

Organizational Memory and Project Development:
A Case Study Examining How a Small Business Uses Its Organizational Memory
When Making Project Development Decisions

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Dedication

To Ed - You are truly my better half. I love and admire you. This degree is as much yours as it is mine.

To the Berridge cats - You saw the whole thing and loved me anyway. Thank you, my furry supervisors.

Acknowledgments

I once heard a researcher say that the best site for research is the one that allows you in. My research site did much more than just allow me in; they welcomed me and helped me in any way that they could. Without them, this research would not have been possible. I am very grateful for their support.

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Abstract of the Dissertation

Organizational Memory and Project Development: A Case Study Examining How a Small Business Uses Its Organizational Memory When Making Project Development Decisions

The goal of this research was to explore the structure and functions of the organizational memory of a small, privately held, for-profit energy consulting and engineering firm, focusing on the use of organizational memory in project development decisions. A secondary focus was the role of technology in this process. At the time of this study, the company had been in business for over 25 years and had begun to contemplate its future without its founder.

Using a case study design, the structure of organizational memory was analyzed based on frameworks developed by Walsh and Ungson (1991) and Olivera (1999, 2000). The Walsh and Ungson (1991) framework, with its emphasis on the storage of organizational memory, provided a starting point for the analysis of the structure of organizational memory. The Olivera (1999, 2000) framework expanded the organizational memory structure discussion by suggesting a dynamic, evolving system of organizational memory, as opposed to the static, separate storage bins proposed by Walsh and Ungson (1991). Olivera's organizational memory systems framework (1999, 2000) was also used to understand the functions of organizational memory.

Through this study, practitioners may gain an appreciation of how, why, and when the past influences the present (Birkinshaw & Sheehan, 2002; Brown & Duguid, 2000; Fisher & White, 2000; Hansen, Nohria, & Tierney, 1999; Kantrow et al., 1986; Storck & Hill, 2000; Swan, Scarborough, & Newell, 2010) in a small business setting. This may include an increased understanding of the influence of organizational memory

on the day-to-day life of a small business as it makes decisions (Brown & Duguid, 2000; Fiedler & Welppe, 2010; Hansen et al., 1999; Kantrow et al., 1986). Practitioners may also gain a better understanding of what is lost to an organization and its memory when employees leave, either voluntarily or involuntarily, taking not only their experiential knowledge (Aiman-Smith, Bergey, Cantwell, & Doran, 2006; Martin de Holan, Phillips, & Lawrence, 2004; Myers & Dreachslin, 2007), but also disrupting unseen social networks (Aiman-Smith et al., 2006; Fisher & White, 2000; Parise, Cross, & Davenport, 2006) and the flow of social capital (Massingham, 2008).

Table of Contents

| | <u>Page</u> |
|---|-------------|
| Dedication | iii |
| Acknowledgments | iv |
| Abstract of the Dissertation | vi |
| List of Figures..... | xiii |
| List of Tables | xiv |
| | |
| CHAPTER 1: INTRODUCTION..... | 1 |
| Problem Statement | 3 |
| Purpose of the Study | 7 |
| Research Questions..... | 9 |
| Significance of the Research..... | 10 |
| Conceptual Framework..... | 11 |
| Methodology..... | 14 |
| Limitations of the Study..... | 17 |
| Definitions..... | 18 |
| | |
| CHAPTER 2: LITERATURE REVIEW | 22 |
| Theoretical Foundation: Organizational Learning..... | 23 |
| Organizational Memory: Walsh and Ungson’s Model | 24 |
| Citation Analysis of Walsh and Ungson’s Model..... | 26 |
| Criticism of Walsh and Ungson’s Model..... | 27 |
| Organizational Memory: Olivera’s Model..... | 27 |

| | |
|---|-----------|
| Issues in Organizational Memory | 28 |
| Technology..... | 28 |
| Relevance and Usefulness..... | 30 |
| Personal Interactions | 32 |
| Employee Exploitation and Turnover | 34 |
| Power | 35 |
| Organizational Memory Functions and Their Relation to Structure | 35 |
| The Current Status of Organizational Memory Research..... | 37 |
| Context for This Study: Small, Privately Held Businesses..... | 38 |
| Chapter Summary | 39 |
| CHAPTER 3: METHODS | 41 |
| Research Questions..... | 41 |
| Justification for the Use of Case Study Methodology | 42 |
| Description of the Organization..... | 43 |
| Description of Project A and Project B..... | 46 |
| Methods for Data Collection..... | 47 |
| Interviews..... | 47 |
| Document Analysis | 50 |
| Observations..... | 50 |
| Methods for Data Analysis | 52 |
| Trustworthiness and Validity..... | 54 |
| Ethical Concerns | 57 |

| | |
|--|-----------|
| CHAPTER 4: FINDINGS | 58 |
| Brief Review of the Purpose of the Research and Conceptual Framework..... | 59 |
| Narrative of Projects A and B..... | 60 |
| Project A..... | 60 |
| Project B..... | 65 |
| The Structure of Organizational Memory..... | 68 |
| The Existing Company Database System | 70 |
| The Planned Implementation of an ERP System | 71 |
| Project A: Structure..... | 72 |
| Project B: Structure | 78 |
| All Projects: Use of Pointer and Substantive Information | 81 |
| Section Summary | 84 |
| The Processes of Storage and Retrieval of Organizational Memory..... | 84 |
| Project A: Process | 85 |
| Project B: Process | 86 |
| Other Examples of Storage and Retrieval of Project Development Knowledge | 87 |
| Capturing and storing best practices | 87 |
| RFPs as a source of project development knowledge | 89 |
| The existing database system and standalone databases..... | 90 |
| The Internet | 91 |
| Interactions with coworkers: in person, by phone, and electronically | 92 |
| Processes for storing organizational knowledge | 94 |
| Section Summary | 96 |

