O

UNIVERSITY OF OREGON

APPLIED INFORMATION MANAGEMENT

Information Sharing Strategies that Successfully Expand the Knowledge Base within a Small Non-Profit Organization and Increase the Potential to Deconstruct Project Silos

CAPSTONE REPORT

Alesha Fox
Lead Program Specialist
Educational Policy Improvement
Center

February 2009

Approved by

_____

Dr. Linda F. Ettinger
Academic Director, AIM Program

Running Head: INFORMATION SHARING STRATEGIES: DECONSTRUCTING

PROJECT SILOS

Information Sharing Strategies that Successfully

Expand the Knowledge Base within a Small Non-Profit Organization and Increase the

Potential to Deconstruct Project Silos

Alesha Fox

Educational Policy and Improvement Center

Abstract

This literature review examines information sharing systems for use in a project-oriented non-profit organization to expand the organizational knowledge base, resulting in the potential to deconstruct project silos. Companies that work in a fast-paced project environment run the risk of creating project silos (Curran, 2002), which segregate employees by task and prevent them from understanding the larger scope of the project (Mohrman, 1999). Systems examined include group decision support strategies, databases and computer based technologies.

Table of Contents

List of Tables

Introduction to the Literature Review

Topic Description

According to Davenport and Prusak (1998), many businesses have recently come to understand that they require more than a casual approach to information sharing systems if they are to succeed in present and future economies. In this study, information sharing systems are referred to as agents that attempt to exchange relevant information with each other in hopes of satisfying another's request (Bitting, Carter & Ghorbani, 2002). These strategies include computer-based systems, database systems and group decision support systems that improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals (Constant, Keisler & Sproull, 1994). Davenport and Hall (2002) believe that information sharing systems are an essential activity in all work, and help to bind groups together. Baura and Winston (2007) determine that organizations need to identify appropriate information sharing systems to realize all of the benefits of sharing information.

Research Problem

When a particular group within an organization works in relative isolation from others, the situation is referred to as a corporate silo (Gilbert, 2008). A corporate silo is defined as a lack of interaction across the strategic business unit, the organizational function, and the geographic office location (Gilbert, 2008). Gilbert (2008) concludes "although many companies aspire to promote easy interaction and coordination across departments, the corporate silo is still alive and well" (p. 1). Albrechet (2003) determines that

characteristics of silos can include turf wars, lack of cooperation, lack of participation in cross-functional teams, and lack of commitment to corporate goals. As a result, once a corporate silo forms, it is difficult for organizations to deconstruct it due to employee attitudes (Constant, Kiesler, & Sproll, 1994) that go beyond organizational design.

Hobday (2000) states that project-based organizations that employ a form of management ideally suited for increasing product complexity, fast changing markets, cross-functional business expertise and customer focused innovation are particularly susceptible to corporate silos. The notion is supported by Brensen, Goussevskaia, and Swan (2004), who extend the concept to project silos. A project silo is defined as aspects of work done redundantly assigned and performed by individual contributors in many different, self-contained locations (Mohrman, 1999).

Project-based organizations often run at a fast pace devoting little time to develop trust and information sharing systems (Johns, 1998). As an organization becomes more project-based, the need to manage projects successfully and learn from them is increased (Williams, 2008). Project silos can have a negative effect on an organization. Research finds that organizations operating with project silos experience a great deal of difficulty working effectively (Mohrman, 1999). Allen and Katz (1983) find that without proper information sharing, project managers must compete to obtain the proper resources for individual projects (p. 3). Heifetz and Laurie (1997) explain that if organizations work in silos, they are not able to adapt to new challenges and further conclude that if an organization cannot adapt to new challenges, it will eventually become extinct.

Gruenfeld, Mannix, Neale, and Phillips (2003) believe that information sharing systems are critical to organizational success.

Purpose

 The purpose of this literature review is to examine information sharing systems that can be used in a project-oriented non-profit organization to successfully expand the organizational knowledge base (Brensen, Goussevskaia & Swan, 2004), resulting in the potential to deconstruct project silos.

Botero, Hollingshead, and Wittenbaum (2004) identify that the goal of information sharing is to take advantage of individual expertise and allow project groups to make effective decisions that in turn increase organizational performance. One example of an information sharing strategy that project teams can utilize to communicate effectively to this end is matrix management. Matrix management refers to collaborative activities, transparent interfaces, and implicit trust while sharing the risks associated with the project. This requires parties to work cooperatively and requires that parties increase their knowledge of each other (Walker, 2003).

In order to present successful information sharing systems, this literature review investigates the following:

- Definitions of information sharing systems and supporting concepts including a description of how terms are interrelated

- Descriptions of a selected list of information sharing systems in relation to the

  potential to expand the organizational knowledge base

- Further analysis of how each of the selected information sharing systems could

  benefit small non-profit organizations.

The intended outcome of this study is a list of information sharing systems related to

computer based technologies, databases and group decision support systems, complete

with an analysis of the pros and cons of each in relation to the potential to expand the

organizational knowledge base and deconstruct the project silo. The primary goal is to

provide managers who believe that they do not have the staffing or time to share

information throughout the organization with strategies to help them do so.

Strategies are selected for the needs of project managers, executives and middle

managers who are interested in learning about various information sharing systems and

how they can positively affect communication of organizational knowledge among staff

in project-based non-profit organizations. The specific types of information sharing

systems that are examined are known as "interorganizational strategies", i.e., those that

can facilitate cross-communication within an organization (Hobday, 2000).

Significance

Brensen, Goussevskaia, and Swan (2004) find that it is possible that project work creates

barriers to information sharing and knowledge management by valuing the short-term

task over long-term knowledge. Thus, Brensen, Goussevkaia, and Swan (2004) find that

it is important that organizations do not allow the notion of information sharing systems to maintain knowledge management be neglected. The study of information sharing systems falls within the larger area of inquiry called knowledge management, which can be defined as the act of doing something useful with knowledge to accomplish organizational objectives through the structuring of people, technology, and knowledge content (Beers, Davenport, & Long, 1998). According to Burk (1999), most firms value knowledge management as a highly effective tool to ensure that project teams can communicate effectively and share essential information. Burk (1999) states that information-sharing strategies such as conversations around the office coffee machine and daily team progress check-ins are effective types of knowledge management methods.

Anheier and Seibel (1990) find that the way nonprofit organizations in the public and business sectors use their distinctive mechanisms of interorganizational communication, may affect the outcome of work within their own organization (Anheier & Seibel, 1990). The assumption underlying this study is that nonprofit organizations can benefit from sharing interorganizational knowledge as much as for profit organizations.

There are both organizational and employee benefits to be gained from information sharing. Hollings (2005) believes that employing information sharing systems can help mitigate project silos. Constant, Kiesler and Sproull (1994) state that employees benefit from being able to show off their expertise and feel proud that they are part of an organization. Organizationally, Phillips, Mannix, Neale, and Gruenfeld (2003) find that

information sharing assists in converting inaccurate pre-discussion opinions into accurate solutions and assists in integrating information instead of just aggregating opinions.

Montoni, Miranda, Rocha, and Travassos (2004) determine that information sharing enhances the organizational knowledge base. Within an organizational context, a knowledge base is defined as knowledge that surpasses individual members to include past experiences and behavioral routines that develop as a result of the application of knowledge to an number of organizational settings (Brown & Cook, 1999). Montoni, Miranda, Rocha, and Travassos (2004) conclude that an organizational knowledge base is important to guarantee a successful business.

Limitations

Topic. Huang and Wang (1999) observe that utilizing previous experiences enables an organization to reuse them and turn them into more structured knowledge through systems analysis and feedback (p. 92). They stress that organized effort to analyze a company's business experience is a critical step toward capturing and creating organizational knowledge (p. 92). This study is limited in scope to the examination of selected information sharing systems that can be used in a project-oriented non-profit organization to successfully expand the organizational knowledge base, and thus deconstruct project silos and as a result.

Time frame. Galbraith first introduced the idea of simple matrix programs that develop liaison roles and coordination across functional departments in 1972 (Burns &

Wholey, 2000). As such, the references provided in this study are published between 1972 and the present. While this timeframe is quite large, the majority of references are published within the past 15 years. References published between 1972 and 1992 provide background on the history of information sharing systems. References published between 1993 and the present include case studies and research pertaining to information sharing systems.

Focus. Literature for this study directly addresses information sharing systems that have the potential to expand the knowledge base within an organization. Burns and Wholey (1993) find that information strategies can dramatically change the dynamic of organizational work; one must understand how they are implemented and how knowledge is actually shared. The focus of this literature review is to describe how particular types of information sharing systems are implemented and if they are successful. Three categories of information sharing systems are pre-selected as a way to frame and organize the data. These strategies, provided by Constant, Keisler and Sproull (1994), include computer-based systems, database systems and group decision support systems. While there are many types of information sharing systems, these three categories are used in this study because they improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals (Constant, Keisler, & Sproull, 1994).

Additionally, only information sharing systems that can also be described as 'interorganizational strategies' are examined and described in detail. The following areas

are excluded:

- Interpersonal information sharing systems

- Project management strategies

- Explanations of how corporate silos form

- Explanations of how project silos form

- Explanations of knowledge management

- Project management close outs

Sources. Literature is selected from academic journals, books, and professional web sites. For this literature review, the academic journals and books refer to research-quality reference information and sources selected by professional librarians, educators, and educational and library consortia (Zillman, 2008). Academic books and journals provide information regarding the history of information sharing strategy as well as case studies that describe how each selected strategy works. Professional journals present in-depth, original research in a specific field and may also contain profession or industry-related news to explain how information sharing systems are currently being deployed (Literature Reviews, 2007).

Target audience. The literature collected for this study is geared toward professionals working in project-based nonprofit organizations. The literature collected for this review contains information appropriate for project managers and middle managers who are responsible for project success. The literature review targets those who are expected to ensure quality products and the support of the needs of the project and do

not have the opportunity to research information sharing systems for themselves.

Data Analysis Plan Preview

The collected literature is analyzed using a process known as content analysis. Content

analysis is a systemic examination of the contents of a particular body of material for

finding patterns and themes, which is a form of qualitative research (Leedy & Ormond,

2005). Because there is a large amount of literature on information sharing systems, the

data analysis spiral has been used to organize, peruse, identify, integrate and summarize

all information (Leedy & Ormond, 2005). Once the literature is collected, it is evaluated

by the following criteria as outlined by Leedy and Ormond (2005):

- Purposefulness
- Explicitness
- Rigor
- Usefulness

After the literature is evaluated, the data analysis process focuses on collecting data about

information sharing systems that promote interorganizational communication in support

of an expanded knowledge base. The assumption is that the process of expanding the

organizational knowledge base will aid in the deconstruction of project silos. Selected

materials are read and coded in a process defined as conceptual analysis, using a set of

key concepts as described by Busch et al. (2005).

Writing Plan Preview

This study is designed as a literature review with the goal being to identify, describe and

examine various information sharing systems for small non-profit project-based

organizations. A literature review is designed to synthesize information in literary sources

and present that information in an organized pattern (Literature Reviews, 2007). The

literature review assists in forming an intellectual framework in the field of study even

though it need not be exhaustive, listing as many relevant books and articles as possible

(Rapple, 2008).

