huang & Liaw, 2004, p.128). The instructor must structure the course in a way that flows for e-learning. This could mean a more structured environment in terms of rules and regulations online. There are three main types of interaction according to Moore (1994, as cited in Huang & Liaw, 2004): learner-to-instructor interaction, learner-to-content interaction, and learner-to-learner interaction. Learner-to-instructor interaction involves the instructor interacting with the learner and providing support and feedback. For example, the

interaction between a teacher and a student about a research project could be discussed in a chat room, and when the conversation is concluded, both parties can save the conversation or print it out to refer back to it in the future. Learner-to-content interaction is the process of obtaining information by the learner which allows them to understand the content. Learner-to-learner interaction is when learners share information and knowledge with one another. This type of interaction moves well into collaboration.

Collaboration is also a form of interaction. The difference is collaboration is a process where two or more people work together toward a common goal. Recently in academic arenas collaboration is becoming more common (Tutty & Klein, 2008). Researchers are coming together to work on new ideas, getting feedback and suggestions to better a project, and to share knowledge with others in a field of study. E-learning sites have been able to utilize technological features and come up with tools to help individuals collaborate ideas. Along with chat rooms and message boards, collaboration tools such as 'wiki' pages have recently been implemented as a collaboration tool. A wiki website or page on an e-learning site is used to collaboratively create, edit, link, and organize the content on the page (Lamb, 2004). This type of collaborative tool allows individuals to share knowledge with others and all participants can comment on the material and form new insights. Wiki pages also have the advantage of being typed out so the individuals can see a record of the conversations and even save or print the collaboration for future use.

Additional Expert and Researcher Views

The research to date has been very one-sided. The academic researchers and the mainstream articles have all said that e-learning will be overtaking face-to-face learning in the future. The time frame for when this overtaking will take place has been mixed. Some researchers and experts said we won't see the pendulum swing to e-learning systems until the technology gets a little better (Britt, 2008 and Colle, 2008). Royal Colle (2008) explains that there needs to be a better infrastructure of information and communication technology in all areas (rural and suburban) before e-learning can really take off. Other experts believe that we have begun to see e-learning systems over take face-to-face learning. Kassop (2003) states, "The growth of virtual learning will just continue and we see the desire for these systems in higher education already." When looking at the growth of e-learning systems they are predominate in higher education. Some college courses are taught solely through an e-learning system, and others are called hybrid classes where half the work is done online while the other part is face-to-face. The popularity for these online and hybrid classes is huge in all types of universities (Chute, 2007).

Implications

While few people debate the obvious advantages of e-learning, systematic research is needed to confirm that learners are actually acquiring and using the skills that are being taught online. Future researchers may question why there is a lack of negative research on the topic of e-learning systems. Since there is an abundance of materials stating the positives of e-learning systems and how the researchers believe the takeover is positive and inevitable, this research may be skewed. The researchers that are doing analyses are already in favor of e-learning systems. Future research may be needed to determine the actual feelings on this topic of e-learning systems overtaking face-to-face learning.

Until a more solid research methodology is developed for measuring e-learning results, we can rely on the mainly qualitative feedback from organizations and schools that are using e-learning to deliver education. But with limited arguments for face-to-face learning maintaining the lead in education, we may be on the cusp of being a virtual learning society.

Conclusion

E-learning systems are tools to enhance education in classrooms and organizations. Looking at the differences between face-to-face and e-learning and determining e-learning benefits provides an understanding of how to utilize both techniques. The benefits of e-learning systems also provide a clear understanding of the importance of knowledge management. The connection between e-learning and knowledge management is important and should be applied to the educational setting.

References

Blair, D.C. (2002). Knowledge management: hype, hope, or help? *Journal of the American Society for Information Science and Technology, 53* (12), 1019–1028.

Britt, P. (2008). Employers and educators embrace e-learning. *KM World, April.* Retrieved April 9, 2008 from http://www.kmworld.com/Articles/PrintArticle.aspx?ArticleID=41341.

Chute, E. (2007). Online courses increase in popularity. Pittsburgh Post-Gazette, October. Retrieved April 9, 2008 from http://www.post-gazette.com/pg/07289/825638–298.stm.

Colle, R.D. (2008). Education, development, and the e-world: Is something missing here? *Comparative Education Review. 52* (2), 275- 280.

Huang, H.-M., & Liaw, S.-S. (2004). Guiding distance educators in building web-based instructions. *International Journal of Instructional Media, 3*(2), 125–137.

Kassop, M. (2003). Ten ways online education matches, or surpasses, face-to-face learning. *The Technology Source. May/June,* 1–7.

Lamb, B. (2004). Wide open spaces: Wiki's ready or not. *Educause Review, 39* (5), 36–48

Nichols, M. (2003). A theory for e-learning. *Educational Technology & Society,* 6(2), 1–10

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: New challenges for managers* (pp.13–31). New York: Oxford University Press.

Shaban, S. & Head, C. (2003*).* E-Learning classroom environment: Description, objectives, considerations and example implementation. *International Journal on E-Learning. 2* (3), 29–35.

Strother, J.B. (2002). An assessment of the effectiveness of e-learning in corporate training programs. *The International Review of Research in Open and Distance Learning, 3* (1), 1–17.

Tutty, J.I. & Klein, J.D. (2008). Computer-mediated instruction: A comparison of online and face-to-face collaboration. *Education Technology Research, 56,* 101–124.

Walls, J. (2000). E-learning vs. face-to-face training: And the winner is . . . *Houston Business Journal, August.* Retrieved April 10, 2008 from http://houston.bizjournals.com/houston/stories/2000/08/07/focus8.html.

Zhang, D., & Nunamaker, J. F. (2003). Powering e-learning in the new millennium: An overview of e-learning and enabling technology. *Information Systems Frontiers, 5*(2), 207–218.

Zhang, D., Zhao, J.L., Zhou, L., & Nunamaker, J.F. (2004). Can e-learning replace classroom learning? *Communications of the ACM, 47* (5), p.75–79

Knowledge Codification:
Strategies toward Storing and Capturing Knowledge

Michael G. Hall
Master of Communication and Information Studies

Abstract

Over the past thirty years, more and more organizations have been collecting knowledge, or individual intake from certain targeted employees, in an effort to enrich the general know-how of the entire organization. This process, known as codification, involves a wide variety of steps and can contribute to a company's overall development in enhancing efficiency, while cutting down on costs and time. The following outline will examine some of the steps and processes that go along with knowledge codification, presenting its benefits as well as negatives.

Introduction

Since knowledge generally rests within the minds of knowers it can be difficult to capture its essence through codification. Nevertheless, certain companies across the world have stepped up efforts in codifying, or capturing bits of tacit and explicit knowledge through audible, visual or textual measures, from a select group of experts in the hopes of gaining special insight. Such efforts have led to increases in productivity and efficiency that have proved highly beneficial to its adopters. This paper will examine some of the various tribulations and successes that often go along with codifying knowledge artifacts, paying special attention to the differences between tacit and explicit knowledge, as well as charting some of the different strategies used by companies in developing knowledge reservoirs through codification.

Benefits of Codifying Knowledge

Codifying knowledge, or gathering bits of tacit and explicit knowledge to put into audible, text, or visual format for a particular company to share across a network, can benefit an organization both internally and externally. First, it provides a way to clearly state a company's goals, setting the entire organization on a unified path. Second, it provides a means for expanding intra-company knowledge, providing the possibility for everyone to become a potential expert in a field outside of his or her specialization. And finally, codifying knowledge can clear up any confusion arising from ambiguous definitions, providing a clear resource for employees to turn to as a guide.

The Process of Knowledge Codification

While codifying knowledge into an audible or text document may seem like a simple task, the very fact that it requires willingness by a company to hunt down experts and codify his or her knowledge makes it a rather arduous process. Adding to this component is the primary difficulty that companies share in attempting to codify knowledge without turning newly codified knowledge into less vibrant information or data.

According to Davenport and Prusak (1998), companies should keep the following four principles in mind when looking to codify knowledge successfully:

1. Managers must decide what business goals the codified knowledge will serve (for example, firms whose strategic intent involves getting closer to the customer may choose to codify customary knowledge).

2. Managers must be able to identify knowledge existing in various forms appropriate to reaching those goals.

3. Knowledge managers must evaluate knowledge for usefulness and appropriateness for codification.

4. Codifiers must identify an appropriate medium for codification and distribution (p. 69).

In other words, since it's impossible to codify all knowledge within the company, as it would be "an immense and futile undertaking" (Davenport & Prusak, 1998, p. 69), it's important that managers root out only those areas that would serve most valuable to the company when codified.

Tacit versus Explicit Knowledge

There is a large debate raging among scholars concerning the origin of knowledge. At the heart of this debate lies the fundamental difference between tacit and explicit knowledge.

Tacit knowledge is best described as knowledge which one gains almost exclusively from personal experience and is often difficult to express, while explicit knowledge is defined as knowledge gained from a combination of personal experience and study that can be easily codified. These definitions are at the heart of a debate concerning the origin of knowledge, as highlighted by the conflict between Davenport and Prusak (1998) and Heaton and Bergeron (2006).

Davenport and Prusak (1998), who are the largest proponents of knowledge separation, believe knowledge to be a personalized process, originating in the individual mind, and passed down in the form of codified or audible documents while their counterparts Heaton and Bergeron (2006) view knowledge as originating from a collaborative source. In their own terms, they define the creation and management of knowledge as "essentially an organizational communication process, and one to which communication scholarship can make a valuable contribution" (Heaton & Bergeron 2006 p. 1). This view of knowledge portrays knowledge as more of an action, rather than a "stock of information" (p. 7), making the way one acts or works within a group more important than the concept of internal knowledge. While Davenport and Prusak (1998) separate tacit from explicit knowledge, citing the latter as that which can be codified clearly, Heaton and Bergeron (2006) provide evidence of only one kind of community knowledge.

While cases can be argued for either side, it seems that Davenport and Prusak (1998) win out when it comes to codification, as their understanding of knowledge existing as either tacit or explicit recognizes the difficulties that can arise when attempting to codify one's tacit knowledge. This is a theme that Davenport and Prusak (1998) expand upon many times, and as such will be explored in greater depth in the following section.

Codifying Tacit Knowledge

While the knowledge codification process as outlined by Davenport and Prusak

(1998) provides a framework for companies wishing to codify explicit knowledge, it cannot be applied as effectively for those wishing to capture tacit knowledge. As the richest form of knowledge available, tacit knowledge "incorporates so much accrued and embedded learning that it may be impossible to separate from how an individual person acts" (p. 70). To dramatize this point, Prusak relates a story from his childhood by which he sought to learn how to bat through a book by Ted Williams. After poring over its content multiple times, Prusak discovered that in the end, he was still little better off than he was before he read the book, concluding that tacit knowledge such as hitting "can't be taught by a book" (p. 71). This is further exemplified if one takes into account the example of cooking, as one will never be able to completely master another's recipe, as experienced cooks always seem to wing it with measurements, in an almost subconscious measure.

Despite the difficulties that can arise in codifying tacit knowledge in print, there are other ways to capture one's richness. One such way is to have the person interact directly with others. This can be done via satellite, video conferencing, or mentoring, but is best accomplished when the person is forced to partake in one of the richest forms of communication, face-to-face interaction. Only through these ways can others attempt to understand and gain some of that person's inner knowledge.

Creating a Knowledge Map

One of the primary ways that a company captures knowledge effectively is through the creation of a knowledge map. These maps are little different than task forms, and contain bits and pieces of textually codified knowledge that can be used as a company-wide resource to divide up work.

The process for assembling a knowledge map is a relatively easy procedure, as the steps for creating such a map already exist within the minds of the companies' employees. In revisiting Davenport and Prusak's (1998) four principles, it's important for a company to integrate a knowledge map accordingly by pinpointing the most valued needs of the company. Once this is accomplished, surveys can be drafted up, and interviews can be given to cipher out that particular brand of knowledge. In many cases, especially during interviews, knowledge keepers are likely to point out others who retain similar knowledge creating a virtual snowball effect by adding additional undocumented knowledge keepers.

Microsoft provides one of the best cases in point when it comes to establishing a knowledge map through their application of the SPUD program. With this program, Microsoft's leaders sought to capture employee knowledge in order to better match up workers with certain tasks and work teams. Skills Planning "und" Development, or SPUD, was accomplished by using the following procedural format:

1. Developing a structure of knowledge competency types and levels.
2. Defining knowledge required for particular jobs.
3. Rating the performance of individual employees in particular jobs by knowledge competencies.
4. Implementing the knowledge competencies in an on-line system.
5. Linking the knowledge model to training programs (Davenport & Prusak, 1998, p. 75).

By following this format, Microsoft was able to better divide up its task-oriented programs among its employees.

Thus, as can be seen, the creation of a knowledge map can be very

beneficial when it comes to staying ahead of one's competitors, as it provides a means to divide up work more efficiently, and effectively stay ahead of the competition. .

Codifying Knowledge into a System

One of the miracles of modern technology is that computer-based components, such as expert and artificially intelligent systems, can play a role in codifying knowledge. This is especially true when the particular brand of knowledge is bounded and unambiguous, guided by specific rules and regulations. One such example that comes to mind is patent knowledge. These types of knowledge are often codified already within the system, and if utilized properly can assist in the development of a more efficient knowledge map.

To further clarify this position Davenport and Prusak (1998) cite the example of Monsanto's Knowledge Management Architecture. In this undertaking Monsanto sought to combine the knowledge of more than 30,000 employees, providing the benefits of "a large company (quantity and diversity of knowledge) with that of a small company (accessibility to knowledge)" (Davenport & Prusak, 1998, p. 85). Making the distinction between quantitative and qualitative knowledge, the company sought to separate out the two kinds of knowledge, in order to effectively establish an integrated knowledge sharing system.

In the end, the company was not only able to create a company-wide knowledge based system, but was able to clarify words and definitions such as "customer," "product," and "material," (Davenport & Prusak, 1998, p. 86) without which the company might not have been able to codify its goals clearly. In addition, the company was able to widen its financial knowledge through the inclusion of financial data, previously reserved for those within the financial department, effectively cutting out the middleman and saving employee time and effort.

Thus, as described in the example above, knowledge codification does not necessarily facilitate a company-wide shake up for knowledge, as it is indeed possible to codify knowledge from already existing documents.

Knowledge Codification in Practice

Knowledge codification has been used by a plethora of companies and organizations as a means of improving efficiency and cutting down costs and effort. One such example was found by Argote (1999) who described how the software of a truck assembly plant in Indiana was modified to capture knowledge about how to apply paint with less scrap material (p. 154). Similarly, Argote (1999) analyzed how fast food franchises adapted their tools to capture knowledge about how to produce products more cost-effectively.

Law firms were among the first organizations to reap the benefits of codifying their knowledge through the use of knowledge reservoirs, or places where knowledge artifacts could be stored. This came about when LexisNexis, a popular searchable archive of content from newspapers, magazines, legal documents and other printed sources, published *Shepard's,* a cite checking tool for law firms (Staudt 2003). Prior to the introduction of this resource, lawyers relied upon an antiquated paper-based system of maroon books and legal case filings to get to the heart of certain legal measures. After its introduction more than fourteen years ago, however, research regarding past verdicts, as well as knowledge regarding the law became firmly

integrated and easily accessed on LexisNexis' new program, cutting down a great amount of time and energy, as well as improving firm costs.

As in the example above, Technology Research Inc., or TRI, a leading international provider of market information and industry analysis to information technology vendors and purchasers, adopted an interconnect program similar to that of *Shepard's,* establishing an online reservoir comprising a standard set of executive summaries, abstracts, main text graphics, and tables and charts from past TRI research reports (Zack, 1999, p. 51). This system allowed TRI to integrate analyst's knowledge across research programs, creating new knowledge not possessed by any one analyst (Zack, 1999, p. 52).

In accomplishing this task, TRI employed a two-stage process involving analysis and publishing. In the analysis process, knowledge artifacts were collected, evaluated, interpreted for value and later reported to be used for the publishing stage. In this stage, editors converted the knowledge artifacts to a standardized form, decomposing them into links based upon keywords and identifiers (Zack, 1999, p. 52). This way of assessing and later organizing knowledge based upon keywords and shared concepts proved highly beneficial in providing staff members with a much-valued knowledge reservoir.

Steps toward Building a Knowledge Reservoir

While TRI's example provides a pathway towards the creation of a knowledge reservoir, theirs is not the only means employed by companies when creating a knowledge-storing system. Zack (1999), for example, suggests a multi-pronged process, beginning with knowledge definition and examination. He suggests in this stage that it is important for managers to examine the kinds of knowledge that they want to capture, ranging in category from declarative knowledge, or a shared, explicit way of understanding categories or concepts, procedural knowledge, or knowledge about how something occurs, and causal knowledge, or knowledge about why a certain phenomena occurs (Zack, 1999, p. 46). After this, Zack (1999) suggests acquiring said knowledge, refining it according to structure and content, storing it, distributing it according to content, presentation context and format, and ultimately presenting it to the employees.

Possible Downsides of Knowledge Codification

There are a few downsides associated with codifying a particular organization's knowledge, most notably associated with espionage. While industrial or corporate espionage is uncommon, it is not unfounded, especially among highly competitive companies that may recruit from the outside solely for the purposes of learning a rival's trade or marketing secrets. An example of this can be found in Xerox's Palo Alto Research Center fiasco, which occurred during the mid-1970s. After audibly codifying (though not company-wide) some key elements for a graphical interface computer, including the mouse, graphical icons and menus, their secrets were leaked by a company "plant" employed by Apple, who beat them in developing the home computer, costing Xerox a prime commercial opportunity (Davenport & Prusak, 1999, p. 59).

A more common downside associated with knowledge codification revolves around codifying highly intricate and detailed knowledge. Xerox is again at the forefront of this example, as early codification techniques regarding repair jobs were often met with frustration by employees who found it difficult to accomplish

tasks simply based upon reading text. This improved, however, with the introduction and establishment of Eureka. Under this system, on-site repair representatives recorded tips onto a "pending tips" database (http://choo.fis.utoronto.ca/Macmillan/default.html), thereby seeking to capture and store knowledge as they went along.

Knowledge codification can also lead to a stifling of creativity. Examples of this were highlighted in class lectures, in which we learned how certain PR companies recycled past examples when introducing strategies for other companies, leading to a stale, textbook approach to tackling new projects.

Conclusion

While knowledge codification may indeed have its flaws, it is without a doubt the single best way to improve upon efficiency and goal setting, while cutting down on costs and energy. This process has many implications for companies seeking to reduce wasted time and effort, and as mentioned, can yield a higher productivity rate. It is important for organizational leaders to remember the basics before delving into such an endeavor by pinpointing a specific kind of knowledge to be captured, as well as locating troublesome areas for reform. It is also important for managers and organizational leaders to weigh in on the costs of such a process and recognize some of the risks that can go along with codifying certain sensitive information. Only when all of this has been examined in a thorough manner can the knowledge codification process truly begin.

References

Argote, L., & Ingram, P. (2000). *Knowledge transfer: A basis for competitive advantage in firms. Academic Press, 82* (1) 150–169.

Choo, C. (2001). *Knowledge management in practice: Xerox Eureka.* Retrieved April 22, 2008, from Encyclopedia of Communication and Information Web Site: http://choo.fis.utoronto.ca/Macmillan/default.html.

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

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

Heaton, L., & Bergeron, P. (2005). Knowledge moves: A communication perspective. *University of Montreal.* Accessed April 10, 2008.

Ichijo, K. & Nonaka, I. (2006). *Knowledge creation and management: new challenges for managers.* Oxford: Oxford University Press.

Jones, A. (2002). How do you capture knowledge from email? *Legal Times 19* (1), 69–78.

Staudt, R. (2003). Perspectives on knowledge management in law firms. *LexisNexis.* Accessed April 15, 2008.

Zack, M. H. (1999). Managing codified knowledge. *Sloan Management Review, 40*(4), 45–58.

Instant Messaging as a Knowledge-Sharing Tool

Karen Hanson
Master of Library and Information Science

Abstract

While numerous organizations have adopted instant messaging (IM) to improve communication, success surrounding its introduction has varied to the extent that it cannot be said with any certainty whether IM has a beneficial or detrimental effect. This paper will explore case studies and literature on IM use in the workplace to determine whether there are patterns that could allow an organization to determine whether it would be beneficial to use this tool as part of their knowledge management program.

Introduction

It is recognized that knowledge sharing is the means of survival in a competitive world for organizations of all kinds. While Davenport & Prusak summarize the key to effective knowledge transfer as "hire smart people and let them talk to one another" (2000, p. 88), they also recognize that this is easier said than done. With globalization, work teams in many companies are becoming more dispersed, which adds to the complexity of knowledge sharing. Coinciding with awareness of the importance of knowledge management, however, is the rise of software that allows workers to communicate with people anywhere in the world using their computer. One software tool that may provide part of the solution to improving communication over great distances is instant messaging.

Instant messaging (IM) is "a text-based tool that allows users to conduct conversations online by exchanging short messages in near synchronicity" (Shiu & Lenhart, 2004, p. 1). Common features of IM are: buddy or contact lists, which show who you can contact, who is available; away messages, set by the user to inform others that they are away from their desk; emoticons, small images that can be incorporated into the message to convey a mood; and avatars, images created by users to represent themselves, which may be a photo or any other image (Shiu & Lenhart, 2004). IM has been increasing in use since it was introduced. The Pew Internet & American Life Project Tracking Survey of May-June 2004 found that 42% of internet users have used IM, and 11 million of these (21% of IM users) do so at work (Shiu & Lenhart, 2004) and this is likely to have increased since the research was carried out.

Instant messaging at first appears to be similar to email, and many organizations continue to rely principally on email for collaborative work (Quan-Haase, Cothrel & Wellman, 2005). Subtle differences, however, are increasingly making IM more popular, with email being less synchronous, more prone to spam, and perceived as more formal than IM. The title of Conlin's article trumpets, "e-mail is so five minutes ago," and goes on to state that the NetGens (Internet Generation) are considering it "ovr," "dn" "w/e" (over, done, whatever) (2005). While this may be a premature assertion, studies appear to agree that contrary to expectations, IM is helping create a higher degree of collaboration (Thompson, 2003), as well as allowing workers to manage interruptions in an era where they are estimated to consume approximately 28% of a knowledge worker's day (Spira, 2005).

Instant messaging has also been found to replace certain types of face-to-face interactions or phone calls. These types of interaction, although important in many cases, are found to create more distraction than the more subtle IM tools (Isaacs, Walendowski, Whittaker, Schiano & Kamm, 2002). By providing a much-needed compromise between the high level of interruption caused by phone calls and face-to-face interactions and the formality and relatively lower synchronicity of email, IM is in a good position to form an extremely useful collaboration tool for knowledge organizations. Secondary features such as presence awareness have proven highly valuable (Cameron & Webster, 2005; Shiu & Lenhart, 2004; Quan-Haase et al., 2005; Thompson, 2003).

Knowledge Management Theory and Instant Messaging

As a potential tool for improving communication within an organization, IM has received much attention from the knowledge management field. The ultimate goal of knowledge management is to increase the "useful knowledge within the organization," which can be accomplished in three general ways: "encouraging communication, offering opportunities to learn, and promoting and sharing of appropriate knowledge artifacts" (McInerney, 2002, p. 1014). Davenport and Prusak say, "Spontaneous, unstructured knowledge transfer is vital to a firm's success" (p. 89) particularly when it comes to knowledge-creating organizations (2000). The water cooler, cafeteria, or hallway are seen to be good places for these spontaneous conversations that are said to be a key part of knowledge transfer (Davenport & Prusak, 2000) and this type of exchange is the first casualty for geographically distributed workers. IM may fill the gap that remote workers experience in terms of the loss of spontaneous knowledge sharing and collaboration (Thompson, 2003), while also creating additional channels of communication for workers existing in the same building (Quan-Haasee, Cothrel & Welman, 2005). Furthermore, Heaton & Taylor refer to the concept of "constructing bridges" between knowledge communities, where the more bridges that are built the more knowledge can move between knowledge communities (2002). In this theory, building bridges is not restricted to a single department, but includes bridges between departments, between branches and with clients. IM may potentially provide an additional bridge-building mechanism in addition to the random chance meetings that may occur in face-to-face situations.

There is, however, a major drawback to remote communication via IM, and that is the loss in "richness" of the means of communication compared to face-to-face. Hung, Huang, Yen & Chang describe "media richness theory" (MRT) as a "media's ability to change a recipient's understanding within a given amount of time" with rich information leading to a quicker change in understanding than lean information (2007). Leaner mediums for communication have fewer cues such as expressions, gestures, and tones to help convey the meaning behind what is being said (Hung et al., 2007). Though use of IM has been adapted to incorporate some expression (emoticons, avatars) it still pales in comparison to the richness of face-to-face interactions. IM, therefore, may not be suitable for transferring more complex knowledge (Quan-Haase et al, 2005).

Case Studies / Literature

Much of the IM literature to date has focused on high-tech companies. This is no surprise, since the employees of these companies are generally more technologically literate and more likely to spend much of their time at a computer. A report by Herbsleb, Atkins, Boyer, Handal & Finold looked at their experiences while introducing IM into a high-tech company with geographically distributed work groups (2002). Some issues were encountered, such as privacy concerns, and individual views on the importance of informal communication. The paper provides lessons learned, such as the need to be able to configure contacts, training as groups so that employees can practice using the software with others, and the need for critical mass where enough people must be using the software at once for it to be of use.

Isaacs et al., while still looking at the introduction of IM into a high-tech company (AT&T), focused more on the way the IM software was used (2002). They discovered there was a wide range in levels of use (heavy to light use) and that people tended to develop regular IM partners. Contrary to the concern of many employers, Isaacs et al. found that the primary use of IM was to talk about or carry out work. Many users multitasked while IMing. The study also found that IM was used for both simple questions and more complex interactions, as well as to schedule face-to-face or phone meetings.

Several key features of this study were found in other studies: that IM was used mainly to carry out work (Cho, Trier & Kim, 2005), was performed while multitasking (Cameron & Webster, 2005; Shiu & Lenhart, 2004), and was used for quick answers to simple questions (Cameron & Webster, 2005; Quan-Haase et al., 2005; Thompson, 2003). This pattern applied even in the few studies that made no distinction of the types of companies people were working for in their survey (Shiu & Lenhart, 2004).

A key theme in many of the case studies was interruption management, with some studies finding that its interruptive nature was unfair (Cameron & Webster, 2004) or asserting that "the ease with which users can initiate and participate in online conversations contributes to an increase in task interruption" (Garett & Danziger, 2007), while others found IM useful for handling interruptions through the ability to avoid more disruptive face-to-face or telephone interactions, and negotiate when colleagues are available thus avoiding telephone tag (Nardi, Whittaker, and Bradner, 2000).

Another factor cited as important in many of the studies was presence awareness. The ability to see when people were online had obvious uses such as knowing when someone was contactable, to more subtle advantages such as building a feeling of community simply by knowing people were around (Cameron & Webster, 2005; Quan-Haase et al., 2005; Shiu & Lenhart, 2004; Thompson, 2003).

Discussion of Case Study Findings

The majority of the case studies found the introduction of IM to be a successful venture overall. Where major problems existed, it appeared to be more to do with initial technical problems (Herbsleb et. al., 2002), or lingering questions over whether the new medium's ability to create another channel for interruptions was more harmful than helpful (Cameron & Webster, 2004; Garett & Danziger, 2007).

Organizations in Which IM Is Useful. While many of the studies have focused on

high-tech companies, those that have focused on other environments show that IM can be useful for encouraging knowledge sharing and a general sense of community in a broad range of organizations. Studies have shown IM to be useful in manufacturing companies (Cho et al., 2005), geographically distributed companies (Thompson, 2003; Cho et al., 2005), single site companies (Quan-Haase et al., 2005), high-tech companies (Cameron & Webster, 2005; Herbsleb et al., 2002; Isaacs et al., 2002; Quan-Haase et al.), insurance companies (Thompson, 2003) and investment banks (Conlin, 2005; Deckmyn, 1999). It has also been useful for all kinds of employees: managers (Whittaker & Bradner, 2000), software developers (Quan-Haase, 2005), tech support (Isaacs et al., 2002), secretaries (Whittaker & Bradner, 2000), and traders (Conlin, 2005; Deckmyn, 1999). The primary factor in determining whether IM will be useful, therefore, appears to be whether a significant proportion of the employees spend a lot of time on the computer connected to the Internet.

What Makes IM in the Workplace Successful? Why has IM been a successful tool in such a broad range of environments? The studies suggest a number of reasons. First, it allows employees to maintain and improve working relationships within departments, between departments, and even with clients regardless of physical proximity (Cho, Trier & Kim, 2005). While several studies found that these relationships are generally pre-existing, there is still a great deal of benefit in sustaining positive relationships with colleagues, to create a stronger team (Cho et al. 2005). With the ability to add new contacts, it also allows a channel for sustaining a relationship with new acquaintances. Creating and maintaining such "bridges," as Heaton & Taylor call them, fulfils one of the primary criteria for successful knowledge sharing (2002).

Another common finding among the studies is the usefulness of the presence awareness feature of IM. Presence awareness allows you to know who is available, and who may be around to help, thus saving employees time trying to hunt people down or leaving multiple messages (Cameron & Webster, 2005; Shiu & Lenhart, 2004; Quan-Haase et al., 2005; Thompson, 2003). Presence awareness therefore allows employees to avoid the familiar office game of telephone tag. To add to the richness of this awareness feature, many IM systems allow users to configure an "away message," which gives other users information about a person's whereabouts. This can indicate whether a person is in the office that day, but has, for example, gone to lunch, or is in a meeting. Two studies referred to the feeling of connectivity, or social connection, that a remote worker can experience by seeing that others are available (To, Liao, Chiang, Shih, & Chang, 2008; Whittaker & Bradner, 2000).

Due to the much-talked-about concept of information overload, and the existing problems with managing huge email accounts, some studies expressed initial concern about introducing another potential for distraction to the workplace. In most cases, this was found to be contrary to actual experiences with IM. In many cases, interruptions were reduced, as people could use the less invasive IM to see if someone was available rather than fully distracting by calling them or approaching them face to face. Use of away messages could also provide information to people about a colleague's current status so that some unimportant interactions could be avoided altogether. All in all, most studies found the ability of workers to select more appropriate times for contacting people actually allowed employees to manage

interruptions to some degree (Thompson, 2003; Garrett & Danziger, 2007). In one article, Spira, the chief analyst of Basex, actually recommended IM for helping manage interruptions (2005).

The perception of IM as an informal tool played a large role in how it was used. Its reputation of popularity among teens and being used to keep in contact with friends and relatives provides symbolic cues as to the way in which IM should be used. A few studies commented on this effect, noting that IM communication rarely took place up the company hierarchy, or with clients. In these cases, email was the preferred tool since it was perceived as more formal (Cho et al., 2005; Quan-Haase, 2005). This informality is also useful for speeding up communication, however, since none of the usual formalities that are used in face to face or telephone conversations ("hi, how are you" . . . etc) were seen as necessary for IM.

The studies discussed the types of conversations that took place via IM. Two conversation types that were mentioned in almost all studies were quick question and answer conversations (Cameron & Webster, 2005; Isaacs et al., 2002; Quan-Haase, 2005; Thompson, 2003), and arranging spontaneous face-to-face or telephone conversations (Cho et al., 2005; Isaacs et al., 2002; Quan-Haase, 2005). Either of these conversation types has positive implications for creating situations for knowledge sharing.

Other uses of IM were also cited by various studies including: use as a sticky note, so a colleague could see a message when they returned to their desk (Isaacs et al., 2002); for private conversations in an open plan office (Cameron & Webster, 2005); for more complex discussions (Isaacs et al., 2002); or to check in with family members (Garrett & Danziger, 2007).

What Are Potential Problems/Barriers to IM Introduction? The consensus of almost all studies is that the positive aspects of IM outweigh the negative. 11% of IM users at work say they couldn't live without it; 68% say it's a mixed blessing, mostly positive; 4% say it is a mixed blessing, mostly negative; and 10% wish they could get rid of it (Shiu & Lenhart, 2004). It is, however, important to be aware of potential issues. First, the perception of IM as an informal tool can work against adoption of use (Cho et al., 2005), with 32% saying it encourages gossip (Shiu & Lenhart, 2004). This could be partly a subjective view that can be mostly eliminated by a culture promoting its professional use.

While knowledge managers can do much to promote the use of IM through training, and possibly incentives, organizations should try to avoid specific enforcement by management (Cameron & Webster, 2005; Herbsleb et al., 2002). The presence awareness feature can make some users concerned about it being used for monitoring by managers and cite privacy issues (Quan-Haase et al., 2005). Also, one study mentioned that being unable to control presence signals may breach privacy laws in some countries (Herbsleb et al., 2002).

The reluctance to communicate outside of familiar social loops may present a barrier to knowledge sharing. When people need help, they are likely to turn first to colleagues that they are closest to socially, even though they may not be the best resource available. This social tendency is also reflected in IM interactions (Cho et al., 2005). One way to attempt to encourage people to communicate beyond their immediate social circle would be, for example, to include IM names on a "yellow pages" web site that makes finding appropriate experts easier. The organization would then have to develop a culture that encourages this kind of communication.

There is still some question as to the level of interruption caused by IM. Fried, for example, points out that humans are not very good at multitasking, and so IM interruptions can be counterproductive (2005). The real-time nature of IM makes users feel more compelled to respond quickly to messages, unlike email which can be left for a while before responding (Quan-Haase, 2005). This urgency is reflected in the Pew Internet & American Life Project statistics which says 29% of users find IM distracting, and 11% saying it adds stress to their day (Shiu & Lenhart, 2004). In particular, the opening of this channel of communication raises issues for those employees that tend to get asked a lot of questions. Certain people may be overwhelmed as key experts, and so this issue will have to be managed; interruptions are convenient for the interrupter, but not for the interrupted (Spira, 2005).

How Can an Organization Improve Its Chances of a Successful IM Program?

From the studies it appears that successful integration depends less on the type of company, and more on the way it is introduced. Thompson, in discussing the highly successful use of IM in the St. Paul Companies, attributes successful integration to "using it within virtual business communities, which are a closed, trusted group of colleagues who are dedicated to achieving a clearly defined, shared business purpose" (2003, p. 16). The emphasis in Thompson's view is on the creation of a shared defined goal among the community so that everyone has the same agenda. This reflects Nonaka and Toyama's theory of creating a shared "knowledge vision" that, "inspires the intellectual passion of the organization's members so that they are encouraged to create knowledge" (2007, p.18).

Herbsleb et al. refer to two different groups in their study, one in which IM use was enforced, and another where it was voluntary (2002). The group in which use was enforced was suspicious that it was being used for surveillance by management. The second group developed several supporters of IM who convinced others of its benefits. While enforcing use resulted in more people signing on each day, it caused distrust towards management, which in turn can affect knowledge sharing (Davenport & Prusak, 1998). St. Paul Companies, for example, ran a highly successful IM program by encouraging but not mandating its use, and allowing its use to be driven by business needs (Thompson, 2003).

Another key factor in the success of introducing IM is ensuring that critical mass is reached (Herbsleb et.al., 2002; Cameron & Webster, 2005). This means ensuring enough users log on frequently to make the system useful. Critical mass must be achieved fairly quickly to avoid a number of users logging on a few times, finding no one available, and then never returning. Herbsleb suggests training groups of people, so that they can try it out with other people in the training session.

The ability to configure buddy groups is important, as employees may want control over the groups they are visible to in order to avoid low-priority interruptions or unnecessary communications (Herbsleb et al., 2002). One solution is for employees to have the ability to download entire staff buddy lists that can be configured as required (Quan-Haase et al., 2005; Cho et al., 2005). These downloadable lists can also help with achieving critical mass, since users won't have to work to populate their lists before they can use the system.

Conclusion

"In the global race for innovation, it's not as much about leveraging what's inside

your factories' machines as what's in your employees' heads," (Conlin, 2005). Knowledge creation is most effective when the individual expertise of each employee in an organization is made accessible to those who need it. In a globalizing world, the minds that must work together are increasingly likely to be geographically distant from one another. While computers have long played a role as a repository of information that can be made sharable, current trends of software development focus on ways to make software more social and remote work more collaborative. Over the last few decades, computers have evolved to play a huge role in communicating with others. As a tool that provides an alternative channel of communication with different, though not necessarily superior, features to the more established forms (email, telephone and face-to-face), it appears that IM is already on the path to obtaining a position among these other tools. The fact that approximately 42% of Internet users in the USA are already using IM (Shieu & Lenhart, 2004) suggests that many see a place for IM as a form of communication that is different from others available. Contrary to the concern that IM is primarily an informal tool, the studies have shown that it is a useful means of communicating in all kinds of organizations, and can contribute to more effective knowledge sharing. Provided a significant proportion of employees spend much of their time at a computer, the successful introduction of IM depends more on how it is integrated than on the type of organization. By introducing an IM program under the appropriate conditions, an organization could give itself the competitive edge that it needs to evolve in a fast-moving world.