| | |
|---|------------|
| The Functions of Organizational Memory in Project Development Decision-Making.... | 96 |
| Relationship Between Structure and Functions of Organizational Memory | 98 |
| Section Summary | 104 |
| Additional Finding: The Role of the Founder..... | 105 |
| Chapter Summary | 107 |
| | |
| CHAPTER 5: INTERPRETATIONS, RECOMMENDATIONS, AND | |
| CONCLUSIONS | 109 |
| Significant Findings and Their Interpretation..... | 110 |
| The Structure of Organizational Memory | 110 |
| Sharing individual memories | 111 |
| Technology and the interaction of organization members with technology | 113 |
| Processes for the Storage and Retrieval of Organizational Memory During Project | |
| Development Decision Making..... | 118 |
| The Relationship Between the Structure and Functions of Organizational Memory | 120 |
| Conclusions..... | 125 |
| Conclusion 1 | 126 |
| Conclusion 2 | 128 |
| Conclusion 3 | 130 |
| Conclusion 4 | 132 |
| Contributions to Theory..... | 134 |
| Contributions to Practice..... | 139 |
| Recommendations for Future Research | 143 |
| Organizational Memory and Small Business..... | 144 |

| | |
|--|------------|
| Project Choice and Its Possible Influence on the Findings..... | 146 |
| Consideration of a Different Research Method..... | 147 |
| REFERENCES..... | 149 |
| | |
| APPENDIX A: Interview Questions | 159 |
| APPENDIX B: List of Codes | 162 |
| APPENDIX C: Consent Form | 164 |

List of Figures

| | <u>Page</u> |
|---|-------------|
| 1.1. Integration of the Models of Walsh and Ungson (1991) and Olivera (1999, 2000) to Illustrate the Transfer of Organizational Knowledge and Information ... | 15 |
| 4.1. How Project Development Tasks for Project A Were Created, Including Possible Storage Locations | 77 |
| 4.2. Identification of Sources of Pointer and Substantive Information and Organizational Knowledge and How These Are Shared Within the Organization..... | 82 |
| 4.3. How a Manager Accessed Stored Knowledge to Assist with Current Decision Making..... | 83 |
| 4.4. The Process Used by the Management Team When Deciding Whether to Bid on Project A..... | 86 |
| 4.5. The Process Used by Management to Decide to Pilot Project B | 88 |
| 5.1. Revised Conceptual Framework Based on this Research, Morgeson & Hofmann (1999), Olivera (1999, 2000), and Walsh and Ungson (1991) | 140 |

List of Tables

| | <u>Page</u> |
|--|-------------|
| 2.1. Organizational Memory Functions and Their Relation to Structure | 36 |
| 3.1. Research Participants' Titles and Tenure with the Organization at Time of Interview | 48 |
| 4.1. Definitions of Storage Structures from Walsh and Ungson (1991) | 69 |
| 4.2. The Structure of Organizational Memory for Project A | 76 |
| 4.3. Project Development Tasks for Project A Completed at the Time of Data Collection and Their Relationship to the Structure of Organizational Memory | 78 |
| 4.4. The Structure of Organizational Memory Used by the Company When Deciding Whether to Pilot Project B | 80 |
| 4.5. Coworkers as a Source of Project Development Knowledge | 92 |
| 4.6. Functions of Organizational Memory in the Organization | 97 |
| 4.7. How the Structure and Functions of Organizational Memory Were Accessed and Applied when Making Project Development Decisions | 99 |
| 4.8. How Organizational Memory Helps and Hinders Project Development Decision Making | 101 |

CHAPTER 1:

INTRODUCTION

The National Bureau of Economic Research (NBER) met in late November 2008 and announced to the world that the U.S. economy was in a recession. The NBER report (2008) noted that the employment estimates derived from its ongoing national survey of employers had peaked in December 2007 and declined every month since then. At an engineering and energy consulting firm in New Jersey, the NBER announcement was not news. While NBER had reviewed economic data to determine if it met the standards for declaring that the economy was in a recession, the small business was already living with the economic crisis that had resulted in the layoffs of roughly half of its employees and postponed the retirement of the company's founder.

As NBER navigated the macroeconomic evidence of the recession, the small business navigated its microeconomic effects. In addition to the layoffs, the company found itself in need of the lifeblood of any small business: customers. Finding these customers was not an easy task. The company's customers for more than the 25-plus years it had been in business were also affected by the recession, and many were financially unable to enter into new contracts with this company. The company needed a new approach. Given the economic conditions, the new approach had to make use of the employee skill sets and talents that remained with the company after the layoffs, while allowing the company to locate and bid successfully on projects it might not have considered before the recession. This strategy meant that the company would be leaving its project development comfort zone in very uncertain economic times.

To find these customers, the company would have to reinvent itself, drawing on both the individual memory of its remaining employees and its organizational memory, and applying this individual and organizational memory to new types of projects. The company drew on its organizational memory, reliving and reinterpreting both successes and failures, to build the new foundation that might ensure its survival. This research tells the story of how the organizational memory of a small business influenced project development decisions, and the role of the structure and functions of the company's organizational memory in the process.

