3-11-2004

An Exploration of Cultural Factors Affecting Use of Communities of Practice

Peter L. Hinrichsen

AN EXPLORATION OF CULTURAL FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE

THESIS

Peter L. Hinrichsen, First Lieutenant, USAF

AFIT/GIR/ENV/04M-11

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

AFIT/GIR/ENV/04M-11

AN EXPLORATION OF CULTURAL FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Information Resource Management

Peter L. Hinrichsen, BS

First Lieutenant, USAF

March 2004

AFIT/GIR/ENV/04M-11

AN EXPLORATION OF CULTURAL FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE

Peter L. Hinrichsen, BS
First Lieutenant, USAF

Approved:

Alan R. Heminger (Chairman)	11 Mar 2004 date
Summer E. Bartczak (Member)	11 Mar 2004 date
Kevin L. Elder (Member)	11 MAR 2004 date

Abstract

On-line communities of practice are potentially powerful social learning networks that can improve organizational performance. Unfortunately, administrators of on-line communities of practice report that community members do not take full advantage of this potential. This study used Shaw and Tuggle's (2003) factors of knowledge management (KM) culture affecting organizational acceptance of a knowledge management initiative to explore this issue. It was hypothesized that respondents whose communities of practice possessed higher average community use per member would rate KM culture variables higher than respondents whose communities possessed lower average community use. An analysis of survey data collected from Air Force Knowledge Now communities of practice identified two KM culture variables with a significant relationship between how individuals rated their community on each KM culture variable and use.

Acknowledgements

This research effort was a valuable learning experience for me. I am grateful to my thesis committee chair, Dr. Alan Heminger; without his encouragement, support and guidance I could not have completed the thesis process. I would like to thank my readers, Dr. Summer Bartczak and Dr. Kevin Elder, for their professional opinions and guidance during this research effort. I would also like to thank my research sponsor, Air Force Knowledge Now, specifically Randy Atkins, Michael Lipka, and Steve Wypiszynski. I am also grateful for the friendship and support of my classmates. Finally, I want to thank my family; their love and support during the long hours of research kept me focused on what really matters.

Peter L. Hinrichsen

Table of Contents

List of Figures

Figure Page

List of Tables

Table Page

AN EXPLORATION OF CULTURAL FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE

I. Introduction

Overview

Knowledge management (KM) is a relatively new concept (Serban & Luan, 2002). KM relies on people, processes, and systems to improve the development and availability of information. The integration of people, processes, and technology to improve information flow and knowledge creation constitutes a knowledge management system (KMS) (Fulmer, Gibbs, & Keys, 1998). Properly supported from the top and implemented within organizations, a KMS can help to integrate and transform independent business units into fixed or fluid learning organizations (Nonaka & Takeuchi, 1995). Learning organizations are better prepared to maintain continuous flows of innovation to meet tactical and strategic objectives. In today's highly connected and competitive marketplaces, organizational survival hinges on an ability to leverage intellectual capital to streamline operations, develop cutting-edge products and services, and deliver superior value to customers (Hammer, 2001). A community of practice is defined as groups of people "... who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting

on an ongoing basis" (Wenger, McDermott, & Snyder, 2002:4), is one KM tool used to manage knowledge and deliver business improvements.

According to sociotechnical systems theory (STS), the development and implementation of business technologies and processes must incorporate not only the technology or process but human and cultural considerations as well (Pasmore & Sherwood, 1977). Using the STS approach to design systems has yielded consistently superior productivity and quality results for organizations while simultaneously improving employee work environments by developing technology in concert with the people and cultures present in the organization (Trist, 1977). However, failing to consider both technological and sociological or cultural factors in the design of systems can cause profound and potentially harmful effects in organizations (Emery & Trist, 1977).

The importance of understanding culture may have implications for communities of practice use as well. Just as formal organizations have benefited by examining cultural composition to determine compatibility with a new technological initiative, culture in communities of practice must be considered if similar benefits are to be realized. A basic understanding of culture influences on use of communities of practice may help community facilitators and leaders decide how best to implement them so they are used more.

Background

Government agencies in the United States, to include the Department of Defense (DoD), are compelled by executive order ("Executive Order 13011," 1996) and law ("Government Performance Results Act," 1993; "Information Technology Management

Reform Act," 1996) to streamline operations and team with other government agencies using new technology and management practices. KM and communities of practice offer US military departments a powerful tool to meet this federal mandate. Each service has KM initiatives in different levels of development and use; the Army uses a portal technology for its Army Knowledge Online. The Navy is also preparing to launch a portal. The Air Force, as one part of an emerging KM focus, operates web-based communities of practice hosted at Air Force Material Command's (AFMC) Directorate of Resources (DR). Today, the AFMC/DR initiative to develop web-based communities of practice is known as Knowledge Now.

Knowledge Now is the result of an evolution that started in the early 1990s. Federal mandates and a realization among DoD leadership of the need to fix outdated and broken processes spurred Knowledge Now's growth in the Air Force (Bartczak, 2002). Initial efforts to reengineer the AFMC acquisition process necessitated the use of on-line repositories for regulations, "how-to" documents, points of contact, and lessons learned (Bartczak, 2002). Response to these initial reengineering efforts was encouraging. Inspired by AFMC's successful connection of acquisition professionals using technology, the DoD implemented the Defense Acquisition Deskbook program. The DoD Deskbook was a series of online tools and contacts the DoD acquisition community used to improve acquisition practices and was hosted at AFMC/DR. Later AFMC/DR, in implementing Air Force Inspection Agency findings, developed a formal requirement to fund a new Air Force-wide lessons learned pilot program using formal KM strategies (Bartczak, 2002). Based on their previous experience with the DoD Deskbook, the emergence of new KM tools, and new user requirements, AFMC/DR piloted communities of practice. What

started as a pilot program has emerged as a leading Air Force KM initiative. Knowledge Now's goal for the first year was to establish 50 communities of practice. However, at the end of its first year of operation, Knowledge Now was host to over 80. Knowledge Now continues to grow. As of mid-2003, the site was host to over 470 web-based communities of practice.

Problem Statement

A major problem with new information systems including on-line communities of practice is that some people do not use them or do not use them properly (Dennis, 1996). Anecdotal evidence reported by Knowledge Now personnel indicates that most Airmen understand and agree that the community of practice concept is of potential value to individuals and organizations. Despite members' belief in potential benefits and an ever-increasing number of communities forming at Knowledge Now, relatively few community members actively use or visit their on-line community of practice (Lipka, 2003). One possible explanation may be that cultural factors are not properly addressed in KM initiatives like the community of practice.

Research Question

Given this problem, the present study attempts to answer the question, "Does culture internal to communities of practice influence use of communities of practice?" In order to answer this question, the present study hypothesizes that people who are members of communities of practice with higher average use per member will place greater emphasize on KM culture variables than people who belong to communities with low average community use per member. Twelve testable hypotheses are presented at the end of chapter two to help answer the research question.

Scope

The current study uses Shaw and Tuggle's (2003) model of KM culture to test whether the perceived state of KM culture variables is related to use of communities of practice. Additionally, this study presents a snapshot in time, not a longitudinal investigation of whether KM culture variables affect use of communities of practice. Finally, this study excludes other non-culture factors such as technology and content issues that will also likely impact use of communities of practice.

Benefits to the Air Force

Successfully implemented communities of practice can reduce cost, improve quality, enhance innovation, remove barriers to knowledge transfer, and provide value for their members (Nonaka & Takeuchi, 1995). This study may help Knowledge Now administrators identify KM cultural variables that will play a significant role in future acceptance and use of on-line communities of practice.

Summary

In this chapter, culture was introduced as a potential factor influencing community of practice use. Additionally, the background presented both legal and managerial reasons government agencies need to implement KMS, including the community of practice. The underlying problem of community usage at Knowledge Now was discussed and a research question presented.

Chapter two provides an explanation of concepts and terms introduced in chapter one, explores different theories of individual and cultural technology pertaining to use of information systems, and presents a research model with 12 hypotheses. Chapter three explains how data will be collected and analyzed to answer the research question and

hypotheses. Chapter four presents research findings and a detailed data analysis. Chapter five discusses some of the implications and limitations of the current study and offers suggestions for future research.

II. Literature Review

It has been proposed that a greater understanding of social factors will help in the development and implementation of systems in organizations (Trist, 1977). The first section of the present chapter focuses on communities of practice: what they are and why they work. Next, the concept of organizational culture is introduced. Different theories of technology acceptance and use are summarized. Finally, the initial research model for this study is introduced and hypotheses presented.

Community of Practice Framework

A community of practice is a group of people "... who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002:4). A community of practice generally develops among a group of people who already have something in common such as a career specialty or other unique interest (Wenger et al., 2002). Creation of and participation in a community of practice is not the end in and of itself. Instead, by participation in a specialty or unique interest, a community of practice forms.

The term "community of practice" originated in the context of traditional apprenticeship (Lave & Wenger, 1991). In traditional apprenticeships, new members usually joined a trade with little understanding of that trade. However, as members gained greater understanding and internalized a trade's beliefs, meanings, and rituals, they learned the trade and became accepted by their peers (Lave & Wenger, 1991).

Many researchers reference the work of Wenger, McDermott, and Snyder when discussing community of practice concepts (Buysee, Sparkman, & Wesley, 2003;

Palincsar, Magnusson, Marano, Ford, & Brown, 1998; Pugach, 1999). This model, hereafter referred to as the CoP model, provides a framework for discussing communities of practice. The main elements of the CoP model include domain, community, and practice.

Domain

The domain is the essential issue a community of practice cares about; it is the reason the community of practice exists. A domain establishes boundaries, both implicit and explicit, for a community of practice by selecting issues and defining the scope of these issues. A domain can be a simple, short-lived issue such as planning a one-time squadron event or may involve highly complex, protracted issues such as development or improvement of aircraft intake design (Wenger et al., 2002).

Community

A community is "... a group of people who interact, learn together, build relationships, and in the process develop a sense of belonging and mutual commitment" (Wenger et al., 2002:34). A traditional community has been limited in the past by cost and technological restrictions in communication. Today, communication can take place at any time and in almost any place for a fraction of previous costs; information technology makes this possible. This study focuses on communities that exist primarily in the virtual realm.

Practice

A practice establishes "a baseline of common knowledge that can be assumed on the part of each full member" (Wenger et al., 2002:38); it includes the language and tools community members learn and use to refine their understanding and skill in a domain.

Theoretical Basis of the Community of Practice

Some researchers consider the community of practice concept a social learning theory (Buysee et al., 2003). The community of practice method of learning is contrary to standard forms of education that hold that experience and knowledge should be gained through independent study of rigid codes and structures. Instead, members learn a practice and gain legitimacy in a community by participating in and contributing to the group's social and intellectual reservoir (Buysee et al., 2003). This shifts the method of learning from isolated individuals to participatory learning and collaboration in a social environment. This participatory learning approach is capable of bringing people of varying skill levels or specialties together (Hanks, 1991), a concept sometimes referred to as "zones of proximate development" (Hung & Chen, 2001).

Culture

Given the social nature of learning and group development in communities of practice, a brief introduction to culture is appropriate. There are different approaches to culture that include global, national, and organizational perspectives (Hofstede, 2001; Ott, 1989; Schein, 1992). Some of the more commonly accepted definitions of culture include: the collective programming of the mind (Hofstede, 2001); the manner in which individuals understand their environment (Stocker, 2002); a pattern of shared basic assumptions (Schein, 1992). For the purposes of this study, culture was defined as:

> ...a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1992:12).