A literature review helps to provide meaningful context to a research project within

already existing research (Obenzinger, 2005). Obenzinger (2005) lists a number of

potential rhetorical patterns upon which to base the writing approach. Due to the nature

of this literature review, the writing approach selected for this study is called "déjà vu all

over again". Déjà vu all over again refers to the identification of current knowledge, even

existing methodology, but argues for some kind of replication for verification or variation

such as a different sample population (Obenzinger, 2005). Further, information is

presented thematically using the three general information sharing systems including

computer-based technologies, data bases and group decision support systems that

improve organizational efficiency, learning, innovation, flexibility and understanding of

organizational goals (Constant, Keisler & Sproull, 1994). This writing approach supports

the goals of this literature review because it allows for the examination of information

strategies in a three predetermined areas and applies them to a project oriented non-profit

organization.

Definitions

The terms defined in this section have been organized into two categories. The first category includes definitions of various information strategies and includes the definition of information sharing systems as these are framed in this study. The second category contains supporting concepts that relate to the broader topic of information sharing and the goals of this study.

Information Sharing Strategies

CrossFlow is a computer-based system that allows one organizational team to start a project and receive project results, then hand them off to another organizational team electronically (Aberer, Grefen, Hoffner, & Ludwig, 2000).

Cross-project team building applications can be defined as collaborative activities, transparent interfaces, and implicit trust while sharing the risks associated with the project. This requires parties to work cooperatively and requires that parties increase their knowledge of each other. (Hampson & Walker 2003).

Dashboards is defined as a process where project managers define project success criteria via weekly meetings with their teams. Each week the success criteria shifts to the changing needs of the project. Teams are scored on their performance and the scores are shared throughout the organization each week as a way to both monitor progress and correct course of action (Brensen, Goussevkia, & Swan, 2004).

Information sharing systems are referred to as agents that attempt to exchange relevant information with each other in hopes of satisfying another's request (Bitting, Carter, & Ghorbani, 2002). Information sharing strategies include computer-based technologies, data bases and group decision support systems that improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals (Constant, Keisler, & Sproull, 1994).

Interorganizational strategies are those that can facilitate cross-communication within an organization (Hobday, 2000).

Intranet systems are technologies used to share organizational information or operational systems with employees (Scott, 1998).

The **knowledge acquisition process** is a computer-based system that supports access and reuse of information acquired from employees across an organization (Montoni et. al, 2004).

Knowledge management can be defined as the act of doing something useful with knowledge to accomplish organizational objectives through the structuring of people, technology, and knowledge content (Beers, Davenport, & Long, 1998).

Matrix management refers to collaborative activities, transparent interfaces, and

implicit trust whilst sharing the risks associated with the project. This requires parties to work cooperatively and requires that parties increase their knowledge of each other (Walker, 2003).

The network model is when teams are assigned by task and employees can be placed on various teams. An individual may lead one team and be a subordinate on another (Curran, 2002).

Organizational learning is a series of interactions between adaptation at the individual or sub-group level and adaptation at the organizational level. The adaptation occurs due to a variety of stresses which create sub-system learning and total system learning separately and together (Shrivastava, 1983).

The project management method supports specialists from various functional areas across the organization form various ad hoc project teams from inception to completion of projects for which they are wholly responsible (Johns, 1998).

Supporting Concepts

Computer-based information sharing systems support an organization by having the ability to collect experiences about project planning, risk management and other organizational functions in the same place (Montoni et. al, 2004).

The concept of **corporate knowledge** refers to strategies, methodologies, processes, products and services that are acquired and used within an organizational context (Brown & Cook, 1999).

A **corporate silo** is referred to as the small amount of interaction that occurs across the strategic business unit, the organizational function, and the geographic office location (Gilbert, 2008), characteristics of silos range from turf wars to lack of cooperation to lack of participation in cross-functional teams to lack of commitment to corporate goals (Albrecht, 2003).

Database systems are defined as techniques that use both artificial design and user interface design to help solve the problems that tend to occur similarly across the workplace (Brobst, Grant, Malone, & Turbak, 1990).

Group decision support systems is a management style that creates an environment through which different groups of people within an organization can learn together and

work toward acquiring the skills and know-how to reach their goals (Curran, 2002).

The **informational environment** can be described as the ongoing process of creating a collective sense of structure and meaning (Seeger, Sellnow, & Ulmer, 2003).

The **Information lens** labels all organizational information and actions within a database so it can be easily extracted by a data analyst and reviewed by experts to make decisions (Lo, Shaw, & Tan, 2005).

An **interprofessional knowledge base** is insight into the systemic and personal factors, which contribute to the culture of the professions and that can help improve the development of innovative methodologies to improve the interprofessional collaborative process (Hall, 2005).

Within an organizational context, a **knowledge base** is defined as knowledge that surpasses individual members to include past experiences and behavioral routines that develop as a result of the application of knowledge to an number of organizational settings (Brown & Cook, 1999).

Knowledge intensive work can be referred to as technologies, forms, and systems that are analyzable (Blacker, 1996).

Mediation is filing all system actions and information regarding an organization within a

database. These actions are then retrieved at any time for analysis by data analysts (Wiederhold, 1992).

Nonprofit organizations can be defined as a collection of entities that are: organized, institutionally separate from government, and self-governing (Anheier & Salamon, 1997, 32 & 33).

The **organizational context** can be referred to as the use of knowledge within an organization's belief, value and idea system that reflect the overall goals of an organization (Kidwell, Lind,e & Johnson, 2000).

A **project-based organization** refers to a form of management ideally suited for increasing product complexity, fast changing markets, cross-functional business expertise and customer focused innovation (Hobday, 2000).

A **project silo** is defined as aspects of work done redundantly assigned and performed by individual contributors in many different, self- contained locations (Mohrman, 1999).

A **small non-profit organization** is defined as one that has a most reliable knowledge base one that contains two hundred to three hundred people (Davenport & Pursak, 2003).

The **social value of information** is referred to as departments within organizations with different organizational goals, yet the coordination of these goals is the prerequisite for overall organizational effectiveness (Cartsen, Dreu, & Vaart, 2001).

Research Parameters

This section provides the research design framework. Research questions including sub-questions, search terms and search engines are described in detail. Then the documentation approach and methods to record information are explained. The data analysis process is detailed. A writing plan is also included that describes how the findings from the data analysis are presented in the Review of Literature section.

Research Questions and Sub-questions

How can information sharing systems impact the ability of staff to share organizational knowledge across teams in small non-profit organizations, thus aiding in the deconstruction of project silos?

- What are small non-profit organizations?
- What is information sharing/knowledge sharing?
- What is a project-based organization?
- What is a project silo?
- How can project silos impede information sharing?
- What are the benefits to deconstructing project silos?

Search Strategy

In order to obtain support for methodological design, ideas and perspectives regarding information sharing systems, the University of Oregon library catalog, journal indexes, government publications and the World Wide Web were referenced using a set of key

terms. Resources that proved relevant to information sharing systems were documented on a spreadsheet and categorized by key term.

The following terms and controlled vocabulary were identified to support the proposed topic. This list was initially developed with assistance from an Area Director at the Educational Policy Improvement Center (EPIC). The Area Director suggested the terms because the Senior Management Team has discussed them as areas of improvement for EPIC. EPIC is a small non-profit organization that continuously struggles with information sharing and as such, would benefit from learning about various information sharing systems. The terms were further vetted through referencing the University of Oregon library, journal indexes, government publications and the World Wide Web. This search derived the list of terms that includes:

- Project management
- Project communication
- Matrix management
- Cross-project team building
- Work silos
- Project silos
- Non-profit organization
- Information sharing

As the topic continued to evolve and after further investigation to both the University of Oregon index and the initial search results, the following sub-topics were also searched for:

- Social value of organizational information
- Knowledge intensive work
- Small non-profit organizations

- Knowledge base
- Knowledge management
- Corporate Silos

Initial Search Details

The following search sites were selected to provide both a broad sense of what type of information was available as well as specific Full Text articles. To gain a broad sense of the articles for the identified terms Clusty, WorldCat and Google Scholar were searched. All of these sites were deemed reliable because of the quality of articles, amount of Full Text articles and the organization of the articles. EBSCO host, UO libraries and Open Source Project and Governance were searched because they provide an index of materials as well as more specific literature on the topic of information sharing. EBSCO host and UO libraries were used to gather all the information available through the University of Oregon. Open Source Project and Governance was utilized because the search engine was pertinent to the research topic.

Preliminary Results

Google Scholar, EBSCO Host Research Databases—Academic Search Primer, and Open Source Project Management and Governance Search produced the highest quality of search results. The results were determined by a number of limiting factors including; how relevant the article was to the research questions, the year in which the articles were published (within the past 30 years because the concept of matrix management developed in the 1970s), the number of times the articles were cited in other places, and the accessibility to the articles in Full Text.

Google Scholar, WorldCat and EBSCO Host Research Databases—Academic Search

Primer were the databases that produced the highest number of results. The table below

demonstrates the number of results each site provides for each search term. The rating of

the quality of results was determined by the quality of results indicators, these include;

the relevance to research questions, number of articles published since 1972, number of

times an article was citied elsewhere (at least two) and accessibility to articles in full text.

This is demonstrated through the table below (see Table 1).

Search Engine/Database	Search Terms	Results #	Quality of Results
Clusty	Matrix management	210	Fair
	Project management	242	Fair
	Project communication	263	Poor
	Cross-project team building	193	Poor
	Work silos	191	Poor
	Project silos	193	Poor
	Non-profit organization	267	Poor
	Information sharing	267	Fair
	Social value of organizational information	193	Good
	Knowledge intensive work	174	Fair
	Small non-profit organization	88	Fair
	Knowledge base	259	Fair
	Corporate silos	176	Poor

Search Engine/Database	Search Terms	Results #	Quality of Results
Google Scholar	Matrix management	1960000 (best 200 shown)	Good
	Project management	3480000 (best 200 shown)	Fair
	Project communication	3190000 (best 200 shown)	Good
	Cross-project team building	917 (best 200 shown)	Good
	Work silos	0	N/A
	Project silos	0	N/A
	Non-profit organization	22600 (best 200 shown)	Fair
	Information sharing	2030000 (best 200 shown)	Good
	Social value of organizational information	3, 080	Good
	Knowledge intensive work	895,000	Good
	Small non-profit organization	22, 325	Good
	Knowledge base	3,470	Fair
	Corporate silos	10, 500	Good

Search Engine/Database	Search Terms	Results #	Quality of Results
UO Libraries Catalog	Matrix management	29	Fair
	Project management	2024	Good
	Project communication	290	Poor
	Cross-project team building	0	N/A
	Work silos	1	Poor
	Project silos	1	Poor
	Non-profit organization	23	Good
	Information sharing	235	Poor
	Social value of organizational information	20	Poor
	Knowledge intensive work	2	Poor
	Small non-profit organization	0	N/A
	Knowledge base	65	Fair
	Corporate silos	0	N/A
EBSCO HOST Research Databases-Academic Search Premier	Matrix management	0	N/A
	Project management	136	Good
	Project communication	13117	Fair
	Cross-project team building	0	N/A
	Work silos	133	Poor
	Project silos	71	Poor
	Non-profit organization	4135	Good
	Information sharing	119	Good
	Social value of organizational information	30	Good
	Knowledge intensive work	43	Good
	Small non-profit organization	31	Good
	Knowledge base	48	Fair
	Corporate silos	30	Good