Organizational memory was defined based on Walsh and Ungson's 1991 study: "stored information from an organization's past that can be brought to bear on present decisions" (p. 61). Technology was used throughout the company and included common office technologies, such as computers, electronic mail, voicemail, the Internet, cellular phones, telephones, and smartphones (i.e., Blackberry, iPhones). The company also had two databases that held the general policies and procedures that the company used to operate, as well as some project development knowledge. Also included as part of the company's technology were the standalone databases created and maintained by some organizational members, the planned enterprise resource planning system, and the process used to archive organizational knowledge.

The next section presents the problem statement, followed by a discussion of the purpose of the study. This is followed by the research questions and a section describing the possible significance of the research. The last sections of this chapter outline the conceptual framework, present the methodology, and provide definitions of key words and phrases used throughout this dissertation.

Problem Statement

Although an understanding of the relationship between the structure and functions of organizational memory could provide an enhanced understanding of organizational learning and processes, this relationship is underdeveloped in the literature. This research attempted to add to our understanding of the relationship between the structure and functions of organizational memory in the context of project development decisions within a small business, with a secondary emphasis on the utility of technology in the decision-making process.

The idea that an organization might have a memory and that the memory might be more than the sum of the individual memories of its employees is an accepted concept in organizational learning literature, whether stated implicitly (Crossan, Lane, & White, 1999; Fiol & Lyles, 1985) or explicitly (Casey, 1997; Schwandt, 1995; Schwandt & Marquardt, 2000; Walsh & Ungson, 1991; Weick & Roberts, 1993). Researchers have viewed organizational memory as part of processes that involve the creation, retention, and use of organizational knowledge (Schwandt, 1995; Schwandt & Marquardt, 2000; Walsh & Ungson, 1991; Weick & Roberts, 1993).

If one accepts the idea that an organization can learn, it is important to determine the structure of an organization's memory through an understanding of how and what knowledge is retained and stored, as well as how organizational memory functions and is retrieved for use in key organizational decisions. It is also important to understand the relationship between the structure and functions of organizational memory and how they work together to facilitate organizational learning and the creation of organizational memory.

There are common themes in the extant literature on the structure and functions of organizational memory and their interrelationship. Both Walsh and Ungson (1991) and Olivera (1999, 2000) recognized that organizational knowledge was rarely confined to one location or bin and was often dispersed throughout an organization. Olivera's (1999, 2000) conceptualization of organizational memory as a system, as compared to the static bins described by Walsh and Ungson, added the dynamic, fluid, evolving quality lacking in the Walsh and Ungson framework. Olivera's conceptualization also implied a link between organizational memory's structure and functions, but did not address how structure and functions are related.

Olivera's (1999, 2000) research also addressed the importance of technology in the formation and use of organizational memory and provided insight into the link between organizational members and technology. Although his research was conducted in a company that was very technologically adept, he found that the employees still preferred to obtain information and organizational knowledge from other people, instead of using extensive and readily available technology resources.

Nonaka (1994) defined information as a commodity, or "flow of messages" (p. 15), that may or may not become knowledge based upon how organizational members use the information. Organizational knowledge results from the continuous individual knowledge sharing process (Nonaka, 1994). The process of creating organizational knowledge is ongoing and managed by the organization so that it benefits both the "established organizational vision and the newly-created concept" (Nonaka, 1994, p. 27).

When considering the types of information people sought from each other, Olivera categorized the information as either substantive or pointer. Substantive

information was an actual answer to the question asked, while pointer information, as the name implies, pointed the questioner to someone who might have the information needed (Olivera, 1999, 2000).

In the years since Olivera's research was completed, the use of computer-based technology in the business world has expanded rapidly. For example, at the time of his 1999 research, the Internet was not yet widely used as a primary information-gathering tool in organizations. Since then, researchers have found that organizations rely on both computer-based technology and people-based organizational memory to create, store, and access organizational knowledge and information (Anderson & Sun, 2010; Chou, 2005; Corbett, 2000; Croasdell, 2001; Cross & Baird, 2000; Gammelgaard & Ritter, 2005; Gold, Malhotra, & Segars, 2001; Nilakanta, Miller, & Zhu, 2006). Researchers have also noted the link between computer-based technology and social processes in the formation and use of organizational memory (Ackerman & Halverson, 2000; Anand, Manz, & Glick, 1998; Anderson & Sun, 2010; Croasdell, 2001). Researchers found that the balance between computer-based technology and social processes in organizational members' search for organizational knowledge was not the same for every organization (Corbett, 2000; Croasdell, 2001; Cross & Baird, 2000). Finding and implementing the organizational memory structure that suited the organization's needs was an ongoing effort requiring constant evaluation (Stein & Zwass, 1995).

The definition of organizational memory structure used in this research reinforces the link between people and technology and was based on Morgeson and Hofmann's (1999) work on collective constructs: the ongoing actions and interactions of organizational members with each other, with individuals outside of the organization, and

with technology that lead to the emergence and formation of organizational memory. This definition includes both Walsh and Ungson's (1991) conceptualization of organizational memory as a place for storage of organizational knowledge, as well as Olivera's (1999, 2000) thinking that the structure of organizational memory must allow for the dispersion of knowledge as memories are formed, retrieved, and used.

Olivera's framework for viewing organizational memory as a system (1999, 2000) also added to the understanding of the functions of organizational memory, as did his later work with Casey (Casey & Olivera, 2003). Casey and Olivera described the primary functions of organizational memory as informing decision making and supporting organizational learning. The Casey and Olivera definition of the functions of organizational memory was used in this research.