Organizational culture has been evaluated on three different levels (Ott, 1989; Schein, 1992): artifacts, values, and basic assumptions. Figure 1 illustrates how each level relates to another.

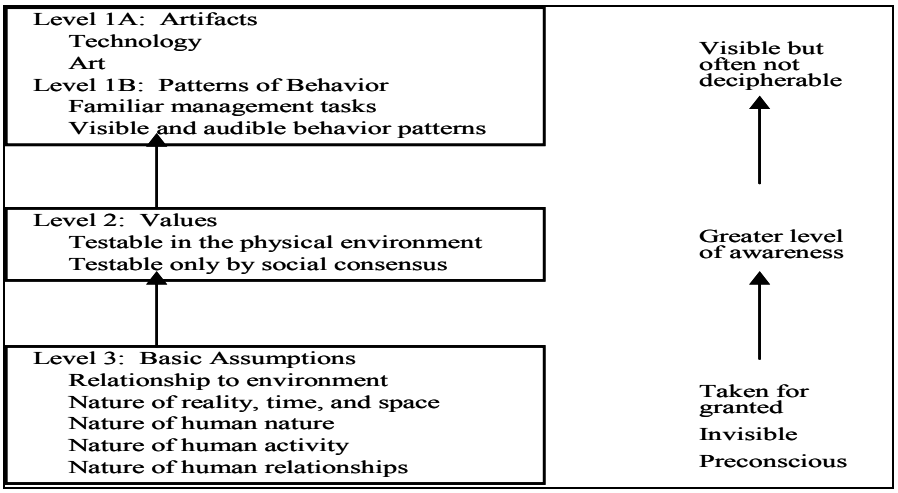

Figure 1. Levels of Organizational Culture (Hofstede, 2001; Ott, 1989; Schein, 1992; Stocker, 2002).

Artifacts (level-one) involve observable community phenomenon (Ott, 1989; Schein, 1992). Level-one includes the "what is" or rather the tangible products and observable behaviors of a group. In the context of communities of practice, artifacts might include community schedules, manners of speech (includes acronyms, technical jargon related to the specific community), and formal and informal community structures. All these things can be observed in organizations, however culture researchers warn that their interpretation can be difficult (Ott, 1989; Sathe, 1985; Schein, 1992). Schein states that, "It is especially dangerous to try to infer the deeper assumptions from artifacts alone because one's interpretations will inevitably be projections of one's own feelings and reactions" (Schein, 1992:18). It is through participative membership in communities that meanings of artifacts might become clear. While outside observers are unlikely to

interpret these meanings properly, community members can provide perceptions useful in determining the meaning and relevance of artifacts.

In contrast to the observed, "what-is" of level-one artifacts, level-two is the "what ought to be" and includes organizational "ethos, philosophies, ideologies, ethical and moral codes, and attitudes" (Ott, 1989). An analysis of level-two cultural factors is useful for revealing how community members explain or rationalize the current state of level-one in a community (Sathe, 1985). Additionally, level-two may be useful in motivating change to current level-one conditions. An apparent incongruence between level-one and level-two is valuable when it provides a vision to which a group can aspire (Schein, 1992). The identified need to reconcile "what is" with "what ought to be" also explains why new members may be of potential value to communities—new members bring fresh perspectives and ideas useful in community growth and development. Level-two is important because it reflects the desired state of a community. As level-two values and beliefs become widely accepted and routine-ized they move into the category of level three: basic assumptions.

Basic assumptions (level-three) are created when a proposed solution to a problem works repeatedly and reliably (Schein, 1992). These fundamental beliefs, values, and perceptions, when strongly held by group members, become automatic and influence behavior at an unconscious level. Basic assumptions:

> ... will find behavior based on any other premise inconceivable... Basic assumptions, in this sense, are similar to what [has been] identified as "theories-in-use," the implicit assumptions that actually guide behavior, that tell group members how to perceive, think about, and feel about things (Schein, 1992:22).

Basic assumptions, like theories-in-use, tend to be those we neither confront nor debate and hence are extremely difficult to change (Schein, 1992).

Theories of Technology Acceptance and Use

An understanding of information system acceptance and use has become more critical to organizations as information technology becomes more pervasive (Taylor & Todd, 1995). Several theories of information technology acceptance have been developed in order to better understand and help predict use of information technology.

As the need to understand why people adopt and use technology grows so too does the body of research. The following nine theories of technology acceptance and use share numerous similarities and may be considered the foundation for understanding individual technology acceptance and use.

Theory of Reasoned Action (TRA)

Drawn from social psychology, TRA was one of the first, most fundamental, and influential theories of human behavior (Compeau & Higgins, 1995; Venkatesh, Morris, Davis, & Davis, 2003). TRA addressed the ability to predict peoples' computer acceptance from a measure of their intentions, the ability to explain their intentions in terms of their attitudes, subjective norms, perceived usefulness, perceived ease of use and other variables. According to the TRA, a person's performance of a specified behavior is determined by his or her behavioral intention to perform the behavior (Davis, Bagozzi, & Warshaw, 1989b). Behavioral intention is determined by the person's attitude (an individual's positive or negative feelings about performing a behavior) and subjective norm (the person's perception that most people who are important to him or her think he should or should not perform a behavior) (Davis et al., 1989b).

Technology Acceptance Model (TAM)

TRA was originally developed to explain use behavior in general, not specifically for use of information systems (Davis et al., 1989b). TAM modified the TRA to predict use of information systems, specifically acceptance and use of information systems on the job (Venkatesh et al., 2003). Two constructs were initially developed in TAM: perceived usefulness, the degree to which a person believes using a particular system will enhance job performance; and perceived ease of use, the degree to which a person believes that using a system would be free of effort (Davis, 1989a). TAM 2, an extension of the original TAM, added subjective norm (see TRA for definition) to account for the effects of mandatory technology use (Venkatesh & Davis, 2000).

Motivational Model (MM)

Like TRA, motivation theory has been used to explain behavior in general (Venkatesh et al., 2003). Davis, Bagozzi, and Warshaw applied motivational theory to understand new technology adoption and use (Davis et al., 1992; Venkatesh et al., 2003). Two primary constructs from motivation theory have been used to predict information system use: extrinsic motivation and intrinsic motivation. Extrinsic motivation was the perception that users will want to perform an activity for valued benefits distinct from the activity (Davis et al., 1992). Intrinsic motivation was the perception that users want to perform an activity for the sake of performing the activity (Davis et al., 1992).

Theory of Planned Behavior (TPB)

TPB utilized the TRA constructs of attitude and subjective norm and added perceived behavioral control. Defined as "perceived ease or difficulty of performing a behavior" in traditional behavioral research (Ajzen, 1991), perceived behavioral control has been

defined in information systems research as "perceptions of internal and external constraints on behavior (Taylor & Todd, 1995).

Combined TAM and TPB (C-TAM-TPB)

The C-TAM-TPB combines TPB constructs with perceived usefulness from TAM (Venkatesh et al., 2003). Each C-TAM-TPB construct is discussed in previous sections.

Model of Personal Computer Utilization (MPCU)

MPCU, based on Triandis' (1980) theory of interpersonal behavior, provides a perspective different from TRA and TPB. This theory suggested that six constructs influence knowledge workers' use of personal computers. The first, social factors, was defined as "the individual's internalization of the reference groups' subjective culture, and specific interpersonal agreements that the individual has made with others in specific social situations" (Thompson, Higgins, & Howell, 1991:126). Affect was defined as "feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" (Thompson et al., 1991:127). Complexity was "the degree to which an innovation is perceived as relatively difficult to understand and use" (Thompson et al., 1991:128). Job-fit was "the extent to which an individual believes that using a PC can enhance the performance of his or her job" (Thompson et al., 1991:129). Long-term consequences of use were "outcomes that have a pay-off in the future" (Thompson et al., 1991:129). Finally, facilitating conditions were "objective factors 'out there' in the environment, that several judges or observers can agree make an act easy to do" (Thompson et al., 1991:129). Although developed to predict PC utilization, MPCU is well suited to predict use of information technologies other than PCs (Venkatesh et al., 2003).

Innovation Diffusion Theory (IDT)

Introduced by sociologists in the 1960's, IDT has been used to study acceptance and use of many different innovations in areas as diverse as acceptance of agriculture practices to organizational and management methods (Venkatesh et al., 2003). IDT has five primary constructs used to determine acceptance and use of technological innovations (Chiasson & Lovato, 2001):

1. Complexity - the degree to which an innovation is perceived as being difficult to understand and use
2. Relative advantage - the degree to which an innovation is perceived as being better than the idea it supersedes
3. Compatibility - the degree to which an innovation is perceived as being consistent with existing values, beliefs, experience and needs
4. Trialability - the degree to which an innovation may be experimented with on a limited basis
5. Observability - the degree to which the results of an innovation are visible

IDT's complexity and relative advantage constructs corresponded closely with TAM and TPB constructs of ease of use and perceived ease of use (Taylor & Todd, 1995).

Social Cognitive Theory (SCT)

SCT is considered by some to be one of the most powerful theories of human behavior (Venkatesh et al., 2003) and has been used to explain human behavior in numerous settings (Compeau & Higgins, 1995). Five SCT constructs were developed specifically to model use of information technology: one construct deals with computer self-efficacy, two deal with outcome expectations, another deals with affect, and the last with anxiety. Computer self-efficacy was "an individual's perceptions of his or her ability to use computers in the accomplishment of a task" (Compeau & Higgins, 1995:191). Outcome expectations were divided into two categories: performance and personal (Venkatesh et al., 2003). Performance outcome expectations was defined as "individuals [being] more

likely to engage in behavior they expect will be rewarded" (Compeau & Higgins, 1995) and dealt specifically with job-related outcomes (Venkatesh et al., 2003). Personal outcome expectations dealt with personal consequences of performing a behavior (Venkatesh et al., 2003). More specifically, personal outcome expectations involve the "satisfaction derived from the favorable consequences of the behavior itself, causing an increased affect for the behavior" (Compeau & Higgins, 1995:196). Affect was a person's liking for performing a particular behavior (Compeau & Higgins, 1995). Finally, anxiety was feelings of anxiety surrounding computers. Whereas the previous theories used behavioral intention to use an information system as the dependent variable, the five-construct SCT model used measures of information system usage as the dependent variable (Venkatesh et al., 2003).

Unified Theory of Acceptance and Use of Technology (UTAUT)

A comprehensive review of the theories of use presented thus far may reveal similarities in constructs. One recent theoretical model, UTAUT, tested the validity of the eight theories above and combined the constructs to create a toolbox from which researchers could explain use of information technology under a variety of conditions. The eight UTAUT constructs include:

1. Performance Expectancy
2. Effort Expectancy
3. Attitude Toward Using Technology
4. Social Influence
5. Facilitating Conditions
6. Self-efficacy
7. Anxiety
8. Behavioral Intention to Use the System

The previous eight models routinely explained 40-60% of the variance in individual information system acceptance or use (Venkatesh et al., 2003). By integrating existing constructs, UTAUT offered a model to account for as much as 70% of variance (Venkatesh et al., 2003).

A Cultural Theory of Knowledge Management Initiative Acceptance

The previous discussion of theories of technology acceptance and use illustrates the benefit of investigating individual perspectives. However, as introduced in chapter one, social considerations have gained increased focus in the design and implementation of technical systems (Emery & Trist, 1977; Pasmore & Sherwood, 1977; Trist, 1977). Socio-technical considerations may be more important when implementing KM initiatives because, as some KM culture researchers point out, "...any discussion of knowledge in organizational settings without explicit reference to its cultural context is likely to be misleading" (DeLong & Fahey, 2000:116).