References

Cameron, A. F. (2005, January). Unintended consequences of emerging communication technologies: Instant messaging in the workplace. *Computers in Human Behavior, 21*(1), 85–103.

Cho, H.-K., Trier, M., & Kim, E. (2005). The use of instant messaging in working relationship development: A case study. *Journal of Computer-Mediated Communication, 10*(4), article 17. Retrieved April 20, 2008 from http://jcmc.indiana.edu/v0110/issue4/cho.html.

Conlin, M. (2005, November). E-mail is so five minutes ago. *Business Week,* 3961. Retrieved April 20, 2008 from Ebscohost database.

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

Deckmyn, D. (1999, July 13). Instant messaging: Valuable tool or distraction? *Computerworld.* Retrieved April 24, 2008 from http://www.cnn.com/TECH/computing/9907/13/instmess.idg/.

Fried, I. (2005, December 5). Driven to distraction by technology. *News.com.* Retrieved April 24, 2008 from http://www.news.com/2102–1022_3–5797028.html.

Garrett, R. K., & Danziger, J. N. (2007). IM=Interruption management? Instant messaging and disruption in the workplace. *Journal of Computer-Mediated Communication, 13*(1), article 2. Retrieved April 24, 2008 from http://jcmc.indiana.edu/v0113/issue1/garrett.html.

Heaton, L., & Taylor, J. R. (2002, November). Knowledge management and professional work: A communication perspective on the knowledge-based

organization. *Management Communication Quarterly, 16*(2), 210–236.
Herbsleb, J. D., Atkins, D. L., Boyer, D. G., Handal, M., & Finhold, T. A. (2002) Introducing instant messaging and chat in the workplace. *Proceedings of the SIGCHI conference on Human factors in computing systems: Changing our world, changing ourselves,* 171–178. Retrieved April 20, 2008 from ACM Portal database.
Hung, S., Huang, A. H., Yen, D. C., & Chang, C. (2007, September). Comparing the task effectiveness of instant messaging and electronic mail for geographically dispersed teams in Taiwan. *Computer Standards and Interfaces, 29*(6), 626–634. Retrieved April 20, 2008 from Engineering Village database.
Isaacs, E., Walendowski, A., Whittaker, S., Schiano, & D. J., Kamm, C. (2002). The character, functions, and styles of instant messaging in the workplace. *Proceedings of the 2002 ACM conference on Computer supported cooperative work,* 11–12. Retrieved April 20, 2008 from ACM Portal database.
Marwick, a.d. (2001). Knowledge management technology. *IBM Systems Journal, 40*(4), 814–830. Retrieved April 24, 2008 from http://www.research.ibm.com/journal/sj/404/marwick.html.
McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science and Technology, 53*(12), 1009–1018.
Nardi, B. A., Whittaker, S., & Bradner, E. (2000). Interaction and outeraction: Instant messaging in action. *CSCW '00: Proceedings of the 2000 ACM Conference on Computer Supported Cooperative Work* (pp. 79–88). Philadelphia. Retrieved April 24, 2008 from ACM Portal database.
Nonaka, I., & Toyama, R. (2007). Why do firms differ? The theory of the knowledge-creating firm. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers.* (pp. 13–31). Oxford: Oxford University Press.
Prusak, L., & Weiss, L. (2007). Knowledge in organizational settings. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management : New challenges for managers.* (pp. 32–43). Oxford: Oxford University Press.
Quan-Haase, A., Cothrel, J., and Wellman, B. (2005). Instant messaging for collaboration: A case study of a high-tech firm. *Journal of Computer-Mediated Communication, 10*(4), article 13. Retrieved April 20, 2008 from http://jcmc.indiana.edu/v0110/issue4/quan-haase.html.
Shiu, E., & Lenhart, A. (2004, September 1). How Americans use instant messaging. *Pew / Internet: Pew Internet & American Life Project.* Retrieved April 20, 2008 from http://www.pewinternet.org/PPF/r/133/report_display.asp.
Spira, J. B. (2005, September 1). The high cost of interruptions. *KM World.* Retrieved April 24, 2008 from http://www.kmworld.com/Articles/News/News-Analysis/The-high-cost-of-interruptions-14543.aspx.
Thompson, E. (2003, September/October). Expertise is one click away with instant messaging. *KM Review, 6*(4), 16.
To, P., Liao, C., Chiang, J.C., Shih, M., & Chang, C. . (2008, March). An empirical investigation of the factors affecting the adoption of instant messaging in organizations. *Computer Standards & Interfaces. 30*(3), 148–56. Retrieved April 20, 2008 from Engineering Village database.

Knowledge Management and the Nonprofit Sector

Timothy Horras
Master of Library and Information Science

Abstract

While Knowledge Management (KM) techniques have mainly been applied to business organizations, there is a great deal which the insights of KM have to offer the nonprofit sector. This paper delineates how KM can be better integrated into a comprehensive nonprofit strategy, and suggests that further dialogue between the KM discipline and the nonprofit sector would be beneficial to both fields.

Introduction

Knowledge management (KM) is a set of practices which emerged from an analysis of corporations and other for-profit firms. However, KM is a paradigm or method which can be applied to any organization. Literature on the nonprofit sector has begun to talk more about KM as part of the "beginning of its reform journey" (Light, 2000, p. 4). However, there is still a great deal which a synthesis of the most current research on KM and the experiences of the nonprofit sector could provide. Capozzi (2003) found that while KM is seen as vital among executives in the nonprofit field, few of these executives had considered applying KM strategically. This shows just how much room for improvement exists in regards to KM and the nonprofit field. The purpose of this paper is to point in the direction of a more comprehensive application of KM techniques in the nonprofit sector, and to make the call for future research and collaboration between those in the KM discipline and the nonprofit sector. But before we begin to work toward this synthesis, we must first take stock of the current state of the actually-existing nonprofit sector.

Overview: The Nonprofit Sector Today

In 2006, there were nearly 2 million not-for-profit organizations operating in the United States (The Independent Sector [IS], 2007). This figure does not include smaller organizations with less than $5,000 in annual revenues, which are not required to register with the IRS. No doubt if these organizations were counted, the number of nonprofits would be exponentially greater.

The nonprofit sector constitutes a diverse array of organizations, including "private country clubs, labor unions, business associations, fraternal organizations . . . hospitals, museums, private schools, religious congregations, orchestras, public television and radio stations, soup kitchens, and foundations" (IS, 2007). In fact, a historian writing about the rise of the nonprofit sector explained that "no other nation has depended so heavily as has the United States on private nonprofit organizations for performing so many public activities" (Hall, 1987, p. 3). In many industrialized societies, by way of contrast, the sorts of services provided in the US by nonprofits are provided through government social programs. The incredible diversity of the nonprofit sector could be explained by the idea that the "nonprofit organizations is neither in the profit sector nor in the public sector but sits somewhere between the two" (Wolf, 1999, p. 20). This means that the nonprofit is neither a business nor a governmental organization. Of course, this opens up a whole range of organizations, all of which present unique management challenges.

This is not to say that certain generally applicable characteristics shared by

most nonprofits can be understood abstractly. Nonprofits are increasingly coming under pressure to gain financial independence and increase self-generated funding. This has become more and more important due to the general trend of a decrease in government funding to nonprofits (Andreasen, Goodstein, & Wilson, 2005). This has been concomitant with an adoption of corporate management approaches and strategies in the sector. Light (2000) puts it succinctly in his pamphlet *Making Nonprofits Work:* "The nonprofit sector has never been under greater pressure to improve" (p. v). Light enumerates the following reasons: expanding missions, increased competition over more limited funding, and the perception of the sector as being inefficient and wasteful. Light also identifies this trend toward nonprofit reform as running parallel to reform impulses in other sectors such as the "tides of reform" which have buffeted corporations and governmental agencies (p. 2).

In an era of decreasing government funding for nonprofits, nonprofits must possess a willingness to adapt. Andreasen, Goodstein and Wilson (2005) point to the paucity of government funding, but also emphasize competition from "private sector challengers in domains such as education and health care" (p. 47). Capozzi points out that the value of many nonprofit endowments has been cut by 20 to 30 percent over the past few years (2003). In this context, knowledge management is an essential component to increasing the competitive advantage of nonprofits. In fact, Teece (1998) claims that "knowledge sharing itself can often be the basis of competitive advantage" (p. 60). It seems clear that the nonprofit sector can use KM insights to be better prepared for the current global environment. However, this does not necessarily mean that all nonprofits are willing to accept KM unequivocally.

Light points to four ideologies or traditions in organizational reform which have been taken up by the nonprofit sector (with greater or lesser degrees of alacrity): 1) scientific management and best practices, 2) metrics and outcome-based measurement, 3) the "war on waste" and implementation of cost-saving techniques, and 4) transparency to public scrutiny as a means of self-disciplining (2000). This reform impulse contends with a traditional resistance to private-sector techniques such as marketing. As Andreasen, Goodstein & Wilson (2005) point out, "the nonprofit and private sectors [have] significantly different cultures due to the different . . . challenges they face" (p. 51). Any application of KM techniques must take into account the inherent differences of every organizational culture. However, there is real potential to move forward with knowledge management and "create a culture that values the creation, sharing, and use of knowledge" (Davenport & Prusak, 2000, p. xii).

The first step to applying KM techniques to the nonprofit field is to understand the similarities and differences between the two types of organizations. Under US law, nonprofits essentially act as tax-exempt corporations. Indeed while ostensibly these two types of organizations are very different, they in fact share many attributes, including (as mandated by federal law) a powerful board of trustees. These boards, which function similarly to many corporate boards, have six main responsibilities: determining the nonprofit's mission and setting policy, long range and year-to-year planning for the organization's future, establishing budgetary policies, provide resources (through either contributions or fundraising efforts), select a chief executive, and link the organization to the community (Wolf, 1999). According to Davenport & Prusak, senior management support is one of the key factors contributing to the success or failure of a KM project (2000). It follows that getting buy-in for a KM project from senior management and major stakeholders is

important regardless of whether the project is introduced into a for-profit or nonprofit setting.

However there are differences between the two types of organizations which can have an effect on the attempt to create a knowledge-friendly culture. Factors such as risk-taking and decision-making culture in nonprofits can make KM implementation very different than a similar endeavor in a for-profit corporation. Andreasen, Goodstein & Wilson (2005) specifically describe the following characteristics of nonprofits: "nonprofits often make decisions by committee, through extensive discussion, and by seeking, where possible, not to upset key stakeholders. This is accompanied by limited risk-taking" (p. 52). All of these factors must be kept in mind as we approach KM within nonprofits.

What Can Knowledge Management Offer the Nonprofit Sector?

So how can the nonprofit sector create such a knowledge-friendly culture? Davenport & Prusak (2000) claim that "the most important factor in establishing a positive knowledge culture is the type of people that a firm attracts and hires" (p. 154). However, there are two major differences which have the potential to mitigate (or at least alter) the validity of this statement. Firstly, nonprofits often rely heavily on volunteers. In 503(c)(3) organizations, volunteers constitute the equivalent of 4.7 million full-time employees, which is ⅓ of the total workforce in the nonprofit sector (IS, 2007). Due to their unpaid status, volunteers can be harder to manage, depending on the context. Further research into the role of volunteers in the knowledge creation process should be undertaken, as well as research on how to recruit more capable, competent volunteers for nonprofits. Secondly, even for those paid full-time employees, nonprofit staff usually have very different motivations than their counterparts in the for-profit world. Nonprofit employees typically are remunerated at a much lower level than their for-profit counterparts, they often have different ideas of what 'success' means within a career context, and they are more likely to be involved with the organization for ideological rather than financial reasons (Andreasen, Goodstein, & Wilson, 2005). Differences in staffing between nonprofits and for-profit corporations must factor into any attempt to introduce KM techniques into a nonprofit.

However there are many other suggestions and models which KM can offer which may be of use. Prusak & Weiss point to the many examples of "how knowledge management interventions led to successful outcomes," specifically mentioning Steve Denning's successful KM projects with the World Bank (p. 34). These examples and many others show that KM projects can have practical applications for organizations, and nonprofits should be no different in this regard. Capozzi (2003) even goes so far as to suggest that a KM project implemented by the Annie E. Casey Foundation (*see below*) might have saved "thousands of dollars across the organization" (p. 91). KM thus seems to make sense for nonprofits simply in terms of dollars and cents.

Implementation: Bringing Knowledge Management to Nonprofits

Assuming acceptance on the part of senior management of a comprehensive KM initiative, the next question becomes how to best implement a KM project. Fortunately there has already been some study of successful KM implementation in the nonprofit industry.

An excellent case study of the introduction of a comprehensive KM strategy at a nonprofit can be found in the example of the Annie E. Casey Foundation. According to its website, the Casey Foundation is one of the largest private foundations in the US, with over $3 billion in assets, and providing around $190 million in grants every year (2007). The Casey Foundation focuses its efforts on helping disadvantaged children and their families through programs which deal with health, juvenile justice reform, education, etc.

In the early 2000s, efforts were made to deal with two major knowledge problems which had begun to affect the Casey Foundation: 1) new staff did not have an adequate understanding of the Foundation's best practices, and 2) the already-existing knowledge was not being managed and was being threatened with diminishing (Capozzi, 2003). The Casey Foundation, realizing the negative affects which these trends were having on the organization, proceeded with a comprehensive KM project to revitalize the organization.

Enright details the five steps which were undertaken at the Foundation in order to better allow the nonprofit to better 'know what it knows,' use existing knowledge more efficiently, and acquire and use new knowledge. This strategy included conducting surveys within the organization, coupled with interviews of colleagues in other nonprofits and foundations, which allowed staff to "test and refine the taxonomy development process and learn how to conduct audits of knowledge resources within a program or knowledge area" (Enright, 2005, p. 5).

Much of the process of implementing strategic KM in a nonprofit is likely to be similar to its counterparts in the for-profit world. Davenport & Prusak list the nine factors leading to a successful KM project as follows: 1) knowledge-oriented or knowledge-friendly culture, 2) technical and organizational infrastructure, 3) senior management support, 4) a link to economics or industry value, 5) a modicum of process orientation, 6) clarity of vision and language, 7) nontrivial motivational aids, 8) some level of knowledge structure, 9) multiple channels for knowledge transfer (2000). The experiences of the Casey Foundation in implementing their KM project confirm many if not all of these factors operate identically to their corporate counterparts; Enright (2005) relates to us that the Casey Foundation learned that a "successful KM strategy requires culture change in the organization and buy-in from senior leadership" (p. 5). The lessons learned from the project are ongoing and the Foundation's strategy continues to evolve.

Conclusion

The experience of the Casey Foundation proves that 1) a successful KM project can be implemented in a nonprofit, and 2) many of the steps which lead to a successful KM project in the business sector are similar or identical to those required in the nonprofit sector. However, there exist gaps in our understanding of applying KM to nonprofits. There exist a number of potential future research projects could help to fill these lacunae.

More empirical studies of KM projects implemented at nonprofits and empirical studies with a more comprehensive and in-depth approach to the effects of KM implementation would be a welcome addition to the literature. Further study which would highlight how the uniqueness of nonprofit staffing could help or hinder the creation of a knowledge-friendly culture would provide great benefits. Finally, it would be useful to study how the risk-averse and compromise-based culture of nonprofits creates a different knowledge culture than that found in the private sector.

Most importantly, as nonprofits continue to face challenges of decreased public spending and competition from for-profit interlopers in formerly sacrosanct segments of society (health care, education, etc.), studying the insights which knowledge management can provide will prove to be essential to surviving and thriving in the 21st century.

References

Andreasen, A. R., Goodstein, R. C., & Wilson, J. W. (2005). Transferring "marketing knowledge" to the nonprofit sector. *California Management Review, 47*(4), 46–67.

The Annie E. Casey Foundation. (2007). "About the Annie E. Casey Foundation." http://www.aecf.org/~/media/PublicationFiles/aboutcasey_new_1%2016%2008.pdf

Capozzi, M. M., Lowell, S. M., & Silverman, L. (2003). Knowledge management comes to philanthropy. *McKinsey Quarterly Special Edition Issue 2,* 89–91.

Enright, K. (2005). Five steps to a foundationwide KM strategy at the Annie E. Casey Foundation. *KM Review, 7*(6), 5.

Hall, P. D. (1987). A historical overview of the private nonprofit sector. In W. W. Powell (Ed.), *The nonprofit sector: A research handbook.* (pp. 3–21). New Haven, CT: Yale University Press.

The Independent Sector. (2007). Facts & figures about charitable organizations. Retrieved April 18, 2008. http://www.independentsector.org/programs/research/Charitable_Fact_Sheet.pdf

Iverson, J. and Burkhart, P. (2007). Managing electronic documents and work flows: Enterprise content management in nonprofit organizations. *Nonprofit Management & Leadership, 17*(4), 403–419.

Light, P. C. (2000). *Making nonprofits work: A report on the tides of nonprofit management reform.* Washington, D.C.: The Aspen Institute; Brookings Institution Press.

Loftis, L. (2008). Follow the yellow brick road. *DM Review,* April 2008. 8.

Prusak, L. & Weiss, L. (2007). Knowledge in organizational settings: How organizations generate, disseminate, and use knowledge for their competitive advantage. In Ichijo, K. & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers.* (pp. 32–43). New York: Oxford University Press.

Stoecker, R. The research practices and needs of non-profit organizations in an urban center. *Journal of Sociology & Social Welfare, 34*(4*),* 97–119.

Teece, D. J. (1998). Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California Management Review 40*(3), 55–79.

Wolf, T. (1999). *Managing a nonprofit organization in the twenty-first century.* New York: Simon & Schuster.

The Importance of Social Capital from the Perspective of Knowledge Management

Laura A. Mannix
Master of Communication and Information Studies

Abstract

In the rapidly changing environment that characterizes today's marketplace, organizations are consistently searching for ways in which they can obtain a competitive advantage over other firms. One such source of competitive advantage is knowledge. As the economy continues to move towards information-based products and services, organizations are faced with the challenge of both understanding and effectively utilizing their intellectual assets. As a response to this challenge, many organizations have begun to implement Knowledge Management (KM) programs. KM initiatives encompass a variety of components, one of which is social capital. The purpose of this paper is to introduce the conceptual framework behind KM, and demonstrate the role and importance that social capital plays in relation to KM.

Introduction

As the implementation of KM programs become more prevalent in today's organizations, it is imperative that firms not only understand the technological aspects required to support the initiative, but the cultural aspects as well. Often, the technology that supports KM is emphasized to the detriment of the cultural and social aspects. While technology is a useful tool in KM, the creation and sharing of knowledge is driven primarily by social interaction among employees, and it is the creation and sharing of knowledge that helps to provide a competitive advantage to the firm. As such, it is one area to which organizations should pay particular attention. The notion of developing social capital within and between organizations addresses the cultural aspect of KM and provides useful insight as to how firms can create an organizational culture supportive of KM.

What Is Knowledge Management?

Before the topic of social capital can be introduced, it is necessary for one to gain a firm understanding of KM, and what it is meant by the phrase. To begin the discussion of KM, it is important to explicate the term "knowledge." For the purpose of this paper, the characteristics of knowledge are different than those of data or information. Data, as Davenport and Prusak (1998) indicate, are objective, distinct facts about events. For instance, data would include transactional details, such as a quantity purchased or the cost of an item. Information on the other hand is meant to influence the way a recipient perceives something. It is meant to affect both judgment and behavior (Davenport & Prusak, 1998). Essentially, information is data that has been arranged for a specific purpose (Blair, 2002). On the other hand, Davenport and Prusak (1998) assert that:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational

routines, processes, practices, and norms (p. 5).

As can be inferred from the above definition, knowledge is a more complex and abstract concept than either data or information. It is not something tangible that can be exchanged or possessed in the same way that data or information may (Blair, 2002). However, knowledge holds many important benefits for organizations. As Peter Drucker explains, "knowledge has become the key economic resource and the dominant—and perhaps even the only—source of comparative advantage" (as cited in Ruggles, 1998, 80). For this reason, firms are looking for ways to enrich and leverage that knowledge present within their organizations. It is why many organizations now see the value in KM, and have moved towards the implementation of such programs. Ruggles (1998) argues that "Knowledge management is more than a sales pitch. It is an approach to adding or creating value by more actively leveraging the know-how, experience, and judgment resident within and, in many cases, outside of an organization" (p. 80). Blair (2002) further posits that KM typically involves two levels. The first level deals with managing supporting data and information. The second level involves the management of individuals with specific expertise.

How do organizations use KM to leverage the expertise of its employees? Since knowledge cannot be easily separated from the individuals who encompass it, organizations need to encourage the sharing of information between parties (Blair, 2002). This transfer of knowledge can be accomplished through interpersonal interactions among employees. However, in order for such interaction to occur, an organization must establish the right kind of culture and provide the necessary resources to employees. This is where the notion of social capital comes into play. It is social capital that provides the infrastructure through which knowledge can be created and shared (Cohen, 2007). Without it, KM initiatives would surely flounder, and yet it is often one of the most overlooked aspects of KM.

Social Capital

As Putnam (1993) describes it, social capital refers to "features of the social organization, such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit" (p. 35). Social capital has also been described as "the value that results from the intangible resources found in personal relationships" (Büchel, 46). It has been argued that through membership in a specific network, and from the interpersonal relationships that form and the repeated interactions that occur, the potential for knowledge sharing by network members is produced (Inkpen & Tsang, 2005). To clarify, a network is defined as "a set of nodes and the set of ties representing some relationship, or lack of relationship, between the nodes. In the case of social networks, the nodes represent actors" (Brass, 2003, 285–286).

This paper will specifically examine social capital and its three dimensions in relation to knowledge transfer from the perspective of intracorporate networks. An intracorporate network "consists of a group of organizations operating under a unified corporate identity, with headquarters of the network having controlling ownership interest in its subsidiaries" (Inkpen & Tsang, 2005). The three dimensions of social capital, as classified by Nahapiet and Ghoshal (1998), include structural, relational and cognitive.

Structural Dimension

The structural dimension of social capital relates to the pattern of relationships

between network members, and includes network ties, network stability and network configuration (Inkpen & Tsang, 2005).

Network Ties. Network ties refer to the ways in which individuals are related (Inkpen & Tsang, 2005). With regard to an intracorporate network, all members belong to the same corporation. Ties may be interdepartmental or interorganizational. The researchers describe the boundaries as being more flexible and porous than those of other network types (Inkpen & Tsang, 2005). This has important implications for the transfer of knowledge. Because of its characteristics, personnel transfers between members will occur more frequently. These transfers help to establish social network ties, in addition to the already formed intermember ties. As Inkpen and Tsang (2005) point out, "the social network ties facilitate intermember social interactions and provide channels for knowledge exchange" (p. 155).

Network Configuration. Network configuration applies to the pattern of linkages among network members (Inkpen & Tsang, 2005). Elements of configuration include hierarchy, connectivity, and density (Inkpen & Tsang, 2005). These elements have direct impacts on the ease with which knowledge flows throughout the network. In an intracorporate network, the network is often organized in a hierarchical way, with headquarters positioned at the top. Inkpen and Tsang note that in this type of network, connectivity is easily established between members, either through headquarters, or by the individual efforts of members. Finally, density is a measure of cohesion. It demonstrates the closeness of relation between members (Büchel, 46). The researchers point out that a general pattern of density for intracorporate networks would be unusual (Inkpen & Tsang, 2005).

In order to allow for the uninterrupted flow of knowledge sharing and creation, organizations should work to decentralize authority. This means that each member of the network can make their own determination as to the best way to use the knowledge that they have acquired (Inkpen & Tsang, 2005). Decentralization also helps promote ties between members, as they do not have to first go through headquarters to get approval. Studies (Tsai, 2002) have found that centralization negatively impacts intracorporate knowledge sharing.

Decentralization may also help to increase the density of the network. Büchel (2007) argues that dense networks are important because they help to promote a shared understanding between members, which leads to the establishment of new knowledge. The creation of new knowledge is imperative in organizations, as it helps to impel innovative actions and assists in establishing communication across the network that leads to the employment of pioneering ideas (Büchel, 2007).

Network Stability. The stability of the network is based upon the change of membership. Generally speaking, intracorporate networks have relatively stable environments (Inkpen & Tsang, 2005). However, the researchers caution that if the intracorporate network is unstable, due to restructuring or a high personnel turnover rate, social capital may be difficult to create (Inkpen & Tsang, 2005). This is due to the fact that when a member in a network leaves, a tie disappears. Also, with a high turnover rate, rapport and interpersonal relations become more difficult to establish (Inkpen & Tsang, 2005). Such relationships often facilitate knowledge sharing on an individual basis. When these relationships are absent, the transfer of knowledge becomes stifled. It is also important to note that organizational learning is partially

reliant on the memories and abilities of individual employees. If an individual leaves the organization, he takes with him knowledge that may have been critical for the success of the firm. (Inkpen & Tsang, 2005). Organizations should try to maintain a stable group of employees within the network, so that individuals can develop interpersonal relationships that are established and long lasting (Inkpen & Tsang, 2005).

Relational Dimension

The relational dimension of social capital focuses on the function of direct ties between actors and the relational outcome of their interaction (Inkpen & Tsang, 2005). Widén-Wulff and Ginman (2004) had conceptualized a similar model of social capital, and argue the relational dimension is "concerned with expectations and obligations as central features of social capital" (p.451). Inkpen and Tsang propose that the relational dimension can be broken down into three components: trust, norms and identification. Widen-Wulff and Ginman agree with the researchers on the components of trust and identification, and have added an additional element: social system closure.

Trust. Trust has been identified as a significant factor affecting knowledge creation and transfer and has been referred to as the "bedrock of social capital" (Cohen, 2007, p. 245). Researchers have highlighted the link between knowledge and social capital; studies (Wenger, 1998; Brown & Duguid, 2000) have shown that knowledge is created and shared the most effectively within communities, or among individuals who know and trust one another, and who share a common "language" (as cited in Cohen, 2007). Trust is based upon social judgments and assessments of costs (Rousseau, Sitkin, Burt & Camerer, 1998, as cited in Inkpen & Tsang, 2005). The researchers further explain that social judgments involve the evaluation of another individual's goodwill, capability, etc. The consideration of costs deals with the risk involved if the other individual shows himself to be untrustworthy (Inkpen & Tsang, 2005).

With regard to intracorporate networks, trust may be institutionally based (Inkpen & Tsang, 2005). This implies that because an organization is a member of the network, they should be viewed as trustworthy by other members, simply because they all belong to the same overarching corporate identity (Inkpen & Tsang, 2005). However, if an environment exists that is characterized by untrustworthiness, members may begin to question whether other members are truly allies or instead competition. This type of culture would no doubt have a negative impact on the flow of knowledge between members. Alternately, if the organizational culture is one of trust and openness, knowledge should flow more freely between members, as employees would not be so concerned with threats of opportunistic behavior (Inkpen & Tsang, 2005). As trust develops between members, more opportunities for knowledge transfer should occur.

Organizations must understand that social capital, along with trust, is built, not made (Cohen, 2007). In order to build social capital in firms where there is currently very little, leaders should look at internal networks to determine where "pockets" of trust exist. It is these pockets that should be nurtured so that the trust can be extended outward through the organization (Cohen, 2007). Cohen notes that another way to facilitate trust within and among organizations is to display openness and transparency. Doing so implies that the organization engages its employees by

sharing the most amount of information possible pertaining to what is happening within the organization and why. Cohen also argues that it is important that organizational leaders demonstrate qualities of trustworthiness themselves as such behavior helps to establish trust among members. To maintain and further facilitate trust, behavior that demonstrates trustworthiness should be rewarded by the organization, whereas deceitful and dishonest behavior should be punished. Finally, firms should be cognizant of the role stories play in developing trust. Stories of what happens in an organization help to shape individuals' understanding of the values of the firm. Stories also communicate to members whether leaders can be trusted, and whether leaders are likely to trust their employees (Cohen, 2007).

Identification. Identification is defined as the "extent to which actors view themselves as connected to other actors" (Widén-Wulff & Ginman, 2004, p.451). When an individual identifies with a specific group or network, one is likely to take the values and standards of that group and use it as a "comparative frame of reference" (Nahapiet & Ghoshal, 1998, 256). Research has shown that when an individual relates to and identifies with a group, concern for the group procedures and outcomes is enhanced. This, in turn, increases the odds that an occasion for exchange will occur. Thus, identification influences an individual's expectation of the value that will be received through the combination and exchange of knowledge. It also serves as motivation for individuals to exchange and combine knowledge (Nahapiet & Ghoshal, 1998). Likewise, opposing and distinct identities in groups may pose substantial barriers to the sharing of information, the creation of knowledge and learning (Nahapiet & Ghoshal, 1998).

Norms. Norms can be defined as the "expectations, or rules of behavior, that develop out of values" (Henslin, 2000, p. 45). Norms can also be described as informal rules that are utilized by groups to help control and normalize the behavior of its members (Feldman, 1984). With regard to social capital, norms can have an extremely powerful impact on knowledge sharing and creation. When trust and cooperation are adopted by the group as the norm, the social influence of the group both encourages and necessitates collaboration and knowledge sharing (Cohen, 2007).

Cohen (2007) suggests that an organization should hire for cultural fit, so as to reinforce and promote the behavior that it values. Groups are able to teach their beliefs and behavior by example, and also through story-telling. Such desired behaviors and beliefs are enforced through "reward and punishment, praise and blame, inclusion and ostracism" (Cohen, 2007, p. 242). Essentially, members either adopt the required behavior, or leave the group. It is through norms that certain behaviors and values become ingrained in the culture of the organization.

Senge's (1990) concept of "mental models" can be related to the idea of norms. Mental models as defined by Senge are "deeply ingrained assumptions, generalizations, or even pictures and images that influence how we understand the world and how we take action" (1990, p. 5). Senge further explains that often individuals are not even aware of these assumptions or their influence on one's behavior. It is important that both organizations and individuals learn to reflect on their mental models, and if necessary, develop new orientations. This paper argues that Senge's idea is akin to developing new norms within an organization, starting from an individual level. If a firm wishes to build social capital, and develop an employee orientation towards collaboration, knowledge sharing and trust where one

did not exist prior, it will need its members to reflect on their values, be open to new ideas, and have the capacity to learn new skills and develop new standards.

Social System Closure. The property of system closure has a direct impact on the effectiveness of group norms. As Coleman (1988) indicates, a necessary condition for the emergence of effective norms is "action that imposes external effects on others" (Coleman, 1988, S105). A function of norms is to minimize negative external effects, or promote positive effects. Closure of the social system or network is not only imperative for developing effective norms, but is also important with regard to another form of social capital, which is the "trustworthiness of social structures that allows the proliferation of obligations and expectations" (Coleman, 1988, S107). For instance, if an individual in a network defers from one's obligation, it induces a negative effect on another member of the system. However, if the structure is open, the individual who deferred on his or her obligation can only be sanctioned by the "victim." In a closed system, however, group sanctions would ensure that the above individual who deferred on his or her obligation would not be seen as trustworthy. That individual would be forced to adjust his or her behavior to fit group norms, or would have to leave the group. Closed systems facilitate the development of reputation (Coleman, 1988). Widén-Wulff and Ginman (2004) concur with Coleman's explanation and reiterate that closure allows successful sanctions to be endorsed by the individuals who value the system of social capital.

Cognitive Dimension

The cognitive dimension of social capital signifies the "resources providing shared meaning and understanding between the network members" (Nahapiet & Ghoshal, 1998, as cited in Inkpen & Tsang, 2005). The cognitive dimension can be broken down into two components: shared goals and shared culture among members of a network.

Shared Goals. Shared goals can be understood as the degree to which members of a network share a mutual understanding and method for achieving the tasks and outcomes required of the group (Inkpen & Tsang, 2005). In intracorporate networks, members of the system often work towards goals that are predetermined by headquarters. Individuals are also frequently charged with fulfilling secondary goals relating to their specific department or organization. Inkpen and Tsang further the idea of shared goals, and relate it to the notion of a shared vision. A shared vision "embodies the collective goals and aspirations of the members of an intracorporate network" (Inkpen & Tsang, 2005, p. 157). A shared vision helps members to establish awareness between each other as to how individuals should interact with one another. Such an understanding helps to encourage joint understanding between members, which in turn fosters exchanges of ideas and resources (Inkpen & Tsang, 2005). A shared vision also helps members in different areas of the network to connect, and is a useful tool in assisting these individuals in the integration of knowledge.

Senge (1990) also addresses the concept of shared vision. He asserts that such a vision has the power to be inspiring and at the same time "encourage experimentation and innovation" (p.5). As Senge so eloquently states, "where there is genuine vision (as opposed to the all-too-familiar 'vision statement'), people excel and learn, not because they are told to, but because they want to" (p. 5).

Shared Culture. Inkpen and Tsang (2005) describe shared culture as the extent to which norms of behavior dictate relationships. Researchers compare the notion of shared culture to that of tie modality, which is a "set of institutionalized rules and norms that govern appropriate behavior in the network . . ." (Gulati, Nohria & Zaheer, 2000, p. 205). In an intracorporate network, the shared culture would be dictated by the all-encompassing corporate identity. It is important to remember, however, that in a network that spans multinational boundaries, each member is embedded within their own local or national culture (Inkpen & Tsang, 2005). Some elements of the corporate culture may conflict with elements of the local culture. It is important for members to understand the various cultures in which their network resides. Accommodating local culture is especially important where the transfer of knowledge is concerned. It is imperative to make sure the sharing and creation process is not stalled due to cultural conflicts between members (Inkpen and Tsang, 2005).

Implications

As more and more firms move towards the implementation of KM programs and are investing large amounts of fiscal capital in such systems, it is becoming increasingly important that individuals and organizations alike understand what it takes to execute a successful KM initiative. Too often firms focus most of their efforts on the technology that is supposed to *supplement* KM, not drive it. Another mistake that firms make is in implementing the program in a vacuum. Such organizations designate the responsibility for KM to a few select individuals or departments, and do not bother with involving all of the members of the system.

What many fail to realize is that KM is the responsibility of every employee or member of the organization. It is here that the idea of social capital holds the most importance. As was mentioned previously, knowledge is often hard to separate from the individuals in which it resides. *People* are the primary sources of knowledge within an organization, and yet many times the human aspect of KM is ignored. By building social capital, firms are cultivating a culture conducive to the creation of new knowledge and the sharing of acquired knowledge. The way knowledge can be "extracted" from individuals and passed on to others is through social interaction. Social capital lays the framework so that such interaction can take place successfully. Establishing social capital is also beneficial for firms in that it will help retain its employees, or primary sources of knowledge. At any given moment, an employee may leave the organization and walk away with knowledge that is crucial for the firm's success. By creating social capital, employees are more likely to be satisfied with their jobs, and are more apt to form closer relationships and bonds, which will make it more beneficial for the employees to stay at the organization. Social capital is a win-win situation for all: employees enjoy the benefits of a trusting environment characterized by mutual understanding and respect and because of this environment employees have the necessary tools to create and exchange knowledge more readily, which directly benefits the organization.

Conclusion

As was illustrated above, social capital encompasses a broad range of activities that

are directly involved with the facilitation of knowledge creation and knowledge sharing, which is but one aspect of KM. As the economy continues to move towards information-based products and services, a firm's intellectual assets are becoming its greatest source of competitive advantage. However, in order to survive and thrive in a knowledge-based economy, an organization must establish a culture that is conducive to social capital. A KM program will surely fail if it is not embedded in a foundation of trust, mutual understanding and cooperation.

References

Blair, D.C. (2002). Knowledge management: Hype, hope, or help? *Journal of the American Society for Information Science and Technology, 53*(12), 1019–1028.

Brass, D.J. (2003). A social network perspective on human resources management. In R.L. Cross, A. Parker & L. Sasson (Eds.), *Networks in the knowledge economy* (pp. 283–323). NY: Oxford University Press.

Büchel, B. (2007). Knowledge creation and transfer: From teams to the whole organization. In K.Ichijo & I. Nonaka (Eds.), *Knowledge creation and management* (pp. 44–56). NY: Oxford University Press.

Cohen, D. (2007). Enhancing social capital for knowledge effectiveness. In K.Ichijo & I. Nonaka (Eds.), *Knowledge creation and management* (pp. 240–253). NY: Oxford University Press.

Coleman, J.S. (1988). Social capital in the creation of human capital. *The American Journal of Sociology, 94,* S95-S120.

Davenport, T.H. & Prusak, L. (1998, 2000). *Working knowledge: how organizations manage what they know.* Boston: Harvard Business School Press.

Feldman, D.C. (1984). The development and enforcement of group norms. *The Academy of Management Review, 9*, 47–53.

Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. *Strategic Management Journal, 21,* 203–215.