Much of the organizational memory literature is in agreement with Olivera's (1999, 2000) and Casey and Olivera's (2003) stated functions of organizational memory, but disagreement remains on how functions and structure are related. For example, Cross and Baird (2000) echoed Olivera's idea of organizational memory as providing pointer knowledge, but did not discuss how this functions of organizational memory might be related to specific memory structures, such as the bins suggested by Walsh and Ungson (1991). Ackerman and Halverson (2000) acknowledged the necessary integration of human and computer-based memories for the appropriate functioning of organizational memory, but took this integration at face value. Corbett (2000) discussed the inseparability of people and computer-based technology in the functioning of organizational memory, but offered few specifics as to how organizational memory might be structured to capitalize on this inextricable link.

Fiedler and Welpé (2010) suggested that the link between organizational memory structure and functions developed through the ongoing implementation and use of standardization in the organization's policies and procedures. In his examination of a specific type of computer-based organizational memory system, Ackerman (1996) came closest to offering a viable strategy for linking the structure and functions of organizational memory. He posited that organizational memory was best structured so that it allowed for the retrieval of recorded organizational knowledge while permitting access to people who retain organizational knowledge.

Using in-depth interviews, on-site observation, and examination of organizational artifacts, this research attempted to understand and explain the link between the organizational memory structure and functions in a small, for-profit company. Specifically, this research examined how the relationship between the structure and functions of the company's organizational memory assisted the company when making project development decisions and the role of technology in the decision-making process.

Purpose of the Study

Casey and Olivera (2003) noted that although Olivera (1999, 2000) categorized the structure of organizational memory as fluid and dynamic, additional research was needed to explore his findings and how the type of structure influences and is influenced by organizational memory functions.

Using Walsh and Ungson's (1991) organizational memory model and Olivera's (1999, 2000) organizational memory systems model as its theoretical framework, this research described the structure and functions of the organizational memory system of a small business and the relationship between the structure and functions. The research also

examined how organizational memory was stored, accessed, retrieved, and used in the daily life of the organization, specifically addressing the primary function of organizational memory, informing decision making (Casey & Olivera, 2003), with a focus on project development decision making.

Decision making on many issues occurs at all levels in an organization. Project development decisions were chosen as a focus of this dissertation because successfully completed projects are the lifeblood of the company studied. Focusing on this type of decision also allowed for a detailed investigation of a key process for this company. Without the profits from successful projects and the concurrent enhancement of the company's reputation that leads to additional work, the company would not survive. The company has survived unsuccessful work proposals in its more than 25-year history, but the cumulative negative impact on company finances that would result from a series of unsuccessful proposals might eventually lead to the company's demise. By focusing on project development decisions and their relationship to the structure and functions of organizational memory, this dissertation addressed how organizational memory influenced the primary function that keeps this organization in business.

The research also examined how organizational members used technology, what types of technology they found most useful, and what types of technology they avoided as they navigated the organizational memory system (Olivera, 1999, 2000). Technology was chosen as a focal point because it is pervasive, unavoidable, and required to complete day-to-day job requirements in most modern organizations. Olivera (1999, 2000) found that computer-based technology and people-based organizational memory systems had an interactive relationship. The systems competed with and complemented each other, but

neither could serve as a substitute for the other. Overall, employees preferred to obtain organizational knowledge from other employees, but often used the computer-based systems as a way to obtain pointer information that led the employee to the desired organizational knowledge. Using Olivera's (1999, 2000) findings as a guide, the research addressed the interaction of the different types of technology found in the organization and how organizational memory structures emerged from this interaction.

Research Questions

The research questions, based on an integration of the frameworks of organizational memory proposed by Walsh and Ungson (1991) and Olivera (1999, 2000), were as follows:

1. What is the structure of organizational memory used by this organization to make decisions on project development matters?
 - What role does technology play in the way organizational memory is used during decisions involving project development matters?
2. What are the processes the organization uses to store and retrieve the knowledge needed to make project development decisions?
 - What is the role of technology in these processes?
3. What function does organizational memory serve in helping the organization make project development decisions?
4. What is the relationship between the structure and functions of the organizational memory used to make project development decisions in this organization?

Significance of the Research

This research added to the growing body of empirical studies that explored the structure and functions of organizational memory, guided by Walsh and Ungson's (1991) characterization of the structure of organizational memory and Olivera's (1999, 2000) description of the structure and functions of organizational memory systems.

This study added to the scholarly conversation on organizational memory by using the rich, detailed descriptions gained through a case study to understand and describe the structure and functions of organizational memory and the relationships between them in a small business. Special emphasis was placed on how the company used its organizational memory to make project development decisions and how the company used technology as a component of its organizational memory. An understanding of the relationship between organizational memory structure and functions may add to our understanding of how organizations learn, how organizations decide what learning will be retained for future use, and how and why organizational members decide to seek and retrieve knowledge from organizational memory.

Practitioners may revisit how organizations manage organizational knowledge and the impact of organizational memory on decision making (Birkinshaw & Sheehan, 2002; Brown & Duguid, 2000; Fisher & White, 2000; Hansen, Nohria, & Tierney, 1999; Kantrow et al., 1986; Storck & Hill, 2000, Swan, Scarbrough, & Newell, 2010). The discussion of the influence of organizational memory on the day-to-day life of the organization may also be of benefit to practitioners, helping them to become more discriminating users of organizational knowledge, especially when considering the past in current decisions (Brown & Duguid, 2000; Fiedler & Welpe, 2010; Hansen et al., 1999;

Kantrow et al., 1986; Massingham, 2008). Practitioners may also consider what the organization forgets or loses when the workforce changes due to retirements (Myers & Dreachslin, 2007) or when an employee leaves an organization, along with his or her tacit or experiential knowledge, unseen social networks, and accumulated social capital (Aiman-Smith, Bergey, Cantwell, & Doran, 2006; Martin de Holan, Phillips, & Lawrence, 2004; Fisher & White, 2000; Massingham, 2008; Parise, Cross, and Davenport, 2006). The overall benefit to practitioners may be an increased appreciation of how, why, and when the past should and does influence the present.