One model posited the use of KM culture variables to predict acceptance of a KM initiative in organizations (Shaw & Tuggle, 2003). This theory attempted to answer the question, "To what degree are organizations ready to accept a KM effort?" This KM acceptance model was divided into two layers: individual acceptance and cultural acceptance.

Layer-one was based on three worker states: activities, interactions, and sentiments. Activities included daily routines workers accomplish. Workers must be capable of performing activities anywhere deemed appropriate (Shaw & Tuggle, 2003). Interactions dealt with how individuals relate with other people in accomplishing activities. These interactions might be to exchange task-related information, perform a task with other

people, or to socialize among coworkers. Interactions might take place in many different ways including: face-to-face, by telephone, via videoconferencing, or at an on-line community of practice (Shaw & Tuggle, 2003). Sentiments are the values people hold that influence every dimension of their lives (Shaw & Tuggle, 2003).

The three states are mutually supportive (Shaw & Tuggle, 2003). A person's sentiments must place a value on the activities and interactions in which they engage in order for these activities and interactions to continue; likewise, activities and interactions must align (Shaw & Tuggle, 2003). Creation of a new, mandatory-use community of practice might best illustrate how layer-one operates. A mandatory-use community of practice will change a person's activity (a person must use the community of practice); it requires people to form new interactions (a person must first train and then interact with new people or interact in new ways). Sentiments will be influenced by the use of a community of practice (they will form opinions about the value of the community of practice) (Shaw & Tuggle, 2003). Without an understanding of how activity, interaction, and sentiment influence each other before implementing a KMS like the community of practice, no guarantee can be made that users will accept this KM initiative (Shaw & Tuggle, 2003).

Layer-two deals specifically "with the effects of the organization's culture upon the way in which the individual's behavior is altered" (Shaw & Tuggle, 2003:76). As worker activities, interactions, and sentiments balance, "the worker's daily behavior falls into a set of [routine activities], patterns of interaction, and attitude clusters about activities and interaction patterns" (Shaw & Tuggle, 2003:76). This balance might then comprise an individual's basic assumptions and, when the same basic assumptions are held by a

critical mass of individuals, the culture of a group (Schein, 1992). Figure 2 illustrates Shaw and Tuggle's (2003) concept of the two-layer KM culture model.

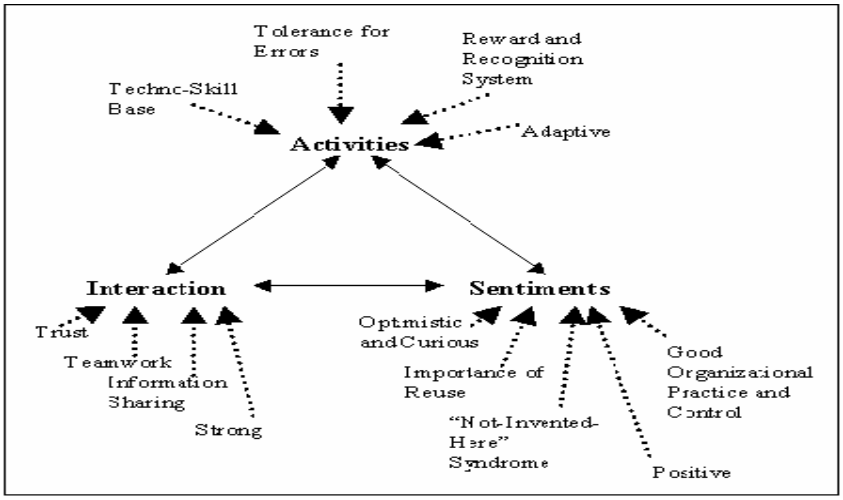

Figure 2. Two-layer model for KM acceptance (Shaw & Tuggle, 2003)

The Research Model

The research model for the current study (see Figure 3, below) does not attempt to associate KM culture variables with specific activities, interactions, or sentiments as outlined by Shaw and Tuggle. Instead, it attempted to find whether 12 KM cultural factors introduced by Shaw and Tuggle (2003) were related to use of one type of KM initiative: the community of practice. Each of the 12 variables are discussed below and a corresponding hypothesis presented. It is important to note that the notion of each KM culture variable originated with the Shaw and Tuggle model. However, because Shaw and Tuggle suggest rather than define variables that may influence acceptance of a KM initiative, the conceptualization of KM culture variables found below originate with this study's author.

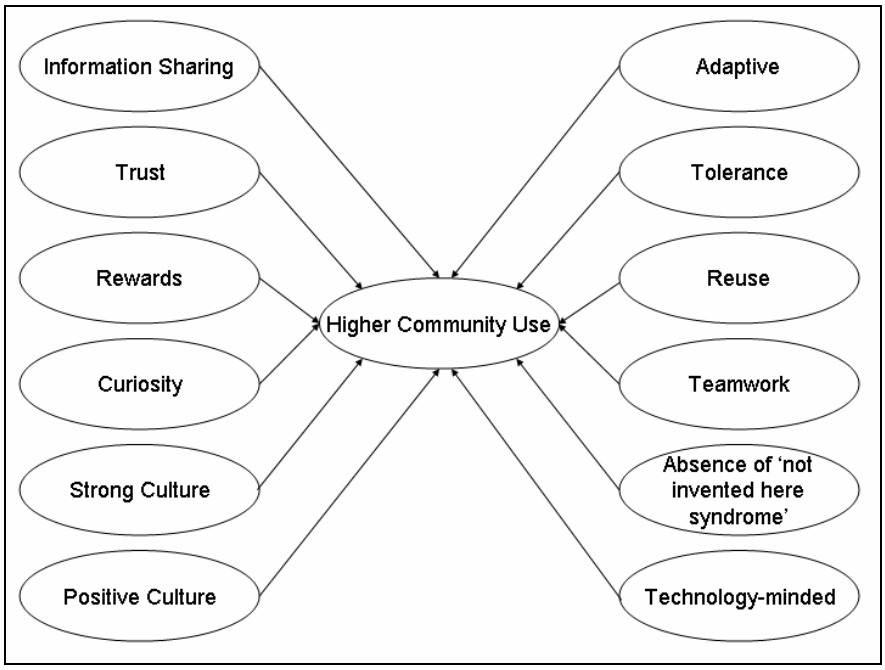

Figure 3. Research Model

Information Sharing

Sharing information, whether via exchange of facts, expertise, or points of view, is critical to decision-making and learning in organizations (Huber, 1984). A community of practice might surface and thrive for many reasons, one of which is to exchange information (Wenger et al., 2002). For the purpose of this study, information sharing was the degree to which people believe information was shared among members of their community. If members of a community of practice perceived that information was shared in their community, they may be more inclined to use their community. Thus, the following hypothesis is presented:

> H1a: *information sharing will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Trust

Trust has been defined as "a state of perceived vulnerability or risk that is derived from [an] individuals' uncertainty regarding the motives, intentions, and prospective

actions of others on whom they depend" (Kramer, 1999:571). In a community of practice, trust was the degree to which people feel they can trust fellow community members.

> H2a: *trust will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Rewards

Meeting employee needs has been argued to improve performance and satisfaction on the job (Herzberg, 1967). Extrinsic rewards (pay, benefits, working conditions) and intrinsic rewards (responsibility, autonomy, feelings of accomplishment), in this view, were deciding factors in job performance (Kanungo & Mendonca, 1988). In most communities of practice, extrinsic rewards may not be a primary factor; intrinsic rewards, however, might. Rewards were the degree to which people feel their community rewarded or recognized members for contribution.

> H3a: *rewards will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Curiosity

Curiosity has been associated with the concept of cognitive absorption. Cognitive absorption was believed to be a closely related predeterminate of two important beliefs about technology use: perceived usefulness and perceived ease of use (Agarwal & Karahanna, 2000). Curiosity, in the context of this study, was the degree to which people feel members of their community seek opportunities to learn new things.

> H4a: *curiosity will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Strong and Positive Culture

Shaw and Tuggle's (2003) strong culture and positive culture variables could not be readily conceptualized. However, after interviewing a co- author of the two-layer model (Tuggle), the definitions emerged. Strong culture was the degree to which people feel members of their community agree on major issues. Strong culture dealt primarily with group cohesion or the ability of a group to reach consensus. Positive culture was defined as the degree to which people feel members of their community work to accomplish worthwhile or valued goals. These variables appear to be similar; however, there is a conceptual difference. Strong culture dealt with unity while positive culture dealt more with direction. It was possible for a community culture to be strong but focused in the wrong direction (total agreement to achieve the wrong objective) or not strong but positive (disagreement on how to achieve a common, valued outcome).

> H5a: *strong culture will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*
>
> H6a: *positive culture will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Adaptive

Argument has been made that efforts to create a learning organization is actually an effort to build adaptive capabilities into organizations (Jankowicz, 2000). Adaptation has been defined by some as "behavior directed towards success and survival" (Jankowicz, 2000). Adaptation may include the need to change in order survive or, in a community of practice, to maximize value by incorporating new community tools and techniques. Adaptive was the degree to which people feel members of their community try new tools or suggestions.

H7a: *adaptive will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Tolerance

Tolerance for error might best be conceptualized by examining a construct developed from national culture research: uncertainty avoidance. One study suggested uncertainty avoidance can affect implementation of technology acceptance models and that people with high uncertainty avoidance tend to require greater structure and are less tolerant of mistakes (Veiga, Floyd, & Dechant, 2001). Tolerance in the context of communities of practice was the degree to which people feel community members are patient with people who make honest mistakes.

H8a: *tolerance will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Reuse

Efforts to codify knowledge in a useful and easy to find form in order to enable reuse often fall short (Markus, 2001). Reuse, as examined in this study, might best be understood in terms of the practices and procedures used to facilitate the transfer of knowledge from those who know to those who do not know. Reuse, then, was the degree to which a community encourages the use of existing information.

H9a: *reuse will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Teamwork

Implementation of teaming concepts has been shown to positively influence job satisfaction, general well-being, motivation, and effectiveness (Gard, Lindstrom, & Dallner, 2002). In one study of organizational politics, respondents who perceived

teamwork as unimportant had lower reported job satisfaction than those who perceived teamwork as being important (Valle & Witt, 2001). This study defined teamwork as the degree to which people feel teamwork is valued in their community.

> H10a: *teamwork will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Absence of 'Not Invented Here' Syndrome

It often happens that an innovation of potential value is misused, abused, or worse, ignored (Weinstein, 1996). In some instances, a community's practices may be protected to the exclusion of outside ideas and tools; when this happens communities may degenerate and eventually dissolve. Absence of 'not invented here' syndrome was the degree to which people feel their community encourages or allows its members to use or post materials originating outside the community of practice.

> H11a: a*bsence of 'not invented here' syndrome will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.*

Technology-minded

Research has shown definite patterns between group, organizational, and national cultures and information technology use (Kambayashi and Scarbrough, 2001). Knowledge Now communities of practice are hosted in an on-line, computer-based environment that requires a level of technical ability to participate. Technology-minded was the degree to which people feel community members are technically competent enough to use the community of practice.

> H12a: *technology-minded will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree.* .

The next chapter explains how each variable was measured and hypotheses tested.

III. Methodology

This chapter explains how the research question and hypotheses were answered. First, the research design is addressed. Next, the variables used for the study are discussed. The population, sample selection, pilot survey, and survey administration are then explained. Finally, a method for data analysis is proposed.

Research Design

The research design for this study was a web-based survey. A survey using Shaw and Tuggle's (2003) KM cultural factors was developed and administered to members of select communities of practice. This measurement instrument was thought to be better able to reach a large number of community members in the time permitted for the study.