Henslin, J.M. (2002). Culture. *Essentials of sociology: A down to earth approach* (4th ed., pp. 45–55). Boston: Allyn and Bacon.

Inkpen, A.C. & Tsang, E.W. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review, 30*(1), 146–165.

Nahapiet, J. & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23,* 242–266.

Putnam, R. (1993, March 21). The prosperous community. *The American Prospect,* 4(13).

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

Senge in the *Encyclopedia of Informal Education.* Retrieved 2/24/2008 from http://www.infed.org/thinkers.senge.htm.

Widén-Wulff, G. & Ginman, M. (2004). Explaining knowledge sharing in organizations through the dimensions of social capital. *Journal of Information Science, 30*(5), 448–458.

Knowledge Management and Major League Baseball

Jonathan McCue
Master of Communication and Information Studies

When you think of intellectuals influencing the course of human affairs you think of physics, or political theory, or economics. You think of John Maynard Keynes' condescending line about men of action—how they believe themselves guided by their own ideas even when they are unwittingly in the thrall of some dead economist. You don't think of baseball, because you don't think of baseball as having an intellectual underpinning. But it does; it has just never been seriously observed and closely questioned, in a writing style sufficiently compelling to catch the attention of people who actually played baseball. Once it had been, it was only a matter of time - a long time - before some men of action seized on newly revealed truths to gain a competitive advantage.

—Michael Lewis, Moneyball, *2004, p. 97*

Abstract

Baseball is a game obsessed with data and information. The teams and leagues from the Major Leagues keep track of 75 official statistics for each player, and a host of 'unofficial' statistics that are recorded by dedicated (and partially obsessed]) fans. Even amateurs at the college and high school level make sure every pitch is recorded in complex scorebooks, and the entire season can be reconstructed by simply looking at the box scores. A high batting average can make a high school student into a professional prospect. A few high readings from the radar gun can turn a college kid into a very rich man. However, all these things mentioned are simply information and data. In order to be a successful baseball organization, the team must be able to transfer that information into knowledge. This paper will examine traditional baseball strategies and ways of measuring professional baseball talent, and outline new theories being put into practice by selected teams to gain a competitive edge.

Statistical Analysis: Controversies

Knowledge is not just information; it is how to *use* information. The most basic and prevalent statistic baseball players and fans use to measure a batter's skill is batting average. This is simply the player's number of hits divided by his number of at-bats. Ichiro Suzuki and Vladimir Guerrero both had batting averages over .320 in the American League in 2007 (.300 is considered a good batting average, .250 mediocre). To an uninitiated person, it may seem like these two hitters are similar and can be treated the same. But in fact, nearly the opposite is true.

The first thing that anyone will notice is that that the two hitters swing from different sides of the plate; Guerrero is a righty, and Ichiro a lefty. This means, among other things, that Ichiro will get out of the box and reach first base a half-second or so faster than Guerrero would, even if they were the same speed. Guerrero is a classic power hitter. He looks to hit the ball hard and far, out of the reach of the fielders trying to catch it, so that most of the time he can make it to first base at his leisure. In contrast, Ichiro is extremely fast. Most of the time, he does not look to hit the ball far, but tries to hit the ball where it takes a few extra seconds for the fielders to reach it, and by that time Ichiro has already reached first base safely with a hit. By just looking at batting average, an opposing team would not be able to attack these

two hitters effectively.

That being said, another important thing to keep in mind for baseball organizations is that the information being used is potentially misleading. In baseball, the statistics are set up so that there are no 'gray areas.' A player either succeeded or he did not according to the statistics, whether they did it because of skill or luck cannot be determined. There are numerous ways that this information can 'lie.' Early in the season, any statistic that involves taking an average will probably not be accurate. Individual incidents play too much of a factor when there is not a large enough sample size, and a good day or a bad day can tip the scales too much in either direction.

Sometimes, players will get credit for doing a good job when they actually got lucky. Players can hit the ball poorly, but if it is in a fortunate spot, the player may get credit for a hit. Similarly, a pitcher may give up three balls that are hit extremely hard, but he might get credit for getting three outs if the players in the field make great plays behind him. In contrast, sometimes mistakes are made in the field but not recorded as errors, therefore hurting a pitcher's stats. The potential unfairness of statistics is summed up in this quote from the movie *Bull Durham:*

> You know what the difference is between hitting .250 and hitting .300? I got it figured out: Twenty-five hits a year in 500 at bats is 50 points. Okay? There's six months in a season, that's about 25 weeks—you get one extra flare a week—just one—a gork, a ground ball with eyes, a dying quail—just one more dying quail a week and you're in Yankee Stadium!

Increasingly, a growing number of people led by author Bill James called sabermatricians have come to believe that the conventional way of viewing statistics is completely misguided. In his the 1988 Baseball Abstract, James defined sabermetrics as "the search for objective knowledge about baseball." (*Saber* comes from SABR, the acronym for the Society for American Baseball Research.) Their classic example goes like this: Ever since Henry Chadwick devised the scorecard in the 1860s, hits have been the most important offensive statistic. Teams and batters have their offenses judged by their batting average. But these sabermatricians argue that *runs* are the goal of an offense, not hits. Hits are only a means to an end and are, therefore, artificially valued. Numerous other things - most notably walks - are, consequently, underappreciated (James, 1977–1988).

Sabermatricians further push their theory, saying that in the current knowledge market, a team can spend much less money on hitters who may not necessarily hit well but walk often. The runs scored will be similar, meaning that teams who employ this method will have the same chance of winning games, but spend much less money doing so.

The sabermatricians have other theories as well. For example, according to them, radar guns are overrated when evaluating pitchers, current defensive statistics are useless, stealing bases is too risky and sacrifice bunts are used by managers to shift blame for losses from the coaching staff to the players, not to win. They are all very controversial and intriguing theories, but up until recently the sabermatricians could not get anyone to listen to them:

> The people who were paid to manage professional teams failed to see the point. They hadn't even bothered to compile the information they need to analyze their systems intelligently. Presented with new information (by sabermatricians), they showed little interest in it, even when it was offered to them gratis. (Lewis, 2004, p. 84)

For example, in a very obvious illustration, sabermatricians noticed that Frank Thomas of the Chicago White Sox hit better when he was playing a position rather than being the team's designated hitter. When told of this, the White Sox simply ignored it rather than change their strategy.

> Having been ignored for so long by Major League Baseball, James and his sabermatricians decided to build an organization of hundreds of volunteer scorekeepers who would collect the stuff you need to know to reduce baseball to a science." James wrote, "what I propose here . . . is to start over . . . I am promising to rebuild the box score, not (build) around the old one. (Lewis, 2004, p.83)

A battle between the baseball people who had run the game since its inception and new knowledge managers was on.

Inside the Game of Baseball

People who have been around the game long enough to understand it deeply have certain knowledge of the sport. Managers often talk about 'hunches'- situations where they cannot explain why, but a certain strategic move just seems like the right one. That is partly why teams composed of "baseball people" had a difficult time accepting advice from "nerds." What was threatening to them was the cold, hard intelligence backed up by fact. This is where knowledge management can play a role in baseball.

These managers' hunches are actually what knowledge management scholars refer to as tacit knowledge. "Tacit knowledge is personal knowledge embedded in individual experience, and involves intangible factors such as personal belief and perspective" (Ichijo and Nonaka, 2007, 298). What can be used in these situations are 'knowledge analysts' similar to the ones discussed in Davenport's 2006 article, Teltech: The Business of Knowledge Management Case Study. These analysts are skilled in asking questions, and can potentially find out what tacit knowledge is being used, even if the possessor of that knowledge cannot express it on his own.

Knowledge management seeks to transfer knowledge that is stored in one place and distribute it to all people in the organization who can benefit from it. Mintzberg outlines this as one of a business manager's most important tasks. This duty, like many others, is easier said than done. But if a team can transfer knowledge it already owns seamlessly to all its members, it will hold a great advantage over its competition.

The previous Guerrero-Ichiro example illustrates what Major League teams have known for years. They make sure that they supplement the statistical data they receive with opinions from knowledgeable experts, called scouts, gathered from viewing the opposing players in person. They also play against the same players often during the season and year after year, so professional teams make databases and write down the skills and weaknesses of each player. After a while there are no secrets anymore, just constant adjustments made by both sides.

When new players come up into the league for the first time, the opposing team who has never faced that player will already have scouted ahead. They will send one of their experts to look at him and report back that player's strengths and weaknesses. They will try and talk to players who have faced that player before in a previous season and ask what kind of advice they can give. Some players will actually go so far as to play lifelike video games in order to try and see if they can

pick up any knowledge about facing another player. In short, they will try to implement knowledge management by transferring what a few people know about an opposing player to everyone in the organization.

Another type of scout employed by professional teams is the talent scout. It is the job of these scouts to find and evaluate amateur talent throughout the country (and now throughout world) so that these talented young ballplayers can sign with the organization and hopefully make an impact on the big league team in the future. This small fraternity of baseball men controls the future of both the aspiring amateurs and Major League teams with just a few flicks of their pens.

In the past up until the 1960s, all amateur talent was bid on in a free market. If a great high school player in, say, Oklahoma was discovered and word got around about him, the teams would bid for the services of that player after his high school graduation (or sometimes even sooner) and that player would almost certainly go to the team which offered the highest starting salary. So, the key for scouts in these early days was secrecy. Scouts would travel alone all over the continent, watching game after game in small backwater towns, to find one great ballplayer a year if they were lucky. Once they found that player, the key was to sign him quickly or keep him hidden so that other teams could not bid on him and drive up the price.

Today, there is an amateur draft. This means, in the simplest terms, that no professional team can sign a player until he graduates from high school. (Foreign players are not subject to the draft, and other eligibility requirements have to be met to be drafted, but for the arguments made in this paper the simple understanding of the draft is sufficient). Once the academic year is over in June, all high school seniors and college players are eligible to be drafted, and teams take turns selecting players, reminiscent of "choosing up sides" on a playground. Once a player is drafted, he can only be signed by that team, and if he signs, that team owns his rights for the next 6–10 years. This means he can only play for that organization unless that organization releases or trades him, making the draft of utmost importance to a team. The players taken in the draft form the foundation for the entire organization.

The scouts' method of traveling around the country has persisted to this day, even though tools like the internet and digital video exist and the circumstances have changed.

> In the scouts' view, you found a big league ballplayer by driving sixty thousand miles, staying in one hundred crappy motels, and eating god knows how many meals at Denny's all so you could watch 200 high school and college baseball games inside of four months, 199 of which were (in hindsight) completely meaningless to you. (Lewis, 2004, p. 37)

This is an extremely subjective way of finding talent, as hardly any facts are used. Scouts attempt to use their baseball experience to project what a player is capable of once he gets older, not what he has done in the past.

Scouts often use past players as references; the scout may see a sixteen year old high school sophomore and be reminded of what Chipper Jones looked and played like at the age of sixteen. Then, in a step that would not hold up in any logic exam, the scout projects this player will become someone with Chipper Jones' abilities. This sounds wildly irrational, and it is. Yet this is still the way most Major League clubs operate. If knowledge management was implemented in this situation, one would realize that an overwhelming number of high school prospects turn out to be busts rather than All-Stars. It is amazing that this practice has survived so long.

Putting Sabermetrics in Action: The Oakland Example

One team is looking to change baseball's widely held conceptions. The Oakland Athletics, led by General Manager (and sabermetrics subscriber) Billy Beane, are using knowledge management to build one of baseball's greatest success stories. When Beane decided to put his theories into use, he said, "We are going to run the organization from the top down. We're controlling player personnel. That's our job. There is a belief that a baseball team starts with the field manager first. It doesn't" (*Boston Herald*). "Billy had his own idea about where to find future Major League Baseball players: inside (a) computer" (Lewis, 2004, p.37).

Beane was extremely unimpressed with baseball organizations' infatuation with high school players. Drafting these players is risky because they are young and immature. Scouts too often see abilities in high school players and believe they will turn into results at the Major League level. In addition, signing these players is expensive compared to college players because the money has to be enough so that the player in question will forgo college and head straight to professional baseball, thereby ruining his collegiate eligibility. Lastly, high school players have not played against good competition, meaning that their statistics are extremely inflated and most likely not a reflection of how talented they are.

Beane also has firsthand knowledge of expectations for high school stars: he was one. Beane had been a great player in high school, and scouts had projected him to be an All-Star at the Major League level. After signing his professional contract at 17, he spent ten years in professional baseball, shuttling between the minors and big leagues, but never coming close to what scouts thought would be his potential. His experience and compunction over his unfulfilled expectations lead to Beane's rejection of many parts of conventional baseball wisdom and the embracing of James' radical theories.

Beane favors drafting players who are already in college. Obviously, they are older and more developed. They have played against greater competition, and play longer seasons, meaning their sample size is larger. Their stats are much more indicative of how they will perform in the future. It is this last point where Beane and the A's rely most heavily on knowledge management.

Beane and his disciples have found that drafting college players is a much wiser investment. They believe that college statistics are suitable enough to draft from. (In fact, Beane said he has toyed with the possibility of eliminating the department of scouting altogether and drafting from stat sheets alone.) With the advance of the Internet, all colleges have downloadable statistic sheets that are updated after every game. With a very simple philosophy, Beane and his assistants believe the players with the best statistics are the ones that should be drafted.

However, because Beane is a devotee of sabermetrics, the stats that are important to him, such as walks, are thought of as largely unimportant by the rest of the league. This enables Beane and the historically cash-strapped A's to continue to win - even while playing teams like the New York Yankees who spend four times as much money as they do. Putting this theory of sabermetrics to use is a case study in knowledge management, and has turned the sport of baseball on its ear.

Implications: Copying the A's Success

Not surprisingly given the success Oakland enjoys both on the field and in the

pocketbook, numerous teams are now beginning to emulate their strategy. This tactic of observing competition and learning from them is also a branch of knowledge management. Another sabermatrician, Theo Epstein, helped build the Boston Red Sox into two -ime World Champions, breaking an eighty-six-year-old championship drought.

According to Henry Mintzberg, another large responsibility for business managers is to find knowledge outside the organization and bring it inside the organization. From ticket prices to uniform designs, baseball is certainly a sport full of copy cats. Teams observe what one another are doing, and many times incorporate those policies into their own organizations. It is a peaceful but fervent arms race that has been taking place since the Cincinnati Red Stockings openly turned professional in 1869.

Business managers can learn two important things from baseball. First is to keep an eye on one's competition. Businesses compete for a finite number of dollars, just as baseball teams compete for a finite number of wins. By adopting some good strategies that have been proven to work elsewhere, it ensures that one's business will not be left staggering behind the competition.

More importantly, it is imperative to think outside the box. Sabermatricians looked at baseball in a new way, and discovered new truths about the game. People who watched baseball games for 100 years had missed these objective facts. The new statistics they have created are now finally revolutionizing the game. The Oakland Athletics, seeking to get a leg up on their richer competition, incorporated the sabermatricians' suggestions and began to win more often. Other teams have now tried to copy the A's strategies and have benefited tremendously as well, reaching the pinnacle of baseball.

Conclusion

Baseball can benefit by implementing knowledge management. Too much knowledge of the game is tacit, and baseball organizations can profit from codifying their knowledge and making it more explicit. Present statistics tell incomplete truths and are not suitable to be the sole basis of strategy. New ones are needed to tell a more complete story of the game. Knowledge management has the potential to help baseball teams gain a competitive advantage and win more games. It can also help ease a baseball team's greatest expense: its player's salary.

> *If gross miscalculations of a person's value could occur on the baseball field, before a live audience of forty thousand and a television audience of millions more, what does that say about the measurement of performance in other lines of work?—Bill James,* 1977 Baseball Abstract

Business managers take heed.

References

Bryant, H. (2003, January 16). The powers that be. *Boston Herald.*

Davenport, T.(2006). *Teltech: The business of knowledge management case study.* Accessed 26 April 2008 at http://choo.fis.utoronto.ca/dla98/teltech.case.html.

Davenport, T. & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Ichijo, K. & Nonaka, I. (2007). *Knowledge creation and management: New*

challenges for managers. New York: Oxford University Press.
James, B. (1977–1985). *Bill James' Baseball Abstract (1977–1985).* New York: Ballantine
Lewis, M. (2004). *Moneyball: The art of winning an unfair game.* New York: W. W. Norton and Company.
Mintzberg, H. (1979). *The structuring of organizations.* Englewood Cliffs, NJ: Prentice Hall.
Shelton, R. (1988). *Bull Durham* (motion picture). USA: Orion.

Beyond Best Practices:
Knowledge Management for Innovation

Dorothy Meaney
Master of Library and Information Science

Abstract

While many knowledge management practices focus on capturing and directing existing expertise for better organizational use, the need for creativity and innovation presents a set of special challenges for those concerned with company productivity and success. This paper will explore the structured elements of knowledge creation and transfer that should be balanced with conditions that encourage free thinking and informed imagination to produce successful implementation of new ideas. Organizational leaders are encouraged to understand the innovation process, the role of tacit knowledge, the importance of cross-pollination of ideas, the behavior of communities of practice, and the element of personal mastery.

Introduction

As Albert Einstein famously said, "Imagination is more important than knowledge." This is something for organizational leaders to keep in mind. While many knowledge management practices focus on capturing and directing existing expertise for better organizational use, the need for creativity and innovation presents a set of special challenges for those concerned with company productivity and success. This paper will explore the structured elements of knowledge creation and transfer that should be balanced with conditions that encourage free thinking and informed imagination to produce successful implementation of new ideas.

Creativity and innovation are critical for effective organizational planning, goal-setting and achievement. Handzic and Chaimungkalanont (2004) clearly state that "the unifying thread among various theoretical views is the perception that creativity and innovation are the key drivers of organizational long-term economic success" (p. 57). Other writers in the field agree (Hardagon, 1998; Henard & McFadyen, 2008). Therefore it is essential for managers to understand how to create and sustain an environment that can cultivate a continuing stream of new ideas.

Fostering Knowledge Creation

It is worth noting that Einstein did not say that knowledge was *un*important. In addition to adequate economic resources and good strategic placement in its particular market, knowledge is an essential factor for providing competitive advantage, particularly knowledge that is unique to the company. Nonaka and Toyami (2007) describe this as a firm's "knowledge assets," which include "not just the knowledge already created, such as know-how, patents, technologies, or brands, but also include the knowledge to create knowledge, such as the organizational capacity to innovate" (p. 25).

One foundational element in creating knowledge assets is socialization. It is the first piece of Nonaka and Takeuchi's well-known SECI process of knowledge conversion—socialization, externalization, combination, internalization—that moves personal tacit knowledge into the external environment and combines it with the knowledge of others to create new knowledge, which is then interpreted and

internalized as new personal knowledge which can be used in the process again (Nonaka & Toyami, 2007). That socialization is a factor in company work may seem obvious, but the quality of social interaction and the degree to which it is structured or unstructured impact the level of creativity.

To test the role of socialization in organizational creativity, Handzic and Chaimungkalanont (2004) did an interesting study comparing the impact of organized, structured socialization, such as that provided by a workplace-sponsored event, with the impact of informal socialization on the level of creativity. Their results showed that while both forms of socialization had a positive correlation with creativity, the effect of informal socialization was significantly stronger (p. 61). Similarly, Henard and McFadyen (2008) state that "knowledge workers cannot be forced to enhance their skills; they must be encouraged" (p. 40). This presents a challenge for management; not only must they recognize and appreciate the value of "water-cooler" interactions, which by definition they do not influence, but they must in effect purposely engineer opportunities for informal gathering and sharing, somewhat of a contradiction in terms.

Management must also have faith in employees, and faith in the creative process. They must recognize that insights come to people as they talk together, similar to the way wisdom may come to individuals as they write about something. These insights can lead to innovative ideas.

Brown and Duguid (2000) caution that all workers need to be included in efforts to foster creativity, not just designers or those in obviously inventive roles. This is because of the fast pace of change. Even routine work will be affected by changes in technology, personnel, economic conditions, and customer expectations. To take a small example from the library world: checking out books is an automated process involving not much more than bar code scanning. Indeed, some libraries have automatic checkout machines where patrons can do this themselves. The circulation staff, however, is likely to encounter not just the occasional technological malfunction but special requests, exceptions to rules, incorrect data in the computer and patron questions on other matters. Over time, staff responses in problem-solving and troubleshooting situations can add up to significant knowledge about better ways to provide good customer service. This knowledge is often shared "on the fly" during shared shifts or at shift changes; sometimes new resulting procedures become the norm before they are documented and officially implemented.

Brown and Duguid (2000) also note that even "a job that seems highly independent on paper is in reality remarkably social" (p. 76). They use the example of Xerox technicians who respond to customer service calls and fix onsite machines. The technicians travel alone, using documented guides to fixing broken machines as well as their own personal experience to get the job done. The technicians, however, had regular, informal breakfasts with one another, which gave them the opportunity to share what they were encountering in their service calls, exchange stories about what did and didn't work, ask questions, offer opinions, and in this unstructured way add greatly to the knowledge base of the company.

In an effort to capture, share and support this socially-generated creative knowledge, Xerox established a formal database called the Eureka project. Rather than have a management-imposed set of criteria, and to prevent the database from becoming a little-used repository for individually-contributed service tips, the Eureka project was designed so that technicians supply the tips, and a technician-run vetting process refines the contributions and includes only those that after review prove to be

relevant and reliable. In this way, the creative problem-solving knowledge that was generated by a combination of personal experience and informal peer-to-peer sharing can be more formally codified and put to use by a wider group. This provides an effective balance between the unstructured communication that supports creativity, and the structured knowledge management techniques that are necessary to spread creative ideas and put them to practical use.

Striking the Right Balance

For an organization to encourage creativity and innovation, there must be a balance between sharing existing knowledge and fostering creative new ideas—and, ultimately, bringing such new ideas to fruition. The best creative ideas are only useful to a company if they can be actually turned into innovations and used in support of the organization's goals.

This balance can be hard to achieve. On the one hand, if management can encourage a culture that appreciates the value of informal as well as formal socialization and teamwork, sponsor more obvious creative endeavors such as brainstorming sessions or design competitions, and incorporate other conditions to be discussed below, they may well end up with a continuous stream of new ideas and innovative thinking. On the other hand, some structure has to be applied in order to narrow down and refine concepts, and to facilitate the conversion of ideas into practical innovation within the conditions and constraints of the company's marketplace and resources.

This need for balance also shows up repeatedly in the literature. Brown & Duguid frame it as balancing "process" with "practice," so new ideas are allowed to emerge but there is enough formally organized structure to harness them (p. 74). Henard and McFadyen (2008) temper their encouragement of what they call higher-order "creative knowledge" with advice to "mind the bottom line" (p. 46). Leonard and Sensiper (1998) state that "at any point in an innovation process . . . managers need to manage both the expansion of thought that gives rise to potentially creative alternatives and the homing in on a viable option" (p. 116). Cohendet and Simon (2007), in their study of a Canadian videogame company, illustrate a hybrid project management structure used by the firm that allows highly creative designers and engineers to channel their efforts along the strict time and economic boundaries that are necessary in an extremely competitive market, while still leaving room for new implementations and improvements up to the last minute.

This is, perhaps, an exercise in looking at organizations through the other end of the telescope. Although innovation is essential to stay competitive and successful, it is more common for companies to err on the side of too much rather than too little structure in managing knowledge. Davenport and Prusak (2000) warn against focusing knowledge management practices too closely on technology; this comes in part from the evolution of the field, which began with such a focus, but also because it is easier to deal with familiar communication tools and concrete knowledge artifacts than to "un-manage" informal socialization, have faith in the creative process, and keep an open mind.

The Innovation Process

Innovation is not a linear process. As Leonard and Sensiper (1998) describe it:

> The process of innovation is a rhythm of search and selection, exploration and synthesis, cycles of divergent thinking followed by convergence. At the

> highest level of abstraction, innovation is often presented as linear: idea generation is followed by development, then by adoption or testing, and finally by implementation or after-sales service. However, within this overall pattern, the stages of idea generation through implementation recur at a smaller scale at each step. (p.116)

The concept of divergent and convergent thinking is key to understanding the balance between creative ideas and their practical application. In order for new ideas to occur, something has to feed the thinking process. The individual has to move beyond his own knowledge and make connections between what he already understands and new concepts he has learned about through interaction with others' ideas. He can then see creative ways of synthesizing these connections. The chances of this happening are increased when there is exposure to a group made up of people with diverse perceptions and experiences. When a diverse group addresses a problem or new situation, expression of the various perspectives held by each will foster what Leonard and Sensiper call "creative abrasion," a source of energy coming from intellectual conflict that results in innovation (p. 118). This encourages divergent thinking.

Convergence occurs when the creative ideas are turned into new products or services. The process of selecting an idea or ideas, designing, testing and refining represents a practical concentration of creative abrasion. At various points, new challenges will arise which need additional problem-solving and creativity applied—divergent thinking–in order to move the process forward. Managers who oversee design teams and other work groups must recognize and appreciate the cyclic nature of the innovative process.

The Role of Tacit Knowledge. Tacit knowledge is personal and subjective, and can be difficult to express. However, tapping into tacit knowledge is not only important for individual creative thinking but for group creativity as well (Leonard & Sensiper, 1998).

Tacit knowledge provides a strong source of competitive advantage in that it is unavailable to rivals in codified form. Transfer of tacit knowledge within an organization is the purpose of Nonaka and Takeuchi's SECI model described above because such transfer is at the heart of their theory of the knowledge-creating firm (Nonaka & Toyama, 2007). It is the tacit knowledge of diverse participants that Leonard and Sensiper credit with facilitating creative abrasion (p. 117). They also note that individuals in studies focusing on demonstrated creativity "refer consistently to their interactions with others as an essential element in their process" (p. 116). This reinforces the importance of socialization even for highly creative individuals.

Organizations can foster the sharing of tacit knowledge between individuals by encouraging mentoring and apprenticeship. When such knowledge is located in organizational processes and social norms, it is spread even further.

The SECI model focuses on individuals, but innovation in organizations is of necessity a group process. Therefore the transfer of tacit knowledge is a necessary but not sufficient condition for maximizing organizational creativity for two reasons:

- some tacit knowledge always stays tacit, either because it is unable to be expressed explicitly or people are unaware of its existence at all, i.e. it's taken for granted;
- outside knowledge must be incorporated into creative processes in order

to prevent "groupthink," which can occur when successfully innovative work groups begin to rely on what made their efforts successful in the past, thus limiting future creativity.

Cross-pollination, Cross-fertilization

Business consultant David Gray (2003) goes Einstein one better, by making the provocative claim that "knowledge can stand in the way of innovation" (p. 22). His concern is that questions that have already been answered and problems that have already been solved create company knowledge, but blind people to new ways of looking at things. His advice to managers is to keep an open mind, let go of the idea that there must be complete certainty before action, accept false starts and dead ends, and see lack of knowledge as an opportunity to tune in to novel ideas from other sources.

Some divergence and lack of shared experiences are critical for developing new ideas. Cross-pollination of ideas is another common theme in the reviewed literature. Creative abrasion and the importance of including diverse perspectives have been discussed above. Henard and McFadyen (2008) recommend rotating individuals across teams or to new responsibilities within teams, as well as finding ways to break down "functional silos" that prevent interaction between company divisions (p. 45). Majchrzak, Cooper and Neece (2004), who studied knowledge reuse by teams preparing for exploration on Mars, found that the most innovative project groups sought knowledge from a variety of internal and external sources (p. 179). Handzic and Chaimungkalanont (2004) state that "collective group learning occurs within teams through cross-fertilisation of ideas and goals setting" (p. 58).

Cohendet and Simon's study of the videogame company (2007) provides a vivid example of the value of such cross-pollination. The firm employs scriptwriters, game designers, software engineers, graphic artists and other skilled and creative people who make up what they call "communities of specialists" within the company. These communities are informal, and people communicate openly with each other about their areas of practice in the kind of informal socialization that supports innovation. In addition, the company is located in the city of Montreal where there has developed a hip, urban culture, a "creative city" of gamers and a technologically skilled workforce. Because of this, employees are also members of creative communities outside the firm. These outside communities indirectly inform the work within the company by their influence on members, and serve as additional sources of inspiration. Also, when employees are assigned to project teams, they become members of the team but also maintain membership in their community of specialists, thus bringing sources of creativity back and forth.

Communities of Practice. The videogame studio's communities of specialists are a form of communities of practice. Davenport and Prusak (2000) state that communities of practice are self-organized groups of colleagues with similar interests and goals (p. 38). Such communities embody the previously discussed informal socialization factor that is so encouraging of creativity. Xerox's technicians formed a community of practice. Software or product user groups are another example. Turner (1999) expands on this idea by positing that such communities can include groups such as the smokers who gather outside at break time, a group that meets regularly but informally for lunch, or even an influential group he found that formed because they played the lottery together (p. 479). The challenge for management is to

recognize the value of these groups as part of the company dynamics and their potential contribution to fostering creative work, while keeping hands-off approach to their formation and interaction.

The Building Block of Personal Mastery. Organizations are made up of individuals, and the character and culture of an organization will reflect the behavior of its people. It is important to keep in mind that the elements of creativity in organizations discussed here also depend on the kind of knowledge, experience and attitude that individuals bring to the table. Peter Senge, in his *Fifth Discipline* (2000) discussion of the building blocks of organizational learning, calls the key individual element "personal mastery." Personal mastery is a commitment to "deepening our personal vision, focusing our energies, developing patience, and seeing reality objectively" (p. 7). It is also a source of individual creative tension when there is a gap between vision and reality (p. 141). When people have a personal commitment to learning, make an ongoing effort to deepen their understanding of the world around them, and work towards a purpose that is meaningful to them, they will be more effective members of community and better able to contribute to a group creative process.

> Henard and McFadyen (2008) describe the individual's role this way:
> To be truly valuable to a company, individuals must be able to identify knowledge located both within and outside of organizational boundaries, integrate this information into their existing knowledge stock, and subsequently draw upon both when developing business solutions. The effect of multiple individuals working at this level . . . leads to an increase in the organization's overall absorptive capacity and ultimately to competitive advantage in the marketplace. (p. 42)

This sounds less lofty than Senge, but it illustrates the same idea: management can create conditions for creative work, up to a point, but individual skill, attitude and commitment must be underlying company efforts.

Managing Innovation

It is important for company leaders to understand that knowledge management has an important role in organizational progress, but that KM techniques must be carefully balanced so they don't cut off the discovery process or hold back the interaction that feeds the development of new ideas. In essence, to use a cliché, managers need to make sure they don't miss the forest for the trees. Too much of an emphasis on codifying knowledge and spreading proven best practices, or too heavy a corporate hand in creating and directing diverse work teams, can stifle the innovation these tools were designed to facilitate.

The challenge for management here is to create the kind of environment where creativity flourishes by:

- Recognizing the value of unstructured as well as structured socialization, and provide opportunities for both to flourish; creating formal and informal space
- Including all workers in efforts to foster creativity
- Providing enough structure, both in terms of guidelines for work groups and clear project goals and constraints, to create practical innovations
- Encouraging work groups and project teams to include people with different intellectual perspectives
- Encouraging and facilitating the incorporation of outside knowledge

- Promoting, and rewarding, mentorship and apprenticeship within the company
- Hiring individuals who demonstrate a commitment to personal mastery• Understanding the creative process, keeping an open mind, and having faith in employees

Albert Einstein also said, "We can't solve problems by using the same kind of thinking we used when we created them." Einstein wasn't an organizational manager, but he has good advice for those who are.

References

Brown, J. S., & Duguid, P. (2000). Balancing act: How to capture knowledge without killing it. *Harvard Business Review, 78*(3), 73–80. Retrieved April 15, 2008, from Business Source Premier database.

Cohendet, P., & Simon, L. (2007). Playing across the playground: paradoxes of knowledge creation in the videogame firm. *Journal of Organizational Behavior, 28*, 587–605. Retrieved April 18, 2008, from Wiley Interscience.

Davenport, T.H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Gray, D. (2003). Wanted: Chief ignorance officer. *Harvard Business Review, 81*(11), 22–24. Retrieved April 18, 2008, from Business Source Premier database.

Handzic, M., & Chaimungkalanont, M. (2004). Enhancing organizational creativity through socialization. *The Electronic Journal of Knowledge Management, 2*(1), 57–64, available online at www.ejkm.com. Retrieved April 15, 2008.

Henard, D., & McFadyen, A. (2008). Making knowledge workers more creative. *Research Technology Management, 51*(2), 40–46. Retrieved April 14, 2008, from Business Source Premier database.

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review, 40*(3), 112–132. Retrieved April 17, 2008, from Business Source Premier database.

Majchrzak, A., Cooper, L., & Neece, O. (2004). Knowledge reuse for innovation. *Management Science, 50*(2), 174–188. Retrieved April 15, 2008, from Business Source Premier database.

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

Senge, P.M. (2006). *The fifth discipline: The art and practice of the learning organization.* New York: Currency, Doubleday.

Turner, C. (1999). Communities of practice. In Senge, P. et al., *The dance of change* (pp.477–480). New York: Random House.

The Role of Social Software Technologies in Knowledge Management Programs

Jennifer Nelson
Master of Library and Information Science

Abstract

This paper will discuss the role of social software, particularly blogs and wikis, in knowledge management programs. Social software tends to be part of a variety of tools under the greater idea of Web 2.0. Social software programs can be a method of building trust and community although individual members of groups may be geographically disparate. Social networking tools may also serve as a means of increasing transparency in organizations. Increasingly, social software tools will be incorporated into knowledge management programs, as they are increasingly incorporated into all elements of modern life. As such, those who are interested in knowledge management and its future much also be interested in social software tools. The purpose of this paper is to examine how social software tools, especially blogs and wikis function, how they may be applied to knowledge management programs and the effects they may have on knowledge management programs.

Introduction

Knowledge management (KM) is a process which will benefit from the introduction of the use of social software tools in its theory and practice. Prior to discussing the ways in which social software tools can benefit the practice of KM, an introduction and definitions for both KM and social software are necessary.

KM is a process which emphasizes the various ways knowledge is shared and disseminated. KM is best understood in terms of the Five Principles of Knowledge Management as identified by Davenport and Prusak (1998):

> Foster awareness of the value of the knowledge sought and a willingness to invest in the process of generating it.
>
> Identify key knowledge workers who can be effectively brought together in a fusion effort.
>
> Emphasize the creative potential inherent in the complexity and diversity of ideas, seeing differences as positive, rather than sources of conflict, and avoid simple answers to complex questions.
>
> Make the need for knowledge generation clear so as to encourage, reward, and direct it toward a common goal.
>
> Introduce measures and milestones of success that reflect the value of knowledge more completely than simple balance-sheet accounting (p. 62).

Social software tools can be quite useful in implementing these principles, in particular principles one, two and four. Another definition of KM is "an effort to increase useful knowledge within the organization" (McInerney, 2002). Additionally, any question of what KM is also begs the question of what knowledge is. A central theme of KM is a discussion of what knowledge is, and the difference between data, information and knowledge. A fairly common view in KM is that there are two essential and separate types of knowledge, explicit knowledge and tacit knowledge (Heaton, Bergeron, Bertrain-Gastaldy, & Mercier, 2005). Explicit knowledge is considered objective and factual. Explicit knowledge may be transmitted as data or information, in the form of manuals, guides and directions. Tacit knowledge is a

much more complicated matter. Tacit knowledge is internal knowledge, the type of knowledge that makes individuals say, "I can't explain it, but I know it." Tacit knowledge is intensely personal and can be extremely challenging to codify. Much of KM is concerned with the process of transforming tacit knowledge into explicit knowledge. While this paper will discuss the role of various technologies in KM, it is important to note that "while KM is often facilitated by technology, technology by itself is not KM" (Levinson, 2008, p. 1).

Social software is a set of tools that encourage collaboration and communication. Many social software technologies are also Web 2.0 technologies, although the terms are not perfect synonyms. Social software tools are applications that "allow individuals to communicate with one another, and to track discussions across the web as they happen" (Tepper, 2003). Some examples of major social software technologies are blogs, social networking websites, wikis, and Twitter. Blogs (the word blog is a shortened version of the word "weblog") are at their most basic online diaries. Blogger, a blog hosting web site, offers the definition that "a blog is a web site, where you write stuff on an ongoing basis" ("What's a blog?," *n.d.*) Blogs will also often incorporate Web 2.0 technology by allowing the author, or blogger, or an administrator, to categorize the posts or entries with meaningful tags, which are similar to index terms. For example, if a library used a blog to publicize new programming they could tag all book club related entries with the term "bookclub." A library user reading that blog could then select that tag and retrieve a listing of all blog entries that have been tagged "bookclub." A strength of blogs is that readers may be allowed to comment on the entries, and the bloggers themselves may respond to reader questions or criticisms. When this function is enabled, it is a fantastic method of open communication.