Search Engine/Database	Search Terms	Results #	Quality of Results
WorldCat	Matrix management	3223	Good
	Project management	141166	Fair
	Project communication	20479	Poor
	Cross-project team building	28	Fair
	Work silos	94	Poor
	Project silos	177	Poor
	Non-profit organization	4364	Good
	Information sharing	4364	Good
	Social value of organizational information	309	Fair
	Knowledge intensive work	287	Fair
	Small non-profit organization	133	Fair
	Knowledge base	11, 295	Good
	Corporate silos	16	Fair
Open Source Project Management & Governance Search	Matrix management	16	Poor
	Project management	30	Good
	Project communication	48	Good
	Cross-project team building	1	Poor
	Work silos	52	Good
	Project silos	36	Poor
	Non-profit organization	42	Good
	Information sharing	27	Fair
	Social value of organizational information	60	Fair
	Knowledge intensive work	30	Fair
	Small non-profit organization	31	Good
	Knowledge base	26	Good
	Corporate silos	30	Fair

Quality of Results Identifiers	Rating Scale
Relevance to research questions	**Good**=Three to four identifiers are met by the source
Articles published in the last 30 years	**Fair**=Two identifiers are met by the source
Number of times the articles were cited elsewhere	**Poor**=One identifier is met by the source
Accessibility to articles in Full Text	**N/A**=The source provided no matches to the search

Table 1: Search Results Summary

Evaluation Criteria for Reference Selection

Each piece of literature selected for this literature review was reviewed for quality based on the guidelines set forth by Smith (2008) at University of Oregon libraries. These guidelines state that the following areas should be examined before literature can be deemed acceptable:

- Authority

- Objectivity

- Quality

- Coverage

- Currency

- Relevance

Authority—is evaluated by examining who the author is and the author's credentials. These credentials include relevant experience, type of degree and past writings. Another way authority is determined is through verifying the publisher of the article, book, or website. Reviewing publisher websites and reviewing the basic goals and values of each examine this facet (Smith, 2008).

Objectivity—is evaluated by ensuring that goals are stated, that biases are explained if they are exhibited, if there are reasonable conclusions and if the author's affiliation to an organization or university is reflected (Smith, 2008).

Quality—is evaluated by ensuring the information is well organized, grammar is clear and concise, there is proper labeling and the documentation appears complete (Smith, 2008).

Coverage—is evaluated by ensuring there is enough evidence to support all arguments, and if there are ample references to other academic literature (Smith, 2005).

Currency -- is evaluated by ensuring that each piece of literature selected was published between 1972 and the present (Smith, 2005).

Relevance—is evaluated by ensuring the article is appropriate to a described content area – in this case, information sharing systems that can be further defined as 'interorganizational strategies' (Leedy & Ormond, 2005).

By utilizing the criteria above, the researcher is attempting to work with only relevant information that is unbiased and credible. Both professional and academic literature is included in this literature review, to show the reader not only research and case studies as seen in academia, but also how information sharing systems are deployed in a professional setting. Both factors are important to the purpose of this study.

Data Analysis Plan

The overall goal of the data analysis process is to identify concepts related to information sharing systems in three pre-selected key larger areas of a) computer-based systems, b)

database systems, and c) group decision support systems. The particular data analysis

process used in this study is known as 'conceptual analysis' (Busch et al., 2005).

Specifically, in conceptual analysis, "a concept is chosen for examination, and the

analysis involves quantifying and tallying its presence" (Busch et al., 2005).

Conceptual analysis allows the researcher to gather and analyze a large amount of useful

published, text-based material regarding the topic area, based on predetermined criteria.

Selected resources are subjected to a coding process, in support of the development of the

Review of Literature section of the paper.

To ensure that all selected literature is valid to this study, it is subjected to a preliminary

evaluation against the criteria that at least two of the pre-selected key terms are included

in the text. The pre-selected key terms must exist one time within the data. If the criterion

is met, then literature is selected for coding as part of the conceptual analysis process.

Table 2 demonstrates the preliminary set of coding terms related to the pre-selected key

concepts, that the researcher expects to identify in the selected pieces of literature during

the conceptual analysis process (See Table 2). Busch et al. (2005) suggest the researcher

create translation rules that allow the researcher to streamline and organize the coding

process so one knows exactly what to code for. The ten key preliminary coding terms

listed below may appear in different forms as long as the meaning or intent of the terms

are generally the same. For example, information sharing strategy may be used as well as

information sharing method.

Preliminary Coding Terms
• Information sharing (and also interorganizational)
• Project Silo
• Corporate Silo
• Non-profit organization
• Knowledge management
• Project management
• Project communication
• Computer-based
• Database
• Group decision support

Table 2: Coding terms for conceptual analysis

To ensure that each piece of selected literature is consistently coded to meet the goals of this study, once key terms are identified, this researcher goes a step farther to determine that identified text is used in relation to interorganizational strategies. Any identified text that describes interpersonal interactions as opposed to work-related interactions are excluded from the data set.

Documentation Process

Selected pieces of literature are coded by key term initial (for example IS stands for information sharing and PS stands for project silo) and additional key term or sub-category initials and saved within an appropriate folder within one of the three general

areas folders for computer based technologies, databases, and group decision support systems. Documents are then labeled by key term and contain sub-folders for all of the additional key terms and sub-categories. The research anticipates that the list of terms will evolve through the actual coding process. A master spreadsheet for quick reference is also saved in the overarching Literature Review folder that shows the researcher where all literature is stored for easy retrieval.

Once the coding process is complete, Busch et al. (2005) direct that the next step in conceptual analysis is for the researcher to examine the data and attempt to come to possible conclusions and generalizations. The Writing Plan below describes how this will be accomplished.

Writing Plan

Leedy and Ormond (2005) suggest that the goal of a Literature Review is to synthesize and summarize the data collected. Once all of the data is identified and coded through conceptual analysis, it is presented using the déjà vu all over again rhetorical pattern as described by Obenzinger (2005). The déjà vu all over again approach refers to the identification of current knowledge, even existing methodology, but argues for some kind of replication for verification or variation such as a different sample population (Obenzinger, 2005). This approach is well suited for the Review of Literature section because identified information sharing systems are explained with the intent that they may be replicated within small nonprofit organizations.

The data is organized thematically according to three pre-selected larger information sharing strategy categories set forth by Constant, Keisler, and Sproull (1994) that include a) computer-based systems, b) database systems, and c) group decision support systems. As a group, these types of strategies are intended to improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals. The explication of each category includes an explanation of the major points of the information sharing strategy, and how the strategy could be used to improve information sharing in small non-profit project-based organizations. Explanations are brief and are further developed within the narrative for each larger category.

The Review of Literature section begins with an explanation of the context of the study, including a description of small non-profit organizations and the condition known as silos. The explanation includes the definition of a small nonprofit organization and explains how corporate silos form in this type of environment. This is done to provide the audience with a clear picture of the type of organization in which each information strategy may be utilized. To add to the context, a brief summary of specific limitations is presented. These limitations include the number of information sharing systems discussed within each thematic section of the Review of Literature that include computer based technology, databases and group decision support systems.

Next, the identified information sharing systems are each aligned with one of the three pre-selected organizing categories and presented in table format. Each strategy is briefly described in relation to its role in the goal to expand the organizational knowledge base.

Initial data analysis shows that there are significantly more group decision support system and computer based technology information sharing systems in comparison to databases. Thus, this researcher anticipates that the final presentation of strategies will be more heavily weighted toward group decision support system and computer based technologies information sharing systems than database information sharing systems. Any overlap among strategies across the three pre-selected organizing categories is also noted in the table.

A more detailed discussion of the three general information sharing systems of group decision support systems, computer technology and databases is presented in narrative format, following the table. Each description is approximately three hundred words and includes an explanation of how each of the three sets of strategies as a whole might be implemented in a small nonprofit organization as a way to expand the knowledge base.

Below is an outline of the Review of Literature section:

    I.   Explanation of a project-based nonprofit organization context, including a summary of key limitations to the study.

    II.   A table, briefly summarizing the individual information sharing systems identified during conceptual analysis, presented within the three pre-selected organizing categories.

    III.   Discussion of Each Information Sharing Strategy Category in Relation to Expanding the Knowledge Base

        i.   *Group Decision Support Systems*

ii. Database Systems

iii. Computer-based Systems

Annotated Bibliography

This annotated bibliography presents literature selected for the data set that is

used during conceptual analysis and reported in the Review of Literature section, as well

as the larger study. Materials that are part of the data set for conceptual analysis are noted

with an (*****). There are 31 references listed in this section – 23 of these form the data set

for conceptual analysis.

*** Aberer, K., Grefen, J., Hoffner, Y., & Ludwig, H. (2000). CrossFlow: Cross-
organizational workflow management in dynamic virtual enterprises. *ACM
SIGecom Exchanges,* 2(1).**

Abstract: The CrossFlow architecture provides support for cross-organisational

workflow management in dynamically established virtual enterprises. The

creation of a business relationship between a service provider organisation

performing a service on behalf of a consumer organisation can be made dynamic

when augmented by virtual market technology, the dynamic configuration of the

contract enactment infrastructures, and the provision of fine-grained service

monitoring and control. Standard ways of describing services and contracts can be

combined with matchmaking technology to create a virtual market for such

service provision and consumption. A provider can then advertise its services in

the market and consumers can search for a compatible business partner. This

provides choice in selecting a partner and allows the deferment of the decision to

a point in time where it can be made on the most up-to-date requirements of the

consumer and service offers in the market. The penalty for deferred decision making is the time to set up the infrastructure in each organisation for the dynamically established contract. Thus, a further aspect of CrossFlow was to exploit the contract in the dynamic and automatic configuration of the contract enactment and supervision infrastructures of the respective organisations and in linking them in a dynamic fashion. The electronic contract, which results from the agreement between the newly established business partners, completely specifies the intended collaboration between them. This includes fine-grained monitoring and control to allow tight co-operation between the organisations.

Value: This article is utilized in the Review of Literature section. The authors define the CrossFlow project management system that fits in the area of computer-based systems.

Blacklar, F. (1995). Knowledge, Knowledge Work and Organizations: An Overview and Interpretation. *Organization Studies*, 16(6).

Abstract: There is current interest in the competitive advantage that knowledge may provide for organizations and in the significance of knowledge workers, organizational competencies and knowledge-intensive firms. Yet the concept of knowledge is complex and its relevance to organization theory has been insufficiently developed. The paper offers a review and critique of current approaches, and outlines an alternative. First, common images of knowledge in the organizational literature as embodied, embedded, embrained, encultured and encoded are identified and, to summarize popular writings on knowledge work, a typology of organizations and knowledge types is constructed. However,

traditional assumptions about knowledge, upon which most current speculation about organizational knowledge is based, offer a compartmentalized and static approach to the subject. Drawing from recent studies of the impact of new technologies and from debates in philosophy, linguistics, social theory and cognitive science, the second part of the paper introduces an alternative. Knowledge (or, more appropriately, knowing) is analyzed as an active process that is mediated, situated, provisional, pragmatic and contested.

Value: This article focuses on knowledge and provides a foundation for the definition of knowledge intensive work and organizational knowledge. This information helps to frame the discussion in the Problem area of the literature review. The types of knowledge are not going to be documented, rather, the literature review focuses on the types of systems through which people achieve their knowing, on the changes that are occurring within such systems, and on the processes through which new knowledge may be generated.