Dependent Variables

The dependent variables for this study were introduced at the end of chapter two. In order to measure the dependent variables, questions were developed based on Shaw and Tuggle's (2003) initial concept of KM culture variables and a review of relevant literature.

Independent Variable

The independent measure of interest for this study was community of practice use. Knowledge Now uses three primary methods to track community of practice use.

1. Cookies – Knowledge Now counts the number of cookies they place on users' systems. Counting cookies is an unreliable method for calculating usage since users can easily delete cookies. Additionally, logging onto Knowledge Now from different systems generates new cookies on each new system a member uses.

2. Number of sessions – Knowledge Now creates a unique session identification number each time someone visits a community. When users access a

community's main page, a new session is created. Browsing a main page is not necessarily indicative of use.

3. Number of web pages accessed – Knowledge Now tracks the number of pages visited in each community of practice.

Interviews with Knowledge Now administrators indicated the average number of web pages accessed to be the most reliable method for determining actual member usage in each community of practice (Wypiszynski, 2003). Therefore, for the purpose of this study, the average number of web pages accessed over a three-month period beginning September 2003 was used to operationalize the independent variable.

Population

The unit of analysis for this study was individual community of practice members. Individual responses were solicited from a population of Knowledge Now communities of practice with 20 or more members. As of November 6, 2003, there were 120 communities of practice with 20 or more members. A best estimate of the number of Knowledge Now community of practice members was 6,165, based on a count of unique account e-mail addresses. However, since accounts were not strictly monitored, it was possible for the same respondents to create more than one unique Knowledge Now account. Additionally, Knowledge Now had no method to determine whether accounts were inactive or no longer contained a valid e-mail address.

Knowledge Now communities consisted of DoD military and civilian personnel of multiple backgrounds and ranks. Although personnel from other governmental departments and military services held Knowledge Now memberships, most Knowledge Now members were affiliated with the Air Force. Appendix A lists all communities selected to participate in the study with key demographics (name of community, number

of members registered to each community, and average pages visited per member per month).

Sample Selection

A convenience sample of the population was taken. The survey was sent to all accounts for the 120 communities of practice selected to participate in the study.

Pilot Survey

A pilot test of the survey was conducted using a group of AFIT/GIR faculty and graduate students (approximately 50 people) two weeks prior to fielding the survey in the population. This group was qualified to pilot the survey because of their familiarity with communities of practice. The purpose of the pilot test was to identify and eliminate leading questions and to refine content, wording, and question sequence. Technical issues inherent to web-based surveys were also identified and resolved with AFIT/SC web-survey developers.

Survey Administration

Since all respondents were members of on-line communities of practice requiring Internet access and an e-mail address to register, the survey was administered electronically using e-mail and a web-based survey. There were two contacts with the population: the first contact provided community members a link to the survey and briefly explained the purpose of the survey, why it was important, and how a respondent's community might benefit by their participation. The next contact also contained a link to the survey instrument and reminded potential respondents of the deadline for survey participation.

Each survey question was based on a separate cultural factor introduced in the research model. Respondents were asked to rate their perception of the current state of each KM culture variable in their community of practice. All rated responses were solicited using a 7-point Likert scale from "strongly disagree" to "strongly agree." The Likert scale included a non-weighted response option for community members who could not answer a question. Space was provided at the end of the survey for respondents to provide comments and personal observations regarding factors that might influence use of their community.

The complete survey, available in Appendix B, was co-developed with another researcher. Even numbered questions between two and 24 (also indicated by an asterisk) were used to collect data for this study.

Data Analysis

First, a descriptive analysis was performed to discover an overall response rate for the survey. Next, "don't know" responses were removed to create a continuous scale. Using the continuous scale, averages for each KM variable were calculated to find how the questions ranked for the entire survey sample. Next, respondent ratings for each variable were rank ordered by average community use and the top and bottom quartiles were used to conduct a mean comparison analysis. Student's paired t tests at an alpha level of .05 were used to test each hypothesis. Detailed results and data analysis are addressed in chapter four.

Summary

Research has suggested that culture is an important consideration when designing technical systems. This study used a web-based survey to ask people their perceptions of KM culture variables present in their communities of practice. An examination of 12 variables was conducted to determine whether KM culture factors were related to use of communities of practice. Mean comparison analysis was used to determine whether high ratings on KM culture variables corresponded to higher measures of community of practice use. The next chapter presents the results of the survey and data analysis for each hypothesis.

IV. Results and Analysis

This chapter addresses the data analysis. First, survey results and an overall response rate are reported. The survey results section also includes a list of survey questions rank ordered by mean responses to give a snapshot of overall Knowledge Now responses. It was hypothesized that mean KM culture ratings would be higher among communities with high average monthly use per member than those with low average monthly use per member. The last section of this chapter details each hypothesis test.

Results

The survey solicitation and instrument link were sent to 6,165 unique e-mail addresses. One thousand, twenty-six surveys were completed and returned for an overall response rate of 16.64%. Three hundred seventy-seven survey solicitations were rejected for various reasons including: invalid e-mail addresses, security settings, and mailboxes over size limits.

Respondents were asked to rate each question on a 7-point Likert scale. Scores for each answer were based on the following scale:

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Point four of the 7-point scale was a non-weighted point included for individuals who could not answer a particular question. All "don't know" responses were included for the overall response rate calculation. However, since a response of "don't know" carried no weight and could not be used to calculate an overall question rank, "don't know" responses were removed and responses 5-7 re-coded to 4-6 in order to create a continuous

scale from 1-6. The 1-6 ranks were used to calculate the question ranks shown in Table 1 and for the individual variable analyses.

Table 1. Survey Questions Ranked by Mean Score

Question:	KM Culture Variable:	Mean Score:
Information is shared in my CoP.	Information sharing	4.845
Members of my CoP are technically competent enough to use our CoP.	Technically minded	4.674
Members of my CoP work to accomplish common goals.	Positive culture	4.665
I trust my fellow CoP members.	Trust	4.644
Teamwork is valued in my CoP.	Teamwork	4.579
In order for a CoP to thrive, members must understand that it is okay to make mistakes: my fellow CoP members are patient with people who make honest mistakes.	Tolerance	4.545
My CoP encourages its members to use materials originating outside our CoP.	Absence of "not invented here" syndrome	4.360
Most members of my CoP agree on major issues discussed in our community.	Strong culture	4.312
My fellow CoP members try new tools or suggestions.	Adaptive	4.283
My CoP ensures members know where to find resources.	Reuse	4.238
My CoP recognizes or rewards its members for making contributions.	Rewards	3.271
Members of my CoP are eager to learn new things.	Curious	2.587

A mean question score above 3.5 indicates the current state of the KM culture variable was high among all respondents. Based on the question means, overall survey respondents for the entire sample rated 10 of 12 KM culture variables high. This finding may be an initial indication that Shaw and Tuggle's KM culture variables may be an

important factor in determining an organization's readiness to accept a KM initiative such as the community of practice.

Analysis

Survey responses were divided by variable, any blank responses removed, and response rates for each question calculated. After the percentage of "don't know" responses was tabulated, they were excluded from further analysis. The primary analysis was a mean comparison of individual KM culture variable ratings between different groups based on average community of practice use. The top and bottom quartiles with some additional responses (responses with usage equal to the quartile cutoff) were compared using an each pair student's t test of the means at an alpha level of .05. Based on the analysis of low and high use groups, statistically significant differences were discovered for two of the 12 KM culture variables investigated in this study. The next pages address KM variable analysis issues with a graphical representation for each hypothesis test.

Information Sharing

H1a was: *information sharing will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate for the information sharing question was 13.45%. Of those who answered this question, 18.26% selected "don't know." Initial arithmetic analysis showed that information sharing ratings were higher for respondents with high average community of practice use (4.8469) than respondents with low average community of practice use (4.5348). Based on the statistical analysis in Figure 4 (below), H1a was supported ($p = .0021$).

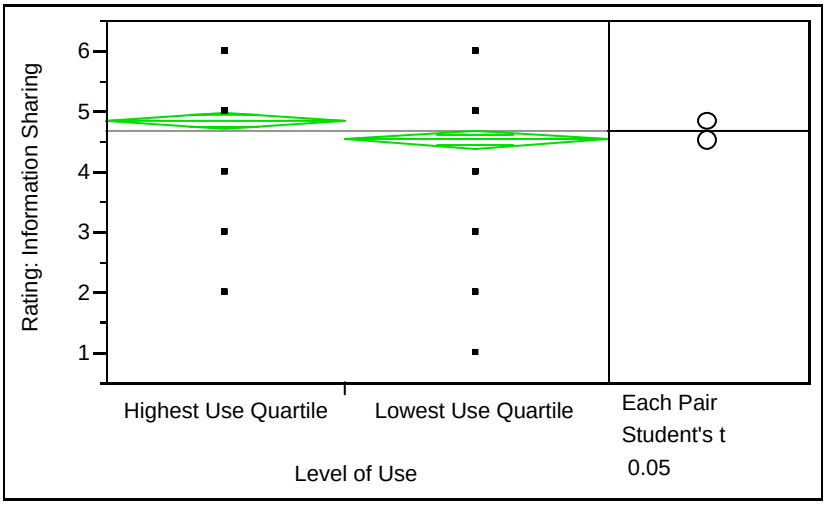

Figure 4. Mean Comparison of Information Sharing Ratings

Trust

H2a was: *trust will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate for trust was 13.34%. Of those who answered this question, 24.41% selected "don't know." The arithmetic analysis showed that trust ratings were lower for respondents with high average community of practice use (4.9026) than respondents with low average community of practice use (4.8413). Based on the statistical analysis in Figure 5 (below), H2a was not supported (p = .4451).

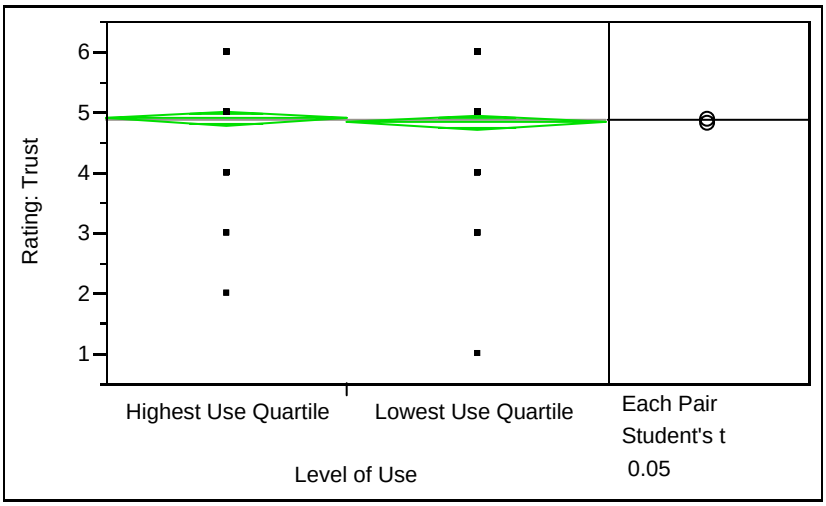

Figure 5. Mean Comparison of Trust Ratings

Rewards

H3a was: *rewards will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the rewards question was 13.33%. Of those who answered this question, 58.33% selected "don't know." The arithmetic analysis showed that rewards ratings were higher for respondents with high average community of practice use (3.3458) than respondents with low average community of practice use (3.1682). Based on the statistical analysis in Figure 6 (below), H3a was not supported (p = .3866).