Social networking websites such as MySpace, Facebook, and LinkedIn are other examples of social software. These platforms allow you to create networks of both individuals you know, and individuals you share interests with, and allow you to access the networks of others. Additional tools such as instant messaging, emails and bulletins are also possible from within the social network platform. While these tools are generally considered somewhat frivolous, profession-specific social networking tools could serve a role in organizations, perhaps as a type of knowledge map or knowledge "yellow pages."

Twitter is a relatively new social software tool that is similar to a social networking site in that Twitter users have contact lists whose updates they see. Twitter has also been described as microblogging because the posts are date-displayed posts of 140 characters or less ("FAQ," 2007). Members of Twitter continually update what they are doing. For example, if the author was currently on Twitter, her current status would be "writing KM paper." These are continually updated throughout the day and users can see what their contacts are doing. One can look at Twitter and see people use it as a research tool by sending out a request for help finding information on a topic from people in their network.

Wikis are a more recent development than blogs or social networking websites, but are rapidly becoming commonplace. Probably the best known example of a wiki is the online encyclopedia, Wikipedia, where the readers generate the content. Wikis are similar to blogs, but differ in several key ways. While blogs are date-organized feeds of posts, wikis are websites with different pages that users are freely allowed to create and modify the content in a web browser (Stafford & Webb, 2006). The greater the number of users who modify and add content to a page, the

greater the likelihood that the information is quality information (Deitering & Bridgewater, 2007). A common problem with websites is that they are not frequently updated because most organizations only have a few webmasters with the capability to modify the information. Wikis are continually being updated because everyone is able to update information as needed. Additionally, wiki pages list recent changes to the pages, so readers are able to see the ways the content is changing (Avram, 2006).

Impact on Knowledge Management

While social software technologies are relatively recent developments, these tools have already begun to change the way organizations function. According to Goetz Boue, "Organic, flowing, and daily dialogue with customers—by which we mean in a two-way, interactive, back-and-forth fashion—is not just possible, it's beginning to be an expectation" (2008).

Social software has strengths that traditional KM tools (such as Microsoft SharePoint or LotusNotes) do not. Traditional KM tools and programs are top-down enterprises, while social software tools are in their very nature bottom-up and "work best without imposed top-down control" (Payne, 2007). This is a critical difference because it means workers tend to want to use social software tools, whereas with traditional tools they were often required or at least expected to use those tools. An example of the bottom-up communication stream can be seen in corporate behemoth Microsoft. Microsoft employs over 4,000 bloggers (Boue, 2008). This would be impressive in and of itself, but is made more impressive in that Microsoft allows and even encourages these bloggers to criticize Microsoft products and tools as a means to learn where they need to improve their product. By giving employees the freedom to create content and to be open about their true feelings, organizations create an environment of trust which is central to any knowledge management program.

In research done with contributors to Wikipedia, it has been found that contributing content to the site increases contributors' feelings of meaningfulness, self-determination and relatedness (Payne, 2007). All of these senses are crucial during collaborations. Wikipedia is an interesting model, because generally workers collaborating together try to build trust prior to offering feedback and modifications. With Wikipedia, because it is so very decentralized, there is no attempt to build trust between those working prior to the presentation of feedback and editing. However, trust is established within the Wikipedia system, which generally allows users to accept feedback and modify as needed. If an organization could have a collaborative system that was so trusted by its workers that there was a reduced need to spend time team and trust building within collaborative groups, think of the time and money that could be saved, while increasing the collaborative environment.

Some elements that are built into wikis are also useful from a KM approach. Anyone can modify a wiki page, therefore the concept of authorship or ownership is somewhat vague (Deitering & Bridgewater, 2007). This need not be a negative. If there is no one individual wholly responsible for a final report on a project, but instead the project report is in the form of an ongoing wiki, the group as a whole will be more invested in the report rather than simply being invested in the process because the report with be embedded in the process. Also, wikis are never completed. With a traditional report, when it's done, it's done. With wikis, there may be ongoing evaluation and on-the-ground reporting of what is and is not working. This enables programs to be far more responsive. If there is a community outreach program, for example, and all the outreach workers are reporting similar difficulties,

rather than waiting for the formal evaluation period, evaluation and modification can occur on an ongoing basis. This makes the organization more flexible and responsive, which is important in a learning organization (Chalofsky, 2005). It can be said that blogs and wikis create living documents (Tepper, 2003). Also, as they provide access to other individual's work and also a space to provide feedback on that work, over time, blogs and wikis can result in self-supporting online communities of practice (Hall & Davison, 2007).

Debate of the Role of Social Software

New technologies are often resisted when first introduced and social software technologies are relatively new on the scene. One argument that can be made against them is that, like many technology heavy approaches, they reduce face-to-face communication and as such, they also reduce the transmission of tacit knowledge. One could argue in response, however, that while face-to-face communication may be lessened, overall communication increases. Also the stream of communication is much flatter rather than rigidly hierarchical due to the medium. If an executive of an organization chose to blog as a way of expressing organizational changes and also chose to enable the comments functionality of that blog, anyone from other upper level executives to part-time workers and interns would have a space to respond. Those who have worked in small, intimate organizations are aware that workers who may be low in the formal hierarchy can also have a great deal to contribute in discussions because they have different perspectives and information than those in upper level management. Depending on one's position within the organizational hierarchy, this may be considered a positive or considered a negative.

As with many knowledge management strategies, people sometimes have difficulty seeing how blogging or creating wikis is "work;" they can sometimes be considered the technological equivalent to sitting around the water cooler chatting. Often in unmoderated blog comment sections, the conversation may veer wildly off course. This can even be seen in some e-learning systems that have discussion boards. Again, the response can be that the openness achieved in this conversational free-for-all far outweighs the loss of time. It is possible, within an organizational culture of support, to create a sense of *ba,* at least digitally. *Ba* is a Japanese concept defined as a "shared context in motion, in which knowledge is shared, created and utilized" (Ichijo & Nonaka, 2007, p. 23). *Ba* is an important concept in KM that encompasses both individual and organizational relationships. By shared context in motion, Ichijo and Nonaka refer to the way knowledge and relationships are continually evolving and taking shape and moving in various directions. Wikis and blogs are responsive to this movement in way other technologies are not. They are both by their very nature fluid and encourage frequent updating and therefore changing. Ichijo and Nonaka plainly state that *ba* can be created in "virtual spaces such as e-mail groups." Blogs are also important in the formation of *ba* because they provide context for the information (Grudin, 2006). They may contain both data and information, but then they include explanations of why the information contained in the post is useful and relevant.

One of the most challenging aspects of implementing successful knowledge management programs in the basic challenge of transforming tacit knowledge into explicit knowledge. Codification is a part of this process. Using technologies such as blogs and wikis can alleviate some of the difficulty of transforming tacit knowledge into explicit knowledge. Because blogs are not highly technical documents and are

not always intended to be very polished products, sometimes they are written in a "stream of consciousness" fashion. Writing in this manner can uncover knowledge the writer was unaware he had. By encouraging those who need to transmit knowledge to write often and to think about what they know on a regular basis, the process of explicating knowledge will become more natural as time progresses. I also suspect that tacit knowledge can be embedded in a blog and extracted by its readers because of the personal and subjective nature of the medium (Avram, 2006).

From an organizational standpoint, social software dramatically alters the traditional model. It reduces bureaucracy, can flatten hierarchies, and increase constituent feedback. While many organizations claim to desire this, in practice, upper level management may actually be somewhat fearful of it. As with KM in general, social software should not be used to justify maintaining the status quo. Workers will sense their feedback is not truly desired and be less engaged in the process. Upper level management must decide if their fear of losing control is more important than having the open communication stream and collaborative nature of social software tools. Workers who are responsible for creating and adding content to blogs and wikis may be uncomfortable with the collaborative and public nature of using those tools. If workers have never been asked for feedback throughout the course of their careers, it can be shocking to suddenly be expected to contribute to the dialog. They may feel uncomfortable at first expressing their opinions. Developing comfort can be accomplished; it will simply take some time and effort. First, it is necessary to create guidelines as to the purpose of the social software tool. While some personal or extraneous information is desirable, a worker who uses the organizational blog solely to update everyone on their Ultimate Frisbee games is not using the tools appropriately. Also, it must be acceptable for users to "lurk," that is just read and not add content to these sites. Many people who are initially uncomfortable contributing to or commenting on a blog, will, if they read it long enough, feel compelled to add their voice to the conversation.

Ideas for the Future and Implications

Social software tools are already embedded in online culture and will increasingly be important to organizations. Blogs and wikis are excellent ways to communicate both with an organization's entire staff, but also all the constituents of an organization. It can be time-consuming to get information to the staff, board, and customers, but a well-developed blog or wiki that is updated frequently can be an efficient way to do so. In organizations with union membership, it is imperative that management maintain union information in a place easily accessible to members. Historically this has been accomplished with the placement of a bulletin board in the offices. However, as telecommuting becomes increasingly commonplace, physical information centers such as bulletin boards will need to be supplemented. Social software offers a set of technologies that can supplement physical information centers.

Earlier, I mentioned the possibility of large organizations creating their own social networking function. Users could show who they worked with on various projects, post ongoing areas of interest or any questions they may have. This type of program could serve multiple functions. First, it would serve as an information center where users could see what their colleagues have expertise in as well as who they work with. It also offers a space to publicly ask questions, increasing the likelihood that someone who has information on that matter will find the question. While it is

challenging to form close bonds via social networking, it does make it easier to form the weak bonds upon which stronger relationships are based. They can also serve as knowledge maps. There are probably more functions that would only be realized upon implementation of such a program.

Embracing social software tools in a KM context have several implications. The primary implication of KM and learning organizations and social software is that they all increase communication both up and down the chain. As those as the bottom of the hierarchical order become more invested in the organization, the hierarchy will flatten. As the hierarchy flattens, power is distributed and everyone throughout the organization feels more invested in their work and the mission of the organization. The users are empowered because social software tools are brought to them (Avram, 2006).

Conclusions

Social software has a place in the organizations of today in support of KM. While it may be challenging to effectively to implement, it is worth the time, effort, and sometimes pain to do so. Benefits that have already been demonstrated are many, and as these technologies become more highly developed and supported by organizations, these benefits will only increase. They have been discussed, but here is a brief review of some of the benefits: faster discussions, unhampered by endless meetings, resulting in increased productivity (Boue, 2008); making it easier for workers to access the information they need and leading to a more collaborative environment. A key element of blogs and wikis is that they serve as knowledge repositories, ensuring that critical knowledge exists outside of employees' heads and note pads. This can be particularly useful in tracking project development.

As in all technology-based knowledge management tools, it is crucial not to let the technology overwhelm the project. It has been said that "the tendency to see IT as independent from the social environment of which it is part has contributed to the lack of success of IT projects" (Deitering and Bridgewater, 2007). This is true and is perhaps the greatest pitfall in the use of social software technologies in the workplace. Social software technologies must be supplementary to a KM program, not a stand-in for a KM program (Ras, Avram, Waterson, & Weibelzahl, 2005). An organization with a cold, highly bureaucratic office environment will not succeed in creating an open, collaborative digital environment without first changing the office environment and culture.

KM and social software are natural partners and should continue to be partnered together. Using social software technologies eliminates many of the pitfalls of older, technologically based KM tools such as LotusNotes. Users generally want to participate in social software and do not need to be forced to become engaged in the process. Also, blogs and wikis are open forms of communication where users can see what they are working on and how others in the organization react to their contributions. As mentioned previously this results in increased feelings of meaningfulness, self-determination, and relatedness (Payne, 2007). Social software is also appropriate in the context of creating and supporting *ba* in a KM organization.

References

Avram, G. (2006). At the crossroads of knowledge management and social software. *The Electronic Journal of Knowledge Management, 4*(1), 1–10.

Boue, G. (2008). Don't say Web 2.0, say Intranet 2.0. *KM Review, 11* (1), 14–17.

Chalofsky, N. (2005). Reshaping the way we view the world. *TD, 60* (11), 15–57.

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

Deitering, A-M. & R. (2007). Stop reinventing the wheel: Using wikis for professional knowledge sharing. *Journal of web librarianship, 1* (1), 27–44.

"FAQ." (2007). *FAQ—Twitter.* Retrieved May 10, 2008 from http://help.twitter.com/index.php?pg=kb.page&id=26.

Grudin, J. (2006). Enterprise knowledge management and emerging technologies. *Proceedings of the 39th Hawaii International Conference on System Sciences, 2006.*

Hall, H. & Davison, B. (2007). Social software as support in hybrid learning environments: The value of the blog as a tool for reflective learning and peer support. *Library & Information Science Research, 29* (2), 162–187.

Heaton, L., Bergeron, P., Bertrain-Gastaldy, S., & Mercier, D. (2005). Knowledge moves: A communication perspective. Accessed April 3, 2006.

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

Levinson, M. (2008). ABC: An introduction to knowledge management: The basic guide to knowledge management. Retrieved May 5, 2008 from http://www.cio.com/article/40343/ABC_An_Introduction_to_Knowledge_Management_KM_/1

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53* (2), 1009–1018.

Payne, J. (2007). Using social software to improve collaboration. *KM Review, 10* (5), 24–29.

Ras, E., Avram, G., Waterson, P., & Weibelzahl, S. (2005). Using weblogs for knowledge sharing and learning in information spaces. *Journal of universal computer science, 11* (3), 1–10.

Stafford, T. & Webb, M. (2006). *What is a wiki (And how to use one for your projects).* Retrieved May 9, 2008 from http://www.oreillynet.com/pub/a/network/2006/07/07/what-is-a-wiki.html.

Tepper, M. (2003). The rise of social software. *Networker, 7* (3), 18–23.

"What's a blog?" (*n.d.*). *What's a blog?* Retrieved May 5, 2008 from http://www.blogger.com/tour_start.g.

Creating the Conditions of Trust for Knowledge Transfer and Creation: A Consensus Model

Connie Pascal
Master of Communication and Information Studies

Abstract

Drawing on recent literature and research into role of trust in knowledge transfer and creation, this paper describes a conceptual model of the conditions an organization must foster for trust to take hold and produce knowledge. For purposes of this paper, the phase 'conditions of trust' is used to describe the relational and structural elements that combine to produce 'trust'—the desired state between the two parties. Without trust, both knowledge creation and transfer become difficult; without trust, the venture, whatever that may be, will fail to meets its potential. This paper outlines what previous research from different disciplines (organizational development, business management and communication / information theory) have identified as key elements necessary for the trust to develop between two parties. For purposes of this paper, these elements include: relational, structural, perceptions, benevolence, reciprocity, dependability and inclusion (Levin D.Z., Whitener, M. and Cross, R. 2006; Levin, D.Z., and Cross, 2003). These trust elements exist on a spectrum that ranges from absolute trust to absolute distrust and can change on any given day. They are modified by risk and the level of shared vision present in the relationship. The weighted importance of each of the trust elements is dependent on a combination of past experience and immediate circumstances and varies given the goals and potential of the venture. Conceptually, the 'conditions of trust' model operates the same between two party relationships whether between individuals, intra-organizational or inter-organizational. This paper also describes two important moderating influences on trust, 1) the length of the relationship, and 2) the relative strength of the ties that bind the two parties together. An interesting finding in the research shows that strong ties facilitate knowledge transfer which nurtures organizational learning and achieves sustainability, while weak ties appear to be best for knowledge creation which ignites organizational innovation and creates competitive advantage.

Introduction

The need and ability to trust for the purposes of creating and transferring knowledge are basic necessities for sustaining life—whether human life or the 'life' of an organization. This has not changed. What has changed is how knowledge work gets done in the 21st century. The effects of globalization, digital technology and multi-national corporate structure have revolutionized the workplace with outsourcing, virtual teamwork and online learning already de facto techniques in today's business world. What has changed is who is doing the knowledge work in the 21st century. The effects of globalization, gender and generation are becoming clear with new emphasis on diversity training, work/life balance and social safety nets at odds with corporate productivity and profits. The effects of wireless telecommunications, social networking and search technology are only accelerating the changing workforce dynamic.

The level of trust one individual has for another individual, or one organization for another, is an indication of how positive or negative the relationship is between the two parties. If there is a high level of trust—which is always defined as a positive – the relationship is usually productive, producing knowledge, social and oftentimes financial capital. If there is a low degree of trust, i.e. distrust, the relationship is usually destructive—blocking knowledge creation and destroying both social and financial capital. If there is apathy between the two, then knowledge transfer stagnates and knowledge creation ceases. The amount and degree of trust established is a determining factor in whether the relationship will be productive or wither on the vine. In Daniel Levin and Rob Cross's 2004 paper, "The strength of weak ties you can trust: the mediating role trust in effective knowledge transfer," they note that trust is a required ingredient in learning. Being able to admit when you do not know something is entirely based on how vulnerable you feel in the relationship. When trust is present, teams / organizations communicate effectively to solve problems, invent products, structure processes . . . the list is never-ending. When there is distrust, communication is blocked and potential goes unfulfilled because all important tacit knowledge is withheld (Levin, et al., 2004) which impedes learning and knowledge creation. The purpose of this paper is present a conceptual model of the 'conditions of trust' that must be present in an organization before knowledge can be either created or transferred. The first part is a review of literature from three different schools of thought that provide evidence to inform this model. The second part of this paper defines the concept of the 'conditions of trust' and presents the conceptual model. The paper concludes with short section on implications for the organization and concludes with a call for more research.

Literature Review—
The Role of Trust in Knowledge Creation and Transfer

The Organizational Development Viewpoint—Trust as a Moderating Influence. The topic of trust has been extensively examined from a variety of academic angles. From the organizational development world, trust can be seen as a mediating influence on knowledge creation and transfer. In their 2006 paper, "Perceived Trustworthiness of Knowledge Sources: The Moderating Impact of Relationship Length," Rutgers professor Daniel Levin and his associates Ellen Whitener and Rob Cross from the University of Virginia note that trust is viewed as a form of social capital produced by relationships that mitigate feelings of risk and vulnerability and creates a feeling of trustworthiness. "Trust refers to the willingness of parties to accept risk and be vulnerable to others. This willingness to be vulnerable derives from the party's perceptions of the other's trustworthiness" (Levin, Whitener and Cross, 2006; Mayer et al, 1995. (91:5) p. 1164). The authors acknowledge that prior research has not proven an association between relationship length and "trustworthiness" but their field study of three companies (N=88) does show a moderating association between how long a relationship lasts and changes in perceived trustworthiness over time. According to Levin, Whitener and Cross, people form their decision to trust on the basis of three kinds of perceptive information: 1) demographic similarities—in other words, how like/unlike am I to this person; 2) trustworthy behavior—how does trust grow/shrink as people interact and reciprocate behavior; and 3) shared perspectives—how alike/dislike are their goals, outlooks and perspectives. At the beginning of the relationship, trust is based on demographic similarity. As time goes on, trust is based on reciprocity and

dependability and with longer relationships; shared perspective is the force that keeps the relationship in a state of trust. Their thesis is that 'trustors are information processors and the relationship length moderates the relative strength of the association between trust and these bases of trust" (Levin, et al., 2006, p 1164). In other words, the decision to trust or distrust is based on perceptions and preconceived notions and is in a constant state of flux.

Another key element in knowledge creation and transfer is the relative strength or weakness of the ties that bind the two parties together. In their 2003 paper, "The Strength of Weak Ties You Can Trust: The Mediating Role of Trust in Effective Knowledge Transfer," Daniel Levin and Rob Cross explore the structural benefit of "weak ties" you can trust as a force for creating new knowledge based on data gathered from employees within three different companies. Tie strength refers to the connection between two parties ranging from weak ties at one extreme to strong ties at the other. The relative strength of the tie is a function of the closeness and interaction frequency of a relationship between two parties. (Levin & Cross, 2003 citing Granovetter 1973 and Hansen 1999, Marsden and Campbell, 1984). In this paper, Levin and Cross put forth a theoretical model for knowledge exchange based on their findings on the "importance of relational and structural characteristics of social capital for the receipt of useful knowledge . . ." (p 1477). They found a clear link between strong ties and the transfer of tacit knowledge but this was mediated by how competent each party perceived the other to be and by the level of benevolence (goodwill) each party felt for the other. Their thinking is that strong ties provide access to wisdom and promotes learning. They also found a beneficial link between knowledge creation and weak ties that is in line with prior research suggesting that weak ties provide access to new information and inspires new ideas . . . i.e. knowledge creation.

The Business School Perspective—Trust as Relationship Capital. From the business and management practices school of thought, Michael Santoro and Patrick Saparito's 2005 paper, "Self-Interest Assumption and Relational Trust in University-Industry Knowledge Transfers" focused on studying the roles of "relational trust" and "self-interest assumption" in collaborative relationships between university research departments and industry. Based on data gathered in a survey of 180 small to large-sized companies they found relational trust to be more strongly associated with knowledge transfer than self-interest assumption—which supports Levin and Roth's idea of strong ties, i.e. closer relationships are better at converting tacit knowledge into explicit. In fact, they found as knowledge got more tacit, self-interest assumption became negatively correlated—meaning as soon as one party perceives the other party was 'out for himself' knowledge transfer stalls.

Li Li's (2004) paper, "The Effects of Trust and Shared Vision on Inward Knowledge Transfer in Subsidiaries' intra—and inter-organizational relationships" presents the results of a survey of 75 Multi-national Corporations (MNC's) with subsidiaries based in China and headquartered in the West. It was designed to shed light on the relationship between trust and shared vision. Surprisingly the data showed that shared vision was more important intra-organizationally with trust more important inter-organizational. This is vital to understand given the network nature of today's multinational corporations and also in keeping with the ideas presented in the 'conditions of trust' model.

Communications—Learning Systems Approach—Trust as a Success Predictor. Trust comes in many forms. One of the most important forms for knowledge transfer and creation is the idea of "Swift Trust." In their 2002 qualitative study, "Building Trust in Virtual Team," Coppola, Hiltz and Rotter identify the development of 'Swift Trust' as something that can explain the success of one online class over another. "Swift trust is a concept developed by Meyerson et al. to describe trust for temporary teams who form around a clear purpose and common task with a finite life span." (Coppola, 2002; Meyerson, et al., 1996 p 95). Swift trust develops in temporary systems and is not a diluted form of real trust, but is described as "unique form of collective perception" (p 95). Coppola cites Meyerson et al's use of the term social characteristics to frame swift trust in terms of the following:

- ♣ Risk—a willingness to take risks
- ♣ Vulnerability—the belief (hope) that others will care for what is being entrusted with good will.
- ♣ Uncertainty—a willingness to suspend doubt in order to execute the task performance.
- ♣ Expectations—a positive expectations of benefits of temporary group activity

Overall, their analysis shows that swift trust can form, but has "unique communication and behaviors" in comparison to face-to-face groups (Coppola, 2002; Meyerson, et al., 1996 p 95). These findings also support the 'conditions of trust' conceptual model presented in this paper as well provide further insight into the power of weak ties (temporary systems) to create knowledge and transfer knowledge.

Communications—Information Engineering Perspective—Trust as a Statistical Value. In their 2007 paper," Swift Trust in a Virtual Temporary System: A Model Based on the Dempster-Shafer Theory of Belief Functions," authors Xu, Feng, Wu and Zhao make the point that, "It is impossible for one party to know everything about the other, but both parties are willing to interact with each other when conditions allow. In fact they are eager to cooperate for mutual interest" (p 95). The Dempster-Shafer theory of belief functions is a mathematical theory of evidence based on belief functions and plausible reasoning to combine separate pieces of information to calculate the probability of an event occurring. This theory was developed by Arthur P. Dempster and Glenn Shafer. The authors agree with Coppola (Coppola, et al., 2002) on the increasing importance of swift trust in virtual temporary system.

> Using complex statistical / mathematical methods, the authors arrive at a model that divides swift trust [in the virtual temporary system] into three sub-objectives (vulnerability, uncertainty and venture) supported by five influencing factors (interdependence, intensity of focusing role, categorization, environmental factors and power of action.) Once the influencing factors are identified, the swift trust mechanism is nearly mastered. (pp 117–118)

They put forth a theory around the concept of 'layered reasoning' which they believe is superior to the typical trust reasoning. By controlling for various factors and combinations of sub objectives and influencing factors, they are able to achieve a 'whole swift trust value.' For Xu, information is also a condition—lack of it can form distrust, misuse of information causes confusion. This idea not only supports the concept of swift trust as presented but also suggests there are 'conditions of trust' that

must be met before trust can emerge in the temporary systems they studied.

The 'Conditions of Trust' Model

The following model seeks to provide a consensus view of the literature and research as outlined in part one of this paper. For knowledge to be created or transferred a fairly set group of elements must come together in order for the 'conditions of trust' to form. This model shows trust emerges from the interaction of relational capital, structural ties and human perceptions to create feelings of benevolence and to induce reciprocity and dependability. A circle of inclusion encompasses the basic model to illustrate the importance of inclusion as the unifying element of this construct. The conditions of trust are dynamic and vary across three different spectrums based on events unfolding around the two parties. This is represented in the model as the *trust spectrum* ranging from absolute trust to absolute distrust; *the risk spectrum,* ranging from low risk to high risk; and the *vision spectrum,* ranging from shared vision to private vision. Risk also influences the social characteristics of vulnerability, uncertainty and expectations (Coppola, 2002). On the left side of the spectrums (absolute trust, shared vision and low risk) knowledge creating and knowledge transferring behavior can be produced. The right side of the model shows that absolute distrust, private vision and high risk produce knowledge blocking and knowledge hoarding behaviors are produced.

Definitions of Terms Found in the Model. This model operates at all levels of two-party relationships making it useful in aligning an organization's business goals with its human capital. The model can also help an organization visualize a complex, messy human-based system. As such, interpersonal communication is the key factor that must be attended to in order to make things happen. Following are definitions of the terms found in the model:

Inclusion: The one element that all the trust literature seems to agree on is that vulnerability is at the heart of trust. At the heart of vulnerability is uncertainty and choice. There is positive uncertainty (Thrasher, 2007) and negative uncertainty and the constant choice to trust (or distrust). The key to mitigating the negative aspects of vulnerability and uncertainty is to create a safe, inclusive environment where there is bi-directional communication, respect for individual rights yet equity in the relationship. [Note: Vulnerability is a combination of behaviors: discretion, availability, reliability, and consistency (Levin, et al., 2006).]

Relational Trust: Primarily based on the ideas from social capital that relationships emerge out of the confidence that each party's motivations are positive and cooperative (Santoro, 2005; Rousseau, et.al).

Structural Trust: Primarily based on the ideas found in social networking theory and the structural properties of networks (Levin, 2005; Adler and Koon, 2002). Structural characteristics of trust manifest in the type of ties that bind together two parties (Levin, 2005, Granovetter, 1973 et al.).

Perceptions: As Levin, Whitener and Cross (2006) put it, "people base their expectations on the extent to which they share the same goals, perspective and identity. Evidence suggests that people exhibit greater trust in those they perceive as having similar outlooks and goals." Three factors appear to be most commonly related to these perceptions: perceptions of the other's ability, integrity and benevolence (Levin and Cross, 2003; Davis, Schoorman, Mayer, & Tan, 2000; Mayer et al., 1995).

Benevolence: Benevolence is about interpersonal relationships and expectations and the affective part of the relationship. According to Levin, Whitener and Ross, (2006) benevolence is a fundamental element created when one person is "willing to be vulnerable to another and he/she expects the other person has his/her interests at heart, cares for him/her and feels goodwill toward him/her."

Trust: The ability to be vulnerable and reveal what you do not know is a scaled-down definition of trust that applies very nicely to the idea of knowledge transfer and creation. It is also ephemeral. "It is neither inevitable nor irreversible and can turn to distrust through dramatic behavior changes by either party, such as betrayal" (Levin, 2006; Jones & Georges, 1998, p 1165).

Reciprocity: Because trust is a network mechanism, trust forms because people need each other to transfer and create knowledge. Knowledge has to be transferred and shared back and forth between the two parties. There must be equity in the form of open, two-way communication and rooted in shared perspectives.

Dependability: In this model, dependability is about meeting expectations and how much one party can trust the other party to come through on their respective promises to each other. To depend on someone is to incorporate both their competence and their reliability into a single measure.

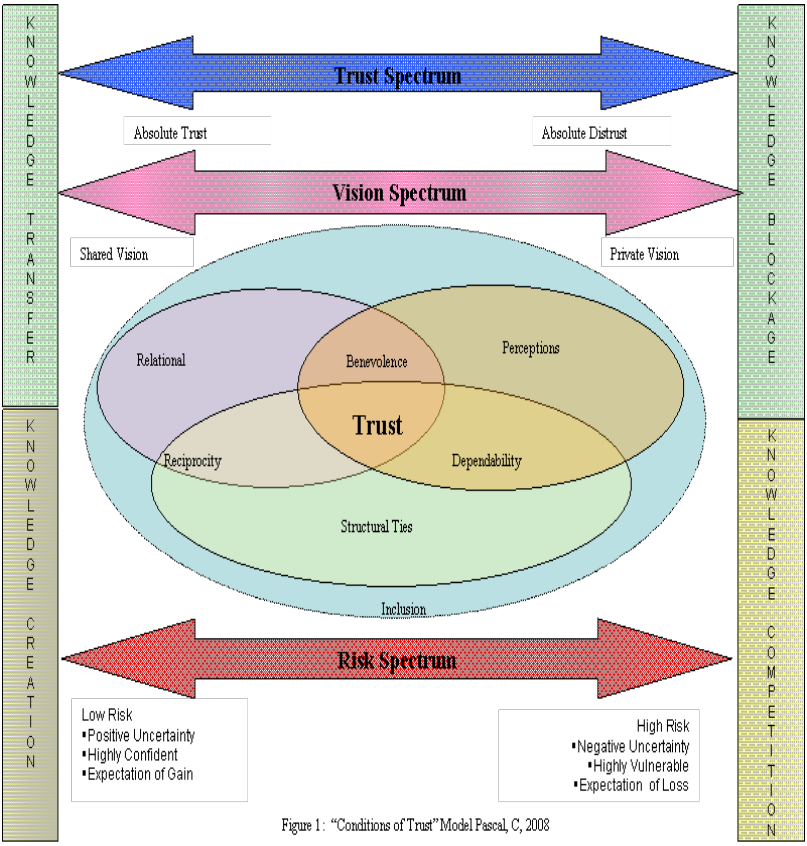


Figure 1: "Conditions of Trust" Model Pascal, C, 2008

Implications

Trust is an important element in the transformation of knowledge into human, economic and political capital. The knowledge economy is an interactive network of relationships bound together by people, process and technology and held together by the perception of trustworthiness between people. For the knowledge economy, the implications for how work is produced is immense. The workplace is vastly different with virtual teams, remote workers and temporary systems as the norm. The virtual temporary system described by Xu (2007) is already the de facto organizing structure for most knowledge taking place within corporations. The implications are clear; organizations must develop the ability to create swift trust between disparate people as a core competency and present in its leaders at every level. This means fostering a culture that creates the conditions of trust as the essence of sustainability and competitive advantage for both knowledge workers and organizations.

Conclusion

There is much more to be said about everything presented in this paper. Each of the elements presented as a 'condition of trust' can and should be studied in much greater detail and understood in context as to how knowledge is created and transferred. Knowledge is now the most valuable asset any organization has in the global economy. It is vitally important that both management and workers understand the fundamentals of how work gets done in the 21st century knowledge economy. This understanding can and should mediate the power balance between capital and labor, in this case capital being the global financial system and labor being knowledge workers. Much needs to be understood about the societal and organizational issues that impact an individual's ability to trust. For instance, gender and generational demographics are changing the workplace as work/life balance takes center stage for both younger and older workers. The effect of a widespread workforce cynicism on trust needs to be studied given the rampant corporate and political corruption and the absolute breakdown of the 20th century employee/employer contract. From an organizational point of view, issues such as diversity, remote/virtual teams and the tyranny of financial reporting all impact how and why people start and stay trusting.

At the risk of being more poetic than scholarly, trust is a beautiful, positive force and something to be nurtured and protected. Trust makes its presence is known as well as its absence. Human society is (and has always been) an interdependent relationship bound together by trust. Hopefully, this paper has shown that trust is a palpable force within knowledge management and thus important to organizations and individual alike.

References

Adler, P.S., & Kwon, S. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 27*, 17–40.

Buchan, N., Croson, R., & Dawes, R. (2002). Swift neighbors and persistent strangers: A cross-cultural investigation of trust and reciprocity in social exchange. *The American Journal of Sociology, 108*(1), 168–206.

Coppola, N. W., Hiltz, S. R., & Rotter, N. G. (2004). Building trust in virtual teams. *IEEE Transactions on Professional Communication, 47*(2), 95–104.

Granovetter, M. 1973. The strength of weak ties. *American Journal of Sociology, 78,*

1360–1380.
Hansen, M. T. 1999. The search-transfer problem: The role of weak ties for contractual choice in alliances. *Academy of Management Journal, 38*, 85–112.
Jones, G.R., George, J. M. (1998). The experience and evolution of trust: Implications for cooperation and teamwork. *Academy of Management Review, 23*, 531–546.
Levin, D. Z. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science, 50*(11), 1477–1490.
Li, L. (2005). The effects of trust and shared vision on inward knowledge transfer in subsidiaries' intra- and inter-organizational relationships. *International Business Review, 14*, 77–95.
Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integration model of organizational trust. *Academy of Management Review, 20*, 709–734.
Meyerson, D., Weick, K.E. & Kramer, R. M. (1996). Swift trust and temporary groups. In M. Kramer and T. R. Tyler (Eds.), *Trust in organizations: Frontiers of theory and research*(pp. 166–195). Thousand Oaks, CA: Sage Publications.
Rousseau, D. M. , Sitkin, S.B., Burt, R.S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*, 393–404.
Santoro, M. D., Saparito, P. A., & Santoro, M. D. (2006). Self-interest assumption and relational trust in university-industry knowledge transfers. *IEEE Transactions on Engineering Management, 53*(3) 335–347.
Thrasher, H. (2004). The opposite of "project risk" isn't "no risk." Retrieved April/25, 2008, from http://www.makingitclear.com/newsletters/newsletter11.html.
Xu, G. (2007). Swift trust in a virtual temporary system: A model based on the Dempster-Shafer theory of belief functions. *International Journal of Electronic Commerce, 12*(1) 93–126.

The Codification and Transfer of Knowledge

Lisa Pierce
Master of Communication and Information Studies

Abstract

The intent of this paper is to discuss the process of codification and the sharing of knowledge between organizational members, and to discuss the frequent challenges to knowledge coding and transfer. Additionally, the paper will discuss what aids the transfer of knowledge, and will argue that the use of technology for coding, storing, and sharing knowledge is not sufficient alone. Human intervention is essential to the creation and maintenance of codification and knowledge transfer (Nonaka & Toyama, 2007). Furthermore, without frequent human intervention, an organization will find it extremely difficult to address both the external and internal changes that occur. An organization that fails to address environmental changes will either cease to remain relevant in society, or cease to exist.

Introduction

"To remain competitive, organizations must efficiently and effectively create, locate, capture, and share their organization's knowledge and expertise" (Zack, 1999, p.45). However, locating, capturing, and sharing knowledge can be a difficult, ongoing process. Scholars, such as Zack (1999), note that many organizations are so intricate that their knowledge is fragmented, and therefore, difficult to capture and share. Today, more companies are turning to new technical resources in hopes of making knowledge distribution and reuse more effective within their organization. While the continued development of computers has made it easier to codify, store and share knowledge, the integration of technology can also exacerbate the distribution and sharing of knowledge when used inappropriately. Organizations must take the time to train employees to critically interpret, evaluate, and adapt knowledge to their own company's context (Zack, 1999).

Codification

In simplest terms, codification refers to when some piece of knowledge is put into an accessible form (Davenport & Prusak, 2000). Knowledge management approaches can be divided into personalization approaches that emphasize human resources and communication, and codification approaches that emphasize the collection and organization of knowledge (McMahon, Lowe, & Culley, 2004). Knowledge that is carefully codified, stored in a repository, and can be easily retrieved by all members of an organization, is known as the codification strategy (Hansen, Nohria, & Tierney, 1999). The codification strategy is used when companies focus on the computer and view it as the source of information or explicit knowledge. Hansen, Nohria, and Tierney (1999) describe the first step of codification as the "people to documents" approach, in which knowledge is externalized; organizations can still take steps to identify where the knowledge resides. The personalization strategy is used when organizations view the computer as a tool that helps people communicate knowledge, rather than store knowledge. The personalization strategy is rooted in building networks of people. In this method knowledge is not only shared face-to-face but through videoconferencing, email, and telephone; the focus is on the dialogue between individuals. The focus on the dialogue and interaction is especially helpful

when coding deeply tacit knowledge.