* **Bleakley, A., Boyden, J., Hobbs, J., Walsh, L., & Llard, J. (2006). Improving teamwork climate in operating theatres: The shift from multiprofessionalism to interprofessionalism.** *Journal of Interprofessional Care*, **20(5), 461-470.**

Abstract: A multi-faceted, longitudinal and prospective collaborative inquiry was initiated in December 2002 with one half of the cohort of operating theatre personnel in a large, acute UK hospital serving a mainly rural population. The same intervention was introduced in January 2004 to the other half of the cohort. The project aims to improve patient safety through a structured educational

intervention focused upon changing teamwork practices. This article reports one critical element of the larger project – changing teamwork climate as a necessary precursor to establishing an interprofessional teamwork culture. The aggregate of individual, unidirectional attitude changes across a large cohort constitutes a change in climate. This shift challenges the conventional culture of multiprofessionalism, where uniprofessional identification (the ''silo'' mentality) is traditionally strong.

Value: While this article is geared toward hospitals, it takes into account a larger project and also discusses establishing a teamwork culture. This is an example of one type of information sharing strategy.

* Bloodgood, J. M., & Salisbury, W. D. (2001). Understanding the influence of organizational change strategies on information technology and knowledge management strategies. *Decision Support Systems***, 31(55).**

Abstract: While discussion about knowledge management often centers around how knowledge may best be codified into an explicit format for use in decision support or expert systems, some knowledge best serves the organization when it is kept in tacit form. We draw upon the resource-based view to identify how information technology can best be used during different types of strategic change. Specifically, we suggest that different change strategies focus on different combinations of tacit and explicit knowledge that make certain types of information technology more appropriate in some situations than in others.

Value: This article reviews computer technology that reflects information sharing

systems. It demonstrates what kind of information technology should be used in specific situations. The information technologies that reflect the needs of small non-profit organization are included in the Review of Literature section.

* Brobst, M. D., Grant, K. R., Malone, T. W., & Turbak, F.A. (1986). Intelligent Information Sharing Systems*. Communication of the ACM*, 10.

Abstract: As it becomes both technically and economically feasible to send electronic messages and other documents to large numbers of possible recipients, the problem of deciding who should receive a particular piece of information will become increasingly important. This paper focuses on the application of techniques from artificial intelligence, user interface design, and organizational science to help people share interesting and relevant information without being inundated by the potentially vast amount of less useful information.

Value: This article describes the use of the Information Lens which is an intelligent information sharing system designed to assist in information sharing by having a computer technology interpret what information is important and who within an organization needs to receive it. This article is utilized in the Review of Literature section as a computer-based technology information sharing strategy.

Brown, J.S., & Cook, S.D. (1999). Bridging Epistemologies: The generative dance between organizational knowledge and organizational knowledge. *Organization Science*, **10(4).**

Abstract: Much current work on organizational knowledge, intellectual capital, knowledge creating organizations, knowledge work and the like rests on a single traditional understanding of the nature of knowledge. We call this understanding the "epistemology of possession," since it treats knowledge as something people possess. Yet, this epistemology cannot account for the knowing found in individual group practice.

Value: This article is useful in defining terms regarding organizational knowledge. Definitions derived from this source are used throughout the paper.

* Brensen, M., Goussevskaia, A., & Swan, J. (2004). Embedding new management knowledge in project-based organizations. *Organization Studies*, **25.**

Abstract: The embedding of new management knowledge in project-based organization is made particularly problematic due to the attenuated links that exist between organization- wide change initiatives and project management practice. To explore the complex processes involved in change in project-based organization, this paper draws upon a case study of change within the UK construction industry. Analyzing the case study through the lens of structuration theory (Giddens 1984), the paper examines the complex, recursive relationship that links change in project management practice with the peculiarities of that context. The findings demonstrate that a number of features of project-based organization — namely, decentralization, short-term emphasis on project performance and distributed work practices — are critically important in understanding the shaping and embedding of new management practice.

Value: This article is used to describe the problems that lack of information sharing causes in project-based organizations. This article informs the definition of project-based organizations and is used to describe project-based information dilemmas in the Problem section of the literature review.

* Burns, L., & Wholey, D. (1993). Adoption and abandonment of matrix management programs: Effects of organizational characteristics and interorganizational networks. *The Academy of Management Journal*, 36(1), 106-138.

Abstract: Organizational design theorists argue that organizations adopt matrix (departmentalized) structures for technical reasons, to solve problems of internal coordination and information processing. Research on how interorganizational networks operate suggests that organizations adopt new structures because of mimetic forces and normative pressures. We examined the effects of both sets of factors on the adoption of matrix management in a group of hospitals. Multivariate analyses revealed the matrix adoption is influenced not only by task diversity, but also by sociometric location, the dissemination of information and the cumulative force of adoption in interorganizational networks. Such variables exert little influence on decisions to abandon matrix programs, however.

Value: While these authors are not proponents of matrix management, they very clearly define what matrix management is. Having this clear definition is helpful as a foundation for further investigation. This article is utilized in the Review of

the Literature section where matrix management is discussed as an information

sharing strategy.

* Cartsen, K., Dreu, W., and Vaart, D. (2001). Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior. *Journal of Organizational Behavior.*

Abstract: In a study in 11 organizations among 120 manufacturing, planning and sales employees, support was found for the hypothesis that a pro-social value orientation – as a personality trait - increases the likelihood that employees show a high concern for the goals of other departments. This concern, combined with a high concern for own goals, furthermore appeared to increase the likelihood of problem-solving behavior during interdepartmental negotiations. Measures of goal concerns were attained, firstly, by asking employees how important they found six specific organizational goals and, secondly, by assessing which goals were found most important by members of which department. The results of this study suggest that problem solving can be induced by selecting or developing prosocial employees, because a prosocial value orientation increases the likelihood of having broad role orientations, in which employees not only care for goals characteristic of their own department, but also for goals of other departments.

Value: The value of this article is two-fold; it provides the definition for social value with regard to information, and it also describes how developing pro-social skills is an information sharing strategy. This information sharing strategy is examined in the Review of the Literature section.

*Davenport, E., & Hall, H. (2002). Communities of practice and organizational Knowledge. *In B. Cronin (Ed.) Annual Review of Information Science and Technology*, **36.**

> **Abstract:** Discusses communities of practice and their role in organizational knowledge. Topics include situated learning and situated actions; distributed cognition; discourse analysis, conversation analysis, and genre analysis; performative perspective; interpretive approach; motivation; creating environments for participation in communities of practice; infrastructure; and online communities of practice.
>
> **Value:** This article provides various information sharing systems and analysis of their use. This article is utilized for the Review of the Literature section. The information sharing systems used are applicable to project-based non-profit organizations.

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

> **Abstract:** Why all of a sudden an interest in knowledge? Numerous conferences and hundreds of articles in scholarly and business journals have tried to get a handle on the elusive subject. The growth of knowledge consulting and much buzzing and bustling within firms signal a growing conviction that knowing about knowledge is critical to business success—and possible survival.
>
> **Value:** This book provides insight to knowledge management and how organizations utilize it. This book goes into detail about the value of knowledge within an organization and how it should be managed. It's also now considered to

be the foundational piece of literature in the area.

*Ghoshal, B. (1990). Matrix management: not a structure, a frame of mind. *Harvard Business Review*, **68(4), 138-45.**

Abstract: In many of the world's leading corporations, strategic thinking has outdistanced organizational capability. As business challenges have grown more complex over the past 20 years, most companies have avoided the trap of one-dimensional strategic responses-stick to your knitting, stick to the big markets. But many of them have fallen into a second, structural trap and adopted elaborate organizational matrices that actually impair their ability to implement sophisticated strategies. Keeping a company light on its feet strategically while still coordinating its activities across divisions, functions, even continents, means eliminating parochialism, improving communications, and weaving the decision-making process into the company's social fabric. Altering formal structure from the top down is a poor way to achieve these goals. It is easier to work from the bottom up, focusing on the attitudes and behavior of individual managers. The companies that have made best use of this focus-among them NEC, Philips, and Unilever-employ three techniques to capture the capabilities and commitment of each manager:

1. They communicate a clear, consistent corporate vision.

2. They use training and career-path management to broaden individual perspectives and increase identification with corporate goals.

3. They co-opt individual energies and ambitions into the broader

corporate-wide agenda.

The goal is to build a matrix of corporate values and priorities in the minds of

managers and let them make the judgments and negotiate the deals that make

strategy pay off.

Value: This article provides an example of information sharing strategy and

explains its benefits. This is an example of how matrix management could be

deployed and is utilized in the Review of the Literature section of this document.

Gilbert, S. (2008). The Silo Lives! Analyzing Coordination and Communication in

Multiunit Companies. *Harvard Business School: Working Knowledge***, 47(3).**

Abstract: A new Harvard Business School working paper looks inside the

communications "black box" of a large company to understand who talks to

whom, and finds the corporate silo as impenetrable as ever. Key concepts include:

- Inside the studied company, practically speaking, little interaction occurred across

  three major corporate boundaries: business units, organizational functions, and

  office locations.

- Communication patterns were extremely hierarchical: Executives, middle

  managers, and rank-and-file employees communicated extensively within their

  own levels, but there were far fewer cross-pay-grade interactions in the firm.

- Junior executives, women, and members of the sales force were the key actors in

bridging the silos.

- Relative to men, women participate in a greater volume of electronic and face-to-face interactions and do so with a larger and more diverse set of communication partners.

- Server logs can provide valuable information to managers on communication flows within their own organizations.

Value: This article is valuable because it defines the term "silo" and also examines some ways that information is shared within organizations. This article is useful in the Problem section of the Introduction. This article defines a silo and further elaborates on how they are formed.

 *Gottieb, M. (2007). *The Matrix Organization Reloaded: Adventures in team and project management.* **Westport, CT: Praeger Publishers.**

Abstract: "Matrix management" was introduced in the 1970s in the context of competition from Japanese manufacturers, computerization of many technical and administrative tasks, and a recognition among business leaders that cross-functional teams (comprised of people from different departments and specialties) were necessary to create and produce complex products rapidly. Ideally, this approach, in which people are assigned to projects, rather than department managers, encourages collaboration, flexibility, and knowledge sharing, but in reality, it can often cause confusion, friction, and excessive bureaucracy. It fell out of fashion in the 1990s, but has resurfaced in a much wider array of companies today, as the pressure to innovate on ever-faster schedules encourages

experimentation in organizational design. Marvin Gottlieb, who has studied and applied the principles of matrix management for over 25 years, takes us on a tour of this phenomenon--its evolution, current practices, and future applications. He argues that most organizations are taking on characteristics of matrix structure, with fluid teams and "dotted-line" reporting relationships across departments and divisions. Featuring case studies of successes and failures, he shows readers how to harness the power of the matrix structure while minimizing the conflict, disorientation, and resistance that often accompany the approach. In an environment where every company--large or small, entrepreneurial or established--is wrestling with the question of how to organize for maximum performance in a harshly competitive world, this book will give leaders and managers valuable insights and tools for promoting cultures that reward creativity and teamwork while maintaining strong leadership and accountability.

Value: This book is key in defining matrix management in project work. It also discusses how matrix management fell out of favor in the 1990's and what pieces of this system have resurfaced and have been identified as effective. This article book it can't be both, can it? Above you use the term "book" is used during in the Literature Review of the Literature section of the document and examines an information sharing strategy.