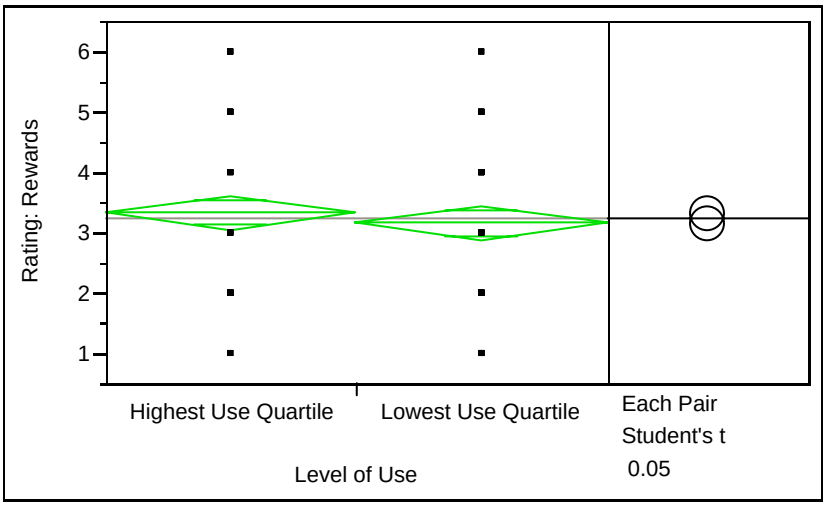

Figure 6. Mean Comparison of Rewards Ratings

Curiosity

H4a was: *curiosity will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate for curiosity was 12.67%. "Don't know" was selected 43.21% of the time. The arithmetic analysis showed that curiosity ratings were higher for respondents with high average community of practice use (4.6619) than respondents with low average community of practice use (4.5556). Based on the statistical analysis in Figure 7 (below), H4a was not supported ($p = .3377$).

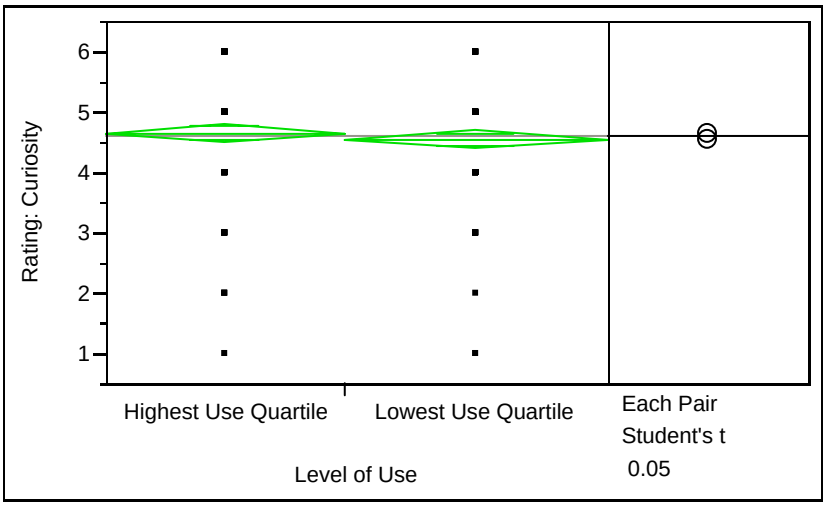

Figure 7. Mean Comparison of Curiosity Ratings

Strong Culture

H5a was: *strong culture will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate for strong culture was 12.63%. Of those who answered this question, 45.74% selected "don't know." The arithmetic analysis showed that strong culture ratings were higher for respondents with high average community of practice use (4.4580) than respondents with low average community of practice use (4.2803). Based on the statistical analysis in Figure 8 (below), H5a was not supported (p = .1446).

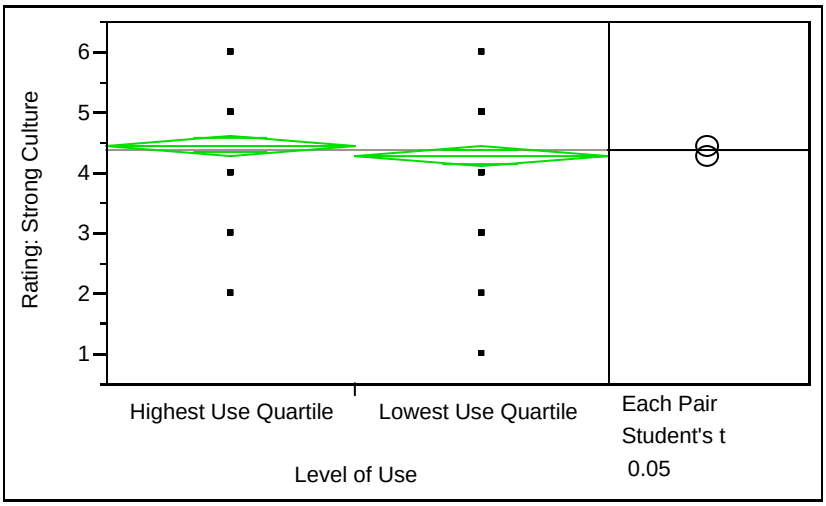

Figure 8. Mean Comparison of Strong Culture Ratings

Positive Culture

H6a was: *positive culture will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the positive culture question was 12.58%. Of those who answered this question, 28.60% selected "don't know." The arithmetic analysis showed that positive culture ratings were higher for respondents with high average community of practice use (4.8613) than respondents with low average community of practice use (4.5784). Based on the statistical analysis in Figure 9 (below), H6a was supported ($p = .0037$).

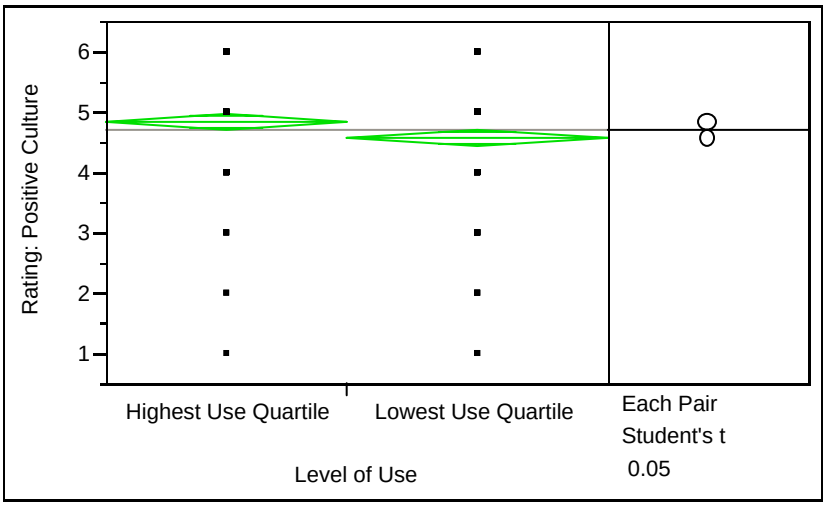

Figure 9. Mean Comparison of Positive Culture Ratings

Adaptive

H7a was: *adaptive will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the adaptive question was 12.10%. Of those who answered this question, 46.36% selected "don't know." The arithmetic analysis showed that adaptive ratings were higher for respondents with high average community of practice use (4.2615) than respondents with low average community of practice use (4.2441). Based on the statistical analysis in Figure 10 (below), H7a was not supported (p = .8905).

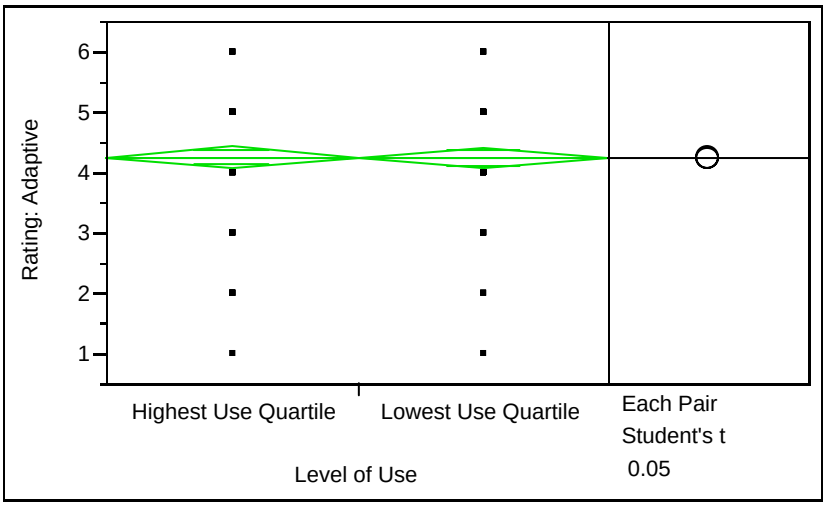

Figure 10. Mean Comparison of Adaptive Ratings

Tolerance

H8a was: *tolerance will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the tolerance question was 11.98%. Of those who answered this question, 47.92% selected "don't know." The arithmetic analysis showed that tolerance ratings were higher for respondents with high average community of practice use (4.6050) than respondents with low average community of practice use (4.5126). Based on the statistical analysis in Figure 11 (below), H8a was not supported (p = .5010).

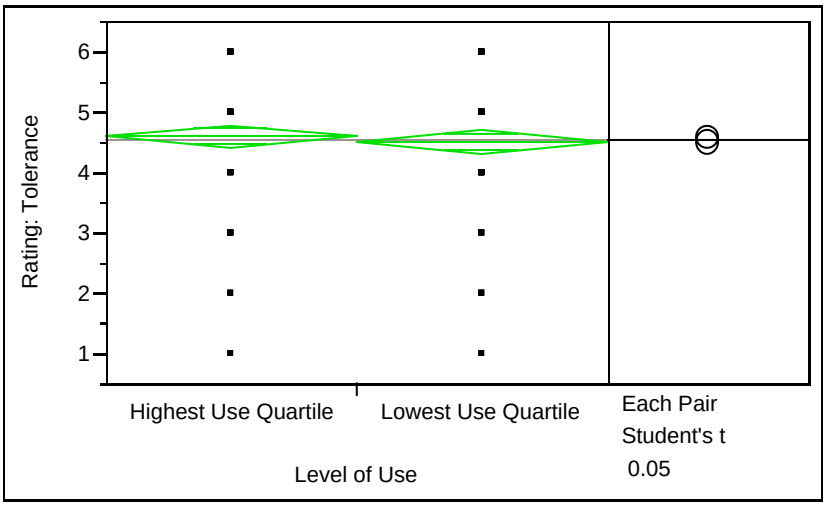

Figure 11. Mean Comparison of Tolerance Ratings

Reuse

H9a was: *reuse will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the reuse question was 12.02%. Of those who answered this question, 27.10% selected "don't know." The arithmetic analysis showed that reuse ratings were higher for respondents with high average community of practice use (4.3214) than respondents with low average community of practice use (4.1667). Based on the statistical analysis in Figure 12 (below), H9a was not supported (p = .2087).