Davenport and Prusak (2000) argue that since tacit knowledge is developed and internalized over a long period of time, it is almost impossible to reproduce in the form of a document or database. Some knowledge cannot be successfully codified outside of the human mind. One example of this would be dancing; some may be able to learn the moves outlined in a book, but cannot master the grace or rhythm of a dance move. The human interaction or actual experience of dance is a major place of knowledge creation and transfer. However, as Hansen et al. (1999) note, trying to implement the wrong strategy or both strategies at the same time can quickly undermine a business. It is important for all organizations to first assess their situation, including functions, goals, financial and human resource capabilities, before choosing one or both strategies. Since each company's situation is unique, one strategy may not be applicable or serve the main interests of a certain organization. Furthermore, employers should take the time to learn about the advantages and shortcomings of the two strategies in order to make an informed decision about which knowledge management system to integrate.

Consulting firms, such as McKinsey and Bain, have adopted the personalization strategy. This strategy is effective for their companies because consultants gain a deeper insight by verbally going back and forth on problems they need to address (Hansen et al., 1999). On the other hand, the codification method can be beneficial to a company that works with a limited budget. The codification process is a one-time investment that results in an increased knowledge reuse rate. Since knowledge is converted from what Hansen et al. (1999) label "people to documents" the recorded knowledge can be retrieved and used by many people multiple times. Employees that assemble toys, for example, may find that the codification strategy is sufficient, and can easily reuse their company's codified knowledge on toy creation and assembly.

Knowledge Reuse

The need to transfer knowledge and to reuse it is crucial to the success of an organization. According to Leonard (2007), leveraging knowledge assets through reuse is essential in several different situations (p. 57). It is especially important that global organizations ensure that job-related information and knowledge is readily available to long distance employees (Connaughton & Daly, 2004). For example, operations that are physically dispersed must duplicate production processes for quality and competitive purposes. In other words, production must be consistent because customers and clients expect to receive the same product or service every time. Intel has a "copy exactly" policy where local plants must duplicate every detail of the model plant. Without the codification process, it becomes much more difficult for employees or members to reuse knowledge. As stated earlier, knowledge in the codified form makes it easier for organizational members to access and retrieve knowledge that is vital to their work. However, this does not mean that an organization needs to follow a replication strategy in order to gain from knowledge reuse. Buckman Labs is an example of a company that used rapid internal knowledge transfer (Leonard, 2007). Buckman set up a worldwide computerized knowledge network through which employees could search for company expertise to serve local customers. The Buckman example illustrates that knowledge reuse can occur in a company that utilities the personalization strategy.

Knowledge with a Purpose

According to Davenport and Prusak (2000), in order for a knowledge management system or codification strategy "to be worthwhile, a knowledge codification project needs more specific aims than just making knowledge generally available" (p.69). In other words, organizational employees or members must first know exactly what they are looking for, or need. Applicable information is far more important than completeness. Codifying everything or anything will not only waste time and money, but also hinder the organization from gathering and distributing knowledge that will be the most beneficial to them. Davenport and Prusak (2000) propose four principles that will aid managers in codifying knowledge successfully. They note that managers must decide what business goals the codified knowledge will serve, must evaluate knowledge for usefulness, and identify knowledge existing in various forms that are suitable for reaching their goals. The coder's role is to identify an appropriate medium for codification and distribution. Additionally, Zack (1999) states that an effective knowledge management system requires that categories and relationships be defined. It is necessary to create identifiable points that make the process of searching and retrieving information and knowledge easier. As a knowledge or information repository becomes larger and is not maintained, it becomes increasingly hard to locate a relevant piece of information or knowledge. Performing frequent checks of repository categories and content will make it easier to manage large knowledge repositories.

Aids in the Transfer of Knowledge

The codification of knowledge is one obvious factor that aids in the location and transfer of knowledge (Leonard, 2007). The degree to which knowledge is made explicit affects how accessible and how quickly knowledge can be transferred. With the help of technology, explicit knowledge can be packaged and sent around the world in a matter of seconds. The second factor that aids transfer is the physical proximity of the knowledge source and the receiver (Leonard, 2007). Even though technologies, like email, have made it possible to overcome physical barriers, physical proximity still significantly helps knowledge transfer. The reason why is because knowledge is most credible when it comes from a trusted source. Employees or group members may be more inclined to trust those they are physically close to because they have established some type of relationship with that person.

While all companies should employ multiple channels to reinforce the knowledge that is transferred, companies that are geographically dispersed should employ multiple channels to overcome the lack of physical proximity. Setting time aside to talk with co-workers about any topic can aid in the transfer of knowledge. Davenport and Prusak (2000) argue that "water cooler" talk and unstructured knowledge transfer is vital to an organization's success. According to Zack (1999), the more communicators share knowledge and experiences, the more effectively knowledge can be communicated through newer mediated channels.

Davenport and Prusak (2000) state that many companies use face-to-face communication to supplement the technology used to transfer knowledge. An MIT researcher, Tom Allen, has "found in many studies that scientists and engineers exchange knowledge in direct proportion to their level of personal care" (p. 159). These findings indicate that, if possible, organizations should mandate some face-to-face meetings in order to enhance knowledge transfer. Some other key strategies to transferring knowledge successfully include phased retirement and implementing a

succession plan where new employees work alongside older employees (HRFocus, 2008).

Another way organizations can help transfer knowledge is to work on building knowledge access projects, which focus on the current and prospective users of knowledge. According to Davenport and Prusak (2000), knowledge access projects acknowledge the fact that the transfer from one person to another is often a difficult process. Similar to repository projects, knowledge access projects vary in how technology is used. For example, the old company Teltech used an expert referral service database that was maintained by external technical experts (Davenport & Prusak, 2000). The Teltech case is just one example of how companies build and manage maps of knowledge sources.

Knowledge Maps

For knowledge repositories to be meaningful the structure must reflect and map out the "contextual knowledge tacitly held by the organization" (Zack, 1999, p. 56). Frequently there are times when knowledge is so inherently tacit that the transfer and sharing becomes almost impossible to accomplish. When an organization finds that it is experiencing trouble with coding deeply tacit knowledge it should adopt the personalization strategy discussed earlier in the paper. More specifically, it should consider developing a knowledge map, like the one used by Teltech. A knowledge map creates an inventory of an organization's employees and networks. A knowledge map links a particular concept, issue, or problem to an individual who possesses some expert knowledge on the topic in question. In simplest terms, a knowledge map "shows people where they need to go when they need expertise" (Davenport & Prusak, 2000, p. 72). Just like any other knowledge management system, a knowledge map should focus on clearly defined organizational needs. It is important to note that a good knowledge map goes beyond departmental boundaries when necessary (Davenport & Prusak, 2000).

In addition to providing access to knowledge sources, that would otherwise be difficult to find, a knowledge map can be used to reveal both an organization's strengths and weak points. One problem with mapping, however, is that it ignores an organization's hierarchical structure, which means knowledge maps may lead to political tensions (Davenport & Prusak, 2000). Depending on the organizational structure and climate, some employees may feel as though the map is giving away access to one's own proprietary source of knowledge. Some may view this type of access as giving away power or influence (Davenport & Prusak, 2000). To help overcome this hesitation to contribute knowledge, employers should foster a sense of community, and emphasize that all employees are working toward the same goals.

Challenges to Codification and Knowledge Transfer

The potential for hierarchal tension is not the only problem that can arise when making tacit knowledge accessible to all. While new technologies can ease the process of codification, one must not expect the technology, alone, to make knowledge codification a success (Majchrzak, Rice, King, Malhotra, & Ba, 2000). Similarly, technological systems do not guarantee that knowledge will be shared (Davenport & Prusak 2000; Prusak & Weiss, 2007). One common problem found in organizations with poor knowledge management programs is the overemphasis on the actual technology itself. As noted by Prusak and Weiss (2007), making Lotus Notes available did little to change a knowledge-hoarding culture into a knowledge-sharing

one. Often employers forget, or do not do a thorough job of training and explaining the new technological system. As a result of the lack of training, the process of knowledge codification can become meaningless.

Zack (1999) states that assigning responsibility for each stage of movement of knowledge, from acquisition to use, will help make sure that repositories are being used in a meaningful way. Vaast and Levina (2006) also pose some suggestions that will help make the codification of knowledge meaningful. They studied a major organizational redesign of an IT company. Their findings indicate that there are specific challenges that designers of support systems face when increasing the degree of codification. The challenges they note lead to a few key implications, two of which include the need for designers to pay careful attention to the organizational context, and the need for designers to communicate constantly with stakeholders.

The Human Component

In order for knowledge codification and transfer to be effective, people need to be willing to communicate and share their knowledge. Often times, individuals are not willing to share because they do not trust their fellow employees or members (Hislop, 2002). For the employees or members that are geographically dispersed, it becomes harder to cultivate trust. The long-distance context can contribute to feelings of isolation and then distrust, which is why employees/organizational members should personalize their interactions with others. Trust between individuals has been shown to be necessary when trying to facilitate knowledge sharing (Hislop, 2002). Therefore, creating a safe communication climate where people trust one another is vital to the successful transfer of knowledge.

Similarly, McInerney (2002) states an organization that is adapting to change must have open communication, a culture of collaboration and trust, and empowerment of people. The idea of establishing trust and open communication is what it means to have a psychologically safe communication climate. Some studies in the communication field have demonstrated that fostering a safe communication climate can help overcome some of the barriers to innovation (Edmondson, 1999; Baer & Frese, 2003). Baer and Frese (2003) have demonstrated that there is a direct relation between climate and firm performance. A safe communication climate is one that encourages employees to propose new ideas and openly discuss problems and critiques without feeling neglected or judged by others. Edmondson (1999) found that a psychologically safe environment encouraged members to admit mistakes and question current practices, which also contributed to members learning more effectively. In line with this research, Zack (1999) argues that effective knowledge sharing and leveraging requires an organizational climate that both rewards and encourages cooperation and trust.

However, the cultivation of trust is not the only time human intervention is needed. Knowledge management systems need to be coupled with regular maintenance by employees or members. Additionally, proper training of how to effectively use the knowledge management system or repository is needed. Employees or members need to establish a context in which to understand the organization's knowledge. The "epistemology of practice perspective suggests that all knowledge is subjective due to ambiguity and fluidity of language" (Hislop, 2002, p. 172). Therefore, without the acknowledgement of the tacit assumptions that people make when they use language, it is not possible to develop a full understanding of that particular piece of knowledge. Regardless of where an individual gathers

knowledge from, internal reflection, dialogue with others, and former experience will affect how that acquired knowledge is understood. Organizational members that belong to a community of practice can better develop a shared context, and thus an improved understanding of the knowledge acquired, coded, and stored (McMahon, Lowe, & Culley, 2004). The community of practice approach states that learning is a social-communal activity. According to Hislop (2002), communities of practice develop their own values and ways of working, which shape the way activity occurs, and influences the way knowledge is developed and interpreted.

Conclusion and Implications

The intended role of information technologies is to assist in the capturing, defining, indexing, storing, linking, and categorizing of knowledge. Additionally, Vaast and Levina (2006) suggest that increased codification may help organizations compete more efficiently with external vendors, and also ease the process of outsourcing. This means that the codification of knowledge is a crucial step that organizations must take if they want to maintain a relevant place in society. A successful and competitive organization combines its technical resources with its knowledge workers' intellect to produce a well-managed knowledge program. When executed properly, the codification of knowledge can make it easier to store, combine, and share knowledge. However, it is important to remember that codified knowledge does not become usable simply because it is made explicit and is accessible. The codified knowledge still needs to be reflected upon, maintained, and evaluated. Furthermore, employees or members need to be directed to relevant sources of knowledge, and given a context in which to understand the knowledge. It is crucial that organizational members or employees have the opportunity to critically interpret, evaluate, and adapt knowledge within their environment.

To address the last point, companies who have the financial wealth can hire people who work only as knowledge advocates. Knowledge advocates would be responsible for recording all obstacles experienced by the organization and the lessons learned. The knowledge advocate would also serve as the company's broker of knowledge. The broker would be in charge of directing fellow members or employees to relevant sources of knowledge, and provide them with any basic clarification that is needed on a particular issue or concept.

Change is inevitable, and the transfer of tacit knowledge becomes much more complicated when it changes often (Ferdows, 2006). Both current and future organizations should engage in the continual reevaluation and editing of their codified knowledge. This continual process will keep the company or organization consistent with both internal and external changes. If an organization refuses to participate in the maintenance of both its codified knowledge and knowledge transfer practices, it will either cease to remain competitive or cease to exist. Organizations must realize that devoting human resources to all stages of knowledge management, from acquisition, to codification, and transfer, will greatly benefit them in the long term.

References

Baer, M., & Frese, M. (2003). Innovation is not enough: Climates for initiative and

psychological safety, process innovations, and firm performance. *Journal of Organizational Behavior, 24,* 45–68.
Connaughton, S.L., & Daly, J.A. (2004). Long distance leadership: Communicative strategies for leading virtual teams. In D. J. Pauleen (Ed.), *Virtual teams: Projects, protocols and processes* (pp. 116–144). Hershey, PA: Idea Group.
Davenport, T. H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.
Edmondson, A. C. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44,* 350–383.
Ferdows, K. (2006). Transfer of changing production know-how. *Production & Operations, 15* (1), 1–9.
Hansen, M.T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review, 77* (2), 106- 116.
Hislop, D. (2002). Mission impossible? Communicating and sharing knowledge via information technology. *Journal of Information Technology, 17* (4), 165–177.
HR works to transfer workforce knowledge and skills. (2008, January). *HRFocus, 85*(1), 1–4.
Leonard, D. (2007). Knowledge transfer within organizations. In Ichijo, K. & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 57–68). New York: Oxford University Press.
Majchrzak, A., Rice, R. E., King, N., Malhotra, A., & Ba, S. (2000). Computer-mediated inter-organizational knowledge-sharing: Insights from a virtual team innovating using a collaborative tool. *Information Resources Management Journal, 13,* 44–53.
McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53* (12), 1009–1018.
McMahon, C., Lowe, A., & Culley, S. (2004). Knowledge management in engineering design: Personalization and codification. *Journal of Engineering Design, 15*(4), 307–325.
Nonaka, I., & Toyama, R. (2007). Why do firms differ? The theory of the knowledge-creating firm. In Ichijo, K. & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for* managers (pp. 13–31). New York: Oxford University Press.
Prusak, L., & Weiss, L. (2007). Knowledge in organizational settings: How organizations generate, disseminate, and use knowledge for their competitive advantage. In Ichijo, K. & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 32–43). New York: Oxford University Press.
Vaast, E., & Levina, N. (2006). Multiple faces of codification*:* Organizational redesign in an IT organization. *Organization Science, 17*(2), 190–201.
Zack, M.H. (1999, Summer). Managing codified knowledge. *Sloan Management Review,* 45–58.

Leveraging Organizational Structure and Communities of Practice for the Transmission of Tacit Knowledge

Carla Schubach
Master of Communication and Information Studies

Abstract

This paper proposes to take an in-depth look at using professional relationships as a vehicle for the transfer of tacit knowledge, knowledge that resists codification. Tacit knowledge is not easily captured, stored or transferred; and when it is subject to these more technical methods of knowledge management (KM) important nuance is often lost. Developing communities of practice (CoPs) and learning cultures may offer a solution to this problem. This paper will examine the methods and benefits of CoPs as a vehicle for transfer of tacit knowledge and a complement to the formal information transfer systems within the New Jersey Division of Child Protection (DCP) (fictional name), a governmental social service agency. Successful social work, in a child welfare setting, relies heavily on the ability of caseworkers (CWs) to make decisions and take action in crisis situations. The knowledge to make these decisions is most often experiential. However, the DCP has a problem with high turnover, meaning that many of these critical decisions are made by inexperienced CWs. It is proposed that implementation of communities of practice would better prepare CWs to make these decisions by providing a way to transfer experiential knowledge. It is also likely that the implementation of communities of practice could provide CWs with a support system, thereby decreasing the incidence of turnover in the organization. In an organization where the work is based on building, assessing and repairing relationships, formal knowledge sharing through relationships suggest communities of practice as an ideal solution.

Introduction

In every position within every organization tacit knowledge is required for success. There are tasks that each person does every day in the course of completing their job tasks that were never specifically "taught." Common examples include the filing system one uses to keep track of completed work, the specific series of actions when starting up a machine that make a production line station run more smoothly or the way appointments are organized on a calendar. None of these things will appear in a handbook and likely were not explained during the first day on the job. They are processes that are developed and honed by each individual through daily experience. Not all examples of tacit knowledge are so seemingly mundane. In many social work job functions these pieces of tacit knowledge have the power to affect decisions about the course of people's lives. However, because this type of knowledge is not formally transferred, it must be gained through experience. When inexperienced people make important decisions with no access to the knowledge they need, the possibility of error is obviously increased. Therefore, having a viable method of knowledge sharing, especially in social work, is important.

This paper proposes implementing communities of practice (CoPs) as a solution to the problem of transferring tacit knowledge. Using the New Jersey Division of Child Protection (DCP) (fictional name) as a platform, this paper will discuss the uses, benefits and drawbacks of using relationships and CoPs as viable

methods of knowledge transfer in a social service setting. A review of the literature on tacit knowledge and CoPs, both inside and outside the social service sector, will be provided followed by a discussion of the DCP, applications of CoPs and ways to develop successful CoPss within the DCP.

Communities of Practice and the Management of Tacit Knowledge

Theories of knowledge management (KM) focus on the ways and means of capturing and storing knowledge for future use. They make distinctions between data, information, and two forms of knowledge, explicit and tacit. In a most basic explanation data is raw facts, information is data in context, and knowledge is information that is interpreted in the mind of the knower. However, once the idea of knowledge is explored more deeply, it becomes evident that there is much more to it. Knowledge requires information, but also social context, understanding, values, experience, and the rules of thumb or intuition to use information well (Davenport & Prusak, 1998).

The more complex view of knowledge is the source for the distinction between explicit and tacit knowledge. Explicit knowledge is that which is, or can easily be, codified, documented and stored for later retrieval. Tacit knowledge "involves human processes . . . creativity, conversation, judgment, teaching, learning —and is difficult to quantify . . ." (Ichijo & Nonaka, p. 7). It is often inexpressible and, as such, cannot easily reside outside of the knower. The effects of experience and intuition on information processing and decision making happen in such a subtle way that the person cannot even begin to recount exactly what impacted how a decision was made. Therefore, ideas about KM that rely on codification and storage of information and knowledge are not necessarily appropriate for the transfer of tacit knowledge.

Although the traditional methods of KM continue to be valuable, it is easy to see that other processes are needed to compliment codified knowledge. Individuals have capabilities that complement information; in order to represent the whole of organizational knowledge there must be ways to transfer the knowledge embedded in those capabilities to make the codified information more meaningful. This is where CoPs come into play.

Communities of Practice

CoPs are "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, n.d.). They involve a socially situated view of learning (Tagliaventi & Mattarelli, 2006) and they require participants to be actively involved in the process of KM. When participant are involved, they are able to gain perspective on the importance of KM. That understanding keeps individuals engaged and invested in building successful CoPs (Wenger, 2004). In addition, the term CoP has come to refer to "informal, intra-organizational group specifically facilitated by management to increase learning" (Cox, 2005, p. 538). Therefore, it is not just about the participants. Management also plays a critical role in the success of CoPs.

According to Wenger (2000), CoPs require members to have a deep understanding of the subject or problem around which they revolve. They must have a level of accountability to which all members are held, called "joint enterprise;" they

must engage on a regular basis to build norms and trust, called "mutuality;" and they must share common language, practices, and standards, called "shared repertoire" (p.229). This description revolves around the expertise of its members.

However, Blaka and Filstad (2007) take a different position. They add that CoPs can also be used to facilitate the learning and identification of new employees within an organization. The commonality between these articles is the importance placed on continual learning. Blaka and Filstad suggest giving newcomers access to, but not immediate input in, CoPs. They must make the effort to learn the culture and the appropriate way to interact. Eventually, being part of a CoP helped newcomers understand tacit knowledge better and feel more confident as a professional than those who did not become part of the CoP.

Amin & Roberts (2008) make distinctions between four different types of CoPs. The DCP definitely fits into the category of professional knowledge sharing in that CWs need to know both codified and tacit knowledge specific to their work. Amin & Roberts' classifications of types of knowledge groups suggest that professionals benefit from face-to-face communication when acquiring the tacit knowledge. They also suggest that new professionals need to observe and then imitate their experienced counterparts.

Being part of a community focused on one's career can have a positive effect on the perceived success of that career (Parker, Arthur & Inkson, 2004) and enhance identity as a professional. Payne (2006) explored participation in CoPs in the field of social work finding that it enhanced professional knowledge.

It is clear that CoPs can have a very positive impact on organizational members. The theories about CoPs were developed in the world of business, as were many of the more traditional KM theories. CoPs are used for creation, innovation, collaboration, and sharing knowledge across boundaries (Büchel, 2007, Amin & Roberts, 2008). However, the type of knowledge that CoPs can contain and their use of communities and relationships for transfer of that knowledge are just as important, if not more so, in the social services sector (Woolis & Restler, 2003).

Background of the New Jersey Division of Child Protection

The New Jersey DCP is a division of the state government responsible for ensuring the safety and well-being of the state's children. It is a statewide government agency that works with schools, law enforcement, hospitals, private social service agencies and the community to do its job. There are many facets of the child welfare system that employees need to understand. This is an agency with very high turnover. As such, many employees are new. They must learn the often-subtle nuances as well as the codified rules and regulations quickly in order to do their jobs.

Much of what caseworkers (CWs) learn, aside from procedure and process, comes from experiencing things first hand out in the field. However, many experiences cannot be understood for practical labeling or storage for use in the future until long after they occur. Information that comes to light in the process of casework is often needed to make sense of feelings or intuition. A new CW may not be able to determine if a parent is neglectful, but an experienced CW may be able to intuit and know right away what the situation is in that house. That experience could help the CW make a quick decision about whether to remove a child from an abusive situation.

In addition, the agency's dual mandate of ensuring the safety and well-being of children often makes decisions even more complicated by providing

conflicting guidance. Sometimes the only way to make tough decisions is by relying on past experience and ability to understand a unique and nuanced situation. Unfortunately, because the turnover rate at the DCP is very high, most CWs are forced to make tough decisions within the first six months out of training—hardly enough time to develop a bank of experiential reference sufficient to make a knowledgeable decision by Davenport and Prusak's (1998) standards.

In some cases, multiple experiences must be combined to make sense of one feeling. Ungar (2004) discusses the postmodern perspective common to social work which allows for clients' multiple views of reality based on their own social perspective. When taking this point of view, social workers operate in many "realities." They must be able not only to call on experience to identify a feeling, but must also have the expertise to understand what their feeling means in their client's reality.

Additionally, as the process of casework is enacted, each CW at works within a "unit," usually made up five to seven CWs, but CWs work on cases individually. Although the decisions of CWs must be approved by their direct supervisors, the CW is the only individual who has direct contact with all the players in a case—parents, children, relatives, foster parents, schools, physicians, therapists, etc. Not only does this reduce the amount of experience being applied to any given case, it also limits the amount of experience any one CW can gain.

All these factors point to the agency's need for a way for individual employees to leverage the years of cumulative experience present in each office and throughout the state. Although, the DCP already has a sophisticated technological system for information (and arguably knowledge) sharing in place, called Statewide Automated Child Welfare Information System or SACWIS (National Resource Center for Child Welfare Data and Technology, n.d.), there is no formalized system for sharing the tacit knowledge that can only be gained through experience. In order for the DCP to ensure that CWs are making decisions that are best for the children in their care in the most efficient way possible, it needs a program that will aid employees in sharing experiences that can help to eliminate some of the uncertainty that is often involved in casework, especially for newer CWs.

Fortunately, the DCP already puts a strong emphasis on community-building, which make it a likely place for successful implementation of CoPs as a method of KM and knowledge creation. The DCP has implemented a practice, called "Family Teams," that has been championed by the Child Welfare League of America (CWLA) and is described in Austin (2005) and Dawson and Berry (2002). These teams bring people together to work on a common problem, develop trust and a shared sense of responsibility, and a common framework in which to work. Although they are not professional, in this way "Family Teams" fit the definition of CoPs. The teams are akin to the type cross-disciplinary interaction on which Tagliaventi and Mattarelli (2006) focus. CWs use the same skills in making successful "Family Teams" that they would employ in creating and participating in CoPs.

The Value of Communities of Practice in the DCP

The feelings and intuitions that are often experienced by CWs may have little meaning for a new CW. Eventually, however, they are rendered understandable as the CW gains field experience. The understanding that allows for feelings and intuitions to be interpreted is a form of tacit knowledge, "the expertise and assumptions developed over the years" (McInerney, 2002, p. 1011). Within the DCP,

this type of knowledge is not formally captured or documented in order to be shared with others. As such, each employee spends time learning from scratch the lessons that other employees have already mastered. A KM program will help to increase the flow of tacit knowledge within the DCP.

The addition of formalized CoPs is an ideal solution for some of the staffing and knowledge transmission challenges that the DCP faces. It will help newcomers learn from the experience of others (Wenger & Snyder, 2000). For the DCP and its employees, a KM program comprised of CoPs, based on sharing experience through group discussion will provide a way to leverage what employees already know without the effort or drawbacks of codification. This program will supplement the existing SACWIS technology with a focus on knowledge transfer and generation between individuals and within groups.

The main focus of a CoPs program should be the expression and transmission of knowledge through relationships with suggestions on how to capture and leverage that knowledge. CWs are already used to getting information through relationships, gaining the majority of their knowledge from communication, social interaction with others and spending time with their clients (Heaton, Bergeron, Bertrand-Gastaldy, & Mercier, 2005). A CoP program would help them to understand how to use the knowledge gained through these interactions to develop knowledge and encourage knowledge sharing (Heaton, et al, 2005; Senge from Smith, 2001).

Considering the professional CoP described by Amin and Roberts (2007), the DCP should be implementing a system that involves creating relationships and apprentice-type interactions between new and experienced CWs. The DCP should be able to do so fairly easily. Its CWs are already employing relationship- and community-building techniques (Austin, 2005; Dawson and Berry, 2002) during the process of implementing "Family Teams." These meetings are designed to bring families, communities, and agencies together to share information, provide resources, and give families the capabilities to care for their children. The DCP and its CWs can use those same techniques to bring CWs, supervisors, and casework supervisors together to increase professional knowledge and improve practice.

The DCP is well equipped for implementing CoPs among its CWs, and not just because of the skills that CWs cultivate through participation in "Family Teams." The DCP has structural elements that can promote the success of CoPs. London and Sessa (2007) suggest that learning communities, CoPs, can be encouraged and stimulated by management. More specifically, management can focus on giving people the opportunity to participate in CoPs and provide a time and place within the structure of the organization for CoPs to thrive (Wenger, 2001; Wenger, 2002).

At the DCP, time and opportunity is already built into the structure of the organization. There is one day per month set aside for CWs to host a lunch and let off some steam. This includes the whole office. In addition, each unit has monthly meetings to update each other on the status of their cases and to share information about new policies or procedures. With a small shift in the purpose for these times, CoPs would immediately have at least two days per month that already exist in CWs busy schedules to provide meeting and discussion times. The biggest change would be that these times would shift from having a management-driven agenda to a more fluid, member-driven agenda.

As well, the DCP has a six-month, built-in training period for new CWs. During this time, CWs currently receive formal training on policy and procedure, mainly through text and lecture. This fulfills the academic knowledge portion of

professional communities. While new CWs receive some hands-on practice, it is simulated during training. On occasion, new CWs also go out with experienced CWs on case visits, but these sessions usually occur on an informal basis whenever the opportunity arises. The DCP could formalize the opportunities for CWs to work alongside experienced colleagues by pairing people up and having them spend larger portions of time together. These times do not have to be only in the field, working with clients. They could extend to court dates, physician visits, educational evaluations, and paperwork preparation. New CWs spend a lot of time trying to muddle through such experiences.

Conclusion

CoPs provide benefits to both the members and the organization (Wenger, 2004). A successful CoP will be able to increase the expression and sharing of tacit knowledge that is gained from field experience (Amin & Roberts, 2008), and possibly make the entrance into the organization less trying (Blaka & Filstad, 2007). Participation in CoPs can also reduce stress (London & Sessa, 2007), provide a feeling of success in one's career (Parker, Arthur, & Inkson, 2004), and strengthen identity as a professional (Payne, 2006) which may encourage workers to stay within the agency longer. Implementing the practice of "team learning," in which deep dialogue occurs between team members in an effort to solve problems, will possibly allow for quicker solution of presenting problems (Larsen, McInerney, Nyquist, Silsbe, & Zagonel, 2002; Senge in Smith, 2001).

If the DCP establishes CoPs, it stands to benefit as much as its employees will. CWs can increase their knowledge and reduce their stress. If that happens, the DCP will have employees who feel more successful and secure in their career, are better able to make important decisions, and will be more likely to remain with the DCP. The DCP on a whole will be more successful. By retaining experienced employees, the DCP will be better able to meet its mission and dual mandate of ensuring the safety and well-being of children.

References

Amin, A. & Roberts, J. (2008). Knowing in action: Beyond communities of practice. *Research Policy, 37,* 353–369.

Austin, S. (2005). Community-building principles: Implications for professional development. *Child Welfare, LXXXIV,* 105–122.

Blaka, G. & Filstad, C. (2007). How does a newcomer construct identity? A socio-cultural approach to workplace learning. *International Journal of Lifelong Education, 26,* 59–73.

Büchel, B. (2007). Knowledge creation and transfer: From teams to the whole organization. In K. Ichijo & I. Nonaka (Eds.) *Knowledge creation and management: New challenges for managers* (pp. 44–56). New York: Oxford University Press.

Cox, A. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science, 31,* 527–540.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge.* Boston: Harvard Business School Press.

Dawson, K. & Berry, M. (2002). Engaging families in child welfare services: An

evidence-based approach to best practice. *Child Welfare, LXXXI,* 293–317.
Heaton, L., Bergeron, P., Bertrand-Gastaldy, S., & Mercier, D. (2005). Knowledge moves: A communication perspective. Retrieved April 3, 2006, from http://scholar.google.com/scholar?hl=en&lr=&q=cache:jnBAVNoII6EJ:www.ofenhandwerk.com/
Ichijo, K. & Nonaka, I. (2007). Introduction: Knowledge as competitive advantage in the age of increasing globalization. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers,* (pp.3–10). New York: Oxford University Press.
Larsen, K., McInerney, C., Nyquist, C., Silsbe, D., & Zagonel, A. A. (2002). Learning organizations. A primer for group facilitators. *Group Facilitation, 4*(1), 30–44.
London, M. & Sessa, V. I. (2007). How groups learn, continuously. *Human Resource Management, 46,* 651–669.
McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science and Technology (53)*12, 1009–1018.
National Resource Center for Child Welfare Data and Technology. (n.d.) *SACWIS resources.* Retrieved March 15, 2008, from http://www.nrccwdt.org/rscs/rscs_sacwis.html.
Parker, P., Arthur, M. B., & Inkson, K. (2004). Career communities: A preliminary exploration of member-defined career support structures. *Journal of Organizational Behavior, 25,* 489–514.
Payne, M. (2006). Identity politics in multiprofessional teams: Palliative care social work. *Journal of Social Work, 6,* 137–150.
Smith, M. K. (2001). Peter Senge and the learning organization. Retrieved January 9, 2004, from *the encyclopedia for informal education:* http://www.infed.org/thinkers/senge.htm.
Tagliaventi, M. R. & Mattarelli, E. (2006). The role of networks of practice, value sharing, and operational proximity in knowledge flows between professional groups. *Human Relations, 59,* 291–319.
Ungar, M. (2004). Surviving as a postmodern social worker: Two Ps and three Rs of direct practice. *Social Work, 49,* 488–496.
Wenger, E. (n.d.).Communities of practice: A brief introduction. Retrieved April 19, 2008 from http://www.ewenger.com/theory/index.htm
Wenger, E. (2000). Communities of practice and social learning systems. *Organization, 7,* 225–246.
Wenger, E. (2001). Organically grown. *Training & Development, June,* 40–42.
Wenger, E. (2002). Cultivating communities of practice: A quick start-up guide. Retrieved April 19, 2008 from http://www.ewenger.com/theory/start-up_guide_PDF.pdf
Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal, Jan/Feb,* 1–8.
Wenger, E. & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review, Jan/Feb,* 139–145.
Woolis, D. D. & Restler, S. (2003). Human services dot net. *Policy & Practice, Dec,* 22–25.

A Right to Mental Privacy?
The Clash of Technology, Knowledge, and Civil Rights

David B. Spira
Master of Communication and Information Studies

Abstract

Recent technological developments have made it possible to make individuals hear voices in their brains through the projection of hypersonic sound, map a person's brain to see how they truly feel when answering questions, or even erase recent traumatic memories through medication. This paper seeks to delve into these new high-tech developments and examine how law, ethics, and the nature of knowledge will play a role in the future debates surrounding the imminent adoption of these technologies.

Introduction

The Founding Fathers of the United States of America had tremendous foresight. This is most evident in the Constitution. The Bill of Rights was clearly crafted to provide for basic freedoms and grow as the fledgling nation developed. However, in spite of their thought and care, there have been technological developments that could not have been foreseen in 1791. Concentrated sound waves that can be projected directly into an individual's head, or hypersonic sound; pills that allow victims of traumatic events to forget their darkest hours; and brain scans that can detect a person's true feelings are all examples of new, cutting edge technologies that impact knowledge and memory, and raise legal and ethical questions. There are no legal precedents that can answer whether any of these technological advances are legal in accordance with United States law, and the question of whether it is right to use these technologies can only be answered through thorough discourse.

New Technologies

Hypersonic Sound. Hypersonic sound is a concentrated beam of sound. Typically, sound emits in waves from a source, and spreads out in all directions, dissipating as the waves fan out, like ripples in a calm pond after a stone is tossed into the water. Hypersonic sound is, in essence, a laser beam of sound. It emits in a straight, concentrated beam. As a consequence, it does not dissipate, and it is only audible by an individual standing in the path of the beam (Maney, 2003). Those who experience it describe it as feeling like the sound is being projected into their skull (Thompson, 2008).

A simple Google search on the topic reveals an incredible list of applications for this technology, ranging from advertising, to assistance for the blind, and, as with so much technology, it can also be weaponized for military and law enforcement purposes. Hypersonic sound is currently being used for advertising in Manhattan by the television station A&E to market one of their shows on the paranormal. A female voice whispers "'Who's there? Who's there?'" (Thompson, 2008). Weaponized hypersonic sound can be used as a non-lethal weapon to either knock down a person, or induce nausea and vomiting (Sample, 2001). A hypersonic sound dish was used by a cruise ship crew to repel pirates attacking with machine guns and rocket propelled grenades off the coast of Africa in 2005 (Pain, 2005).

Hypersonic sound emitters can also be used to send secure messages over short distances, communicate in noisy environments, and could even be used on laptop computers in the future. Both the practical and malicious applications of this technology seem limited only by the imagination.

Self-Induced Memory Loss. The overwhelming majority of memories that an average human collects are quickly forgotten because they are mundane and uneventful. Critical moments in one's life will trigger an emotional response either positive or negative. That emotional response is part of the flow of hormones throughout the body (LaFee, 2004). Essentially, the levels of various neurotransmitters will adjust based upon what an individual is experiencing, and the rise and fall of those neurotransmitters dictates what kind of emotion is felt. By chemically blocking or limiting the neurotransmitters, memories and the feelings of pleasure or pain associated with them can be muted by taking the medication propranolol. On a biological level it is not very different from what happens to people who drink too much alcohol and forget the events of an evening. Propranolol is a beta blocker which is typically used to prevent migraines, treat irregular heartbeats, and reduce blood pressure. "Beta blockers work by blocking the stimulative influence of stress hormones—specifically adrenaline—upon the body, relaxing blood vessels and slowing nerve impulses inside the heart" (LaFee, 2004).

The use of propranolol and other beta blockers for the purposes of dampening or erasing traumatic memories is in late testing (Thompson, 2008). It could become available as a mainstream treatment option in the future, provided it is not ruled illegal by the Congress, the courts, or the Food and Drug Administration. The practical application of this is quite clear. It can be used to help those who experience terrible trauma and wish to be relieved of the burden of remembering the event. It can be used for rape and assault victims, soldier who have served in combat and anyone else who is at risk for suffering from Post-Traumatic Stress Disorder (Thompson, 2008).

Brain Scanning. The researchers have been using the functional magnetic resonance imaging or fMRI to study degenerative diseases and various other phenomena of the brain. Researchers at Columbia University have also used the device to map the neural pathways that are associated with deception to great effect. The fMRI is poised to become the new lie detector because it is far more accurate and much more difficult to deceive than the polygraph test (Sillberman, 2006).
Sillberman (2006) states:

> The polygraph is widely considered unreliable in scientific circles, partly because its effectiveness depends heavily on the intimidation skills of the interrogator. What a polygraph actually measures is the stress of telling a lie, as reflected in accelerated heart rate, rapid breathing, rising blood pressure, and increased sweating. Sociopaths who don't feel guilt and people who learn to inhibit their reactions to stress can slip through a polygrapher's net . . . While evidence based on polygraph tests is barred from most US trials, the device is being used more frequently in parole and child-custody hearings and as a counterintelligence tool in the war on terrorism.