*Gregg, L. (2005). Lessons learned from the brink of disaster. *Journal for Quality & Participation***, 28(1), 8-11.**

Abstract: This article chronicles the ups and downs of merging four independent workgroups into one high-performance, cross-functional team. The four departments: technical education, documentation, human performance support, and process improvement were recently brought together under the management of a new director as the story unfolds. The new manager is faced with four groups of employees with varying degrees of knowledge about the other group's jobs; mistrust of each other and management; and a mandate to transform themselves, the division, and the company. To break out of their own silos, the new team worked to blur the lines between functional groups by creating service lines. The goal was to give all employees the opportunity to learn new skills to increase flexibility in assigning people to projects and programs. The new team took on the task of evaluating how the company should operate in the face of increasing competition and shrinking margins in the industry. Senior management asked for the team's recommendations for breakthrough improvement in efficiency and effectiveness. While the concepts of measurement and continuous improvement were unfamiliar to most team members, after studying these topics the group created a framework for developing, collecting, and analyzing customer-focused measures. Eventually the team developed a balanced scorecard, completed customer satisfaction surveys, and created innovative ways to measure the effectiveness and efficiency of their processes.

Value: The idea of taking individual groups and turning them into a team is important to the topic of this literature review. This article provides many information sharing systems and provides rationale for how they are useful. The

information strategies reviewed are particular project-based organizations and appear in the Review of the Literature section.

*Hardy, C., Phillips, N., & Lawrence, T. (2003). Resources, knowledge and influence: The organizational effects of interorganizational collaboration. *Journal of Management Studies,* **40(2).**

Abstract: Inter-organizational collaboration has been linked to a range of important outcomes for collaborating organizations. The strategy literature emphasizes the way in which collaboration between organizations results in the sharing of critical resources and facilitates knowledge transfer. The learning literature argues that collaboration not only transfers existing knowledge among organizations, but also facilitates the creation of new knowledge and produce synergistic solutions. Finally, research on networks and interorganizational politics suggests that collaboration can help organizations achieve a more central and influential position in relation to other organizations. While these effects have been identified and discussed at some length, little attention has been paid to the relationship between them and the nature of the collaborations that produce them. In this paper, we present the results of a qualitative study that examines the relationship between the effects of interorganizational collaboration and the nature of the collaborations that produce them. Based on our study of the collaborative activities of a small, nongovernmental organization (NGO) in Palestine over a four-year period, we argue that two dimensions of collaboration – embeddedness and involvement – determine the potential of a collaboration to

produce one or more of these effects.

Value: This article discusses the value of information sharing as well as a study that demonstrates its effectiveness. This document informs the Review of the Literature section and helps vet the value of information sharing within information sharing systems.

Hindo, B. (2007). The Empire Strikes at Silos. *Business Week*, 4047, 63-65.

Abstract: The article explains the business model and management styles used by Lucasfilm Ltd. The organization is run by president George Lucas and chief operating officer Micheline Chau in a way that moves employees from one project to another seamlessly while still keeping them motivated. The company also depends highly on freelancers.

Value: This article is valuable because it speaks about the detriment of silos. It also provides a definition of the term "silo" from the business perspective, which is helpful. This article informs the Problem and Significance areas of the literature review.

Hobday, M. (2000). The project-based organization: an ideal form for managing complex projects and systems? *Research Policy*, 29(7), 871-893.

Abstract: This paper examines the effectiveness of producing so-called CoPS (i.e., complex high value products, systems, networks, capital goods, and constructs) in a project-based organization (PBO), as compared with a more traditional functional matrix organization. A simple model is developed to show

how the PBO relates to identified forms of matrix and functional organization and a case study is used to identify some of the strengths and weaknesses of the two organizational forms for CoPS production.

Value: This article is valuable because it shows the strengths and weakness of the project-based approach, when implemented in two different types of organizational structures: matrix and functional. This article is important to the Problem section of the Introduction as it goes into the details of a project-based organization.

*Hollings, J. (2005). Avoid information 'silos' with effective data management. *Plant Engineering*, 59(5), 61-62.

Abstract: Discusses information technology in plant engineering and maintenance. Keeping systems in step with each other during the varying phases of a project is next to impossible. Effective data management becomes critical to reducing costs and increasing the efficiency of plant operations. A backbone connecting existing systems to share information across the enterprise is the best way to manage data.

Value: This article describes sharing information through technological systems. This article is pertinent because it demonstrates the idea of technological systems as an information strategy.

* Jarvenpaa, S., & Staples, D. (2003). The use of collaborative electronic media for information sharing: an exploratory study of determinants. *The Journal of Strategic Information Systems*, 9(2-3).

Abstract: This article reports an exploratory investigation of individual perceptions of factors that underlie the use of collaborative electronic media (electronic mail, World Wide Web, list serves, and other collaborative systems) for sharing information in a large state university in Australia. The model builds on the Constant et al.'s theory of information sharing. We propose that perceptions of information culture, attitudes regarding information ownership and propensity to share, as well as task and personal factors influence people's use of collaborative media. We found that task characteristics (task interdependence), perceived information usefulness and the user's computer comfort were most strongly associated with the person's use of collaborative media. Consistent with Constant et al.'s earlier findings, views of information ownership and propensity to share were significantly related to use. Interestingly, use of electronic media for sharing information and contacting people was weakly associated with a more structured, closed information culture. This implies that heavy users and sharers want more structured information flow in place, possibly due to their need to have reliable access to other individual's knowledge and information. Contrary to suggestions in the literature, a fully open, organic information culture may not always be most desirable. Implications for knowledge managers, practitioners and researchers are suggested.

Value: This article provides an example of how sharing information within an organization needs to be structured for computer technology. This article is

referenced during the Review of Literature section under the organizing category of computer technology.

Katz, R. (1982). The Effects of Group Longevity on Project Communication and Performance. *Administrative Science Quarterly***, 81-104.**

Abstract: Research on 50 project groups in a large corporation's research and development facility examined the effect of group longevity and project characteristics on internal and external communication and project performance. Results indicate that projects became increasingly isolated, adversely affecting technical performance the longer project members had been together.

Value: This article is valuable because it discusses project success as it is tied to being increasingly isolated – in this case, due to longevity. Katz states that being isolated adversely affects projects. This is information is used in the Problem section of the Introduction.

Lewis, J., & Plas, S. (2001). *Person-centered leadership for non profit organizations: management that works in high pressure systems.* **Thousand Oaks, California: Sage Publication.**

Abstract: Non-profit organizations are well-known pressure cookers. With difficult goals, needy clientele, and under-resourced budgets, nonprofit professionals have been particularly vulnerable to issues of burnout. Person-Centered Leadership for Nonprofit Organizations describes a unique approach to

participatory management in which employees are given the same amount of attention as the product or service client. Through a case study account of an award-winning nonprofit organization, authors Jeanne Plas and Susan Lewis present evidence that this strategy may hold the key to stress reduction among staff members.

Value: This article discusses the working environment of non-profit organizations. This article is used to describe the phenomenon of how busy non-profit organizations can be. This article develops the Problem section of the Introduction.

* Li, J., Sikora, R., Shaw, M., & Woo Tan, G. (2006). A strategic analysis of inter organizational information sharing. *Decision Support Systems***, 42(1).**

Abstract: In this paper we study the effect of inter organizational information sharing systems on firm level performance under both stable as well as volatile market conditions. We use information exchange in a supply chain as a representation of inter organizational information sharing, and study five strategies for information sharing that range from minimal to near-complete information exchange. We present analytical evaluation of the relative performance of these strategies and experimental results from a proof-of-concept system. Our results show that near-complete information sharing that combines more than one type of information being shared has better performance in volatile market conditions.

Value: This article is used in the Review of Literature section. It outlines a number of information sharing systems and evaluates how effective they are.

*Martensson, A. (2006). A resource allocation matrix approach to IT management. *Information Technology and Management*, **7(1).**

Abstract: This paper draws on an interview-based study of four information intensive companies in the financial industry. The research uses a portfolio approach to the management of IT, i.e. the IT resources of a company are viewed as a portfolio. Building on different portfolio approaches and prior work on technology shifts, a resource allocation matrix is developed. The Resource Allocation Matrix frames the time perspective and proactivity of efforts. The former is operationalized by short-term and long-term perspectives, while the latter uses meeting obligations and pursuing opportunities. Resources can be allocated towards: Firefighting, Agile Action, Platform Construction and Business Transformation. The Matrix can be used both descriptively, i.e. to illustrate how IT resources are allocated within the company, and prescriptively, i.e. to actively guide the allocation of resources between different concurrent projects. The trade-off between acquiring new technologies and abandoning old technologies is one example of what can be managed using the Matrix.

Value: This article is valuable because it describes how matrix management is used in information intensive organizations. This helps describe an information sharing strategy and is utilized in the Review of the Literature section.

* Montoni, M., Miranda, R., Rocha, A., & Travassos, G. (2004). Knowledge acquisition and communities of practice. *LSO*, 30(96).

Abstract: The implementation of knowledge management mechanisms to convert individual knowledge into organizational knowledge is important to guarantee business success in the global and dynamic economy. Besides that, there is a trend in the software industry to create a consistent body of software process knowledge across different organizations through the conversion of organizational knowledge into multi-organizational knowledge. Since software organizations do not execute software processes in the same way, the creation of such a body of knowledge is a difficult task. This work presents a knowledge acquisition approach aimed to acquire organization members' knowledge and store it in a software process community of practice repository accessible through a Web based system. The application and evaluation of knowledge captured in the context of a specific organization, and reuse of such knowledge in different contexts provides the means for converting organizational knowledge into multiorganizational knowledge.

Value: This article is referenced during the Review of Literature section. It describes computer based technologies that assist in sharing knowledge across organizations.

*Pinto, M.B. , & Pinto, J.K. (1990). Project Team Communication and Cross-Functional Cooperation in New Program Development. *Journal of Product Innovation Managemen*t, 7 (3), 200-212(13).

Abstract: The importance of communication for the successful development of new projects, particularly within the R&D laboratory setting, has been well documented. Yet researchers have seldom examined the relationship between patterns of communication and cross-functional cooperation in the development and management of new programs. In this article Mary Beth and Jeffrey Pinto report on the results of a research study that assessed the relationship of two aspects of project team communication (formal versus informal modes and reason for communication) with the level of cross-functional cooperation actually achieved within a hospital project team charged with developing a new program. A total of 262 team members were surveyed from 72 hospital project teams. The results demonstrated that high cooperation teams differed from low cooperation teams both in terms of their increased use of informal methods for communication as well as their reasons for communicating. Finally, cross-functional cooperation was found to be a strong predictor of certain project outcomes.

Value: This article features the importance of communication and cross-functional cooperation in the development and management of new programs. It demonstrates an examination of the positive effects of this type of communication and shows the benefits. This is used in the Review of the Literature section as an information sharing strategy.

* Scott, J.E. (1998). Organizational Knowledge and the Intranet. *Decision Support Systems*, 3(17).

Abstract: The Intranet phenomenon has been driven by the push of technology standards and the pull of organizational need to communicate across geographic, organizational and functional barriers, and collaborate among sites and with suppliers and customers. The objective of this study is to generate a theoretical framework for the interaction between organizational knowledge and the Intranet. The contribution of this paper is 4-fold. First, we generate a theoretical framework using the paradigm model of grounded theory. We show interactions between the Intranet and three organizational knowledge strategies taking into account drivers, the context, and intervening conditions. Second, previous research on organizational knowledge creation theory is incorporated into the framework. Third, the framework forms the basis for future empirical research on the business value of the Intranet. Finally, the study raises implications for IS developers, IS departments, management and researchers.