Conceptual Framework

The goal of this research was to assess and understand the structure and functions of the organizational memory of a small, for-profit energy consulting and engineering company with a focus on how the company used its memory to make project development decisions. This goal included gaining an understanding of the role of technology in this process. Organizational memory was viewed as one of the many factors that influence and are influenced by organizational learning (Crossan et al., 1999; Schwandt, 1995; Schwandt & Marquardt, 2000). The structure provided by Walsh and Ungson's (1991) organizational memory bins framework, combined with the dynamic qualities of Olivera's (1999, 2000) organizational memory systems framework, with its emphasis on the need for the combination of human and technology-based memory, formed the theoretical foundation for understanding organizational memory structure. Olivera's (1999, 2000) organizational memory systems framework also facilitated an understanding of the functions of organizational memory.

If an organization is to make good decisions and learn, it must understand and manage its knowledge creation, storage, and retrieval processes. These processes include the creation and management of organizational memory. As the literature shows, organizational memory can be people-based, computer-based, or process-based, and will likely incorporate all three approaches (Ackerman & Halverson, 2000; Carlile & Rebentisch, 2003; Corbett, 2000; Cross & Baird, 2000; Fiedler & Welppe, 2010; Olivera, 1999, 2000; Rodan, 2008). For purposes of delimiting the scope of this research, organizational memory was viewed as part of an organization's knowledge creation system within the domain of organizational learning.

Walsh and Ungson (1991) posited that the core of an organization's memory lies in what it chooses to store, which they described as information about "decisions made and problems solved" (p. 62), but they acknowledged that it was sometimes difficult to determine why information was chosen for storage. The information may also take on a malleable nature as it makes its way to storage and is subsequently retrieved, examined, modified, perhaps deleted, reformulated, and stored again. Walsh and Ungson (1991) referenced Weick's (1979) ideas of information equivocality to describe these aspects of organizational memory. Information retrieved from organizational memory may provide little direction for decision makers and may only serve to cloud the decision-making picture, especially if it was retrieved without a recognizable context (Anderson & Sun; 2010; Carlile & Rebentisch, 2003; Corbett, 2000).

Despite these potential impediments, the decision that some piece of organizational knowledge needed to be stored in organizational memory served as the starting point for Walsh and Ungson's (1991) framework, although they did not

specifically address how the item was chosen for storage. Once organizational knowledge was targeted for storage, it was placed in one or more of five internal bins and one external bin. From there, in any, some, or all of these bins, the memory was available for retrieval by the organization.

Walsh and Ungson (1991) did not provide specific details describing how organizational memory should function, but did suggest three possible roles or functions for organizational memory within any organization. First, organizational memory serves an “informational role” (p. 73) by providing information that can influence decision makers for better or worse. Second, organizational memory “fulfills a control function” (p. 73) and may also save the organization time and money by providing a repository for organizational knowledge. Third, through control of the information, organizational memory plays a “political role” (p. 73), since those with desired organizational knowledge may be able to influence those seeking the organizational knowledge, thereby gaining organizational power.

Olivera’s model (1999, 2000) also allowed for the retrieval and use of organizational memory. The addition of his work to the conceptual framework and its emphasis on organizational memory as a dynamic system added the flexibility needed to understand the themes that emerged from this case study. Olivera’s conceptualization of organizational memory as a system allowed for a more realistic understanding of how organizational members chose and used the resources needed to complete information and knowledge processing tasks. The addition of Olivera’s organizational memory systems framework also provided the ability to seek information as pointer or substantive. Olivera’s (1999) framework had several advantages when compared to

Walsh and Ungson's (1991) framework. First, it had the dynamic, evolving quality lacking in the Walsh and Ungson framework. Second, the places available for memory storage were not limited to a specific set of locations, as was the case with Walsh and Ungson's bins. Third, Olivera's model allowed for the extensive use of technology in the storage and retrieval of organizational memory, as well as the integration of people and technology in this process. Finally, as noted above, the Olivera model allowed for the use of organizational memory to uncover and utilize both substantive and pointer information and organizational knowledge. Figure 1.1 illustrates the integration of the two models that formed the conceptual framework for this research.

Methodology

The research used a single-site case study design. Case studies provide rich, detailed descriptions of phenomena, making this research method particularly suited for understanding processes in organizations. Creswell included case study as one of the five "qualitative traditions of inquiry" (1998, p. 47), giving much credit for his thinking to Lincoln and Guba (1985), who more broadly defined case study as one of many types of naturalistic inquiry. Gall, Gall, and Borg (2005) noted that case studies are particularly appropriate when studying "a phenomenon by focusing on specific instances, or cases" (p. 308) or when studying "a phenomenon in its natural context" (p. 308). Siggelkow (2007) suggested that case studies are best used to motivate, inspire, and illustrate.