The practical application of brain scanning clearly extends beyond mapping the progression of Alzheimer's disease in patients. It can be used for legal and

security purposes. However, an even more controversial application is the various ways that employers could use the technology to either screen potential employees or interrogate current employees. Employers already have the option of drug testing their workers (Thompson, 2008).

The Nature of Knowledge

What Is Knowledge? In order to fully understand and appreciate the impact that these technologies can have on human life, one must have an understanding of the nature of knowledge. The distinctions between data, information, and knowledge are an important first step. Data are facts (Davenport & Prusak, 2000), the seeds of our decision making, dormant, but filled with potential. Data can be observation, either scientific or non-scientific in nature. Data can be the observation of one person shooting another. Information is created when an individual assigns meaning to the data that we have collected (Davenport & Prusak, 2000). It is the bud that emerges from the germinated seed of data. An example of this is recognizing that the person who shot another individual was in physical danger from the very person he or she shot. From that point, we can then apply thought, logic, experience, and design to that information to make judgments and comparisons, and in doing so we generate knowledge (Davenport & Prusak, 2000). Our bud of information can blossom into a flower of knowledge. The final judgment, that the person who shot the other individual was acting in self-defense, is knowledge. In short, data can grow into information which, in turn, can expand into knowledge (Davenport & Prusak, 2000).

Knowledge can be broken up into two specific types, tacit and explicit. Explicit knowledge, the easier of the two to explain and handle, is knowledge that can be written down and expressed. The Constitution is an explicit knowledge artifact. It clearly details the framework of the United States. Explicit knowledge can be recorded, stored, transferred, and manipulated fairly simply. Tacit knowledge is much more difficult to work with. Tacit knowledge is silent, frequently understood, while remaining unspoken. It can take the form of experience, wisdom, or internal assumptions, residing in the minds of our employees and quietly guiding their judgments, decisions, actions, and shaping their final products. Tacit knowledge is the kind of knowledge that may seem like a hunch or intuition, but is derived from experience. For obvious reasons, this knowledge is incredibly difficult to capture and transfer from one person to another (Davenport & Prusak, 2000). The deep understanding of the nuance of the Constitution and the ability to make a logical, well-founded argument about it, as a Constitutional lawyer or Court of Appeals judge would, is a demonstration of tacit knowledge.

Knowledge and Rights. With these new technologies and the obvious impact that they will have on knowledge, it is important to reflect on the legal and ethical ramifications. One must keep in mind that what is legal and what is ethical are sometimes two completely different things. The most pertinent question is: Is there a right to mental privacy? To begin with, the Constitution does not establish an explicit right to privacy. The “right to privacy,” as it exists today, is the byproduct of many Supreme Court rulings that have argued that the Constitution implies a right to privacy. Amendment I establishes privacy of beliefs; Amendment III provides for privacy of the home; Amendment IV creates privacy of the person and his/her possessions. While the legal precedents that create the “right to privacy” are well-founded and supported in sound Constitutional theory, it is not rock solid, and there

has been a fairly constant debate about the extent to which Americans have a right to privacy (Linder, 2008). In April of 2008, the New Jersey Supreme Court ruled unanimously in favor of a reasonable expectation of privacy online in the case *State v. Shirley Reid* (Winter, 2008).

Based on the current established legal precedents that provide for privacy of beliefs, home, property, and possession, along with the growing right to online privacy, it is more than reasonable to presume a right to mental privacy. If there is one place on Earth that should be a safe haven for each person, it most definitely is his or her own mind. The Fifth Amendment protects each American against self-incrimination. Brain scans, like polygraph examinations, cannot be used to convict people of crimes (Sillberman, 2006). On the other hand, there does not seem to be a legal precedent that would keep brain scans from being used for counterintelligence or child custody hearings.

The courts have the right to subpoena witnesses and compel them to testify under penalty of law (Thompson, 2008). If the subpoenaed lie, they can be convicted of perjury, and if they refuse to testify, subpoenaed witnesses can be found guilty of contempt of court; both offenses entail jail time. The courts have a well-established claim on human data, information, and knowledge through this power. Should the victims of crimes, who wish to forget their trauma, be permitted to take a beta blocker like propranolol (Thompson, 2008)? Can the courts order that a victim not receive the treatment in order to testify and assist in the conviction of their assailants? To reverse the question, should wicked men and women be able to escape justice because their crimes are so heinous that their victims would rather forget them than assist in the conviction and be burdened with the memories? These questions currently have no answer. There is no legal precedent that can help guide the decision. However, both sides of the argument are incredibly valid and either answer to this question carries with it deep and scary ramifications.

Hypersonic sound is, at its core, fundamentally a First Amendment issue. The First Amendment states: “Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances” (The Bill of Rights Institute, 2008). On its most fundamental levels, the First Amendment guarantees every citizen the right to not only hold whatever opinion they want, but also express it verbally. It makes this guarantee in a very specific manner; it prevents Congress from creating any laws that would limit these freedoms. This is the freedom that protects all of the others; it was not a coincidence that the Founding Fathers made it the first addition to the newly written Constitution.

Barring any negative impacts to the health of those exposed to hypersonic sound which would bring about lawsuits, it seems unlikely that there is a lot that can be done to stop people from using the technology. If the use of hypersonic sound is for expression, the First Amendment would protect it unless the use of the hypersonic sound fell under one of the exceptions to free speech which include: “obscenity, defamation, breach of the peace, incitement to crime, ‘fighting words,’ and sedition” (Van Camp, 2005). Essentially, hypersonic sound is just another medium of expression like television, radio, or pen and paper. The subtlety of whether it is legal or not will probably be an issue of content and usage.

Implications. While hypersonic sound will most likely be considered legal on First Amendment grounds, it does raise questions about how ethical it is in practice. Is emitting a message through hypersonic sound literally planting knowledge into the minds of receivers? If it is, is that ethical? I do not believe that it is putting knowledge directly into the minds of receivers any more than audio messages. Those who hear hypersonic sound messages can choose to agree or disagree with the message, just like any other sounds. It is a new form of delivering auditory messages. It just feels different for those hearing it, and will probably take time for people to adjust to the new method. Most new technology carries a certain degree of apprehension with it; people will become comfortable with it at their own pace and some will never accept it. This is no different from the Internet, television, radio, telephone, or other communication technology. We do not have a right to censor others and keep their words from striking our ears; this is no different, it just feels different. Perhaps further research on the physiological impact that hypersonic sound has on the bodies and minds of receivers must be done to insure that it is completely safe. The one ethical concern that I have is that it should never be used to make a person feel like they are suffering from mental illness unless it is being used for educational purposes to simulate mental illness for informed and consenting learners.

Self-induced memory loss is a much more complicated ethical issue. As stated earlier, society does have claims to an individual's knowledge through the use of subpoenas. This is a longstanding and common practice of making a person's tacit knowledge public and explicit. Failure to comply with this process can result in fines and jail time. Is it right to allow people to intentionally forget important pieces of information? This is a question that is circular because the inverse is: Is it correct to force people to remember that which is hurtful to them? There is no good answer to this ethical quagmire. Either the guilty get away with their crimes, or the innocent are forced to live with trauma and anguish that they do not have to live with. I find this question paralyzing and impossible to answer. I can see virtue in both allowing and prohibiting this type of treatment.

Brain scan technology should be subject to the same laws that apply to the polygraph examination, regardless of the fact that they are more accurate. For both Constitutional and ethical reasons, people should be able to keep their thoughts to themselves. What matters is what people do, not what they think. I do not have to like my boss, I just need to be respectful and do what my boss wishes. It is not his or her business to know what I think. Similarly, wrongdoing should be proven or disproven by evidence that resides in the physical world and should not be gathered by forcing tacit knowledge into explicit.

The Future of this Discussion. These ethical and legal questions can only be answered through serious and in-depth public discourse. Business and government leaders will also have to decide if or how this technology will be applied in the future. For hypersonic sound, local governments will have to decide if or how to regulate the medium. People, in general, will have to decide whether they like it or not. Self-induced memory loss will have to be debated at the highest levels of government and argued in the court system. This is one issue that will probably never be completely resolved simply because both sides of the argument are extremely valid. As with hypersonic sound, brain scanning will have to be debated by business and government leaders to decide the best course of action. All of these issues are for

society to decide and each decision will have far-reaching consequences. Once again, technology is ushering in a brave new world and we must tread carefully and make each choice with care and grace in order to emerge safely on the other side.

References

Barsch, P. (2008) *Is mental privacy destined for extinction?* <http://www.mpdailyfix.com/2008/04/is_mental_privacy_destined_for.html>. Retrieved 20 April 2008.

The Bill of Rights Institute (2008). *The Bill of Rights.* <http://www.billofrightsinstitute.org/teach/freeresources/foundingdocuments/Docs/TheBillofRights.asp >. Retrieved April 27, 2008.

Davenport, T. H. & Prusak, L. (1998, 2000). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

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

Linder, D. (2008). *Exploring constitutional conflicts. The right to privacy.* <http://www.law.umkc.edu/faculty/projects/ftrials/conlaw/rightofprivacy.html>. Retrieved 20 April 2008.

Maney, K. (2003) *Sound technology turns the way you hear on its ear.* <http://www.usatoday.com/tech/news/techinnovations/2003–05–19-hss_x.htm>. Retrieved April 27, 2008.

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53* (12), 1009–1018.

Pain, J. (2005). *Cruise ship attacked by pirates used sonic weapon*. <http://www.usatoday.com/tech/news/techinnovations/2005–11–07-cruise-blast_x.htm>. Retrieved April 27, 2008.

Sample, I. (2001). *Pentagon considers ear-blasting anti-hijack gun.* <http://www.newscientist.com/article.ns?id=dn1564>. Retrieved April 27, 2008.

Sillberman, S. (2006). *Don't even think about lying.* <http://www.wired.com/wired/archive/14.01/lying.html>. Retrieved April 27, 2008.

Thompson, C. (2008). Clive Thompson on why the next civil rights battle will be over the mind. *Wired Magazine 16.04.* p. 60.

Van Camp, J. (2005). *Freedom of expression at the National Endowment for the Arts.* <http://www.csulb.edu/~jvancamp/freedom1.html>. Retrieved April 27, 2008.

Winter, M. (2008). *N.J. high court endorses online privacy*. <http://blogs.usatoday.com/ondeadline/2008/04/nj-high-court-e.html>. Retrieved April 27, 2008.

Organizations as Complex Adaptive Systems: Implications for Knowledge Management

Iulian Vamanu
Visiting student, PhD candidate in Philosophy, Central European University, Budapest (Hungary)

Abstract

This paper explores the implications for the organizational knowledge management of the complexity theory. More precisely, it starts with presenting the main ideas advanced by the complexity theory: complex systems are constituted by numerous and richly connected elements that interact dynamically, non-linearly, and locally, based on the limited information that is available to them; complex systems also display recurrence, i.e., reinforcing feedback loops, and are open and unstable, as well as dependent upon "initial conditions." Since organizations can be seen as complex systems, the paper derives normative consequences for organizational knowledge management: the members of the organization have to be able to interact in numerous and various ways among themselves and with agents outside the organization; they need to be allowed more freedom at the local level where they work, so that they have incentives to be more creative and more innovative; and they also have to be provided with rich information and knowledge. In addition, a "shared vision" needs to be developed, so that the members of the organization can make sense of their activity in its light. Finally, "vicious" feedback loops should be identified and eliminated, whereas "virtuous" feedback loops should be bolstered.

Introduction

Complexity theory has recently become an extremely useful way of making sense of the evolution of different systems. Along with the human brain, language, and society, organizations have also started being considered within a complexity framework (Jantsch, 1980; Kellert, 1993; Kauffman, 1995; Guastello, 1995; Cilliers, 1998; McKelvey, 1999; Capra 2002). In this paper, I attempt to elaborate on some of the implications that the complexity approach to organizations has for successful knowledge management. In other words, if we conceive of organizations as complex adaptive systems, the question is: what are the challenges that knowledge management needs to address? The issue of the management of organizations in the context of complexity theory has already been treated in the literature (Guastello, 1995; Stacey, 1996; Axelrod & Cohen, 1999). Authors have focused more on management in general than on knowledge management, with a few notable and very recent exceptions (Senge, 2000; McElroy, 2000). Elaborating on a framework of intelligibility for knowledge management constitutes a necessary step in the process of developing knowledge management into a full-fledged discipline.

The first part of the paper outlines the main points of complexity theory: complex systems are constituted by numerous and richly connected elements that interact dynamically, non-linearly, and locally, based on the limited information that is available to them; complex systems also display recurrence, i.e., reinforcing feedback loops, and are open and unstable, as well as dependent upon "initial conditions." The second part sketches a view of organizations as complex adaptive systems, based on the previously identified points. The third and last part elaborates a

model of knowledge management that emerges from the considerations in the previous part.

The Complexity Theory

The paper starts by outlining the main points of complexity theory as they emerge from the studies of the authors mentioned in the introduction. To have a preliminary grasp of complexity theory, let us say that it designates not just a simple theory, but also a paradigm for considering phenomena that display complex structures that defy a simplistic mechanistic approach. More precisely, complexity theory describes systems which are so complex that an accurate prediction of their evolution is practically impossible, but which, nevertheless, exhibit patterns of coping with challenges in the environment.

The main points of complexity theory are the following:

Complex systems are constituted by numerous *elements* (parts).

These elements *interact dynamically* and in many competitive and/or cooperative ways. In itself, an element in a system is meaningless; meaningfulness results from the interconnectedness of the elements of the system.

The elements are *richly connected* to other elements.

Interactions are *non-linear* (i.e., small causes can have large effects and the combination of the patterns of interaction generally results in the formation of new patterns). Non-linearity prevents the system from becoming homogeneous, through the phenomenon of the so-called bifurcations (i.e., "symmetry-breaking transitions") (Jantsch, 1980, p. 47).

The interactions usually occur *locally* (among neighbor elements), but certain elements can also have wide-range influence.

Complex systems display *recurrence,* i.e., *loops* can occur in interactions. Effects can feedback onto themselves both in positive (enhancing, stimulating), and negative (detracting, inhibiting) ways.

Complex systems are *open,* i.e., they interact with the environment.

Complex systems are *unstable,* i.e., under a constant flow of energy to and from the outside.

Complex systems have a *history* in the sense that they constantly evolve in such a way that past states influence their present state. An important related feature of complex systems is that they are sensitive to initial conditions: their associated trajectories may diverge exponentially over time, regardless of how small the difference or uncertainty in their initial conditions is.

Knowledge about the behavior of the system as a whole is unavailable to the elements themselves. In fact, complexity results from "a rich interaction of simple elements that only respond the limited information each of them is presented with" (Cilliers, 1998, p. 5).

These are characteristics that describe the structure of complex systems. Since we want to understand in what sense dynamic systems such as organizations are truly complex systems, it is important to also understand in what sense the structure itself is dynamic (i.e., we need to understand its genesis, evolution, patterns of adaptation and survival, and so on).

The most important concepts related to the dynamics of the system's structure are those of *self-organization, emergence,* and *co-evolution. Self-organization* is the process by which plural local interactions generate order (new structures and patterns) without any need for control and direction from the top.

Emergence is the process by which a system acquires new properties (new structures and patterns) that are the result not of a simple aggregation of the characteristics of its component elements, but of the non-linear interactions of the elements with the system. *Co-evolution* refers to the process of the mutual transformation of the system and the environment in which it exists.

Organizations as Complex Adaptive Systems

Based on the ten points mentioned above, it is fairly easy to provide a complexity approach to organizations. Let me articulate this view along the lines of the ten previously mentioned points.

Organizations usually comprise numerous agents, such as professionals, clerks, clients, etc. (Cilliers, 1998; McDaniel & Driebe, 2001).

There are various types of interactions among agents; they can interact in face-to-face conversation, or by exchanging information and knowledge via email, phone, and so on (Cilliers, 1998).

Each agent interacts with a number of other agents in and/or outside of the organization (Capra, 2002; Kauffman, 1995). Being more richly connected does not necessarily correlate with the agent's importance in the organization.

The interactions that occur in the organization are *non-linear.* Small moves or apparently insignificant interactions can generate large outcomes, and vice-versa, large events can lead to small outcomes (Kellert, 1993; Axelrod & Cohen, 1999; Capra, 1996, 2002; Kauffman, 1995).

Agents interact primarily with other neighbor agents, but they can also be in close contact with agents situated at a distance.

Organizations display *recurrence,* i.e., numerous *reinforcing feedback loops.* The activity of an agent reflects back on itself positively (a good move can generate good returns), or negatively (a misfortunate move, however small, can result in serious deficits, shortages, or disadvantages).

Organizations are open systems with fuzzy boundaries, and are usually traversed by constant flows of goods and information. They evolve together with the environment.

These constant flows make organizations become unstable systems, and this is a positive phenomenon; were these systems to reach a still point, they would literally die.

Organizations have a *history:* they are sensitive to *initial conditions,* which have influence on how these systems evolve. In other words, past and present are interdependent.

Each agent acts only on the available information she possesses. Usually, she is unaware of what most of the other agents are doing.

Organizations are dynamic phenomena and the changes in their structure can be accounted for in terms of the three processes we identified above, namely self-organization, emergence, and co-evolution. Self-organization suggests that there is no need for an organization to have a hierarchical structure of decision and control. The idea of emergence suggests that there are always new patterns of interaction among the members of the organization, as well as structures that will become obvious over time. Co-evolution suggests that the organization does not have fixed boundaries, but rather is open and in a constant exchange with the environment. In other words, there is reciprocal influence between the organization and the environment.

Implications for the Successful Knowledge Management of the Complexity Approach to Organizations

Having thus far sketched the main lines of the complexity approach to organizations, the paper now elaborates on a few consequences that this view of organizations as complex adaptive systems has for knowledge management. For a visual representation of what a successful organization ought to look like, see Figure 1.

It is important to note that knowledge management represents all concerted, coordinated, and deliberate processes or practices of locating (or identifying), acquiring, developing, preserving, sharing and distributing, as well as applying (or using) knowledge (or "intellectual capital"), wherever it resides (especially in an organization's network), to enhance organizational learning, adaptability, and performance (Nonaka & Takeuchi, 1995; Stewart, 1997; Davenport & Prusak, 1998; Bate & Robert, 2002; Bose, 2003; Orzano et al., 2007). Identifying knowledge refers to processes of successfully keeping track of knowledge resources inside and outside the company. Acquiring knowledge refers to hiring and recruiting people with needed skills, in such a way as to successfully integrate their knowledge into the existing knowledge database. Developing knowledge concerns the processes of innovation and problem-solving. Knowledge sharing and distribution deal with making knowledge available through diffusion and transfer. Using knowledge refers to processes of applying available knowledge to concrete situations (Probst, Raub & Romhardt, 2000).

In the context of the complexity paradigm, knowledge management designates the set of processes or practices that explicitly aim at improving the adaptability and success of the system (in our case, the organization). What the complexity paradigm brings to knowledge management is an explanatory framework for the dynamics of knowledge in organizations.

To recap, organizations are complex systems that need to evolve together with the environment, if they want to survive and thrive. This presupposes that they develop the ability to constantly learn, create, and innovate. In terms of complexity theory, this means that self-organization and new patterns and structures need to emerge.

Let us now present the main consequences of complexity theory for knowledge management processes and practices. The paper lists and discusses only a few of them: the members of the organization have to be able to interact in numerous and various ways among themselves and with agents outside the organization; they need to be allowed more freedom at the local level where they work, so that they have incentives to be more creative and more innovative; and they also have to be provided with rich information and knowledge; in addition, a "shared vision" needs to be developed, so that the members of the organization can make sense of their activity in its light; finally, vicious feedback loops should be identified and eliminated.

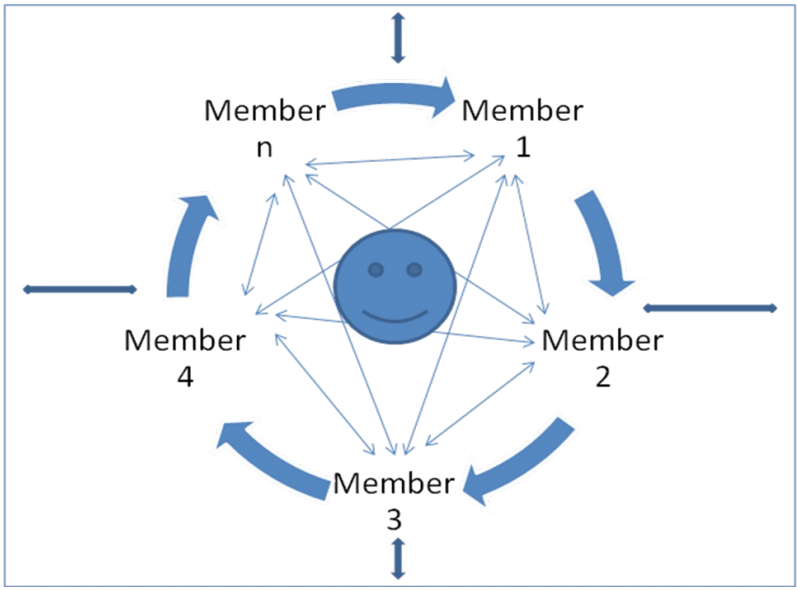


Figure 1. The interrelations of the members of the organization (who share a common vision) and the co-evolutive relation of the organization and its environment (the four bi-directional arrows suggest interactions of the system with the environment).

A. Help members build numerous and various relationships.

Complexity theory (points 1, 2, 3, and 5) suggests that (inter-) connections and relationships are much more important for organizations than the particular roles and present skills of the isolated agents. In fact, a simple clerk could be extremely useful, if she is connected to as many other members as possible. We know, for instance, how important a role the reception nurse plays in medical organizations, in spite of the general perception that only doctors really matter.

In this context, relationship building becomes a crucial task for knowledge management. More precisely this means, among other things, that (1) the quantity/number of interdependencies and interactions has to increase (Kauffman, 1995; McKelvey, 1999); (2) the types of interdependencies and interactions have to be as diverse as possible; (3) their quality has to be enhanced (Daft, 1989; Thompson, 1967); and (4) they ought to be of an appropriate intensity (Granovetter, 1973).

Obviously, new, more diverse, and more qualitative relationships presuppose the flexibility of those who engage in these relationships. This means that the agents in the organizations should count less in terms of what they already know or of what role they play, and more in terms of whether and how they can learn, adapt, or change roles. This aspect responds to the "identifying knowledge" aspect of knowledge management, by means of which a company succeeds in hiring and keeping track of those people (inside and/or outside the company) who have the needed abilities for the purposes of the company.

Clearly, bringing *people* as *different* as possible into the organization and

having them interact in multiple ways is a brilliant way of making room for new and surprising interdependency and interaction types to emerge. Also, it is important to initiate and maintain *constructive dialogue* among these members.

Since complexity theory (point 5) suggests that an agent interacts primarily with the agents that are spatially proximate to her, it is crucial to encourage her interactions with as many other members as possible. This can happen if part of the job of the members of an organization includes more or less planned meetings with as many other members as possible. The literature is replete with examples of how one can accomplish this putting together of the organization's members: formal or informal meetings, the "water cooler" strategy, the facilitation of interaction via IT tools (email, chat, social networking, phone, fax, etc).

B. Increase localness. Complexity theory (point 4) points to the fact that the interactions among the agents and between the agents and the organization in general are *non-linear.* This suggests, among other things, that a good knowledge management strategy would be to use what is called "loose couplings," or loosely dependent modules (Weick, 2001), as well as "weak ties" (Granovetter, 1973). This strategy presupposes a network type of interrelations instead of a hierarchical one, and allows for more degrees of freedom at the local level. More precisely, instead of exaggerated control and strict supervision of the activity of the agents in the organization, a certain degree of creative "organizational disorder" should be permitted and even encouraged (Warglien & Masuch, 1995). More freedom can mean that agents are encouraged to be more creative (Guastello, 1995; Jones, 1997; Stacey, 1992) and more improvisational (Brown & Eisenhardt, 1997; Crossan, 1998). This means that they need to be allowed to deviate from already planned actions and routines in order to search for solutions to problems or to just attempt to organize the context of the work itself in different, and perhaps more appropriate, ways. In fact, companies such as Royal Dutch/Shell, Johnson & Johnson, 3M, and Citicorp have realized that "rigid authoritarian hierarchies thwart learning, failing both to harness the spirit, enthusiasm, and knowledge of people throughout the organization and to be responsive to shifting business conditions" (Senge, 1990, p. 289).

C. Pay attention to recurring processes. Complexity theory insists upon the fact that activities tend to generate feedback loops (point 6). This fact suggests that we need to understand processes in organizations not so much according to a linear logic of the cause-effect type (which is only a partial description of what really happens), as in terms of "circles of influence" (Senge, 1990, p. 79). Some feedback loops are reinforcing, in the sense that small events can build on themselves and generate a pattern or structure of activity. The phenomenon of "self-fulfilling prophecies," also known as the "Pygmalion effect," is a good illustration of this (Senge, 1990, p. 80–1). Moreover, mention ought to be made of the fact that processes can be reinforcing in both vicious and virtuous ways. Obviously, vicious (or detrimental) cycles have to be undercut (as they lead to inefficient patterns of activity and organizational losses), whereas virtuous (or productive) cycles need to be encouraged (as they tend to have good effects on the organization). For instance, it is known that Japanese cars are extremely reliable. Word of mouth propagated by happy owners of Japanese cars can have the above-mentioned reinforcing effect, through contributing to increases in the sale of Japanese cars. These sale increases, in turn, are likely to yield higher revenues and more research funds. Intense research usually leads to an increase in the quality

of these cars, and the whole process is reproduced in a virtuous way. The imperative that one should consider recurring processes of this sort relates to the "sharing and distributing knowledge" aspect of knowledge management.

D. Encourage members of the organization to interact with the environment. Since organizations are open systems which evolve together with their environment (points 7 and 8), it makes sense to encourage interactions between their members and the members of other organizations, as well as between their members and the environment in general. In this way, the flow of information and knowledge will be enhanced. It is extremely problematic to force artificial boundaries upon an organization. This is likely to lead to an impoverishment of information and knowledge flows through the organization, and, expectedly, to a "lethal" sort of stability. For instance, a company that is highly successful in a particular area of activity may lose the incentive to diversify its portfolio and to encourage its members to learn. However, should it happen that circumstances in the environment reduce the value of that particular activity in which the company excelled, the company would find itself in a lethal situation. For instance, Orzano et al. (2007) suggest that the process of health care ought to involve not only doctors, nurses, and patients, but also the relatives of the patients. Medical practices would really benefit from the insights offered by the latter. Neglecting the possibility of constant learning from the environment, a medical practice can become closed in on itself, that is, self-sufficient in a bad way.

Given the fact that new structures always emerge and that self-organization always occurs, a system should welcome as many flows of information and knowledge as possible and encourage as many types of interactions as possible. This sort of instability is the sure sign of vitality in an organization. This illustrates well all the aspects of knowledge management: identification, acquisition, development, sharing and distribution, as well as use of knowledge.

E. Try to make sense of what happens and to reach a shared vision. Pay attention to outliers. Since, according to complexity theory, the trajectory of an organization depends on its *initial conditions* and, moreover, is *unpredictable* (point 9), it does not really make much sense to insist upon very detailed and strict plans based on allegedly clear predictions. There are two main consequences of this idea:

(1) It is more important to try to create meaning through interpretation than to predict outcomes and determine appropriate courses of action that may or may not be conducive to these outcomes. More precisely, *sense making* is the process of creating a "shared awareness of corporate goals and strategies," which helps agents make sense of their own decisions and actions (Davenport & Prusak, 1998, p. 49). Senge (1990) uses the notion of "a shared vision" to refer to this aspect, Bresman et al. (1999) call it a "shared sense of identity," whereas Nonaka and Toyama (2007) label it the "knowledge vision" (pp. 18–9). The shared or knowledge vision in a health-care organization, for instance, would most probably consist in living up to the ideal of the organization that provides not only health care but also emotional comfort, and that believes in the value of the humanity of each human person and strives to serve him or her as best it can. This presupposes that all the agents involved in the organization manage to understand themselves and their own work in light of such an ideal. One of the tasks of knowledge management is to enable and contribute to the formation of such a collective identity or vision.

(2) It is also very important to pay attention not only to outcomes that one can predict, but also to outliers, marginal phenomena, or events that turn out to be unexpectedly different, as they can constitute the source of new structures and patterns of interaction.

F. Enable the agent's access to cognitive resources as rich as possible. Since complexity theory predicts that agents stick to available information and knowledge (point 10), it is important to provide them with access to rich information and knowledge. This relates to the "sharing and distributing knowledge" aspect of knowledge management.

Conclusion

What emerges from this paper is that complexity theory can constitute a fruitful framework for making sense of successful knowledge management in organizations. Complexity theory has a series of implications for knowledge management: the members of the organization have to be able to interact in numerous and various ways among themselves and with agents outside the organization; they need to be allowed more freedom at the local level where they work, so that they have incentives to be more creative and more innovative; and they also have to be provided with rich information and knowledge; in addition, a "shared vision" needs to be developed, so that the members of the organization can make sense of their activity in its light; finally, vicious feed-back loops should be identified and eliminated. Further research will have to study these implications in more depth.

References

Anderson, R. A., Crabtree B. E., Steele D. J., & McDaniel, R. R. (2005). Case study research: The view from complexity science. *Qualitative Health Research, 15*(5), 669–85.

Anderson, P. (1999). Complexity theory and organization science. *Organization Science, 10*(3), 216–32.

Axelrod, R. & Cohen, M. D. (1999). *Harnessing complexity: Organizational implications of a scientific frontier.* New York: The Free Press.

Bate, S.P., & Robert, G. (2002). Knowledge management and communities of practice in. the private sector: Lessons for modernizing the National Health Service in England and Wales. *Public Administration, 80*(4), 643–663.

Bose, R. (2003) Knowledge management-enabled health care management systems: Capabilities, infrastructure, and decision-support. *Expert Systems with Applications, 24*(1), 59–71.

Bresman, H., Birkinshaw J., & Nobel R. (1999) Knowledge transfer in international acquisitions. *Journal of International Business Studies 30*(3), 439–462.

Brown, S.L., & Eisenhardt, K.M. (1997). *Competing on the edge: Strategy as structured chaos.* Boston: Harvard Business School Press.

Capra, F. (2002). *The hidden connections.* New York: Anchor.

Cilliers, P. (1999). *Complexity and postmodernism: Understanding complex systems.* New York, NY: Routledge.

Crossan, M. (1998). Improvisation in action. *Organization Science, 9*(5), 593–599.

Daft, R. L. (1989). *Organization theory and design* (3rd ed.). St. Paul, MN: West.

Davenport, T. H., & L. Prusak. (1997). *Information ecology: Mastering the*

information and knowledge environment. New York, NY: Oxford University Press.
Fraser, S. W., & Greenhalgh, T. (2001). Coping with complexity: educating for capability. *British Medical Journal, 323*(7316), 799–803.
Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 82,* 929–964.
Guastello, S. J. (1995). *Chaos, catastrophe, and human affairs: Application of nonlinear dynamics to work, organizations, and social evolution.* Hillsdale, NJ: Lawrence Erlbaum.
Jantsch, E. (1980). *The self-organizing universe—scientific and human implication of the emerging paradigm of evolution.* New York, NY: Pergamon.
Jones, M. (1997). Getting creativity back into corporate decision making. *Journal for Quality and Participation, 20*(1), 58–62.
Kauffman, S. A. (1995). *At home in the universe: The search for the laws of self-organization and complexity.* London: Penguin.
Kellert, S. H. (1993). *In the wake of chaos: Unpredictable order in dynamical systems.* Chicago: University of Chicago Press.
Leonard, D. (1998). *Wellsprings of knowledge: Building and sustaining the sources of innovation.* Boston: Harvard Business School Press.
McDaniel, R. R., & Driebe, D. J. (2001). Complexity science and health care management. In J. D. Blair, M. D. Fottler, & G. T. Savage (Eds.) *Advances in health care management* (Vol. 2, pp. 11–36). Stamford, CT: JAI.
McElroy, M. (2003). *The new knowledge management, complexity, learning and sustainable innovation.* London: Butterworth-Heinemann.
McElroy, M. W. (2000). Integrating complexity theory, knowledge management and organizational learning, *Journal of Knowledge Management, 4*(3), 195–203.
McInerney, C. R. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53*(12), 1009–1018.
McKelvey, B. (1999) Avoiding complexity catastrophe in co-evolutionary pockets. Strategies for rugged landscapes. *Organization Science, 10*(3): 249–321.
Nonaka, I. & Takeuchi, H. (1995). *The knowledge creating company.* New York, NY: Oxford University Press.
Orlikowski, W. J. (2002). Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science, 13*(3), 249–273.
Orzano, A. J., McInerney, C. R., Tallia, A. F., Scharf, D., & Crabtree, B. F. (2007). A knowledge management model: Implications for enhancing quality in health care. *Journal of the American Society for Information Science & Technology, 59*(3), 489–505.
Plsek, P., and Greenhalgh, T. (2001). The challenge of complexity in health care. *British Medical Journal, 323* (7313), 625–628.
Probst, G., Raub, S., & Romhardt, K. (2000). *Managing Knowledge: Building Blocks for Success.* Hoboken, NJ: John Wiley & Sons.
Senge, P. (2000). *The fifth discipline: The art and practice of learning organizations.* New York, NY: Doubleday.
Stacey, R. D. (1996). *Strategic management and organizational dynamics.* London: Pitman Publishing.
Stacey, R. D. (1992). *Managing the unknowable.* San Francisco, CA: Jossey-Bass.

Stewart, T.A. (1997). *Intellectual Capital*. New York: Doubleday.
Tsoukas, H. (2005). *Complex Knowledge: Studies in Organizational Epistemology,* Oxford: Oxford University Press.
Waldrop, M. M. (1992). *Complexity: The emerging science at the edge of order and chaos.* London: Penguin.
Warglien, M., & Masuch, M. (1995). The logic of organizational disorder: An introduction. In *The Logic of Organizational Disorder.* Berlin: Walter de Gruyter, pp. 1–34.
Weick, K. (2001) *Making Sense of the Organization.* Oxford: Blackwell.

Measuring Knowledge Management

Emmy de Visser
Master of Communication and Information Studies

Abstract

"You can't manage what you can't measure," is a slogan that is often used by scholars in some version when describing the controversy among knowledge management, especially when it comes to its evaluation (Van Buren, 1999; Papmehl, 2004; Tobin & Volavsek, 2006). Researchers and practitioners have both been stressing the importance of knowledge management for the past 20 years (Grossman, 2006). Chen and Chen (2005) explain the importance of this phenomenon: "a knowledge-based economy is emerging, and knowledge management (KM) is being rapidly disseminated in academic circles, as well as in the business world" (p. 17). The technical aspect in these KM projects has been emphasized, excluding the possible advantages of knowledge management as a whole (Chen & Chen, 2005). Knowledge management as a whole is still a controversial topic, which also adds to the challenges of measuring knowledge management. Even the most recent literature shows that there is not one consistent way of measuring, "yet service companies now account for two-thirds of the employment in the industrialized world . . . the wealth of knowledge-intensive organizations is now surpassing the manufacturing sector in most global economies" (Bontis, 2001, p. 59). To examine these controversies more closely, this paper will address the following aspects of KM assessment: rationale for measurement, measurement challenges, measurement tools, and future implications.

Introduction of Knowledge Management

Before going into the challenges and ways of measuring KM, it is essential to define it first. Despite the controversy among KM definitions, for this paper the best way to describe KM is through McInerney's (2002) description, which states that "KM is an effort to benefit from the knowledge that resides in an organization by using it to achieve the organization's mission" (p. 1009). Since knowledge is the product, it is important for the company to know what knowledge they specifically excel in, to keep up their competitiveness in the market, and to be able to communicate and sell this clearly to future clients (Davenport & Prusak, 2000).

Although most of the literature emphasizes knowledge management in a corporate setting, more recent literature has emphasized KM in governmental settings such as at NASA , the Navy and Air Force (Asoh, Belardo, & Neilson, 2002), and smaller and mid-size businesses (SMEs) (Montequín, Fernández, Cabal, & Gutierrez, 2006). Whether for-profit or nonprofit, KM is becoming more important for the whole services sector; "private sector organizations collect data about their customers while governments do the same on citizens" (Asoh et al., 2002, Knowledge Assets and KM section, para. 4). At first, it seems that governments do not have to deal with competition, yet citizens' services demand has grown because of their comparison with businesses; for example "governments are now embarking on e-Government and even e-Commerce"(Asoh et al., 2002, Introduction section, para. 4).