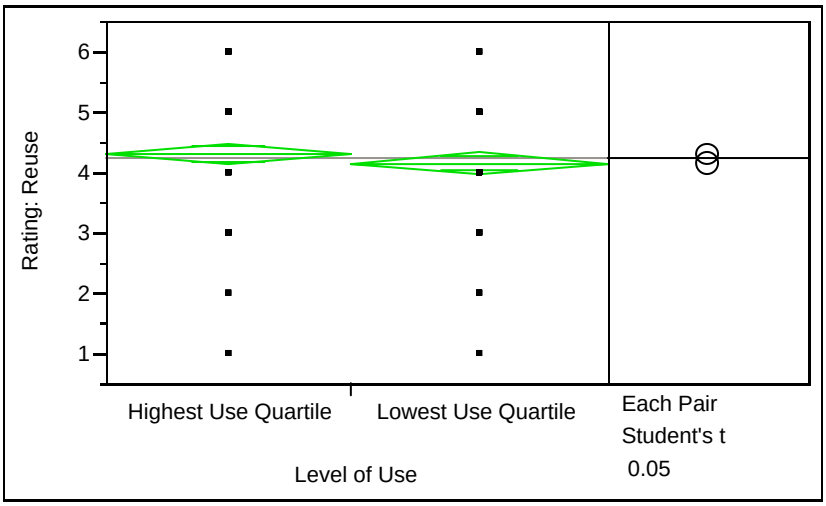

Figure 12. Mean Comparison of Reuse Ratings

Teamwork

H10a was: *teamwork will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the teamwork question was 11.79%. Of those who answered this question, 39.20% selected "don't know." The arithmetic analysis showed that teamwork ratings were higher for respondents with high average community of practice use (4.6691) than respondents with low average community of practice use (4.5473). Based on the statistical analysis in Figure 13 (below), H10a was not supported (p = .2771).

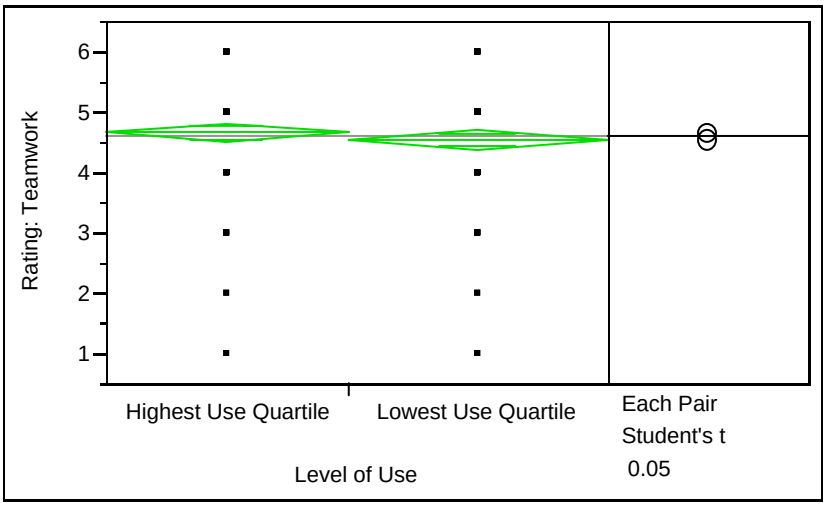

Figure 13. Mean Comparison of Teamwork Ratings

Absence of "Not Invented Here" Syndrome

H11a was: a*bsence of 'not invented here' syndrome will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the absence of 'not invented here' syndrome question was 11.81%. Of those who answered this question, 54.62% selected "don't know." The arithmetic analysis showed that absence of "not invented here" syndrome ratings were higher for respondents with high average community of practice use (4.5534) than respondents with low average community of practice use (4.2736). Based on the statistical analysis in Figure 14 (below), H11a was not supported (p = .0610).

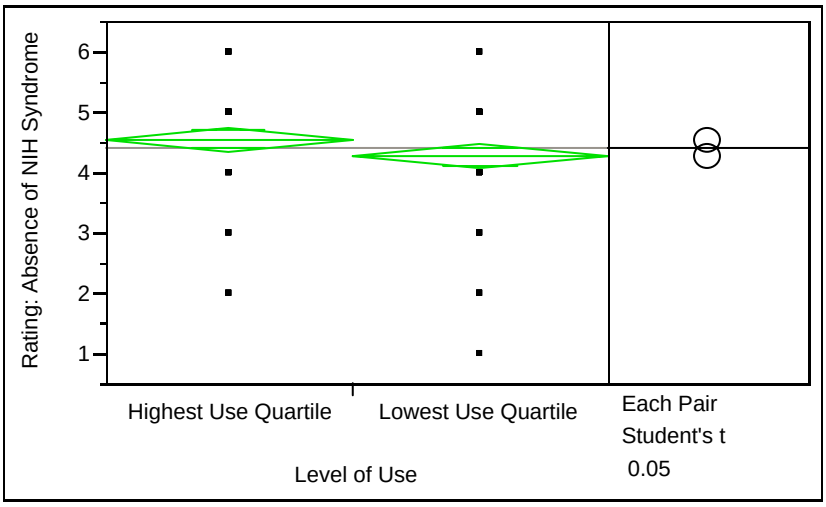

Figure 14. Mean Comparison of Absence of 'Not Invented Here' Syndrome Ratings

Technology-minded

H12a was: *technology-minded will be more prevalent in communities of practice that are used to a higher degree than communities used to a lower degree*. The response rate on the technology-minded question was 11.83%. Of those who answered this question, 26.19% selected "don't know." The arithmetic analysis showed that technology-minded ratings were higher for respondents with high average community of practice use (4.7283) than respondents with low average community of practice use (4.6512). Based on the statistical analysis in Figure 15 (below), H12a was not supported (.3993).

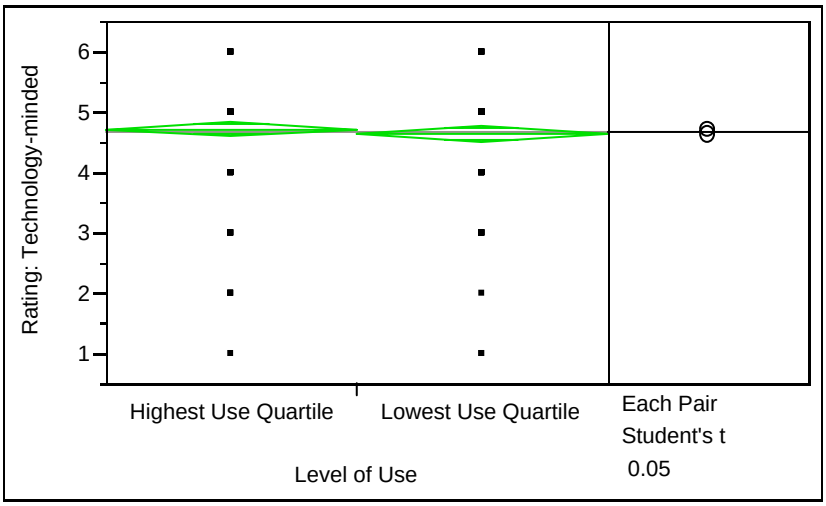

Figure 15. Mean Comparison of Technology-minded Ratings

Table 2 (below) provides a summary of data analysis findings.

Table 2. Summary Data Analysis Findings

Hypothesis	Variable	High Quartile Mean	Low Quartile Mean	P-Value (α= .05)	Hypothesis Supported? (y/n)
H1a	Info Sharing	4.8469	4.5348	0.0021	**Y**
H2a	Trust	4.9026	4.8413	0.4451	n
H3a	Rewards	3.3458	3.1682	0.3866	n
H4a	Curiosity	4.6619	4.5556	0.3377	n
H5a	Strong culture	4.4580	4.2803	0.1446	n
H6a	Positive culture	4.8613	4.5784	0.0037	**Y**
H7a	Adaptive	4.2615	4.2441	0.8905	n
H8a	Tolerance	4.6050	4.5126	0.5010	n
H9a	Reuse	4.3214	4.1670	0.2087	n
H10a	Teamwork	4.6691	4.5473	0.2771	n
H11a	Absence of NIH	4.5534	4.2736	0.0610	n
H12a	Technology-minded	4.7283	4.6512	0.3993	n

Summary

Survey respondents rated the perceived state of each KM cultural variable under study. Mean response rates for each question were presented for all survey respondents. Next, mean comparisons were conducted to test each hypothesis. Although mean KM culture ratings were higher for all groups with higher community of practice use, only two, information sharing and positive culture, were statistically significant. Based on the data analysis, hypotheses H1a and H6a were supported. Chapter five discusses some of the implications of the data analysis.

V. Discussion, Limitations and Recommendations

The purpose of this study was to answer the question, "Does culture internal to communities of practice influence use of communities of practice?" To answer this question, an investigation of Shaw and Tuggle's (2003) KM cultural acceptance model as it related to use of Air Force communities of practice was conducted. Although mean ratings for all KM culture variables were higher among higher use communities of practice, the findings of this study only revealed significant differences in mean ratings for two of the 12 KM culture factors investigated: information sharing and positive culture. This chapter addresses these relevant KM culture factors and implications of findings, details limitations of the study, and offers suggestions for future research.

Discussion

The discussion of research findings that follows is addressed in two ways: first, observations pertaining to the usefulness of Shaw and Tuggle's model in general are presented. Next, implications of study findings in terms of practical use are outlined.

Definitive support for the predictive value of Shaw and Tuggle's KM culture variables in communities of practice was not discovered. This finding may indicate that culture internal to a community of practice is not significantly related to use of a community of practice. Another possible and perhaps more likely explanation for this finding is that no attempt was made to distinguish between different types of communities or their stages of development; additional research that accounts for these confounds may be able to show a stronger relationship between Shaw and Tuggle's KM culture factors and community of

practice use. The remaining discussion addresses significant individual research findings that may have implications for practitioners.

Ratings on information sharing were significantly different between high and low use groups. This may suggest that community of practice administrators attempting to create new communities or improve participation and use in existing communities may find it beneficial to concentrate efforts on developing strategies to encourage and enable information sharing. While Knowledge Now provides many of the tools to facilitate on-line information sharing, development of procedures unique to the needs of individual communities may improve use. A greater understanding of what motivates community members to share information may also provide insight valuable in improving use of communities of practice.

Positive culture was also discovered to be rated significantly different between high and low use groups. Based on the positive culture finding, the direction a community of practice takes may be related to use. If people believe their community addresses important issues, they may be more likely to use their community of practice. In creating and addressing domain issues, community leaders may find community participation improves as they devote more time to carefully considering and developing the community domain; in doing so, clear and actionable community directions may emerge which general community of practice membership find more in line with their individual needs. The positive culture finding may also suggest that Knowledge Now administrators or community leaders will benefit from development of community implementation strategies that refocus a community on a common, valued domain. This process may include direct and indirect solicitation for community member participation

in domain development. In a well-developed community, this process of domain development may seem to happen automatically. New or weaker communities may require more direct intervention; this might include conducting periodic polls in order to help nurture a positive community culture.

Overall question scores may provide qualitative support that Shaw and Tuggle's KM cultural acceptance factors will be an important organizational consideration prior to implementing a community of practice. Since signing up for and participating in a community of practice constitutes acceptance and use of one type of KM initiative by organizational members, ratings of KM cultural variables would be expected to be higher among community members. KM culture rankings were in the high range for 10 of the 12 factors studied; only rewards and curiosity were rated low. This overall finding suggests that members of a community of practice may consider 10 of the 12 KM culture factors important to their participation in a community of practice.

The high number of people who selected "don't know" for each survey question was unexpected. The number of individuals selecting "don't know" ranged from 18.26 to 58.33% of total survey responses. This finding perhaps quantitatively confirms what Knowledge Now administrators have reported anecdotally: people understand the potential value of communities of practice but do not use them. Further explanation of this finding is addressed in the limitations section.

Limitations

Self-reports of the current state of KM cultural variables in a community of practice were used for this study. Respondent knowledge of and willingness to disclose their perceived current state of KM cultural variables in a community or practice may be a

research limitation. Given the number of "don't know" responses (from 18.26 to 58.33%), unknowledgeable respondents were a likely limitation. This limitation may have been caused, in part, by a failure to account for different types of communities or the degree of social integration among members of different on-line communities of practice.