There was significant precedent for the use of case studies in organizational memory research. Some of the settings previously chosen for case studies of organizational memory or some aspect of organizational memory were computer-based technology companies (Ackermann & Halverson, 2000; Anand, 1999), consultancies

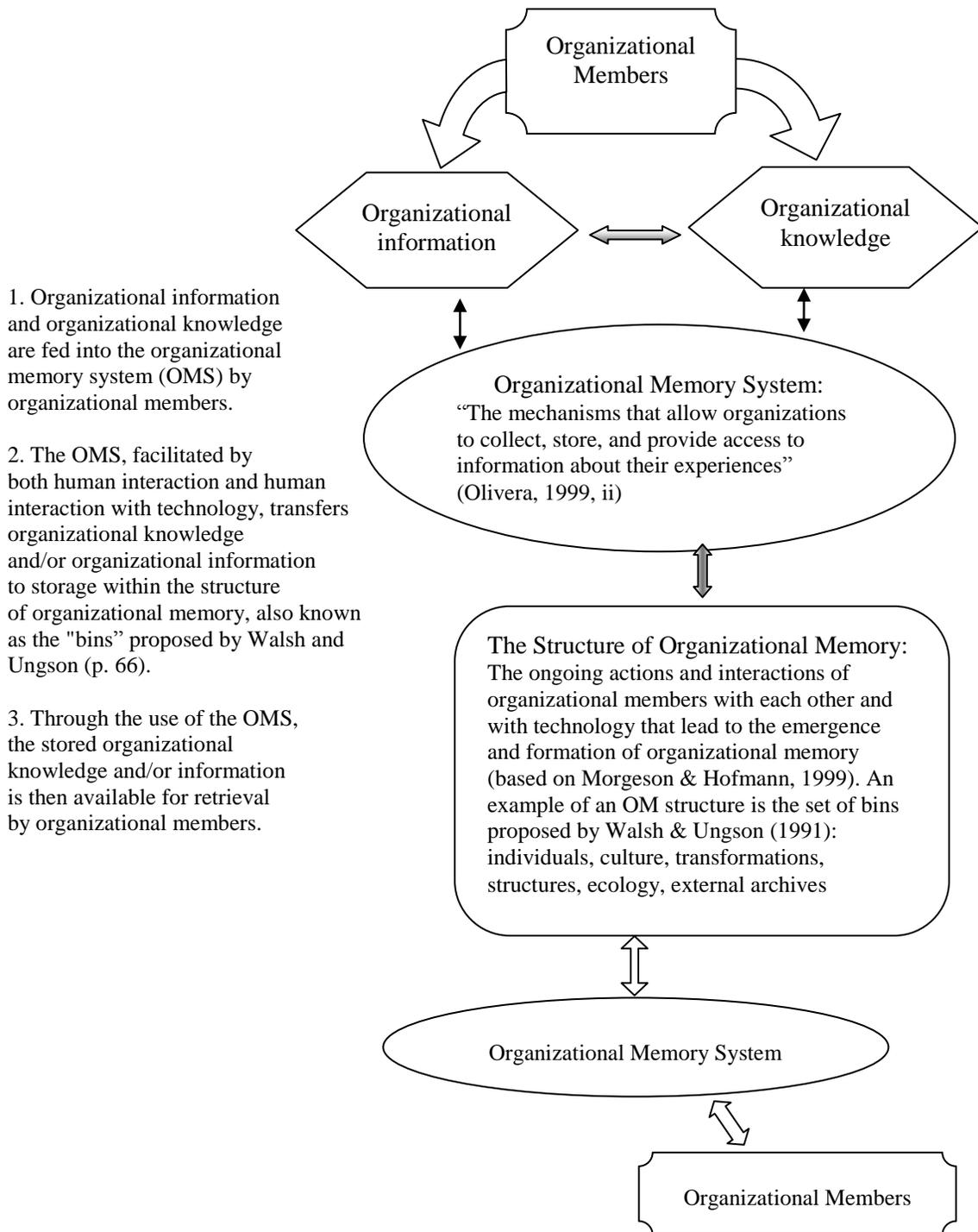


Figure 1.1. Integration of the models of Walsh and Ungson (1991) and Olivera (1999, 2000) to illustrate the transfer of organizational knowledge and information.

(Olivera, 1999, 2000), a drug treatment and rehabilitation organization (Casey, 1994), a government agency (Campbell-Kelly, 1996), the military (Adler & Zirger, 1998), large corporations (Fiedler & Welppe, 2010; Moorman & Miner, 1997, 1998a, 1998b), and large project-driven organizations (Swan et al., 2010).

The organization that was the subject of this research is an energy consulting and engineering company that employs 35 to 40 people in two divisions. The program services division provides large-scale energy conservation consulting to government agencies, including states and municipalities, while the consulting services division provides consulting on individual commercial and residential construction projects. Since its founding in 1982, the overall vision, direction, and strategy of the organization has been guided by one individual. He is now in his late 50s and plans to retire in 5 to 7 years. The founder has built a management team that has allowed him to step back from some of the day-to-day duties of business ownership.

The data collection methods used in this case study were interviews, observations, and artifact reviews. I conducted one-on-one interviews with nine key employees involved in project development decision making to answer the questions outlined in Appendix A. The key employees were identified with the help of the company owner, his designee, and existing verbal job descriptions (written job descriptions were not available). These employees were senior and middle managers. Patton (2002) described this type of interview as a “general interview guide approach” (p. 342). In this approach, certain topics must be explored during the interview, but the researcher can expand or modify the questions to clarify and further understand a topic.