Why Should Knowledge Management Be Measured?

The most important benefit of knowledge management, that is repeatedly referenced in both academic and practitioner literature, is its competitive advantage (Kim, 2006; Huang et al., 2007; Chen & Chen, 2005; Atkinson, 2007; Asoh et al., 2002; Freeze & Kulkarni, 2005; Chua & Goh, 2007; Tobin & Volavsek, 2006). To be more specific, García-Morales, Lloréns-Montes, and Verdú-Jover (2007) emphasize "long-term" competitive advantage (p. 561). According to Huang, Chen and Yie (2007) knowledge is "the future value" of a company, because it impacts the stock price of a company (p. 417). Knowledge Management plays a valuable role in the achievements of a company (Huang et al., 2007). Chen and Chen (2006) state that interest in KM measurements is only a recent trend, while most of KM literature is focused on "theory, model and application development phases" (p. 18). Therefore, to keep up the support for KM from management and other company stakeholders, it is crucial to show evidence that KM tactics "have contributed to the organization's performance improvement" (Kim, 2006, p. 362).

Second, another reason for assessment involves the evolving nature of the KM field. According to Grossman (2006), KM is deficient in concrete fundamental theories; "measurement is perhaps the least developed aspect of KM because of the inherent difficulty of measuring something that can not be seen or touched" (p. 243). A specific form that can assess the usefulness of KM does not exist (Halawi et al., 2007, p. 121; Van Buren, 1999). Haskel (2007) argues that "the services sector has grown and that productivity in it is not well measured" (p. 27). In order to develop this discipline, a lot of attention needs to be given to "formalize the frameworks, taxonomies, and procedures that are necessary to serve practitioners and which are critical to solidify its position as a unique and valuable discipline" (Grossman, 2006, p. 242).

Third, to guarantee KM's progress, Grossman (2006) suggests that its assessment is necessary to attain consistency and improved measures to evaluate its impact. Through assessment one can learn "what works and what does not work" (Kankanhalli & Tan, 2004, p.1). KM should be measured just as any other contribution to the company (Fairchild, 2002). Measurement, according to Lim and Ahmed (2000), "provides important mechanism to evaluate, control and improve upon existing performance" (p. 695).

Fourth, measuring KM is beneficial for comparisons with competitors. Montequín, Fernández, Cabal, and Gutierrez (2006) state it aids a company in "estimating their real value or even to controlling their improvement year-to-year . . . such as valuation for shareholders and raising capital" (p. 526). Besides external advantage, KM assessment is also important for improvement within a company (Montequín et al., 2006).

Fifth, to take KM seriously, and not as some "management fad" (Tobin & Volavsek, 2006, p. 96), it is essential to measure its impact. Traditional financial measures usually do not easily apply to KM measures because of its intangible nature (Van Buren, 1999). However, other measures have to be used to indicate the financial rewards of KM (Van Buren, 1999; Lim & Ahmed, 2000). Also, linking KM initiatives to financial investment may help justify KM to senior management and thus improve the firm's ability to manage knowledge effectively (Lee, Lee, & Kang, 2005; García-Morales et al., 2007).

Measurement Challenges

Despite the many attempts of practitioners and academia to define measures for knowledge management, it remains a controversial issue. KM is still under development as a discipline and so is its meaning (Grossman, 2006). Although plenty of measurement methodologies have been developed, a lack of clarity about certain terms still exists, such as 'KM project management' versus 'intellectual capital management' (Chua & Goh, 2007). This limitation, according to Lim and Ahmed (2000) "is associated with the diffused nature of KM and the broadness of measures and metrics employed thus far" (p. 694).

The controversy is embedded in the lack of consensus on which approach is best on how to evaluate KM (Grossman 2006; Kim, 2006). Yates-Mercer and Bawden (2002) describe the complexity of this issue more in depth: "a tension exists between the desire to evaluate activities and initiatives relating to knowledge and the apparent near impossibility of doing so in ways which can be shown to be meaningful, and which do not do violence to the nature of things being evaluated" (p. 27). Basically, it is difficult to translate KM into concrete outcomes (Chen & Chen, 2005).

Another explanation for this KM controversy is that KM is hard to capture because it goes across many borders in business (Kim, 2006). In most literature, KM is seen from a very broad perspective (Fairchild, 2002). This broad perspective is illustrated through a study by Alavi and Leidner who argue that the broadness occurs because of the diversity of academia and their field of study, proficiency and issue areas (as cited in Huang et al., 2007).The impact of KM may be among many factors that impact the performance of a company (Kim, 2006). Factors such as "competitive environment and industry conditions" (p. 363) should be considered as well.

Also, the size of a company can change the approach of KM measures: "although the KM and IC [intellectual capital] concepts were developed around large enterprises, mainly related to the financial sector, nowadays efforts are addressed to transfer those concepts among SMEs" (Montequín et al., 2006, p. 527).

How Is Knowledge Management Measured?

The controversy continues as to how to measure knowledge management. Both practitioners and researchers seem to customize what categories of knowledge to measure, a few of which will be illustrated. For instance, Chen and Chen (2006) reviewed a decade of knowledge management performance evaluation and organized KM measures into eight components: "qualitative analysis, quantitative analysis, financial indicator analysis, non-financial indicator analysis, internal performance analysis, external performance analysis, project-oriented analysis and organization-oriented analysis" (p. 18).

Other researchers use the same type of categories, but give different definitions, such as Yates-Mercer and Bawden (2002), who distinguish: "Knowledge Capital, Intellectual capital/ intangible assets; benefits and cost-benefit analysis; KM systems and Learning" (p. 24–25). Huang et al. (2007) compared KM measurement in companies with five components of the "knowledge circulation process: knowledge creation, knowledge accumulation, knowledge sharing, knowledge utilization, and knowledge internalization" (p. 430) and found out that knowledge utilization and knowledge creation are the most important in verifying KM performance measurement.

Other practitioners and academia specifically narrow intellectual capital down to three categories: human capital, structural capital and relational capital

(Papmehl, 2004; Montequín et al., 2006). Human capital is focused on employees' capabilities such as their proficiency and aptitude. Structural capital portrays the knowledge within an organization, such as using IT to improve the knowledge flow. Relational capital illustrates the external relationships of an organization, such as its customers and suppliers. Van Buren (1999) gives his own spin on these terms, by dividing structural capital into two categories: "innovation capital and process capital" (p. 2), and naming structure capital "process capital" (p.2). These are merely slight changes, but this is a good example of how inconsistent the literature can be when it comes to defining KM. It is difficult to detect consistency among terms.

Besides various assessment levels, timing should also be taken in consideration when it comes to KM measurement. In the beginning phases of knowledge management implementation, assessment usually does not take place, because it is not necessary (Fairchild, 2002). However, as KM develops within an organization, assessment becomes more crucial, especially when it is formally integrated into a company (Fairchild, 2002). Harlow and Imam (2006) suggest that longitudinal studies should specifically assess "tacit knowledge before and after implementations of the tacit methods" (p. 1248). Although Yates-Mercer (2002) bring up this issue, they do not give a definite answer, but state that considerations such as continuous evaluation versus evaluation after a decade to decide on the impact of a program. Besides timing, the cost of evaluation should be in balance with the information that is derived from these measurements (Desouza, 2003; Yates-Mercer & Bawden, 2002). On the contrary, Papmehl (2004) argues that "ultimately, the value of intellectual capital measures resides in the results achieved, not in the amount of money invested" (p.28).

Measurement Tools

With these challenges in mind, a few of the measurement tools will be discussed that were continuously mentioned in the literature. Many models are variations of existing models and have been adapted for specific organizations or research interests (Lee et al., 2005; Montequín et al., 2006). Two main distinctions can be made of measurement tools: some are used to measure KM internally, and some are used to measure KM outside the company (Huang et al., 2007).

The Skandia Navigator is a tool that was created by Edvinsson and Malon in 1997 (as cited in Bontis, 2001). The tool is named after the Swedish financial company Skandia where the tool was developed. The Navigator focuses on five components: 1) financial; 2) customer; 3) process; 4) renewal and development; 5) human capital (Bontis 2001; Grossman 2006). The tool contains both financial and non-financial elements which can be merged to approximate the market value of a company.

The Success Case Method (SCM) is a method that was developed by Brinkerhoff in the human resources development division (as cited in Kim, 2006). It is a tool that can measure the strengths and weaknesses of a "training-to-performance process" (p. 366). Two components are measured by the SCM: 1) identifying success cases, which is usually done through surveys and 2) recording these cases, which is accomplished through interviews.

The Balanced Scorecard (BSC), developed by Kaplan and Norton, gives a balanced perspective on both fiscal and operational process measures (as cited in Grossman, 2006; Kim, 2006). Three out of the four views measure a non-financial aspect: 1) financial; 2) customers; 3) internal business process; 4) learning and

growth. The BSC should be tailored to a company in terms of developing objectives for each of the components and describe suitable assessments for these objectives (Kim, 2006).

The aforementioned models are concerned with internal and external measures; however Huang et al. (2007) suggest that the main focus of a company when dealing with KM measurement should be its foremost competitors. This can be done through the ANP (Analytical Network Process) to achieve or sustain a competitive advantage. The model "is used to derive scales from both discrete and continuous paired comparisons in multilevel network structures" (Huang et al., 2007, p. 420).

Conclusion

The controversy surrounding KM and its measurement methodologies as well as a lack of a formalized framework should not withhold practitioners and scholars from measuring KM. Bontis (1999) concludes that "there is no universally best tool: there are only tools that are more or less appropriate to specific situations and companies" (p. 400). However, that does not mean that one should not be careful with choosing tools as Bontis (1999) continues his conclusion: "those same tools applied to the wrong situation would damage companies, or at the very least generate some undesired side effects" (Bontis et al., p. 400). This means that every organization should measure KM within its own context (Grossman, 2005). Therefore, definitions of Knowledge Management should also be defined within the context of an organization.

When a company has reached the stage of KM measurement, a company should treat it as an evolving process, just as KM is still evolving. Shu-mei and Sheng-hua (2006) suggest: "KM is not an isolated procedure, but periodic, and also exhibits the innovative nature of KM in organization" (p. 1396). Thus, every KM assessment can be an improvement for the next assessment period (Shu-mei & Sheng-hua, 2006).

Implications

For the future of KM measurement it is important that academics and practitioners keep working together and document measurement procedures and distribute those across businesses. KM measurements should stimulate research across disciplines, but also as the global economy is rising, best practices should be both developed and spread worldwide (Halawi et al., 2007; Bontis, 2001). In Tobin and Volavsek's (2006) study about KM measurement in South African organizations, the US and Europe seem to use singular methods of measurement within one organization, while in South African organizations a variety of methods are practiced.

Conferences can help keep the discussion going between both practitioners and academia. Despite the controversy about the definition of KM, measurement categories and tools, an ongoing discussion needs to continue to find answers and to formalize and standardize certain methods. Those conferences can also stimulate Communication and Information education programs to promote KM awareness, to better prepare people for their future careers.

Although both academics and practitioners should be aware that many managers may approach KM measurement as a phenomenon that remains difficult to measure, organizations should not give up paying attention to it. The nature of KM is so complex that it requires a certain degree of complexity to measure it accurately. Therefore, the bold statement that initiated this paper should not be taken literally

when it comes to evaluating Knowledge Management.

References

Asoh, D., Belardo, S., Neilson, R.(2002). Knowledge management: Issues, challenges and opportunities for governments in the new economy. *Proceedings of the 35th Annual Hawaii International Conference on System Sciences.*

Atkinson, R.D. (2007). Measuring up. *Economic Development Journal, 6,* 5–12.

Bontis, N. (2001). Assessing knowledge assets: A review of the models used to measure intellectual capital. *International Journal of Management Reviews, 3,* 41–60.

Bontis, N., Dragonetti, N.C., Jacobsen, K., & Roos, G. (1999). The knowledge toolbox: A review of the tools available to measure and manage intangible resources. *European Management Journal, 17,* 391–402.

Chen, M., & Chen, A. (2005). Integrating option model and knowledge management performance measures: An empirical study. *Journal of Information Science, 31,* 381–393.

Chen, M., & Chen, A.(2006). Knowledge management performance evaluation: A decade review from 1995 to 2004. *Journal of Information Science, 32,* 17–38.

Chua, A.Y.K., & Goh, D. (2007). Measuring knowledge management projects: Fitting the mosaic pieces together. *Proceedings of the 40th Hawaii International Conference on System Sciences (HICSS'07).*

Davenport, T.H., & Prusak, L. (1998). *Working knowledge.* Boston, MA: Harvard Business School Press.

Desouza, K.C. (2003). Barriers to effective use of knowledge management systems in software engineering. *Communications of the ACM, 46,* 99–101.

Fairchild, a.m. (2002). Knowledge management metrics via a balanced scorecard methodology. *Proceedings of the 35th Hawaii International Conference on System Sciences.*

Freeze, R., & Kulkarni, U. (2005). Knowledge management capability assessment: Validating a knowledge assets measurement instrument. *Proceedings of the 38th Hawaii International Conference on System-Sciences,* 1–10.

García-Morales, V.J., Lloréns-Montes F.J., & Verdú-Jover, A.J. (2007). Influence of personal mastery on organizational performance through organizational learning and innovation in large firms and SMEs. *Technovation, 27,* 547–568.

Grossman, M.(2006). An overview of knowledge management assessment approaches. *The Journal of American Academy of Business, Cambridge, 8,* 242–247.

Halawi, L.A., McCarthy, R.V., & Aronson, J.E. (2007–2008,Winter). An empirical investigation of knowledge management system's success. *Journal of Computer Information Systems,* 121–135.

Harlow, H.D., & Imam, S. (2006). The effect of tacit knowledge management on innovation: Matching technology to strategies. *Proceedings of PICMET,* 1236–1250.

Haskel, J. (2007). Measuring innovation and productivity in a knowledge-based service economy. *Economic & Labour Market Review, 1,* 27–31.

Huang, M., Chen, M., & Yieh, K. (2007). Comparing with your main competitor: The single most important task of knowledge management performance measurement. *Journal of Information Science, 33,* 416–434.

Kankanhalli, A., & Tan, B.C.Y. (2004). A review of metrics for knowledge management systems and knowledge management initiatives. *Proceedings of the 37th Hawaii International Conference on System Sciences,* 1–8.

Kim, J.(2006). Measuring the impact of knowledge management. *IFLA Journal, 32,* 362–367.

Lee, K.C., Lee, S., & Kang, I.W.(2005). KMPI: Measuring knowledge management performance. *Information & Management, 42,* 469–482.

Lim, K.K., & Ahmed, P.K. (2000). Enabling knowledge management: A measurement perspective. *ICMIT,* 690–695.

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge *Journal of the American Society for Information Science and Technology, 53,* 1009–1018.

Montequín, V.R., Fernández, F.O., Cabal, V.C., & Gutierrez, N.R.(2006). An integrated framework for intellectual capital measurement and knowledge managementimplementation in small and medium-sized enterprises. *Journal of Information Science, 32,* 525–538.

Papmehl, A.(2004, March). Accounting for knowledge. *CMA Management,* 26–28.

Shu-mei, L., & Sheng-hua, X.(2006). The road map to KM evaluation in organization: A holistic view. *Proceedings from the International Conference on Management Science and Engineering,* 1393–1398.

Tobin, P.K.J., & Volavsek, P. (2006). Knowledge management measurement in South African organisations. *Mousaion, 24,* 96–118.

Van Buren, M.E. (1999). A yardstick for knowledge management [Electronic version]. *Training and Development,* 71–73.

Yates-Mercer, P., & Bawden, D.(2002). Managing the paradox: The valuation of knowledge and knowledge management. *Journal of Information Science, 28,* 19–29.

Knowledge Management in Nonprofit, Volunteer-based Organizations

Melissa Waggenspack
Master of Communication and Information Studies

Abstract

This paper examines how knowledge management (KM) can be implemented in a nonprofit organization that relies on volunteers to help carry out its mission. Each time a volunteer leaves an organization, essential knowledge also leaves. Nonprofit organizations that think strategically about KM will be able to identify best practices, and better manage institutional knowledge and volunteer expertise in order to make the best use of limited resources. This paper reviews relevant KM literature and applies KM principles to the unique challenges faced by nonprofit, volunteer-based organizations. This paper assesses the benefits and potential difficulties associated with implementing codification and personalization strategies, and looks at the role of technology in a KM program.

Introduction

Nonprofit, volunteer-based organizations face a number of challenges that make knowledge sharing difficult. This paper argues that implementing a knowledge management (KM) program will enable a nonprofit, volunteer-based organization to operate more efficiently and ultimately better serve their community. This paper focuses on the issue of codification and explains two knowledge management strategies, codification and personalization. The benefits and challenges of implementing each are explored within the context of nonprofit, volunteer-based organizations. The issue of limited resources, including staff and technology infrastructure, is also considered within this context.

Why Nonprofit, Volunteer-based Organizations Need Knowledge Management

Nonprofit organizations face unique challenges in managing their knowledge. Unlike or-profit organizations, nonprofits have both permanent and volunteer staff members they rely on to carry out their missions. The volunteers might be board members, community groups, or individuals who have varying degrees of commitment to their roles. These volunteers are not assessed by performance reviews and do not have financial incentives to continue with the organization. Due to the nature of this workforce, it can be difficult to manage this unpaid support staff, and therefore difficult to manage the knowledge they possess and contribute to the organization.

Hume and Hume (2007) observe that in nonprofit organizations, knowledge is "often fragmented, heterogeneous, rarely formalized and transient due to the considerable turnover of volunteer staff" (para. 5). This turnover presents two problems: how does a nonprofit encourage knowledge sharing among both staff and volunteers to benefit the organization's future endeavors, and how can an organization reduce the amount of staff time and organizational resources required to train new volunteers. Leonard (2007) argues that "knowledge loss is a serious threat to innovative capability, to growth, and to efficiency" (p.58). Much like the knowledge loss that occurs when a paid staff member leaves an organization,

volunteers also have organizational knowledge that walks out the door when they leave the nonprofit. Furthermore, nonprofit staff members should be focused on developing and executing their programs and initiatives, not on continuously bringing volunteers up to speed. This is especially true in the case of local, community-based nonprofit organizations with scarce resources who spend "large amounts of time, funds and imagination . . . reinventing the wheel, while the potential of programs that have already proven their effectiveness remains sadly underdeveloped" (Bradach, 2003, p. 19, as cited in Hurley & Green, 2005). Nonprofits need to better manage what they know in order to maximize the benefits of utilizing volunteers in the organization.

Knowledge management programs require time and dedicated resources. Developing a KM program can seem like a daunting or frivolous task to a nonprofit with limited staff and resources. Capozzi, Lowell, & Silverman, (2003) posit that "many philanthropies, fearing that a dollar spent internally is a dollar wasted, have neither the organization nor the systems to manage their knowledge properly" (para. 1). It can be difficult enough to explain this to a small staff that is already juggling more than one job responsibility, but nonprofits have the added challenge of making their case for KM outside of the organization as well. Hume & Hume (2007) argue "accountability to members and the public make it very difficult to gain the requisite financial investment and change management resources required to undertake strategic initiatives such as KM" (para. 2). An outside observer might argue that KM is a luxury and precious time, resources, and funding would be better spent on initiatives that explicitly carry out the organization's main objective. However, a KM program can actually enable a nonprofit organization to use its resources more efficiently.

Benefits of Implementing a KM Program

Across all organizational types, there are several benefits associated with implementing a KM program. KM allows organizations to manage institutional knowledge and identify and share best practices. Davenport & Prusak (1998) argue that KM enables a sustainable competitive advantage for corporations. This advantage can also be applied to nonprofits. By identifying and sharing knowledge among staff and volunteers, more time and resources can be focused on growth opportunities such as new program ideas and funding sources.

Capozzi, Lowell, and Silverman (2003) offer the example of the Casey Foundation, a Baltimore-based foundation serving disadvantaged children and their families. The Foundation experienced a reorganization which led to an increase in staff and changing roles of existing staff members. Before this foundation established a KM program "staff members were spending endless time looking for information, and experts were constantly asking the same basic questions" (para. 8). However, by identifying where knowledge resides in the organization and making that knowledge accessible, it was easier to orient new individuals to the foundation.

The Casey Foundation realized that the benefits of managing its knowledge extended beyond the reorganization process. The Foundation was able to streamline its internal processes and use institutional knowledge to the advantage of its programs. Capozzi et al. (2003) further argue that thinking strategically about KM will enable nonprofits to "improve the long-term effectiveness of their grants, to lower the cost of administration, and to invest in more effective strategies for social change" (para.3). If a nonprofit organization invests the time and resources into

managing its knowledge, the return will manifest itself both inside the organization and externally in the community it serves.

Defining Knowledge

Before an organization looks at implementing KM, it is essential to explore the difference between information and knowledge. It is also helpful to understand the difference between tacit and explicit knowledge in order to determine the best codification strategy for an organization.

Davenport and Prusak (1998) explain that "information is meant to change the way the receiver perceives something, to have an impact on his judgment or behavior" and information is "data that makes a difference" (p.3). For example, information such as invitations, guest lists, and promotional materials are useful when looking at how a nonprofit organization executed past annual fundraising events. Information collected in databases about donors' names, addresses, and amounts of past donations can be used in a number of ways, including generating appeal letters, guest lists for events, and more. However, the event materials alone do not tell the story of why the organization chose to execute its event in the manner it did, and the database information does not reveal the motivations behind what prompted a donor to give. In other words, information does not provide the rich context necessary to provide insight into the situation.

Knowledge, on the other hand, is "a fluid mix of framed experience, values, contextual information, an expert insight that provides a framework for evaluating and incorporating new experiences and information" (Davenport & Prusak, 1998, p. 5). Knowledge is more of a process than a fixed entity. Ichijo (2007) explains, "Knowledge in an organization is dynamic, relational, and based on human action; it depends on the situation and people involved rather than on absolute truth or hard facts" (p.85). Both of these definitions reflect the active component of knowledge, emphasizing the important contributions of interpretation and insight.

Davenport and Prusak (1998) define some of the active characteristics of knowledge as experience, ground truth, judgment, intuition, and values and beliefs. What each of these components of knowledge has in common is the benefit of perspective. In a nonprofit organization, the experience of the staff members is crucial to the organization. They can provide context for the organization's values as well as insight into organizational processes and best practices, which help to integrate new staff and volunteers into the organization. However, nonprofit organizations may overlook the knowledge that its volunteers contribute. For example, board members with a corporate background may be able to offer up organizational experience which can help the nonprofit better streamline its grant writing process. Or, a volunteer with an event management background can provide insight into best practices in order to execute a fundraising event. Just as when a staff member leaves, when a volunteer no longer works with a nonprofit this insight may leave, too.

The challenge then is how nonprofits can capture the tacit knowledge, or the insight and perspective, of staff and volunteers. Tacit knowledge is characterized as unspoken knowledge, or "the expertise and assumptions that individuals develop over the years that may never have been recorded or documented" (McInerney, 2002, p. 1011). Ichijo and Nonaka (2007) explain that tacit knowledge "involves human processes in knowledge management—creativity, conversation, judgment, teaching, learning" (p.7). Tacit knowledge is difficult to identify and measure because it is

linked to action, rather than representative of a thing that can be quantified.

Tacit knowledge can also be embedded in the routines and understood rules of an organization (Davenport & Prusak, 1998). Davenport (2002) calls these routines of practice mundane knowledge management, which "focuses on the issue of the maintenance work that sustains communities: the identification and negotiation of aims, tasks, resource allocations, alignments, alliances, and the nature of apprenticeship in such matters" (p. 1038). Mundane knowledge management reflects the processes of acquiring and maintaining organizational processes and norms. A nonprofit organization must understand the difficulty in sharing this tacit knowledge with volunteers who are not on site full time, or even at all, and therefore will not have the benefit of seeing the organization's processes in action.

On the other end of the knowledge spectrum is explicit knowledge, which is shared knowledge that has been articulated or documented in manuals, databases, or other resources. Zack (1999) observes that explicit knowledge in the form of procedure manuals or other literature is a large component of an organization's KM strategy. The assumption in much of the KM literature is that explicit knowledge can "easily be disseminated within and across organizational borders" (Stenmark, 2002, p.6). However, because knowledge is subjective, organizational members may hold a different set of assumptions and perspectives that would make the communication of that knowledge difficult. Stenmark (2002) argues that if the receiver does not understand the context or value of explicit knowledge, then it is merely information. It is important for a nonprofit organization to understand the difficulty inherent in sharing explicit knowledge in the form of manuals or other materials with volunteers because they may not possess the mutual language or understanding that staff members share.

An organization must understand and identify its knowledge assets in order to determine what knowledge needs to be shared. Zack (1999) observes "many organizations are so complex that knowledge is fragmented, difficult to locate and share, and therefore redundant, inconsistent, or not used at all" (p. 45). This may be especially true in nonprofit organizations that rely on volunteers to supplement the work of the staff. Senior members of the organization may not interact with volunteers, and therefore may not know what knowledge assets it has. It is essential, then, that all employees and volunteers are involved in the organization's KM processes in order to "efficiently and effectively create, locate, capture, and share knowledge and expertise" (Zack, 1999, p. 45).

Knowledge Management Strategies

Hurley and Green (2005) argue that "nonprofit organizations lack the critical processes and knowledge needed to help them develop, evaluate, document, and share successful programs" (para. 4). Implementing a codification strategy will aid nonprofit organizations in the essential functions of knowledge transfer and knowledge generation. Codification is the process of organizing, standardizing, and categorizing knowledge in order to make it available within the organization.

Davenport and Prusak (1998) explain "the aim of codification is to put organizational knowledge into a form that makes it accessible to those who need it" (p. 68). The biggest challenge of codification is how to manage knowledge while preserving the unique features that make it valuable to the organization. Capozzi et al. (2003) warn against using a "piecemeal" strategy for KM and taking a fragmented approach to codification without thinking about "what knowledge should be

harnessed, who should codify it, how it should be maintained and disseminated, and who should receive it" (para. 10). Davenport & Prusak (1998) offer guidelines for codification and outline four principles that organizations should follow, including determining the purpose for codifying knowledge, identifying existing knowledge, evaluating knowledge, and determining the appropriate strategy for codifying knowledge.

Hansen, Nohira, & Tierney (1999) categorize two KM strategies as codification and personalization. Through their analysis of consulting companies, they found that all of the companies they looked at used both strategies, but the successful KM programs focused on one strategy more than the other. The same principle can apply to nonprofit organizations looking to implement a KM program. Both the codification and personalization strategies have benefits and drawbacks. The correct strategy for a nonprofit's KM program will depend on that organization's culture and available resources.

Codification Strategy. In the codification strategy, "knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the organization" (Hansen et al., 1999, p. 107). Knowledge can also be embedded in documents, training materials, websites, intranets, and other types of knowledge repositories or knowledge objects. Hurley and Green discuss how nonprofits can use past experience to their advantage: "by combining and documenting the explicit knowledge learned from program development, management, and program evaluation, these 'best practices' and 'lessons learned' can be stored for use" (Hurley & Green, 2005, para. 20). By codifying this knowledge into knowledge objects stored in databases, or knowledge repositories, both staff and volunteers can avoid reinventing the wheel and recreating previous or existing effective programs and organizational practices.

Habitat for Humanity provides an example of a nonprofit organization that implemented a codification strategy in order to free up staff time and resources from new volunteer training. "We have such turnover architected into our model because we rely so heavily on volunteers that many of our trainers spend the majority of their time just constantly reacquainting the new people who come in" (Hollis, 2002, para. 12). Habitat for Humanity decided to mitigate this problem by developing training manuals which contained best practices in order to orient new volunteers to the organization. In this case, Habitat for Humanity trainers determined the types of knowledge that would be valuable and useful to new volunteers in order to spend time focusing on other areas, such as developing the skills of established volunteers.

Knowledge repositories can also be an effective way to disseminate knowledge among staff and volunteers and encourage knowledge sharing as well. Zack (1999) discusses the benefits of allowing for knowledge repositories that have an interactive component where organizational members can link to and cross-reference among knowledge units. "A high degree of viewing flexibility enables users to dynamically alter and interactively combine views to more easily apply the knowledge to new contexts and circumstances. Knowledge-as-object becomes knowledge-as-process" (p. 48). The organization should also encourage staff and, where appropriate, volunteers, to share knowledge by contributing to the repositories.

Hume & Hume (2007) suggest that nonprofit organizations establish an intranet to encourage knowledge sharing. Similar to Zack's (1999) description of an interactive repository, intranets can be "a shared information space for content,

communication, and collaboration" (Stenmark, 2002, p. 8). An intranet could be a resource for staff members and volunteers to access knowledge objects. It could also function as a communication tool in which staff and volunteers can connect, network, and share knowledge.

Hansen et al. (1999) discuss how companies who employ a codification strategy "rely on the economics of re-use" (p.110), which is recycling knowledge contained in knowledge repositories or documents for the benefit of the organization. Re-using codified knowledge "saves work, reduces communications costs, and allows a company to take on more projects (p.110). Although they are speaking about this issue within the context of consulting companies, this concept has relevance to nonprofit organizations. For example, the Casey Foundation wanted to capture its senior associates' observations from site visits to its grant recipients in order to identify and record best practices for use in other programs. The Foundation developed templates so people could record their knowledge in a way that would be easy for them to use, but would also classify that knowledge for others to understand and refer to in the future (Capozzi et al., 2003).

However, the transfer of explicit knowledge isn't always as simple as recording and storing it in a knowledge repository. Knowledge sharing becomes complicated or impossible if there doesn't exist a shared understanding of language, culture, and organizational processes. As McInerney (2002) observes, "whatever codification system is devised for repositories of knowledge objects, it must coincide with what was meant by the knowledge expert in language that makes sense to others within the organizational culture" (p. 1014). Volunteers may not understand explicit knowledge stored in documents or databases. It is important to establish with both staff and volunteers a shared language and context for understanding codified knowledge.

For example, the global nonprofit Habitat for Humanity understands that each community in which it operates is unique, with its own language, culture, and locally-based resources. Habitat for Humanity "relies on its subject matter experts and trainers locally to uncover the best practices and most important pieces of knowledge to share" (Hollis, 2002, para. 8). Rather than passing down mandated knowledge from headquarters, the organization recognizes the benefit of leveraging the expertise of local staff and volunteers in order to better develop and share knowledge objects, such as training manuals.

There are other problems associated with relying on knowledge repositories to store codified knowledge. If they aren't maintained, knowledge repositories can become outdated and full of useless or irrelevant knowledge. Therefore, the organization must establish quality criteria for the knowledge repositories and they must be updated on a regular basis (McInerney, 2002; Zack, 1999). Prusak and Weiss (2007) add that when knowledge repositories become too large, it can become difficult for individuals to make the contextual connections that enable the transfer of knowledge.

The codification strategy relies heavily on knowledge repositories and other computer mediated communication tools to share explicit knowledge among organizational members. The problem here lies in the difficulty in codifying or reproducing tacit knowledge (Davenport & Prusak, 1998), such as organizational processes and routines, in databases or documents. The second type of codification strategy, the personalization strategy, provides insight in how nonprofit organizations can transfer tacit knowledge among its staff and volunteers.

Personalization Strategy. In the personalization strategy, communication strategies and technologies connect people who can share knowledge. Hansen et al. (1999) explain that in this strategy "knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts" such as face-to-face interactions or through telephone, email, or other means (p. 107). One of the main benefits of this strategy is the transfer of rich, tacit knowledge through conversations and networking. Davenport and Prusak (1998) argue that when it comes to dealing with the issue of sharing tacit knowledge, connecting people might yield better results than attempting to codify and store tacit knowledge in repositories.

There are several ways a nonprofit organization can employ the personalization strategy. Training sessions (Hurley & Green, 2005) and seminars (Symons, 2003) offer an opportunity for staff and volunteers to learn new skills and knowledge and share that knowledge within their organization when they return. Mentoring (Davenport & Prusak, 1998) also presents an opportunity for facilitating knowledge sharing. In a nonprofit, a mentoring relationship could be established between staff members or a staff member and a volunteer. In the latter relationship, the volunteer would benefit from learning organizational processes and norms from the staff member, and the staff member would benefit from the outside experience of the volunteer. "Away days" (Symons, 2003) in which the staff and volunteers plan an outing can be an opportunity for knowledge sharing. Symons (2003) describes a successful initiative implemented at a UK-based nonprofit where the board of trustees and staff traveled together to an organic farm to discuss lessons learned from the past year.

The personalization strategy also includes "the formal and informal sharing of knowledge within and among workgroups and individuals as well as the sharing of information within a 'community of practice' . . . voluntary forums of employees formed around a topic of interest" (Hurley & Green, 2005, para. 18). Communities of practice don't necessarily have to be formed within the organization, but can develop virtually through message boards, chat rooms, or other forums where participants can connect and share knowledge. This would be a useful solution for connecting staff members and volunteers who are interested in the same topics and programs but may not be operating out of the same location. Buchel (2007) discusses the importance of keeping communication open between the organization's members and external contacts in order to gain new perspectives. This is especially important for small, local nonprofits that can connect with other agencies in order to share best practices or lessons learned. Establishing a blog (Symons, 2003) can encourage staff and volunteers to communicate no matter where their location, and can also bring together staff and volunteers from nonprofits around the country or even the world.

Larson, Levy, and Schmitz (2005) provide insight into a unique, large-scale personalization strategy in their discussion of the role of nonprofit information specialists within the California Management Assistance Partnership. This unique network helps to "ensure equal access to accurate nonprofit information statewide for both urban and rural communities" (Larson et al., 2005, para. 2). The specialist acts as a knowledge resource for board members, staff, volunteers, and the public. In order to answer questions specific to the context of nonprofits, the specialist and consults a number of resources, including files, books, websites, electronic databases, and known experts on the topic. While this network is still looking to expand its KM strategies, it provides an example of a formal knowledge-sharing initiative that has

benefited not only nonprofit organizations but the communities they serve.

Within the context of a nonprofit organization, the personalization strategy also presents some difficulties. The biggest problem is socialization among staff and volunteers (Hume & Hume, 2007). Volunteers do not spend as much time on-site as staff members do, and they also may have erratic schedules that would not allow for face-to-face knowledge sharing, such as a mentoring relationship. This would also limit the occasions for spontaneous knowledge exchange (Davenport & Prusak, 1998) such as conversation around the water cooler. However, Davenport and Prusak (1998) believe that activities can be planned to encourage this type of exchange, such as knowledge fairs and picnics. The caution here is that the activity can't be too structured or planned out, or the opportunity for spontaneous knowledge exchange will be missed. Creating a "Yellow Pages" resource (Davenport & Prusak, 1998) where staff and volunteers can list their areas of expertise and other relevant information might help connect people in the organization who do not have the occasion to interact.

The most obvious barrier to implementing a personalization strategy is the time and energy necessary for people to meet face-to-face or virtually. Time is also required to establish a trust relationship among staff members and volunteers. Trust is a crucial component of knowledge sharing within an organization (Davenport & Prusak, 1998) and among communities of practice (McInerney, 2002). It may be difficult to build trust among individuals who are unable to connect in person. Additionally, due to the high turnover associated with volunteers, staff may be unwilling to commit to knowledge sharing if the volunteer's tenure is uncertain. One strategy for addressing this issue is arranging the opportunity for regular face-to-face interaction in order for staff and volunteers to establish a trust relationship.

The Role of Technology in Codification

Nonprofit organizations with limited resources and technology infrastructure may be pleasantly surprised to learn that technology is not the key to a successful KM program. However, technology does play a role in both the codification and personalization strategies. Before implementing a codification strategy, it is important to understand how technology can both hinder and aid in the exchange of knowledge within an organization.

Organizations should not rely too heavily on technology as a solution for knowledge sharing. "Knowledge sharing must rely on the human intelligence, energy, and the will to cooperate and use knowledge in collaborative endeavors. Technology can help, but the active nature of knowledge means that human intervention is a constant requirement for KM programs to be successful" (McInerney, 2002, p. 1013). While documents, training manuals, and other knowledge objects can be easily accessible in a database, intranet, or other tool, "information technology systems . . . provide a much less 'rich' medium of communication than face-to-face interaction due to the loss of social cues" (Hislop, 2002, p. 173). Organizations must be aware of the limitations of computer-mediated technologies, but should also understand that these tools also present the opportunity for interaction and knowledge sharing. In the personalization strategy, technology can be used to implement blogs, message boards, or an intranet, while in the codification strategy technology can be used to develop knowledge repositories, documents, and other materials.

The major benefit associated with the use of technology in a KM program

is providing access to knowledge without the constraints of space and time. This can be especially beneficial if individuals are not in the same fixed location. Communication technologies can "ease the problem of getting the right knowledge to the right person at the right time" (Davenport & Prusak, 1998, p. 143). While these tools are highly useful, it is also important to remember that staff and volunteers must have a shared context for understanding knowledge stored in a repository in order for the program to be successful (Zack, 1999). It is also necessary to examine IT needs within the context of the knowledge management strategy being employed.