Though based on concepts introduced in previous research, the survey instrument administered in this study was not a validated instrument. The potential exists that survey questions asked do not measure what was intended. Research using well-defined and understood constructs may yield a greater understanding of culture's influence on use of communities of practice. Additionally, in the interest of achieving higher response rates, multiple questions to test internal instrument reliability were not used.

This study may not be generalizable. The communities of practice surveyed were limited primarily to Air Force communities of practice. No support was found to indicate how Air Force communities of practice would rate KM cultural variables with respect to communities of practice initiated and maintained in other government agencies or in the private sector. Finally, a snapshot of current KM culture conditions in a community of practice is limited in its ability to tell a story; the present study is applicable to Air Force communities of practice hosted at Knowledge Now during a specific time.

Recommendations for Future Study

Based on the findings of this study, future research using Shaw and Tuggle's KM cultural acceptance model appears to be appropriate. Individuals may use different types of communities for different reasons and different types of communities likely fulfill diverse membership needs. These two factors for community creation and use were

outside the scope of the current research effort but represent perhaps the most significant limitations of this study. Any future effort using Shaw and Tuggle's model may yield improved results by accounting for these differences.

This research used one cultural model for KM acceptance. Other cultural models may provide better predictors for use of communities of practice. Future studies of community of practice use might focus on any one of the nine theoretical models of use identified in chapter two. Additionally, other non-cultural factors relating to technological implementation or content management issues might be investigated to determine their effects on community of practice use.

Conclusions

This study showed that of the KM cultural factors explored, information sharing and positive culture were significantly related to use of communities of practice. Results also showed that 10 of 12 KM cultural factors were rated high overall among survey respondents providing qualitative support for Shaw and Tuggle's KM cultural acceptance model. Although no definitive evidence was found to show that culture influences use of communities of practice, these research findings may justify further investigation of the effects of community of practice culture on use.

Appendix A - List of Communities of Practice Surveyed

Community Name	Member Count	Average Pages Per Member
Air Armament Academy Registration	23	2760
KN Team	26	1514
Discovery Map Training	42	975
Financial Management USAFE	30	409
IT Transformation for AFMC	30	324
AF Recruiting Service Financial Management	43	285
My Learning	37	273
Transformation	26	266
WPAFB ACSC Seminar 4543304A	28	263
ESA Central	22	232
FM Cost Estimates	58	230
Financial Management	182	217
AFMC IG	40	203
Financial Management Policy	30	189
AFMC FM Palace Acquires	32	187
AFMC Portal Team	36	174
OO-ALC/LGK	38	168
Financial Management AFRC	64	160
Automatic Identification Technology Technical Working Group	87	142
Transportation	27	137
NonNuclear Munitions Standard Volume Technical Orders	51	125
CDO CONOPs Team	29	125
Palace Acquire Program (PAQ) Community of Practice	76	124
Communication Electronics Scheduled Review (CESR)	21	122
E-Learning/Knowledge Management	23	120
Financial Management Financial Services	53	120
Accounting Liaison Office	25	118
ASC/RAJ Sensors	44	113
- 33S Utilization and Training -	34	104
Operations & Maintenance	32	101
AF Video Teleconferencing	26	98
FM Customer Support	25	97
Financial Management Budget	104	96
ASMC Aviation Chapter (Executive Board)	34	92
AFMC T&E Transformation Team	29	91
Test Investment Planning and Programming	39	89
AF Shelters / Radomes / Towers Program Office	39	87
Capital Purchase Program (CPP)	39	85
Product Support Resources	47	84
POM – All MAJCOM/XPs CoP	60	80
Policy Integration (AFMC) CoP	63	78
Packaging	89	76
Hypersonics Study	25	72
Policy Integration Team CoP	42	72
Program Management Support Environment (PMSE) IPT	32	70

Community Name	Member Count	Average Pages Per Member
Product Support Management Plan	24	68
POM - AFMC Internal	106	66
Comprehensive AF Technical Order Plan (CAFTOP) WG	247	66
HSI Human Factors Engineering	22	65
Financial Management ANG	253	64
USG F-15K	25	61
HSI Manpower	20	55
AFMC/DR Information and Training	125	55
Operationally Responsive Spacelift (ORS)	44	54
DODAACs	21	53
AFSPC Science & Technology	125	50
FM Customer Service	46	50
AFSAC International Programs	32	45
Systems Engineering	31	44
Tobyhanna Comm-Elect Workload Info System	43	43
ATCALS	59	42
Procurement	20	40
AF Tech Data Programs	105	39
Air Force Analysts Community	146	39
METNAV	36	39
CE Operations Support	21	38
Maintenance Management Analysis	164	38
Air Force Intelligence in Force Modernization	247	37
FM Automated Tools Forum	679	37
Joint Human Systems Integration	57	36
HSI Occupational Health	21	35
HSI Personnel Survivability	21	35
Serial Number Tracking	164	33
Discovery Map Training (HQ AFMC)	46	31
ANG Weapons	103	31
Aircraft Maintenance Info System Requirements	32	28
Air Force Postal Operations & Policy	53	25
Program Management Directives	155	24
Mentoring	186	24
CP Process Re-engineering	110	22
ACE Community of Practice	119	21
C3I Supply Chain Management	21	21
Software Management CoP	48	20
Capabilities Based Manpower Determinants	38	20
AFMC Experts/POCs	88	19
Enterprise Data Requirements Working Group	20	18
607th Weather Squadron	89	17
Enterprise Leadership	365	17
ETS F-16 Avionics	20	17
Joint Reserve Intelligence Center	95	15

Community Name	Member Count	Average Pages Per Member
Army e-learning	28	13
Air Force Chief Information Officers	46	12
Ramstein Web Based Process & Application Development Group	21	12
ACC Conventional Munitions	26	12
WPAFB Super Saturday 2003	25	11
F-15 System Program Office	33	9
Enterprise Integration Council	49	9
Anti-Tamper (AT) Management	21	9
Air Force Acquisition Center of Excellence	21	9
Acquisition Commanders IOIs	21	9
Weapon System Management Support (WSMS)	416	9
Ramstein AB Knowledge Management	55	8
86 Communications Group	26	8
AF Knowledge Management	92	7
AFIT Information Resource Management Graduates	29	7
C-20 CLS	23	7
Program Management Issues	39	7
Command Structure CoP	30	6
Ogden Space and C3I TO Information and Requirements	21	6
F-15 Armament Tester Tech Data	21	6
ASC Aeronautical Enterprise	50	5
Air Force Spacecraft Control Network	39	5
CoP Training	80	4
Sandia National Labs CoP	47	3
Software Modification Management	31	3
Product Support Policy	46	3
Capabilities Planning	120	2
AFMC/DR Commanders Conference	27	1
Airborne Laser	120	0.3
Acquisition Logistics Excellence Week 2002	27	0.1

Appendix B: Community of Practice Survey

Survey Control Number: USAF SCN 03-112

PURPOSE:
Our research team is investigating the effects of various factors of use in communities of practice (CoPs) hosted at Air Force Knowledge Now. Our goal is to more fully understand factors that promote and discourage CoP usage. Results may be beneficial in the future development and management of CoPs.

PARTICIPATION:
Your participation is COMPLETELY VOLUNTARY however, your input is important for us to understand factors of use in Air Force CoPs.

CONFIDENTIALITY:
ALL ANSWERS ARE STRICTLY ANONYMOUS. We request demographic information in order to interpret results more accurately and to better understand the factors of CoP usage being researched.

By participating in this survey you acknowledge that you have read the above information and are willing to participate in the study.

Contact information:
If you have any questions or comments about the survey, please contact Capt David Fitzgerald (david.fitzgerald@afit.edu) or 1Lt Peter Hinrichsen (peter.hinrichsen@afit.edu).

Privacy Notice:
In accordance with AFI 37-132, paragraph 3.2, the information below is provided as required by the Privacy Act of 1974.

Authority: 10 U.S.C. 8012, Secretary of the Air Force; powers and duties; delegation by; implemented by AFI 36-2601, USAF Survey Program.

Purpose: To evaluate factors affecting usage within Air Force communities of practice.

Routine Use: To increase understanding of factors affecting use of Air Force communities of practice. No analyses of individual responses will be conducted. Reports summarizing factors in CoP usage may be published.

Disclosure: Participation is VOLUNTARY. No adverse action will be taken against any member who does not participate in this survey or who does not complete any part of this survey.

DEMOGRAPHIC QUESTIONS (3 Questions)

IF YOU ARE A MEMBER OF MORE THAN ONE COMMUNITY OF PRACTICE, CONSIDER THE ONE YOU PARTICIPATE IN MOST OFTEN. ONLY COMPLETE ONE SURVEY.

D1. To which community of practice do you belong? (List only the community with which you are most involved) [DROP DOWN]

D2. How many months have you been a member of your CoP? [DROP DOWN]
- Less than 1
- 1-12
- 13-24
- 25-36
- more than 36

D3. What is your rank? [DROP DOWN]
- E-1 through E-4
- E-5 and E-6
- E-7 through E-9
- O-1 through O-3
- O-4 through O-6
- O-7 through O-10
- GS-1 through GS-5
- GS-6 through GS-10
- GS-11 through GS-15
- Contractor
- Other

FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE (43 Questions)

CAREFULLY CONSIDER EACH STATEMENT. MARK THE BOX THAT MAKES EACH STATEMENT MOST ACCURATE.

1. Information obtained from my CoP is reliable enough to use in my job.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*2. Information is shared in my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

3. If I use my CoP I will increase my chances of obtaining a promotion.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*4. I trust my fellow CoP members.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

5. Training in the use of my CoP was available to me.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*6. My CoP recognizes or rewards its members for making contributions.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

7. I would participate more often in my CoP if I could remain anonymous.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*8. Members of my CoP are eager to learn new things.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

9. My supervisor is very supportive of my use of CoPs in my job.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*10. Most members of my CoP agree on major issues discussed in our community.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

11. The members of my CoP are competent enough in their job knowledge to provide accurate information to others within the CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*12. Members of my CoP work to accomplish common goals.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

13. A knowledge champion is responsible for invigorating a CoP, encouraging CoP members to participate and share knowledge, highlighting successes, recognizing the contributions of members, and so on: my CoP has a knowledge champion.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*14. My fellow CoP members try new tools or suggestions.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

15. If I use my CoP I will increase my effectiveness on the job.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*16. In order for a CoP to thrive, members must understand that it is okay to make mistakes: my fellow CoP members are patient with people who make honest mistakes.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

17. I have the knowledge necessary to use my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*18. My CoP ensures members know where to find resources.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

19. I would share my opinions and insights more often in my CoP if I could remain anonymous.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*20. Teamwork is valued in my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

21. The level of security my job deals with limits my ability to use CoPs in my work.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*22. My CoP encourages its members to use materials originating outside our CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

23. I would participate more in my CoP if the sharing of classified and higher information were allowed.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

*24. Members of my CoP are technically competent enough to use our CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

25. In general, my organization has supported my use of CoPs.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

26. My CoP should rely on "tried and tested" tools to get things done.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

27. Use of CoPs can significantly increase the quality of output on my job.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

28. My community should encourage its members to use resources posted at our CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

29. Use of CoPs will affect the performance of my job.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

30. Material originating outside my community should not be posted on my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

31. I have no reservations about sharing my job knowledge with other members of my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

32. It is important to be patient with people who make honest mistakes in my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

33. The efforts of my CoP's knowledge owner affect how much I participate within my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

34. Working in teams is not important in my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

35. Sharing my job knowledge with other members of my CoP will make me more valuable to my organization.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

36. Members of my community should be highly proficient in using our CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

37. It is not necessary that information be shared among members of my CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

38. Members who make contributions to my CoP should be given credit.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

39. It is not important for CoP members to agree on major issues.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

40. My fellow community members should be cautious about taking advice or using tools posted on our CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

41. CoP members should explore new or unfamiliar areas of their CoP.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

42. Members of my CoP should make some concession to reach common goals.

Strongly Disagree	Disagree	Slightly Disagree	Don't know	Slightly Agree	Agree	Strongly Agree
□	□	□	□	□	□	□

43. What factors, positive or negative, affect your participation in your CoP? Please use the block below to input your comments
COMMENTS: [RESPONDENT WRITE-IN]

IF YOU HAVE ADDITIONAL COMMENTS REGARDING EXPERIENCES OR OBSERVATIONS IN YOUR CoP OR IF YOU HAVE QUESTIONS REGARDING THIS STUDY, PLEASE USE THE SPACE BELOW.