Value: This article evidences a computer-based information sharing technology. This article and is referenced in the Review of Literature section, as well as and is used to describe the intranet.

* Shrivastiva, A. (1983). A typology of organizational learning-systems. *Journal of Management Studies,* 20(1).

Abstract: This paper synthesizes research on the organizational learning phenomenon.

The concept of organizational learning systems is proposed and developed. Learning systems are the mechanisms by which learning is perpetuated and institutionalized in organizations. Findings from an exploratory study of organizational learning are used as a basis for developing a typology of organizational learning systems.

Value: This article describes organizational learning-systems and in turn describes how these systems increase information sharing and organizational knowledge base. The systems described in this article are interpreted as information sharing systems as they extend to the organizational knowledge base. This article is used in the Review of Literature section to describe information sharing systems.

*Sills, J. (2007). Walking the Teamwork Tightrope. *Psychology Today*, 40 (4): 61-62.

    Abstract: The article focuses on the one-for-all model of management in the U.S. Every management consulting system is basically a refinement of the connective tissue of the team--getting different parts of the company to communicate, coordinate, and cross-pollinate. Whether the scale is grand or minute, success stems from the group pulling together as one, the author says. Guidelines for improving one's performance are also explained.

    Value: This article focuses on the benefits of information sharing. This article also shows that information sharing is important to project success because it is a model designed for all types of business. Also, the term cross-pollinate is utilized throughout the literature. This demonstrates an information sharing strategy.

* Wiederhold, G. (1992). Mediators in the Architechture of Future Information Systems. *IEEE Computer Magazine*, 3.

Abstract: The installation of high speed networks using optical fiber and high bandwidth message forwarding gateways is changing the physical capabilities of information systems. These capabilities must be complemented with corresponding software systems advances to obtain a real benefit. Without smart software we will gain access to more data but not improve access to the type and quality of information needed for decision making. To develop the concepts needed for future information systems we model information processing as an interaction of data and knowledge. This model provides criteria for a high level functional partitioning. These partitions are mapped into information processing modules. The modules are assigned to nodes of the distributed information systems. A central role is assigned to modules that mediate between the users workstations and data resources. Mediators contain the administrative and technical knowledge to create information needed for decision making. Software which mediates is common today but the structure the interfaces and implementations vary greatly so that automation of integration is awkward. By formalizing and implementing mediation we establish a partitioned information systems architecture which is of manageable complexity and can deliver much of the power that technology puts into our reach. The partitions and modules map into the powerful distributed hardware that is becoming available We refer to the modules that perform these services in a sharable and composable way as mediators. We will present conceptual requirements that must be placed on mediators to assure effective large scale information systems. The

modularity in this architecture is not only a goal but also enables the goal to be reached since these systems will need autonomous modules to permit growth and enable them to survive in a rapidly changing world. The intent of this paper is to provide a conceptual framework for many distinct efforts. The concepts provide a direction for an information processing systems in the foreseeable future. We also indicate some sub tasks that are of research concern to us. In the long range the experience gathered by diverse efforts may lead to a new layer of high level communication standards.

Value: This article is utilized in the Review of Literature section. It explains how databases assist in the sharing of information and can have a positive effect on knowledge management.

Williams, T. (2008). How do organizations learn lessons from projects—and do they? *IEEE Transactions on Engineering Management*, **Vol 55(2).**

Abstract: The need to learn from one project to the next is clearly of vital importance, but is often neglected. Furthermore, there are fundamental issues within projects that inhibit such learning, such as the temporary nature of project organizations and the fundamental complexity of projects. This paper surveys the diverse literature that can help explain these factors and help projects to learn, and describes a large survey of project managers to look at what actual practice is and how successful it is perceived, as well as some empirical work. From this, a number of general conclusions are drawn as to how to create project organizations

that are learning organizations.

Value: This article articulates how project managers may be more successful if they are able to learn from each other. This article is used in the Problem section of the Introduction.

Review of Literature

The purpose of this literature review is to examine information sharing systems that can be used in a project-oriented non-profit organization to successfully expand the organizational knowledge base (Brensen, Goussevskaia & Swan, 2004), resulting in the potential to deconstruct project silos.

The information sharing systems examined within this Review of Literature section include group decision support strategies, databases and computer based technologies. These strategies purportedly improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals (Constant, Keisler, & Sproull, 1994). Selected information sharing systems are described in detail and include further description of how they might be incorporated into a nonprofit organization.

The Review of Literature is presented in three parts. The first part includes an explanation of the context of the study, including a description of small non-profit organizations and the condition known as silos. The explanation includes the definition of a small nonprofit organization and explains how corporate silos form in this type of environment. To add to the context, a brief summary of specific limitations is presented. Part two identifies information sharing systems and aligns them with one of the three pre-selected organizing categories presented in table format. Lastly, Part three of the Review

of Literature provides a more detailed discussion of the three general information sharing

systems of group decision support systems, computer-based system and database

systems. Each description is approximately three hundred words and includes an

explanation of how each of the three sets of strategies as a whole might be implemented

in a small nonprofit organization as a way to expand the knowledge base.

Part I: Explanation of a Project-Based Nonprofit Organization Context

According to Curran (2002), today's nonprofit organizations require creativity and

innovation on the part of all staff to run effectively. This type of organization, especially

one that is project-based, cannot flourish within a silo structure (Brensen, Goussevskiaia,

& Swan, 2004). However, nonprofit organizations often form corporate and project silos

because it is more comfortable for managers, as they work under tight deadlines leaving

little time to support information sharing (Curran, 2002). In addition, there are many

other disadvantages to non-profit organizations silos, including the feeling among staff

that they are consistently reinventing the wheel, lack of ability among staff to get help

when they need it, and absence of a sense of the "big picture", or project goals, within the

organization as a whole (Curran, 2002).

Burns and Wholey (1993) conclude that nonprofit project-based organizations with

diverse client demands often seek information sharing systems in an attempt to

deconstruct project silos. These information sharing systems allow expansion of the

organizational knowledge based, which in turn tends to mitigate the feeling encountered

by many nonprofit staff that they are always reinventing the wheel (Curran, 2002). These

information sharing systems also ensure that project-based nonprofit organizations that

constantly change and shift organizational terrain do not lose the ability to share

information (Brensen, Goussevska, & Swan, 2004).

This study focuses on interorganizational information sharing systems, or those that can

facilitate cross-communication within an organization (Hobday, 2000). Such information

sharing systems support organizational success and do not address interpersonal

information sharing systems. While interpersonal information sharing systems might be

valuable to nonprofit organizations, they are not included in this Review of Literature.

Part II: Brief Summary of Individual Information Sharing Strategies

Table 3 summarizes the individual information sharing systems identified during

conceptual analysis, presented within the three pre-selected organizing categories. Within

each of the three categories, examples of various information sharing systems are

identified with a brief description of each included. Once the set of references was coded,

it became evident that more references center on group decision support systems (5) and

less on computer-based systems (3) and database systems (2). While there are more group

decision support based strategies discussed in the literature, database systems and

computer-based systems are still important information sharing systems for nonprofit

organizations.

Interorganizational Information Sharing Strategies
Category 1: Group Decision Support Systems

Dashboards-Project managers define project success criteria via weekly meetings with their teams. Each week the success criteria shifts to the changing needs of the project. Teams are scored on their performance and the scores are shared throughout the organization each week as a way to both monitor progress and correct course of action (Brensen, Goussevkia, & Swan, 2004).

Matrix management-Roles are developed similar to that of a project manager, in order to provide coordination across all functional departments(Burns & Wholey, 1993). These project managers work both vertically and horizontally within an organizational hierarchy (Curran, 2002).

Network model-Teams are assigned by task and employees can be placed on various teams. An individual may lead one team and be a subordinate on another (Curran, 2002).

Organizational learning-A series of interactions between adaptation at the individual or sub-group level and adaptation at the organizational level. The adaptation occurs due to a variety of stresses which create sub-system learning and total system learning separately and together (Shrivastava, 1983).

Project management method-Management method where specialists from various functional areas across the organization form various ad hoc project teams from inception to completion of projects for which they are wholly responsible (Johns, 1998).

Category 2: Computer-based Systems

CrossFlow-Linked workflow systems allow one project to start a project and receive project results, then hand them off to another project electronically (Aberer et. al, 2000).

Intranet systems—Technology used to share organizational information or operational systems with employees (Scott, 1998).

Knowledge acquisition process—Computer-based system that supports access and reuse of information acquired from employees across an organization (Montoni et. al, 2004).

Interorganizational Information Sharing Strategies
Category 3: Database Systems
Information lens- Labels all organizational information and actions within a database so it can be easily extracted by a data analyst and reviewed by experts to make decisions (Lo, Shaw, & Tan, 2005). *Mediation*—Filing all system actions and information regarding an organization within a database. These actions are then retrieved at any time for analysis by data analysts (Wiederhold, 1992).

Table 3: Interorganizational information sharing systems overview

Part III: Information Sharing Strategy Categories in Relation to Expanding the

Knowledge Base

Group Decision Support Systems: Curran (2002) describes group decision support

systems as a management style. This management style creates an environment through

which different groups of people within an organization can learn together and work

toward acquiring the skills and know-how to reach their goals (Curran, 2002). Burns and

Wholey (1993) find that this management style is often adopted by organizations looking

for ways to quickly disseminate information by having employees work together either

across departments or in groups.

Burns and Wholey (1993) establish that matrix management promotes team-oriented

arrangements that coordinate multidisciplinary activities across functional areas, thus,

increasing participation in decision-making and the sharing of knowledge (Burns &

Wholey, 1993). Within matrix management, Burns and Wholey (1993) find that roles are

developed similar to that of a project manager, in order to provide coordination across all

functional departments. These project managers work both vertically and horizontally within an organizational hierarchy (Curran, 2002). Burns and Wholey (1993) conclude that these systems support a fast paced work environment because they allow management to improve utilization of personnel, better integrate personnel and functions and help increase control in the face of increasingly complex projects.

Brensen, Goussevkia, and Swan (2004) identify dashboards as a group support based system that allows for interorganizational communication. Dashboards requires that project managers define project success criteria via weekly meetings with their teams. Each week the success criteria shifts to the changing needs of the project. Teams are scored on their performance and the scores are shared throughout the organization each week as a way to both monitor progress and correct course of action (Brensen, Goussevkia & Swan, 2004). Brensen, Goussevkia, and Swan (2004) state that to implement dashboards, project managers need a formal introduction to the tool so they are aware of the tool's parameters. They also suggest that once project managers are trained, they are allowed a three-month trial period within their project and they are provided support by paid consultants (Brensen, Goussevkia, & Swan, 2004). Brensen, Goussevkia and Swan (2004) find that in order for dashboards to be successful, it is important that project managers continue to utilize the tool consistently across the organization. This information sharing method formalizes planning processes and helps project managers identify future problems (Brensen, Goussevkia, & Swan, 2004).

Curran (2002) concludes that the network model develops an organizational structure in

which the entire organization works in teams. In this model, teams are assigned by task and employees can be placed on various teams where an individual may lead one team and be a subordinate on another (Curran, 2002). Burns and Wholey (1993) find that the network model is adopted initially by having a strong organizational department develop the network design and implement it. Once the network model is in place for the first department it is developed across others. Burns and Wholey (1993) conclude that the network model brings news of innovations, support for adoption, helpful hints regarding implementation, and social support for encouraging change.