I also gained an understanding of the company's day-to-day operations through informal observations in the organization. Due to the small size of the organization, formal meetings were kept to a minimum, so the observations were completed by simply spending time at the organization. I arrived early for interview appointments and, when more than one interview was scheduled on the same day, also had time between interviews to observe employee interactions. I also received a tour of the offices and attended a trade show as part of the observations.

During the preliminary planning phase, the founder and his designee assisted me in identifying projects that suited the nature of this case study. These projects, labeled Project A and Project B, are described in more detail in chapter 4. The projects were discussed with the research participants. Since the company was still feeling the economic effects of the recession at the time of the interviews, the number of projects planned and under way was limited. Both Project A and Project B represented new types of projects for the company that were pursued due to economic conditions and the company's need to reinvent itself due to the recession.

Limitations of the Study

The reliability of the research was limited by the use of only one organization to study the structure and functions of organizational memory, as well as by the small size of the organization and the industry type. Research on similar-sized organizations in different industries may have yielded different findings. Another possible limitation of the research was the two projects chosen as its focus. These were the only significant projects at this site at the time of data collection.

The long tenure of many of the participants with the organization may also have been a limitation of the research. Tenure may have influenced organizational members perception of Projects A and B, their perception of the severity of the economic conditions, and their overall perception of the organization.

Although future researchers will be not be able to replicate this research exactly, they may be able to use its findings to support or contradict their own work. In addition, the questionnaire that was used for the interviews may be useful in future qualitative organizational memory research.

Definitions

Definitions of key terms used throughout this research are as follows:

Decision: A choice among considered alternatives that includes reflection on the potential outcomes of the choice (based on March & Heath, 1994).

Information: A commodity, or “flow of messages” (Nonaka, 1994, p. 15), that may or may not become knowledge based upon how organizational members use the information.

Organizational knowledge: A result of the continuous individual knowledge sharing process. Nonaka (1994) defined knowledge as a “justified true belief” (p. 15). He described the creation of organizational knowledge as beginning on the individual level with the “mobilizing” (p. 16) of tacit knowledge and formal transmission of explicit or codified knowledge. The sharing of their knowledge allows individuals to develop “common perspectives” (p. 24) and builds trust within the group. The ongoing process of organizational knowledge creation is then managed by the

organization so that it benefits both the “established organizational vision and the newly-created concept” (p. 27).

Organizational learning: “A system of actions, actors, symbols, and processes that enables an organization to transform information into valued knowledge which in turn increases its long-run adaptive capacity” (Schwandt, 1995, p. 370).

Organizational memory: “Stored information from an organization’s past that can be brought to bear on present decisions” (Walsh & Ungson, 1991, p. 61).

Organizational memory functions: Functions such as informing decision making, helping the organization to learn by integrating dispersed knowledge, providing a stable framework for the retention and storage of existing knowledge, assisting in the decoding of knowledge so that it can be used by the organization, assisting in organizational innovation, and assisting in organizational improvisation by helping the organization recombine existing knowledge in new ways (Casey & Olivera, 2003).

Organizational memory structure: The ongoing actions and interactions of organizational members with each other, with individuals outside of the company, and with technology that lead to the emergence and formation of organizational memory (based on Morgeson & Hofmann, 1999). The organizational memory structure proposed by Walsh and Ungson (1991) consisted of six locations, or bins, used to store organizational memory: individual memory, culture, transformations, structures, ecology, and external archives.

Organizational memory system: A system that provides “the mechanisms that allow organizations to collect, store, and provide access to information about their experiences” (Olivera, 1999, p. ii).

Project: “Any series of activities and tasks that:

- Have a specific objective to be completed within certain specifications
- Have a defined start and end dates
- Have funding limits (if applicable)
- Consume human and nonhuman resources (i.e., money, people, equipment)
- Are multifunctional (i.e., cut across several functional lines)” (Kerzner, 2006, p. 2).

Project development: A process having five steps:

“Phase 1 - Identify and assess business opportunity

Phase 2 - Select from alternatives

Phase 3 - Develop preferred alternatives for full funding

Phase 4 - Execute (detail design, procurement, and construction)

Phase 5 - Operate and evaluate” (Lavingia, 2006)

Project development was the primary unit of analysis for this case study. At the time data were collected, steps 1-3 had been completed for both Project A and Project B and both projects had entered Stage 4 - Execute. Neither project had reached Stage 5 at the time of data collection.

Technology: Includes the common office technologies used by the company, such as computers, electronic mail, voicemail, the Internet, cellular phones, telephones, and smartphones (i.e., Blackberry, iPhone). The company also had two databases

that held the general policies and procedures that the company used to operate, as well as some project development knowledge. Also included are the standalone databases created and maintained by some organizational members, the planned enterprise resource planning system, and the process used to archive organizational knowledge.

CHAPTER 2:

LITERATURE REVIEW

This chapter reviews the literature relevant to this study on the relationship between the structure and functions of organizational memory through a case study of a small business. Database searches, primarily using Proquest and EBSCO, were conducted throughout 2008 and were updated in 2009, 2010, and 2011. Search terms included various combinations of organizational memory, organizational memory structure, and organizational memory function, as well as other names for organizational memory, such as institutional memory, group memory, public memory, and collective memory. Through these searches, additional information sources emerged and were pursued. Other significant sources of information on the organizational memory literature were Casey and Olivera's (2003) literature review and its subsequent updates, as well as Anderson and Sun's (2010) citation context analysis of Walsh and Ungson (1991).