IF YOU WOULD LIKE A RESPONSE TO A COMMENT, ENTER YOUR CONTACT INFORMATION. PERSONAL INFORMATION YOU PROVIDE IS OPTIONAL AND WILL REMAIN CONFIDENTIAL.

COMMENTS: (250 character maximum) [RESPONDENT WRITE-IN]

Survey Complete.

Thank you for your participation.

If you would like more information about Air Force Knowledge Now, visit https://afkm.wpafb.af.mil/ASPs/cop/Entry.asp?Filter=OO (from a .mil account)

If you would like to know more about the Air Force Institute of Technology, visit http://www.afit.edu/

Bibliography

Agarwal, R., & Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs About Information Technology Usage. *MIS Quarterly, 24*(4), 665-694.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Bartczak, S. *Identifying Barriers to Knowledge Management in the United States Military.* PhD Dissertation. Auburn University, Auburn, AL, 2002 (AAI3071350).

Buysee, V., Sparkman, K., & Wesley, P. (2003). Communities of Practice: Connecting What We Know With What We Do. *Exceptional Children, 69*(3), 263-277.

Chiasson, M., & Lovato, C. (2001). Factors Influencing the Formation of a User's Perceptions and Use of a DSS Software Innovation. *Database for Advances in Information Systems, 32*(3), 16-35.

Compeau, D., & Higgins, C. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly, 19*(2), 189-211.

Davis, F. (1989a). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319-339.

Davis, F., Bagozzi, R., & Warshaw, P. (1989b). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science, 35*(8), 982-1003.

Davis, F., Bagozzi, R., & Warshaw, P. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Psychology, 22*(14), 1111-1132.

DeLong, D., & Fahey, L. (2000). Diagnosing Cultural Barriers to Knowledge Management. *Academy of Management Executive, 14*(4), 113-127.

Dennis, A. (1996). Information Exchange and Use in Group Decision Making: You Can Lead a Group to Information, but You Can't Make It Think. *MIS Quarterly, 20*(4), 433-458.

Emery, F., & Trist, E. (1977). The Casual Texture of Organizational Environments. In W. Pasmore, A & J. Sherwood, J (Eds.), *Sociotechnical Systems: A Sourcebook*. La Jolla, CA: University Associates, Inc.

Executive Order 13011(1996).

Fulmer, R., Gibbs, P., & Keys, J. (1998). The second generation learning organizations: New tools for sustaining competitve advantage. *Organizational Dynamics, 27*(2), 6-21.

Gard, G., Lindstrom, K., & Dallner, M. (2002). Effects of the transition to a client-centered team organization in administrative surveying work. *Behavior and Information Technology, 21*(2), 105-116.

Government Performance Results Act, (1993).

Hammer, M. (2001). *The Agenda: What Every Business Must Do to Dominate the Decade*. New York: Crown Business.

Hanks, W. (1991). Forward. In *Situated Learning: Legitimate Peripheral Participation*. New York: Cambridge University Press.

Herzberg, F. (1967). One More Time: How Do You Motivate Employees? In W. Natemeyer & J. McMahon (Eds.), *Classics of Organizational Behavior* (3rd ed., pp. 81-95). Long Grove, IL: Waveland Press, Inc.

Hofstede, G. (2001). *Cultures Consequences* (2 ed.). Thousand Oaks, CA: Sage Publications, Inc.

Huber, G. (1984). Issues in the Design of Group Decision Support Systems. *MIS Quarterly, 2*(1), 195-204.

Hung, D., & Chen, D. (2001). Situated Cognition, Vygotskian Thought and Learning from the Communities of Practice Perspective: Implications for the Design of Web-Based E-Learning. *Education Media International, 38*(1), 3-12.

Information Technology Management Reform Act, (1996).

Jankowicz, D. (2000). From 'Learning Organization' to 'Adaptive Organization'. *Management Learning, 31*(4), 471-490.

Kambayashi, N., & Scarbrough, H. (2001). Cultural influences on IT use amongst factory managers : A UK-Japanese comparison. *Journal of Information Technology, 16(4),* 221-236.

Kanungo, R., & Mendonca, M. (1988). Evaluating Employee Compensation. *California Management Review, 31*(1), 23-39.

Kramer, R. (1999). Trust and Distrust in Organizations: Emerging Perspectives, Enduring Questions. *Annual Review of Psychology, 50*, 569-598.

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. New York: Cambridge University Press.

Lipka, M. (2003). Discussion of usage problem with communities of practice. In P. Hinrichsen (Ed.). Wright-Patterson AFB, OH.

Markus, M. (2001). Toward a Theory of Knowledge Reuse: Types of Knowledge Reuse Situations and Factors in Reuse Success. *Journal of Management Information Systems, 18*(1), 57-93.

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

Ott, J. (1989). *The Organizational Culture Perspective*. Pacific Grove, CA: Brooks/Cole Publishing Company.

Palincsar, A., Magnusson, S., Marano, N., Ford, D., & Brown, N. (1998). Designing A Community of Practice: Principles and Practices of the GIsML Community. *Teaching and Teacher Education, 14*, 5-19.

Pasmore, W., & Sherwood, J. (1977). Organizations as Sociotechnical Systems. In W. Pasmore, A & J. Sherwood, J (Eds.), *Sociotechnical Systems: A Sourcebook* (pp. 3-7). La Jolla, CA: University Associates, Inc.

Pugach, M. (1999). The Professional Development of Teachers From A "Communities of Practice" Perspective. *Teacher Education and Special Education, 22*(4), 217-233.

Sathe, V. (1985). *Culture and Related Corporate Realities: Text, Cases, and Readings on Organizational Entry, Establishment, and Change*. Homewood, IL: Irwin.

Schein, E. (1992). *Organizational Culture and Leadership* (2 ed.). San Francisco: Jossey-Bass Inc.

Serban, A., & Luan, J. (2002). Overview of Knowledge Management. *New Directions for Institutional Research*(113), 5-16.

Shaw, N., & Tuggle, F. (2003). An Expanded Model of the Effects of Organizational Culture upon the Acceptance of Knowledge Management. In A. Gunasekaran, O. Khalil & S. Rahman, M (Eds.), *Knowledge and Information Technology Management: Human and Social Perspectives* (pp. 72-88). Hershey, PA: Idea Group Publishing.

Stocker, M. (2002). Cultural Values at Work on the Advanced Command and Staff Course (ACSC). *Defence Studies, 2*(1), 139-156.

Taylor, S., & Todd, P. (1995). Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research, 6*(2), 144-176.

Thompson, R., Higgins, C., & Howell, J. (1991). Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly, 15*(1), 124-143.

Trist, E. (1977). On Socio-Technical Systems. In W. Pasmore, A & J. Sherwood, J (Eds.), *Sociotechnical Systems: A Sourcebook* (pp. 43-57). La Jolla, CA: University Associates, Inc.

Valle, M., & Witt, L. (2001). The Moderating Effect of Teamwork Perceptions on the Organizational Politics-Job Satisfaction Relationship. *The Journal of Social Psychology, 141*(3), 379-388.

Veiga, J., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology, 16*, 145-158.

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science, 45*(2), 186-204.

Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly, 27*(3), 425-478.

Weinstein, L. (1996). Behind the State of the Art. *Association for Computing Machinery. Communications of the ACM, 39*(9), 130.

Wenger, E., McDermott, R., & Snyder, W. (2002). *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Boston: Harvard Business School Press.

Wypiszynski, S. (2003). Discussion of methods for tracking use of communities of practice. In P. Hinrichsen (Ed.). Wright-Patterson AFB, OH.

Vita

First Lieutenant Peter L. Hinrichsen was born in Seattle, Washington and graduated from Beavercreek High School in Beavercreek, Ohio in June 1986. He enlisted in the Air Force in May 1988 as an aerospace ground equipment technician. After earning a degree in Computer and Information Science from Troy State University in 1999, he earned a commission through Officer Training School at Maxwell AFB, Alabama in May 2000.

During Lieutenant Hinrichsen's enlisted service, he was stationed at Wurtsmith AFB, Michigan; Nellis AFB, Nevada; Hurlburt Field, Florida; and Osan AB, Korea. After commissioning in 2000, he was assigned to the 375th Airlift Wing at Scott AFB, Illinois where he served as the 375th Communications Squadron Planning and Implementation Flight deputy commander and later as executive officer for the 375th Communications Squadron. In September 2002, he entered the Graduate Information Resource Management program, School of Engineering and Management, Air Force Institute of Technology at Wright-Patterson AFB, Ohio. Upon Graduation, he will be assigned to the Air Force Research Laboratory at Wright-Patterson AFB, Ohio.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 074-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From – To)*
23 Mar 2004	**Master's Thesis**	Aug 2002 – Mar 2004

4. TITLE AND SUBTITLE

AN EXPLORATION OF CULTURAL FACTORS AFFECTING USE OF COMMUNITIES OF PRACTICE

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Hinrichsen, Peter L., 1Lt, USAF

5d. PROJECT NUMBER
If funded, enter ENR #

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)
Air Force Institute of Technology
Graduate School of Engineering and Management (AFIT/EN)
2950 Hobson Way, Building 641
WPAFB OH 45433-7765

8. PERFORMING ORGANIZATION REPORT NUMBER

AFIT/GIR/ENV/04M-11

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Air Force Knowledge Now
Attn: Mr. Randy Adkins
AFMC/DRW
4375 Chidlaw Rd
WPAFB OH 45433
DSN: 986-0822

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

On-line communities of practice are potentially powerful social learning networks that can improve organizational performance. Unfortunately, administrators of on-line communities of practice report that community members do not take full advantage of this potential. This study used Shaw and Tuggle's (2003) factors of knowledge management (KM) culture affecting organizational acceptance of a knowledge management initiative to explore this issue. It was hypothesized that respondents whose communities of practice possessed higher average community use per member would rate KM culture variables higher than respondents whose communities possessed a lower average community use. An analysis of survey data collected from Air Force Knowledge Now communities of practice identified two KM culture variables with a significant relationship between how individuals rated their community on each KM culture variable and use.

15. SUBJECT TERMS
Knowledge management, communities of practice, culture, technology acceptance, technology use

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
REPORT	**ABSTRACT**	**c. THIS PAGE**			Alan Heminger, PhD
U	**U**	**U**	**UU**	81	**19b. TELEPHONE NUMBER** *(Include area code)* (937) 255-3636, ext. 4797; e-mail: alan.heminger@afit.edu

Standard Form 298 (Rev: 8-98)
Prescribed by ANSI Std. Z39-18