Johns (1998) identifies the project management method as a way to successfully share interorganizational information. With this method, specialists from various functional areas across the organization form various ad hoc project teams from inception to completion of projects for which they are wholey responsible (Johns, 1998). For the project management method to be successful, Johns (1998) finds that organizations must ensure each project team member adhere to specific activities. These activities are found below in Table 4.

Management Method Activities
• Understand the scope and priorities of the project • Clarify the authority of functional support areas of the project • Communicate regularly with project team members to solve problems • Solicit feedback from all team members • Encourage team members to complete assignments and remain active

Table 4: Management Method Project Team Activities

Johns (1998) concludes that the project method allows managers to successfully complete projects while keeping an organization as centralized as possible. In this way, silos of independence are not formed because the structure in designed in a wat that all employees work together (Johns, 1998).

Shrivasta (1983) names organizational learning as a group decision based system. Organizational learning is a series of interactions between adaptation at the individual or sub-group level and adaptation at the organizational level. Shrivasta (1983) believes that for adaption to occur, one project team must experience something new and create procedures on how to handle the new event. These procedures can then be utilized elsewhere in the organization as similar experiences occur (Shrivasta (1983). Shrivasta (1983) finds that in order for organizational learning to deconstruct project silos, four specific phases must be utilized. These four phases include: organizational learning as adaptation, organizational learning as assumption sharing, organizational learning as

developing knowledge of action-outcome relationships and organizational learning as an institutional experience. Table five below outlines the different phases of organizational learning and how they are adapted within an organization.

Phase	Adaptation of Phase
Organizational learning as adaptation	Project teams have experiences while working on a project. During this experience, procedures and rules are created (Shrivasta, 1983).
Organizational learning as assumption sharing	Once rules are created, they are then adapted to fit new projects based on staff interpretation (Shrivasta, 1983).
Phase	Adaptation of Phase
Organizational learning as developing knowledge of action-outcome relationships	As the new project unfolds, the procedures and rules are improved upon (Shrivasta, 1983).
Organizational learning as an institutional experience	Managers begin to use project procedures and rules to make critical organizational decisions (Shrivasta, 1983).

Table 5: Organizational Learning Phases from Shrivasta (1983)

Shrivasta (1983) finds that organizational learning is linked with experience that the organization possesses. As such, Shrivasta (1983) finds that organizational learning occurs at all levels within an organization and allows management to utilize all experiences in future decisions, thus deconstructing project silos as all employee experience is considered when institutional decisions are made (Shrivasta, 1983).

Wittenbaum et. al (2004) conclude that there are a number of factors that create the best possible group decision support system environments. These factors include ample amount of time for discussion among groups, a group larger than three people, and

having people within groups play various parts such as group leader and facilitator (Wittenbaum et. al, 2004). Burns and Wholey (1993) go on that strong leadership is imperative to group based decisions support systems. If management does not create and support these information sharing systems, information sharing will be abandoned (Burns & Wholey, 1993).

Computer-based Systems: Montoni et. al (2004) find that organizations should promote the exchange of information through computer-based systems. Computer-based information sharing systems support an organization by having the ability to collect experiences about project planning, risk management and other organizational functions in the same place (Montoni et. al, 2004). Li et. al (2006) find that computer-based systems aid organizations in meeting the need to share information efficiently.

Montoni et. al (2004) find that one effective computer-based system is the knowledge acquisition process. The knowledge acquisition process supports the access and reuse of information acquired from employees across an organization (Montoni et. al, 2004). Individual information about best practices, past experiences and other organizational members can be obtained through the acquisition process (Miranda et. al, 2004). Montoni et. al (2004) continue that to successfully complete the knowledge acquisition process, an organization must structure and organize organizational knowledge from one source so it can shared with others through software. Lo et. al (2005) state that once information is extracted, it is entered into a computer-based system. This system is then decentralized so that each member of an organization can connect directly with the computer-based

information through their personal computers (Lo et. al, 2005). Intelligent agents within a computer-based system then present information in a clear and concise way that can improve the efficient exchange of information (Lo et. al, 2005).

Intranet systems are identified by Scott (1998) as another form of computer-based information system. Intranet systems are technologies used to share organizational information or operational systems with employees (Scott, 1998). Scott (1998) goes on that an intranet is a powerful tool for organizational communication, collaborative projects, and the establishment of a sense of community, because it supports systems integration, information legacy systems, and use of hypertext documents (Scott, 1998).

Aberer et al. (2000) name CrossFlow as another computer-based support system that can be successfully implemented by nonprofit organizations. Aberer et al. (2000) describe CrossFlow as linked workflow systems allow one project to start a project and receive project results, then hand them off to another project electronically. CrossFlow develops information technology for advanced process support in project organizations (Aberer et al., 2000). Processes are created within a system that allow project staff to map internal processes and allow management to understand the sequence of events for monitoring purposes and make decisions based on the knowledge (Aberer et al., 2000). CrossFlow consists of four distinct phases that allow for information sharing success (Aberer et al., 2000). These phases as described by Aberer et al. (2000) are presented in Table 6 below.

CrossFlow Phases for Organizations
• Establish the project scope of work • Work with programmers to configure a system to support the scope of work • Enact the system • As the project continues, continue to refine the system so it can be shared with   other projects

Table 6: CrossFlow Phases for Organizations

Aberer et al. (2000) find that CrossFlow supports interorganizational workflow. This is

done through organizational cooperation and the establishment of project processes and

monitoring systems (Aberer et al., 2000). They also find that to successfully implement a

computer-based system, an organization must create clear organizational policy regarding

how the system is to be used. The policy that is created must describe what types of

information need to be shared within the system (Arber et al., 2000). Buara (2007) adds

that senior management must foster an environment of cooperation and reciprocity to

support the computer based technology.

Database Systems: Brobst et al. (1990) define database systems as techniques that use

both artificial design and user interface design to help solve the work problems caused by

lack of information that is known elsewhere in the organization. Wiederhold (1992) states

that database systems allow organizations the possibility to access and analyze data like never before. Wiederhold (1992) continues that in manual information sharing systems the decision maker must have assistance from staff and colleagues to prepare summarizations and documentation. With the use of database systems, the decision maker can easily find information and use staff and colleagues to provide insight on the data as opposed to spending time formatting it (Weiderhold, 1992). Database systems allow organizations to share pertinent data as opposed to raw data, thus expanding the knowledge base (Chan & Stolfo, 1995).

One common database system information sharing method is identified by Brobst et. al (1990) as the information lens. Brobst et al. (1990) define the Information Lens as the sending of information via semi-structured templates. These templates both prioritize the importance of a message to any person within an organization and embed structured queries inside a message in a way that makes them easily accessible to the user (Brobst et al., 1990). Brobst et al. (1990) go on to state that through the use of semi-structured templates (artificial intelligence), information is automatically filtered for the user by importance. Wiederhold (1992) states that once a user has a message with the correct data already embedded, they are more able to provide insight and make informed decisions, instead of making decisions without the aid of organizational information.

Another frequently used database system identified by Wiederhold (1992) is mediation. Mediation is a database filing system that stores all actions and information regarding an organization within a database (Wiederhold, 1992). Once the information is stored within

the database, it can be shared horizontally across an organization (Weiderhold, 1992).

Brobst, et. al (1990) find that database information can then be found using queries and

if/then factors. Once information is found within the database, it can be utilized by team

members (Wiederhold, 1992). Wiederhold (1992) states that information can be found

within the database and shared using programs such as SQL and RDA. Chan and Stolfo

(1995) add that mediation can also be used to see common patterns across an

organization.

Weiderhold (1992) finds that in order to implement a database system like Information

Lens or mediation within an organization, specialists need to be employed to manage the

data and database(s). These specialists create the semi-structured message templates and

queries to ensure that all data pulled from the system and sent is relevant to the person

receiving it (Weiderhold, 1992). Chan and Stolfo (1995) further conclude that specialists

can help create databases that allow for data to be shared across different servers within

an organization, thus decentralizing information across an organization and

deconstructing project silos.

Conclusion

Gilbert (2008) states that "although many companies aspire to promote easy interaction and coordination across departments, the corporate silo is still alive and well" (p. 1). However, according to Brensen, Gussevskaia, and Swan (2004), implementing information sharing stratetgies can aid nonprofit organizations successfully expand the organizational knowledge base , resulting in the potential to deconstruct project silos.

Anheier and Seibel (1990) find that the way nonprofit organizations use their distinctive mechanisms of interorganizational communication may affect the outcome of their work (Anheier & Seibel, 1990). Because nonprofit project based organizations rely so heavily on information sharing systems, it it imperative that they are part of an organization (Anheier & Seibel, 1990).

Hollings notes that there are both organizational and employee benefits to be gained from information sharing and believes that employing information sharing systems can help mitigate project silos. Constant, Kiesler, and Sproull (1994) state that employees benefit from being able to show off their expertise and feel proud that they are part of an organization. Organizationally, Phillips, Mannix, Neale, and Gruenfeld (2003) find that information sharing assists in converting inaccurate opinions into accurate solutions and assists in integrating information instead of just aggregating opinions. Montoni, Miranda, Rocha, and Travassos (2004) determine that information sharing enhances the organizational knowledge base and) conclude that an organizational knowledge base is

important to guarantee a successful business.

The information sharing systems examined in this document include computer-based systems, database systems and group decision support systems designed to improve organizational efficiency, learning, innovation, flexibility and understanding of organizational goals (Constant, Keisler, & Sproull, 1994). By expanding the organizational knowledge base, these systems work to deconstruct project silos in nonprofit organizations (Gilbert, 2008). Strategies selected reflect the needs of project managers, executives and middle managers who are interested in learning about various information sharing systems and how they can positively affect communication of organizational knowledge among staff in project-based non-profit organizations.

Computer-based information sharing systems support an organization by having the ability to collect experiences about project planning, risk management and other organizational functions in the same place (Montoni et al., 2004). Systems identified in this review of literature include: intranet systems, the knowledge acquisition process and CrossFlow. Intranet systems share organizational information or operational systems with employees (Scott, 1998). The knowledge acquisition process supports access and reuse of information acquired from employees across an organization (Montoni et al., 2004). CrossFlow is a computer-based system that allows one organizational team to start a project and receive project results, then hand them off to another organizational team electronically (Aberer et al., 2000).

Database systems are defined as techniques that use both artificial design and user interface design to help solve the problems that tend to occur similarly across the workplace (Brobst et al., 1990). Database systems allow organizations to share pertinent data as opposed to raw data, thus expanding the knowledge base (Chan & Stolfo, 1995). Database systems examined in this document include information lens and mediation. The information lens labels all organizational information and actions within a database so it can be easily extracted by a data analyst and reviewed by experts to make decisions (Lo, Shaw, & Tan, 2005). Mediation entails filing all system actions and information regarding an organization within a database. These actions are then retrieved at any time for analysis by data analysts (Wiederhold, 1992).