Conclusion/Implications

Time wasted in nonprofit organizations is money wasted that could be better used for the programs and services the organization provides. By investing in KM initiatives, nonprofit, volunteer-based organizations will be better able to leverage their resources in the future. This paper examined two strategies, codification and personalization. A nonprofit organization must consider its existing knowledge assets, resources, and technology infrastructure in order to implement these KM strategies successfully. For organizations that rely more heavily on explicit knowledge shared in documents, databases, or other knowledge repositories, the codification strategy may be more prominent. The personalization strategy may be more effective in organizations with more tacit knowledge that rely on connections and communication to share knowledge. However, a combination of these strategies may be beneficial in order to address the specific needs of an organization.

Research is scarce on the topic of knowledge management in nonprofit organizations. It would be beneficial to examine how organization size affects which strategy works best in nonprofit, volunteer-based organizations. It would also be interesting to investigate which strategies are effective in convincing the public to support a nonprofit's KM program. Another issue worth expanding on is the role of the nonprofit information specialist. Nonprofits would benefit from further study addressing formal knowledge sharing initiatives such as the California Management Assistance Partnership. It would also be interesting to examine informal knowledge sharing initiatives among nonprofit organizations, especially small, local nonprofits that share best practices.

References

Buchel, B. (2007). Knowledge creation and transfer: From teams to the whole organization. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 44–56). New York: Oxford University Press.

Capozzi, M., Lowell, S., & Silverman, L. (2003). Knowledge management comes to philanthropy. *The McKinsey Quarterly.* Retrieved April 12, 2008, from http://www.mckinseyquarterly.com/article_print.aspx?L2=33&L3=95&ar=1310.

Davenport, E. (2002). Mundane knowledge management and microlevel organizational learning: An ethological approach. *Journal of the American Society for Information Science and Technology 53* (12), 1038–1046.

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

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

Hislop, D. (2002). Mission impossible? Communicating and sharing knowledge via information technology. *Journal of Information Technology, 17* (4), 165–177.

Hollis, E. (2003, July/August). Nonprofit Habitat for Humanity adopts corporate university model. *Chief Learning Officer Magazine.* Retrieved April 12, 2008, from http://www.clomedia.com/content/anmviewer.asp?a=231.

Hume, C., & Hume, M. (2007). The strategic role of knowledge management in nonprofit organisations. *International Journal of Nonprofit and Voluntary Sector Marketing, 3* (2), 129–140. Retrieved April 12, 2008, from doi.wiley.com/10.1002/nvsm.316

Hurley, T., & Green, C. (2005). Knowledge management and the nonprofit industry: A within and between approach. *Journal of Knowledge Management Practice, 6.* Retrieved April 12, 2008, from http://www.tlainc.com/artic179.htm.

Ichijo, K. (2007). Enabling knowledge-based competence of a corporation. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 83–96). New York: Oxford University Press.

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

Larson, P., Levy, J., & Schmitz, M. (2005). The nonprofit world in California: Knowledge management on a shoestring. *Information Outlook, 9* (11). Retrieved April 17, 2008, from http://findarticles.com/p/articles/mi_m0FWE/is_11_9/ai_n15979882.

Leonard, D. (2007). Knowledge transfer within organizations. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 32–43). New York: Oxford University Press.

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science & Technology, 53* (12), 1009–1018.

Prusak, L., & Weiss, L. (2007). Knowledge in organizational settings: How organizations generate, disseminate, and use knowledge for their competitive advantage. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 32–43). New York: Oxford University Press.

Stenmark, D. (2002). Information vs. knowledge: The role of intranets in knowledge management. In *Proceedings of HICSS-35,* Hawaii, January 7–10, 2002.

Symons, J. (2003). Charity begins with KM. *Inside Knowledge, 7* (3). Retrieved April 12, 2008, from http://www.ikmagazine.com/xq/asp/sid.0/articleid.07213604-D4B9–4A29-B53993369C26AE11/eTitle.Case_study_Charity_begins_with_KM/qx/display.htm.

Zack, M. (1999). Managing codified knowledge. *Sloan Management Review, 40* (4), 45–58.

Managing and Distributing Knowledge: Application of Knowledge Management Principles in an Organizational Setting

Samantha Yakal-Kremski
Master of Communication and Information Studies

Abstract

Knowledge management describes the way in which data, information, and knowledge are translated and organized for use and understanding. Application of knowledge management principles to organizations is effective for practical understanding. A review of current theoretical paradigms will be examined and a self-created definition that attempts to incorporate all aspects of the academic frameworks will be presented. Additionally, application to the communication discipline will be explored. Specifically, this paper will review the means and methods of information and knowledge flow and sharing once knowledge has been attained in an organization. Lastly, overarching connections between knowledge management and communication will be reviewed.

Theoretical Background

Although knowledge management is an emergent discipline in communication and information management, there are several working views of how knowledge management should be defined. The following presents several frameworks for understanding and review of knowledge management application and design within an organization.

Theoretical Frameworks. DiMatta and Oder (1997) define knowledge management as "blending a company's internal and external information and turning it into actionable knowledge via a technology platform" (p. 33). Converse to this linear perspective, Nonaka and Takeuchi (1995) describe knowledge management as a circular process that involves translating knowledge from tacit to explicit means. That is, explicit knowledge is 'formal and systematic,' and examples of this are offered as product specifications and computer programs (Nonaka, 1991). Tacit knowledge is knowledge that cannot be articulated or described; that is, the knowing in this instance is the behavior that individuals perform, and yet cannot be shared through formal communication strategies. Nonaka and Takeuchi (1995) emphasize that knowledge must convert implicit knowledge into explicit knowledge, as well as allow for individuals to internalize and codify knowledge into personally meaningful pieces of information.

To date, a holistic definition of knowledge has not been provided. Davenport and Prusak (1998) describe knowledge management as a hierarchy of data, information, and knowledge. Therefore, knowledge can be understood as made up of data and information that has been translated and transformed from a raw piece of data or information into an analytic, 'thick' (Geertz, 1973) piece of knowledge. Additionally, Davenport and Prusack (1998) place a value on experiential knowledge. They state, "knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information . . . in organizations, it often becomes

embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms" (Davenport & Prusak, 1998, p. 5). This latter view is considered one of the most encompassing definitions in the field.

Although knowledge management differs from information management, the two programs do have some slight overlap in content and design elements. Information management is typically derived from Davenport and Prusak's (1998) components of knowledge and the adaptation of implicit knowledge into explicit knowledge through the socialization, externalization, combination, internalization (SECI) model. So, while information management attempts to capture and record explicit items, knowledge management attempts to understand implicit and explicit factors, including behavior.

Personal Definition. As illustrated, several theories of knowledge management have been developed for a better understanding of the discipline, and all are respected as viable definitions of the practice. A self-developed definition of knowledge management would describe the process as an 'understanding of acquiring, translating, and sharing knowledge with team members and the rules for managing knowledge and information through a general systems theory (Lewin, 1947) approach.'

Application of Knowledge Management to Communication

Theoretical Frameworks. Discussing knowledge acquisition and management must be applied to a real-world setting in order to appreciate the significance of this area of expertise. In particular, practitioners should examine how knowledge, once acquired and identified, is shared within an organization. For without being able to satisfactorily disseminate knowledge to the correct individuals, the economic value of knowledge becomes diminished. That is, knowledge can be identified and correctly organized, but without getting the information and knowledge out to the correct persons, the significance and utility of that information or knowledge is worthless, despite having been correctly culled and classified. As a result, network theory is especially pertinent to the study of knowledge management. A succinct review of relevant network and informational diffusion theories will be provided, and relevance to knowledge management will be discussed.

Diffusion of Innovations. Rogers' (1962) diffusion of innovation addresses how innovations, or trends, are spread to other members of society. Rogers (1962) predicted that trends would follow an S-curve pattern, meaning that early adopters would embrace the said fad or technology, followed by the adoption from a majority, thereby making the technology commonplace. A third population, referred to as the laggards, would be the last subset to adopt or refuse membership into the using the technology. Understanding the 'tipping point' (Gladwell, 2000), or the point at which critical mass is reached, is a major component of this paradigm. Early adopters, and consequently the organizations relying on this group, should understand that an innovation is minimally effective until the majority, or critical mass, is reached. Once critical mass is reached, it is understood that the innovation becomes self-sustaining within the contextual environment. It is important to note that the definition of innovation is loose, and can apply circumstances such as adoption of a technology, worldview, or policy.

Social Network Theory. Milgram's (1967) Social Network Theory examines how relationships are formed and maintained and how one's social network of ties can be expanded. This theory considers social connections both internal and external to one's personal relationships. Thus, ties can be strong or weak dependant upon the type of relationship and context that each individual has with other nodes. This theory is particularly effective when examined in conjunction with the introduction of mediated communication methods at an organization in that mediated channels ease and facilitate easier communication between individuals and groups. This theory, as well as the use of mediated sources, will be discussed when examining how knowledge and information can be shared within an organization.

Strength of Weak Ties. Granovetter (1973) presents the idea that relationships which may be considered weak or to have limited social consequence can, in select instances, have greater benefits over ties that are perceived as, and considered, strong. Therefore, the 'strength of weak ties' is considered a framework that can aid in understanding information transfer and what role social means play when passing information within a network or organization. Again, it should be noted that like Social Network Theory (Milgram, 1967), mediated channels could serve as a method for distributing information and knowledge, particularly when examining information distribution within an organizational setting.

Social Application and Findings. As presented above, theoretical frameworks aid in understanding how information and knowledge can be passed amongst individuals within a social network. These paradigms are important in that they not only show the flow pattern of that information, but social influence and media technology aid in facilitating these streams of information dissemination. The following presents select case studies which present the power of these two factors. Lastly, commentary on the implications of social influence and technology will be discussed.

Social Influence. The content and design of a message is essential to creating successful communications, but the role of how and through whom the message is learned must not be overlooked. McCrosky and Young (1981) maintain "contemporary research generally has supported the proposition that source credibility is a very important element in the communication process, whether the goal of the communication effort be persuasion or the generation of understanding" (p. 24). It is necessary to establish a source that maintains credibility with an audience, as "a highly credible source is more commonly found to induce more persuasion toward the advocacy than a low-credibility one" (Pornpitakpan, 2004). Hovland, Janis, and Kelley (1953) identify expertise and trustworthiness as two guiding dimensions of source credibility. Additionally, sociability, extroversion, and composure have also been recognized as characteristics that lend itself to credibility (McCroskey, Holdridge, & Toomb, 1974). Often, credibility is linked to a title or power dimension. Cialdini (2001) argues that "there is an unsettling tendency in our society to accept unthinkingly the statements and directions of individuals who appear to be authorities on the topic" (p. 8). However, it is necessary to note that while these dimensions are important constituents of individual perception, they are not direct components or variables of credibility (McCroskey & Young, 1981).

Several factors are considered dimensions that aid in individuals having more social influence. As previously discussed, the social process by which ideas

travel from individual to individual is best exemplified through Rogers' (1962) diffusion of innovation model. This study uses opinion leaders (Katz & Lazarsfeld, 1955) as agents of message transmission that hold characteristics of credibility and influence. It explores how an influential player in a communication sequence can continue to pass on a message. This process plays a key role in persuasion studies. By supplementing persuasive messages with sources that are themselves considered persuasive (or hold persuasive qualities) as perceived by an audience, a message is more likely to reach a target audience and carry out a said message. Further, senders may prolong the message of campaigns or advertisements. Their effect should more fully be assessed during the evaluation phase of a campaign. The role of message sources should be explored at both short- and long-term levels. In particular, their role in the exposure (or insufficient exposure) of a message may help to explain why and how a campaign was successful or failed. Sources of a message are a critical aspect to message transmission and should be chosen based on ability and possession of persuasive qualities that enhance the content of a campaign.

Role of Technology. The "interplay between the social environment and the application of communication technologies in organizations" (p.143–144) is explored by Contractor and Eisenberg (1990) as they cover the role of media in helping to diffuse information. Specifically, communication networks are operationalized and evaluated to determine how social interactions surround the diffusion and adaptation of media. Their study examines how social networks play a role in media adoption and how media use influences information flow through social networks. It was determined that an individual's attitude is influenced by social positioning within an informational network and use of new media. Relationally, decisions about use of select media are determined by strength, multiplexity, and structural equivalence (Contractor & Eisenberg, 1990). At a small group level, collective action is identified as a factor that influences media adoption and use. Additionally, "changes in patterns of media use will impact member's positions in their social networks, and as a result influence and alter the information they receive" (Contractor & Eisenberg, 1990, p. 157). Because technology can play a key role in how people communicate, it is natural to investigate how media usage impacts communication networks. Access, coping abilities, and emphasis on positive-affect cues are essential to influencing a communication network. Technology can also play a role in expanding one's social network, whether geographically or temporally. These factors can also result in new relationships and contacts across boundaries and organizations. Technology and social factors are mutually influencing in this instance, and an "emergent network perspective provides an opportunity to examine how microlevel appropriation processes impact macrolevel adoption by the group" (Contractor & Eisenberg, 1990, p. 161). That is, individual actions can have an effect on the behavior of the group or organization.

Relationship between Social Influence, Technology Use, and Flow of Knowledge. The importance of obtaining information and knowledge is necessary in order for an organization to be functioning and productive. Knowledge management addresses how these banks of knowledge can be organized to ensure quick retrieval and accessibility. However, knowledge management does not touch upon how information and knowledge are shared amongst group members or the means by which these variables flow in an organizational hierarchy or network. Examining

social networks and influential factors help to explain the way in which information travels within an organizational network. Certainly, social influence and mediated communication technologies aid in the flow of information within an organization and internal or external social networks. As demonstrated, these factors play a role in how information is shared and how it is diffused within an organization. In particular, who the informational source is plays a large role in how information is received by other organizational members. Source credibility and power positioning play a large role in how information is passed through a social network. By identifying these variables, researchers and practitioners can better recognize and diagram the way information and knowledge travels through an organizational network. Additionally, based on the culture of an organization, certain media channels may be more or less effective in facilitating information diffusion.

Obviously, certain organizational cultures will embrace different mediated channels or knowledge management programs. Therefore, it is important to understand the organizational context that these programs will be employed at. In other words, it is necessary to note that different organizations will require different knowledge management programs and the means by which information flows will be unique in each context. Yet, an organization's ability to identify how information moves within a network will provide valuable information for departments to issue communications and ensure that employees receive the correct announcements.

Knowledge Management and Communication

Impact on Organizations. Knowledge management programs are critical for organizations to successfully identify and document data, information, and knowledge. Furthermore, it is necessary to explore how information and knowledge is organizationally disseminated, as without understanding the networks through which these variables transfer to other individuals, it will be difficult to share and create programs of knowledge diffusion. Additionally, recognizing key opinion leaders within an organizational network will help to establish a knowledge management program by influencing how other people perceive induction of such a program.

For instance, a small nonprofit looking to establish a knowledge management program should distinguish who is an influential member of their organizational team and debrief them on the workings of the knowledge management program being considered. These individuals can then serve as dominant examples to the rest of the staff by educating and demonstrating the use of the knowledge management program.

Spread of Information. Once knowledge has been identified it is important to share this within an organization to make it economically valuable. Thus, identifying the networks through which information travels is essential to sharing information and knowledge once it has been identified and classified through a management program. Identifying both formal and informal (such as grapevine) networks will aid in the dissemination of information and knowledge. Neglecting to share information and knowledge that has been acquired defeats the purpose of having a knowledge management program that eases the retrieval and accessibility to information.

At a nonprofit, identifying how past information has traveled through the organization will help to pinpoint the opinion leaders. Additionally, examining how past information has traveled within the organization will also aid in recognizing

network makeup, which can be recreated when attempting to diffuse knowledge and management principles. For instance, past history may be indicative of how current and future practices of diffusion can be refined to ensure that knowledge can be successfully communicated to organizational members.

Relationship Development. Insight into network theory provides important information on relationships and the strength of organizational and relational ties. In other words, networks will reveal both strong and weak ties between individuals, or nodes. Necessitating that individuals work or speak with each other in order to share and disseminate information may facilitate or strengthen relationship development between members.

In the case of a non-profit, relationships between internal and external contacts can be evaluated and strengthened by encouraging communication between parties by way of passing knowledge. By maintaining and increasing contact between individuals in order to pass information and knowledge, relationships will be cultivated and weak ties can become stronger ties. Additionally, the strength of weak ties should be seriously considered as a framework when evaluating how to best diffuse information to a network.

Implications and Conclusions

As demonstrated, knowledge management programs can be a critical component of organizational success. The role of communication in the implementation and maintenance of knowledge management is essential for effective program development. Theories, frameworks, and future studies should consider how knowledge is subsequently passed to organizational members once it has been acquired, organized, and codified. Communication theories such as diffusion of innovation, the strength of weak ties, and social network theory lend themselves to exploring the sharing of information and knowledge from a communication perspective. Both communication and knowledge management practitioners would greatly benefit from familiarizing themselves with these complementary programs and frameworks in order to best create strategic plans for knowledge diffusion. Furthermore, the important role of communication is clear for the successful implementation of a knowledge management program.

References

Cialdini, R. B. (2001). *Influence: Science and practice* (4th ed.). Boston: Allyn & Bacon.

Constant, D., Sproull, L., & Kiesler, S. (1999). The kindness of strangers: The usefulness of electronic weak ties for technical advice. In DeSanctis, G., & Fulk, J. (Eds), *Shaping organization form* (pp. 415—444). Thousand Oaks, CA: SAGE.

Davenport, T. & Prusak, L. (1998). *Working knowledge.* Boston: Harvard Business School Press.

Geertz, Clifford. (1973). Thick description: Toward an interpretive theory of culture. In Geertz, C. (Ed.), *The interpretation of cultures: Selected essays* (pp. 3—30). New York: Basic Books.

Gladwell, M. (2000). *The tipping point.* NY: Little, Brown and Company.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology,*

78, 1360—1380.
Hinds, P., & Kiesler, S. (1999). Communication across boundaries: Work, structure, and use of communication technologies in a large organization. In DeSanctis, G., & Fulk, J. (Eds), *Shaping organization form* (pp. 211—246). Thousand Oaks, CA: SAGE.
Katz, E., & Lazarsfeld, P. F. (1955). *Personal influence.* New York: Free Press.
Lewin, K. (1947). Frontiers in group dynamics. *Human Relations, 1,* 5–41.
McCroskey, J. C., Holdridge , W., & Toomb, J. K. (1974). An instrument for measuring the source credibility of basic speech communication instructors. *The Speech Teacher (23*), 26–33.
McCroskey, J. C. & Young, T. J. (1981). Teacher Credibility. In Rubin, R. B., Palmgreen, P., & Sypher, H. E. (Eds.), *Communication Research Measures: A Sourcebook.* (pp. 352–355). New York, London: The Guilford Press.
Milgram, S. (1967). The Small World Problem. *Psychology Today, 5,* 60–67.
Milgram, S. (1967) The small world problem. *Psychology Today, 5,* 60–67.
Pornpitakpan, C. (2004). The persuasiveness of source credibility: A critical review of five decades' evidence. *Journal of Applied Social Psychology, 34,* 243–281.
Prusak, L., & Weiss, L. (2007). Knowledge in organizational settings: How organizations generate, disseminate, and use knowledge for their competitive advantage. In Ichijo, K., Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers*. New York: Oxford University Press.
Rice, R. E., & Aydin, C. (1991). Attitudes toward new organizational technology: Network proximity as a mechanism for social information processing. *Administrative Science Quarterly, 36,* 219—244.
Rogers, E. M. (1962). *Diffusion of innovation.* New York: Free Press.
Rogers, E. M. (2003). Diffusion networks. In Cross, R., Parker, A., & Sasson, L. (Eds). *Networks in the knowledge economy* (pp. 130–179). New York: Oxford University Press.
Rogers, E. M. (1994). *A history of communication: A biographical approach.* NY: Free Press.

Crime Suppression Through Knowledge Management

Theodore Yurgel
Master of Library and Information Science

Abstract

Many municipal police agencies are moving away from the traditional policing model and adopting the *Community Oriented Policing and Problem Solving (COP)* or *Problem Oriented Policing models (POP).* These are policing models that involve enhanced interactions between the police and the members of the community they serve. This paper proposes combining the elements of COP and POP and creating a *Learning Organization* that includes the police agency and the community it serves.

Introduction

Over the last twenty years, there has been a paradigm shift in the law enforcement community. Across the nation, local police departments have shifted from the centuries-old traditional, reactive law enforcement model, to one that emphasizes a proactive stance. Throughout the 1980's and 1990's, many in law enforcement have embraced what has been labeled Community Oriented Policing and Problem Solving (COP) or what has evolved into Problem Oriented Policing (POP).

The objective of Community Oriented Policing and Problem Solving is to control crime and improve the quality of life by creating interactive partnerships between the community, municipal services and the patrol officer (Ellison 2006).

Problem Oriented Policing builds on the general principles of COP and adds to it by implementing a formalized methodology for police to identify and address " . . . persistent community crime, disorder and fear problems . . ." through a focused analytic problem solving approach (Greene 2005 p. 309).

This paper explores crime control through the application of knowledge creation and management principles by law enforcement, through the perspective of a municipal agency. It is the position of this paper that a modern day municipal law enforcement agency can become more effective through the implementation of elements of the Community Policing and Problem Solving and Problem Oriented Policing. It is the purpose of this paper to propose the creation of an enhanced policing model. This model involves combining the elements of COP/POP initiatives with knowledge management principles of a learning organization. This model not only includes the police agency in the learning organization, but the community as well.

Community-Oriented Policing and Problem Solving

Community-Oriented Policing and Problem Solving (COP*),* was designed to replace the centuries-old traditional policing model, which was "centered on serious crime, as opposed to maintenance of community social order or general service delivery" (Greene, 2005, p. 310). Under the traditional model, police acted as *a crime fighter;* that is they responded to calls for service from the public, applied the law and then returned to patrol to await the next call from the public. Members of the community were limited to the role of initiating a police response, through calls for service, and had little input on how police resources were deployed or what tactics if any were employed.

COP initiatives were designed " . . . to produce more committed,

empowered, and analytical police officers; to flatten the police hierarchies; and to open the process of locally administered justice to those who often are the object of justice decision making . . . that makes crime prevention, not crime suppression, the ascendant goal of policing" (Ellison, 2006, p.12).

Through COP initiatives, the patrol officer is encouraged to do more than just suppress crime through routine patrols and respond to calls for service. They are deployed in specific communities and are encouraged to engage in rapport-building activities with the merchants and residents. Rapport building involves solving community problems, such as mediating neighborhood disputes, getting public works to repair a playground and organizing neighborhood watches. The patrol officer becomes a conduit to municipal services. He moves beyond the application of criminal law, to that of social work and crime prevention.

Through rapport building, a patrol officer becomes approachable by members of the community and members of the community become more open to the patrol officer. It is through this rapport that a patrol officer can gather information regarding criminal activities.

On the agency level, law enforcement managers are tasked with being more open with the community, in an effort to give members of the community a voice in policing efforts. Doing so, creates " . . . a more harmonious relationship between the police and the public, including some power sharing with respect to police policy making and tactical priorities" (Ellison, 2006, p. 12).

Community policing methods are very broad in nature, allowing the police to develop and employ creative solutions to community problems. For example, members of a neighborhood might approach a patrol officer and make a complaint regarding loiterers on a street corner. These loiterers may be disruptive, leave trash behind and may be responsible for a rash of thefts in the immediate area. The patrol officer may develop a solution by contacting the public works department, or the local power company, and having them install some street lamps. In addition, he may also leave a direct phone number to a police shift commander with members of the neighborhood, so they can call the authorities when the loiterers are present. The patrol officer may also request extra attention to the area from his fellow officers. Solving the problem through a partnership between the police and the community gives members of that community a sense of empowerment that they have a voice in the control of their neighborhood. "Community involvement . . . is the essential ingredient for reducing the fear of crime" (Wolfer, Baker & Zezza, 1999 p. 9).

Problem-Oriented Policing

Problem-Oriented Policing narrows the focus of law enforcement by targeting specific problems, or hot spots, that affect quality of life and crime issues in the community. Under this model, community members are still involved in the crime prevention/suppression, much the same way as in the COP model.

"The central thrust of problem oriented policing is to make the police more thoughtful about the problems they address and their methods of intervention. In short, the police are to be more analytic" (Greene, 2005, p.315). Formalized methodologies such as *Scan, Analyze, Respond, Assess (SARA),* are employed at the agency level as a problem solving initiative. "Using *SARA,* the police are to scan communities for problems, analyze the dynamics of these problems in a thorough and systematic way, design a response to address the defined and analyzed problem, and then assess the impact of the response on the identified problem" (Greene, 2005,

p.315).

Using the above example of the loiterers, under the POP model, members of the law enforcement agency may develop information not only through community contacts but also by way of routine surveillance, crime statistics analysis or "computer mapping and photographs" (Wolfer, Baker & Zezza, 1999, p.9). Once the corner is identified as a hot spot for deviant behavior, the members of the agency develop a response plan, which may include installing streetlights, engaging neighborhood watch programs and employing targeted enforcement initiatives.

By combining elements of the above models, municipal law enforcement agencies can enhance their efforts of crime prevention, crime suppression, and quality of life issues, while reducing the fear of crime within the community they serve. As the COP and POP models suggest, this can only be accomplished through community partnerships with the police.

A successful partnership with the community will enable the police to access bodies of information (tacit knowledge) within the neighborhoods, which through analysis and codification, be transformed into intelligence (explicit knowledge) which can then be applied to crime suppression and crime prevention initiatives. The challenge of this model is the creation of a working partnership between the law enforcement agency and the community it serves. Viewing the partnership as a complex system or learning organization can accomplish this.

The Police–Community Partnership as a Learning Organization

Community partnerships, created through the COP / POP law enforcement models, can improve efforts to prevent and suppress crime while enhancing the quality of life through a reduction in the fear of crime within the community. To be effective, a two-way exchange of intelligence or knowledge has to be established. This can be accomplished, by transforming the police/community partnership, developed through COP/POP initiatives, into a learning organization. Senge defines a learning organization as:

> . . . organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together (Senge as cited in Smith, 2001).

Elements of Senge's definition of a learning organization can be applied to the COP/POP models, as the police/community initiative. Those that are a part of the partnership, "attempt to see the whole together . . . to create the results they truly desire . . ." - the prevention and suppression of crime and the enhancement of the quality of life within the community. (Senge as cited in Smith, 2001). But to truly transform the partnership into a learning organization, both parts have to come together as a whole. To accomplish this goal, members of the partnership need to innovate and master ". . . certain basic disciplines or component technologies . . ." that Peter Senge identifies as "*Systems thinking, Personal mastery, Mental models, Building a shared vision,* and *Team learning*" (Senge as cited in Smith 2001).

Systems Thinking. Aronson describes systems thinking as looking at the organization as a whole and focusing "on how the thing being studied interacts with the other constituents of the system—a set of elements that interact to produce behavior—of which it is a part" (1998).

Under the proposed model, all of the elements of the community, the schools, residents, merchants, police and other municipal agencies, are seen as combined together as a complex system. Each of these elements or agents is studied as a whole with the understanding that each element or agent interacts with one another. Actions that affect one element of the system may very well have a positive or negative effect on any number of other elements of the system. By engaging in systems thinking, all of the interacting elements of the police and the community can "see the 'big picture' and not just their part of it" (Aronson 1998 p. 2). Approaching the police/community partnership as a complex system will allow its members to "study the system as a whole, attempting to understand how agent interaction affects the system (rather than to take a 'reductionist' approach of studying individual agents)" (Solow & Szmerekovsky, 2006, p. 53).

Solow and Szmerekovsky draw a parallel between their description of complex systems research and business research that can be compared to the traditional police model and the proposed police/community model discussed here. Solow and Szmerekovsky use the example that "complex systems thinking in business research is in the realization that the actions and decisions in one functional area affect the performance of other functional areas. Thus, rather than using the reductionist approach of studying each functional area separately- as was often done in the past—much recent research in business includes the interaction of two or more functional areas" (2006, p.53).

These principles can be illustrated using the loitering example. Under the traditional policing model, the loitering problem would probably not be addressed by the police until a member of the community made a complaint. More than likely, the response would be limited to moving the group on to another corner, where they would be left alone until someone from that neighborhood complained. Dealing with the problem of moving the loiterers (studying a single functional area) to satisfy the complainant is a reductionist approach. All that is accomplished is gaining the satisfaction of an individual from the neighborhood. The limited actions on the part of the police have done nothing to gain trust or cooperation from the community as a whole, nor does it address the other problems created by the loiterers. It just moved the problem to another location.

Through their interactions with the community, COP/POP patrol officers may pick up on complaints regarding the loitering problem. Linking the loiterers with other deviant behavior in the neighborhood could be achieved through analysis and codification of information gained from members of the neighborhoods, patrol officers and incident reports. These efforts would result in a systematic plan that could be implemented to address the overall problem.

Systems thinking would enable authorities to develop a plan that would extend beyond neighborhood watches and improved street lighting. The problem of the single street corner would be analyzed from the perspective of the big picture, taking into account what effects the initiatives would have on surrounding neighborhoods, municipal services etc. Would the installation of additional street lamps on one corner open the floodgates for requests for the same in other neighborhoods? And would the denial of those requests create consternation in those neighborhoods?

Or, looking at the big picture, could a community-wide street lighting campaign be initiated through a community/utility partnership? Could deviant behavior be preempted through school-police-community-church etc. intervention

initiatives or perhaps neighborhood merchant-sponsored job programs? Also to be considered, what municipal programs of any kind should be continued, cancelled or initiated? Where can the funds for these programs be put to best use? These questions can be addressed by the employment of systems thinking through a community as a learning organization. But to bring all parties involved as one, a *shared vision* must be nurtured.

Shared Vision. Building a shared vision is an element of the Senge learning organization. A method to bring all members of the community at large together is to nurture a shared vision among all of the participants or stakeholders. This includes persons or organizations with an interest in the community, the residents, police, municipal government, merchants etc. Senge argues, "When there is a genuine vision . . . people excel and learn, not because they are told to, but because they want to . . ." (Senge as cited in Smith, 2001, p.5).

By fostering a shared vision of a crime-free community with the members of the partnership, the police can build a sense of trust within that partnership. "The practice of shared vision involves the skills of unearthing shared 'pictures of the future' that foster genuine commitment and enrolment rather than compliance" (Senge as cited in Smith, 2001, p. 5). The success of the partnership can only be achieved through the genuine commitment of its members.

Shared visions can be communicated to the participants through a variety of outreach programs through existing community organizations such as block associations and merchant groups. Additional community groups can be created where none exist.

If given a shared vision and common goals, these individual organizations can join together and involve into what Davenport and Prusak term a *community of practice.* Communities of practice are initiated by groups of people "who communicate with one another because they share common work practices, interests, or aims" (Davenport & Prusak, 2001, p.38).

Reaching out to the community through a vision shared by all, the police can provide the residents with a means to become involved in the decision making process regarding crime suppression and prevention initiatives within their communities. This cooperation and power sharing can improve police-community relations by altering the mental models the residents may have of the police.

Mental Models. Mental models "are deeply ingrained assumptions, generalizations, or even pictures and images that influence how we understand the world and how we take action" (Senge as cited in Smith, 2001, p.5). Often in communities plagued by crime problems, the residents have preconceived conceptions, often negative, of the police. These feelings can lead to an air of mistrust and hopelessness that can cause a community to spiral downwards out of control. It is the objective of the police to reverse negative mental models by building informal trust relationships or what Cohen describes as *social capital* (2007).

Social capital is "an essential social infrastructure for knowledge sharing and the knowledge creation sparked by new combinations of existing knowledge" (2007). "Trust is the bedrock of social capital. Without it, cooperative social connections cannot exist. Where distrust prevails, it is almost impossible even to begin to build social capital because the most benign or generous action is greeted with suspicion and given a negative twist" (Cohen, 2007, p. 245).

To overcome trust issues and build social capital, Cohen suggests that one should seek out and locate pockets of trust. From there the *social capital builder* should continue to nurture these pockets of trust by "giving people connected by some degree of trust opportunities to talk and work together to develop more" (Cohen, 2007, p.245).

Building relationships based on trust is the foundation of the COP/POP policing models; without it the entire model would collapse. The police can build trust and social capital through outreach programs that make connections with neighborhood organizations and communities of practice. It is through this dialogue that the police can reverse negative mental models and cultivate social capital and trust.

Personal Mastery. To be successful in the adoption of any of the described police models, an agency has to be completely committed to those models from the top down. It has to develop the ability to create innovative learning initiatives to attain its goals. To accomplish this, the individual members of an agency need to achieve what Senge describes as *personal mastery.* "Organizations learn only through individuals who learn. Individual learning does not guarantee organizational learning. But without it no organizational learning occurs" (Senge as cited in Smith, 2001, p. 4).

A police agency engaged in a complex systems model should encourage and foster the higher learning of its members through in-service training initiatives, higher education and mentoring programs. Initiatives to codify and communicate the knowledge of its members should be an ongoing process. "People with a high level of personal mastery live in a continual learning mode. They never 'arrive'" (Senge as cited in Smith, 2001, p. 5). Personal mastery within an organization leads to the next element of a learning organization, *team learning.*

Team Learning. Senge describes team learning as "the process of aligning and developing the capacities of a team to create the results its members truly desire" (Senge as cited in Smith, 2001, p. 6). In this case, the ability to implement a successful policing model that gains the community's trust, suppresses and prevents crime and improves the quality of life. Team learning builds on personal mastery and a shared vision that allows its members to grow far more rapidly than could have occurred otherwise. "Team learning starts with 'dialogue,' the capacity of members of a team to suspend assumptions and enter into a genuine 'thinking together' . . . allowing the group to discover insights not attainable individually" (Senge as cited in Smith, 2001). It is through dialogue among members of an organization that enables the creation of explicit knowledge.

Policing is a knowledge-based profession. Being able to find answers to who, what, where, when, why and how are all based on the collecting of information and data and converting that data through analysis into knowledge. Team learning can enhance the process.

Conclusion and Implications

Adopting a new policing model can be a challenge for a municipal police department. Adding the community as a whole can be an even greater challenge. To accomplish this, stakeholders and gatekeepers would have to be identified and brought on board. This is not an easy task, as many in municipal government as well as the private

sector have their own agendas, which may clash with the vision of the partnership.

Effective implementation this model as a whole will take the full commitment of the law enforcement agency and the community. Through effective training, leadership and development of social capital through a shared vision, this can be accomplished.

References

Aronson, D. (1998) Introduction to systems thinking. *Thinking Page.* Retrieved April 18, 2008 from http://thinking.net/Systems_Thinking/OverviewSTarticle.pdf.

Brodeur, J., Dupont, B. (2006) Knowledge workers or "knowledge" workers? *Policing & Society. 16* (1) 7–26. Retrieved April 18 2008 from Ebscohost database.

Cohen, D. (2007) Enhancing social capital for knowledge effectiveness. In K. Ichijo & I. Nonaka (Eds.) Knowledge creation and management (pp. 240–253) New York: Oxford University Press.

Davenport, T.H. & Prusak, L. (1998) *Working knowledge.* Boston: Harvard Business School Press.

Ellison, J. (2006) Community policing implementation issues. *FBI Law Enforcement Journal. 75* (4) 12–16. Retrieved April 18, 2008 from H.W. Wilson database.

Greene, J. (2005) Community policing in America: changing the nature, structure and function of the police. *Policies, Processes and Decisions of the Criminal Justice System. 3* (3) *299–370.* Retrieved April 18, 2008 from http//www.ncjrs.org/criminal_justice200/vol_3/03g.pdf

Smith, M. K. (2001) Peter Senge and the learning organization, *the encyclopedia of informal education.* Retrieved April 18, 2008 from http://www.infed.org/thinkers/senge.htm

Solow, D. Szmerekovsky, J. (2006) The role of leadership: what management science can give back to the study of complex systems. *Emergence :Complexity & Organization. 8* (4) 52–60. Retrieved April 18 2008 from Ebscohost database.

Wolfer, L., Baker T., Zezza, R. (1999) Problem-solving policing: eliminating hot spots. *FBI Law Enforcement Bulletin 68* (11) 9–14. Retrieved April 18, 2008 from H.W. Wilson database.

May 2008

Knowledge Management in Organizations

School of Communication, Information and Library Studies

Professor:

Claire McInerney

Publishing Committee

Bibi Alajmi

Marilyn Campbell

Crystal DeCotiis

Christine Goldthwaite

Dorothy Meaney

Connie Pascal

Iulian Vamanu

RUTGERS

UNIVERSITY