Group decision support systems is a management style that creates an environment through which different groups of people within an organization can learn together and work toward acquiring the skills and know-how to reach their goals (Curran, 2002). The group decision support systems examined in this document are matrix management, dashboards, the network model, project management method, and organizational learning. Matrix management provides coordination across all functional departments (Burns & Wholey, 1993). Project managers work both vertically and horizontally within an organizational hierarchy (Curran, 2002). By applying dashboards, project managers define project success criteria via weekly meetings with their teams. Teams are scored on their performance and the scores are shared throughout the organization each week as a way to both monitor progress and correct course of action (Brensen, Goussevkia, & Swan, 2004). Within the Project management method, specialists from various functional

areas across the organization form various ad hoc project teams from inception to completion of projects for which they are wholly responsible (Johns, 1998). A series of interactions is planned between adaptation at the individual or sub-group level and adaptation at the organizational level.

Each information sharing strategy idenfied in this literature review can be implemented in nonprofit project-based organizations (Johns, 1998). To successfully accomplish the implementation of an information sharing system, nonprofit organizations must have organizational support (Johns, 1998). Johns (1998) explains that while some managers feel that project silos are too difficult to establish, nonprofit organizations that deconstruct project silos maintain a higher performance level. Given appropriate management support, information sharing systems help organizations attain this higher performance level (Johns, 1998).

Brensen, et al. (2004) find that there are a number of ways for a nonprofit project-based organization to be successful. Some of these ways include decentralization, the short-term emphasis on project performance and distributed work practices, all which have an important impact on information sharing in a nonprofit organization (Brensen et al., 2004).

A project-based nonprofit organization must fulfill the needs of many different stakeholders (Curran, 2002). Funders, Board of Directors, and contractors name just a few of the stakeholders that must be satisfied with the work of any given project based nonprofit organization (Curran, 2002). Curran (2002) states that all employees must work

together in order to ensure organizational success and that project teams cannot work in

silos. For nonprofits to break free from project silos, they must incorporate information

sharing systems (Curran, 2002).

References

Aberer, K., Grefen, J., Hoffner, Y., & Ludwig, H. (2000). CrossFlow: Cross-organizational workflow management in dynamic virtual enterprises. *ACM SIGecom Exchanges,* 2(1).

Albrecht, K. (2003). AMA Offers Advice on "Living with Silos." *American Management Association.*

Anheiner, H. K., & Salamon, L. M. (1997). *Defining the Nonprofit Sector: A Cross-national Analysis.* New York: Manchester University Press.

Anheier, H. K., & Seibel, W. (1990). *The Third Sector: Comparative studies of nonprofit organizations*. New York: Walter de Gruyter.

Beers, M. C., Davenport, T. H., & Long, D.W. (1998). Successful knowledge management projects. *Sloan Management Review*, 12.

Bitting, D., Carter, C., & Ghorbani, R. (2002). Reputation formalizing for an information-system multi-agent system. *Computational Intelligence,* 18(4).

Blacklar, F. (1995). Knowledge, knowledge work and organizations: An overview and interpretation. *Organization Studies,* 16 (6).

Bleakley, A., Boyden, J., Hobbs, J., Walsh, L., & Llard, J. (2006). Improving teamwork climate in operating theatres: The shift from multiprofessionalism to interprofessionalism. *Journal of Interprofessional Care*, 20(5), 461-470.

Bloodgood, J. M., & Salisbury, W. D. (2001). Understanding the influence of organizational change strategies on information technology and knowledge management strategies. *Decision Support Systems*, 31(55).

Borgotti, S. P., Cross, R., Parker, A., & Prusak, L. (2001). Knowing what we know:

    Supporting knowledge creation and sharing in social networks. *Organizational*

    Dynamics, 30(3), 100.

Botero, I. C., Hollingshead, A.B., & Wittenbaum, G. M. (2004). From cooperative to

    motivated information sharing groups: moving beyond the hidden profile paradigm.

    Communication Monographs, Vol. 71 (3), 286-310.

Boura, J. A., Ravindran, K., &Whinston, A. B. (2007). Enabling information sharing

    within organizations. *Information Technology Management*, Vol. 45 (10).

Brobst, M. D., Grant, K. R., Malone, T. W., & Turbak, F.A. (1986). Intelligent

    Information Sharing Systems. *Communication of the ACM*, 10.

Brown, J.S., & Cook, S.D. (1999). Bridging Epistemologies: The generative dance

    between organizational knowledge and organizational knowledge. *Organization*

    Science, 10(4).

Brensen, M., Goussevskaia, A., & Swan, J. (2004). Embedding new management

    knowledge in project-based organizations. *Organization Studies*, 25.

Burk, M. (1999) Knowledge management: Everyone benefits by sharing information.

    Public Roads, 63(3), 1.

Burns, L.R. (1989). Matrix management in hospitals: Testing theories of matrix structure

    and development. *Administrative Science Quarterly*, 34, 349-368.

Burns, L., & Wholey, D. (1993). Adoption and abandonment of matrix management

    programs: Effects of organizational characteristics and interorganizational

    networks. *The Academy of Management Journal*, 36(1), 106-138.

Busch, C. De Maret, P. S., Flynn, T. Kellum, R., Le, S., Meyers, B., Saunders, M., White, R., & Palmquist, M. (2005). *Content Analysis*. Writing@CSU. Colorado State University Department of English. Retrieved November 26, 2008 from http://writing.colostate.edu/guides/research/content/

Cartsen, K., Dreu, W., & Vaart, D. (2001). Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior. *Journal of Organizational Behavior.*

Constant, C. R., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *The Institute of Management Sciences,* 5.

Curran, C. (2002). The myth of equality in flatline organizations. *OD Practitioner*, 34 (4).

Davenport, E., & Hall, H. (2002). Communities of practice and organizational knowledge. In B. Cronin (Ed.) *Annual Review of Information Science and Technology*, 36.

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

Dyer, J., & Singh, H. (1998). The relational view: cooperative strategies and sources of interorganizational competitive advantage. *Academy of Management Review*, 23 (4), 660–79.

Ghoshal, S., & Barlett, C. A. (1990). Matrix management: not a structure, a frame of mind. *Harvard Business Review*, 68(4), 138-45.

Gilbert, S. (2008). The silo lives! Analyzing coordination and communication in

multiunit companies. *Harvard Business School: Working Knowledge*, 47(3).

Gottieb, M. (2007). *The Matrix Organization Reloaded: Adventures in team and project*

management. Westport, CT: Praeger Publishers.

Gray, B. (1989). *Collaborating: Finding common ground for multiparty problems*. San

Francisco: Jossey- Bass.

Gregg, L. (2005). Lessons learned from the brink of disaster. *Journal for Quality &*

Participation, 28(1), 8-11.

Grimes, G. (2007). *Information Sharing Strategy*. Department of Defense, USA.

Hall, P. (2005). Interprofessional teamwork: Professional cultures as barriers. *Journal of*

Interprofessional Care, 19(1).

Hampson, K., & Walker, D. (2003). *Procurement Strategies: A Relationship Based*

Approach. New Jersey: Blackwell Publishing.

Hardy, C., Phillips, N., & Lawrence, T. (2003). Resources, knowledge and influence: The

organizational effects of interorganizational collaboration. *Journal of Management*

Studies, 40(2).

Hindo, B. (2007). The empire strikes at silos. *Business Week*, 4047, 63-65.

Hobday, M. (2000). The project-based organization: an ideal form for managing complex

projects and systems? *Research Policy*, 29(7), 871-893.

Hollings, J. (2005). Avoid information 'silos' with effective data management. *Plant*

Engineering, 59(5), 61-62.

Huang, K., & Wang, Y. (1999). *Quality Information and Knowledge*. Prentice Hall: New

    Jersey.

Jarvenpaa, S., & Staples, D. (2003). The use of collaborative electronic media for

    information sharing: an exploratory study of determinants. *The Journal of*

    Strategic Information Systems, 9(2-3).

Jones, P. (1989). Knowledge Acquisition. *Knowledge Engineering in Agriculture*, 8.

Johns, T. (1998). On creating organizational support for the project management method.

    International Journal of Project Management, 17(1).

Katz, R. (1982). The Effects of Group Longevity on Project Communication and

    Performance. *Administrative Science Quarterly*, 81-104.

Kidwell, J., Linde, K., & Johnson, S. (2000). Applying corporate knowledge management

    practices in higher education. *Educase Quarterly,* 4.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical Research.* Upper Saddle River, NJ:

    Pearson Education.

Lewis, J., & Plas, S. (2001). *Person-centered leadership for non profit organizations:*

    management that works in high pressure systems. Thousand Oaks, California: Sage

    Publication.

Li, J., Sikora, R., Shaw, M., & Woo Tan, G. (2006). A strategic analysis of inter

    organizational information sharing. *Decision Support Systems*, 42(1).

Literature Reviews. University of North Carolina. Retrieved November 28, 2008 from:

    www.unc.edu/depts/wcweb/handouts/literature_review.html

Martensson, A. (2006). A resource allocation matrix approach to IT management.

    Information Technology and Management, 7(1).

Montoni, M., Miranda, R., Rocha, A., & Travassos, G. (2004). Knowledge acquisition

and communities of practice. *LSO*, 30(96).

Obenzinger, H. (2005). *What can a literature review do for me?* Retrieved December 9,

2008, from Stanford University:

http://ual.stanford.edu/pdf/uar_literaturereviewhandout.pdf

Phillips, K. W., Mannix, E. A., Neale, M. A., & Gruenfeld, D. H. (2003). Diverse groups

information sharing: the effects of congruent ties. *Journal of Experimental Social

Psychology*, 40.

Pinto, M., & Pinto, J. (1990). Project team communication and cross-functional

cooperation in new program development. *Journal of Product Innovation

Managemen*t, 7(3), 200-212(13).

Martensson, A. (2006). A resource allocation matrix approach to IT management.

Information Technology and Management, 7(1).

Morhman, S. (1999). The Context for Geographically Dispersed Teams and Networks.

Trends in Organizational Behavior, 21.

Morris, P W. G. (1997). *The Management of Projects,* 2nd edition. London: Thomas

Telford.

Rapple, D. (n.d.). *How do I Write a Literature Review?* Boston College. Retrieved

November 29, 2008 from:

http://libguides.bc.edu/print_content.php?pid=1194&sid=4957&mode=g

Scott, J.E. (1998). Organizational Knowledge and the Intranet. *Decision Support Systems*,

3(17).

Seeger, M., Sellnow, T., & Ulmer, R. (2003). *Communication and Organizational Crisis.* Massachusetts: Greenwood Publishing Group.

Salls, M. (2005). How organizations create social value. *Harvard Business School: Working Knowledge*, 24(12).

Shrivastiva, A. (1983). A typology of organizational learning-systems. *Journal of Management Studies,* 20(1).

Sills, J. (2007). Walking the Teamwork Tightrope. *Psychology Today*, 40 (4), 61-62.

Smith, T. (2008). *Critical evaluation of information sources*. University of Oregon libraries. Retrieved December 4, 2008 from:

http://libweb.uoregon.edu/guides/findarticles/credibility.html

Walker, D. (2003). Procurement strategies: A relationship-based approach. *Implications of Human Capital Issues*, 258-95.

Wiederhold, G. (1992). Mediators in the Architechture of Future Information Systems. *IEEE Computer Magazine*, 3.

Williams, T. (2008). How do organizations learn lessons from projects—and do they? *IEEE Transactions on Engineering Management*, Vol 55(2).

Zillman, M. (2008). *Academic and scholar search engines and sources: An internet miniguide annotated link compilation*. Retrieved December 2, 2008 from:

www.ScholarSearchEngines.com/zillman@virtualprivatelibrary.com