The chapter begins by briefly discussing organizational learning, which relies on organizational memory, and then reviews Walsh and Ungson's model of organizational memory, its use by other scholars, and its critics. Olivera's (1999, 2000) model is then discussed, followed by a variety of issues related to organizational memory. The interlocking and often inseparable nature of organizational memory structure and functions emerged as a key construct in the literature review and is highlighted in this chapter. The remaining sections note the current status of research on organizational memory and provide context for this research through a discussion of small businesses.

Theoretical Foundation: Organizational Learning

The theoretical foundation for this research was provided by the Schwandt organizational learning systems model (OLSM) (Schwandt, 1995; Schwandt & Marquardt, 2000) and the Crossan et al. (1999) 4Is model. The explicit inclusion of organizational memory in the OLSM model and the implicit inclusion of organizational memory in the 4Is model provided an interesting juxtaposition of perspectives from which to view the construct of organizational memory.

Schwandt's OLSM (Schwandt, 1995; Schwandt & Marquardt, 2000) stressed the transformative and dynamic nature of organizational learning and explicitly relied on organizational memory and organizational memory processes as the core or heart of the organization's learning process. In the OLSM, the organizational memory subsystem served as the primary storage location for what was learned and must be retained by the organization. Schwandt did not specifically advocate a particular type of communication method or storage mechanism, but as with the 4Is model (Crossan et al., 1999), organizational learning implied a variety and combination of various technology-based and people-based methods for knowledge creation, storage, and retrieval.

The emphasis on reflection and communication inherent in the Crossan et al. 4Is model (1999) implied that organizational members must continually communicate and share knowledge from their individual and collective memories for organizational learning to occur (Swan et al., 2010). The form of this communication was not specified, but given the variety of communication methods available to an organizational member, a number of methods might be employed, including some combination of human interaction and human interaction with technology.

Organizational Memory: Walsh and Ungson's Model

One of the first articles to review research about organizational memory, define the concept, and offer a model of its structure was published by Walsh and Ungson in 1991. Walsh and Ungson defined organizational memory as “stored information from an organization’s history that can be brought to bear on present decisions” (p. 61). In their discussion of the construction of this definition, Walsh and Ungson (1991) acknowledged their concerns and the concerns of some of their colleagues that the underlying processes and concepts of individual memory formation cannot be generalized to organizational memory. They also discussed the debate among organizational scholars as to whether organizational memory exists at all, and if the idea of organizational memory was merely an anthropomorphizing of individual memory. They concluded that the debate comparing and contrasting individual and organizational memory was a moot point: “Organizational memory is both an individual and organizational level construct” (1991, p. 61).

Walsh and Ungson (1991) viewed organizations as entities that are constantly processing information, creating organizational knowledge, and storing it in organizational memory. They provided an overarching three-part framework for understanding how this organizational memory was structured. The first step was to determine where organizational memory was stored, or its “retention structure” (p. 61). The second step required an examination of how information and organizational knowledge became part of this retention structure, or how they were “acquired, stored, and retrieved” (p. 61). The third step was to determine the “utility of organizational memory” (p. 62) or why organizational memory was of value to the organization.

In support of their three-part framework to understand the structure of organizational memory, Walsh and Ungson (1991) offered their model of the “storage bins”: “We posit the existence of five storage bins or retention facilities that compose the structure of memory within organizations and one source outside of the organization” (p. 63). Walsh and Ungson labeled the six bins individuals, culture, transformations, structures, ecology, and external archives. The first five were internal to the organization and the sixth was outside the organization.

Once information and organizational knowledge were stored in a particular bin or bins, they were then available for retrieval by organizational members for their use in doing their jobs. Walsh and Ungson (1991) saw this storage process as distributed in nature, meaning that stored information and knowledge were rarely confined to one bin and/or one part of an organization. They cited this distributed nature as the factor that makes organizational memory so difficult to measure and recommended that, when assessing organizational memory structure, researchers thoroughly examine all of the organization’s memory bins to understand its organizational memory.

Walsh and Ungson (1991) also recommended that organizations actively manage their memory, focusing on both knowing where to look for what has been stored and understanding why a memory was stored in a particular place. This proactive attention to the usefulness of both organizational memory structure and its contents was echoed in the findings of Beis, Loucopoulos, Pyrgiotis, and Zografos (2006), De Weerd-Nederhof, Wouters, Teuns, and Hissel (2007), Fiedler and Welppe (2010), and Nevo and Wand (2005). Fiedler and Welppe noted that when purposeful codification of organizational

knowledge accompanies the active management of organizational memory, the structure of organizational memory is influenced and may change to support the new knowledge.

Citation Analysis of Walsh and Ungson's Model

In 2010, Anderson and Sun reviewed the citations of Walsh and Ungson in the literature, with a goal of understanding how scholars understand the relationship between the interdependent concepts of organizational memory and organizational learning. They found 301 citations of Walsh and Ungson in English-language journals between 1991 and 2006. Their first round of coding resulted in 496 “citation contexts” (p. 135), of which only 17 were critical of Walsh and Ungson. The 496 citation contexts were refined and reduced to 16 codes. After the articles citing Walsh and Ungson were coded using the 16 codes, Anderson and Sun found that the majority of the citations (170) referenced the storage bins that form the structure of organizational memory in the Walsh and Ungson model. The second most prevalent reason for citing Walsh and Ungson (99 citations) was to provide a general description of organizational memory. This reason for citing was followed by 90 citations that cited Walsh and Ungson when describing “the use, misuse, and abuse of organizational memory” (Anderson & Sun, 2010, p. 137). The fourth most common reason for citing Walsh and Ungson was to provide a definition of organizational memory (49 citations). Anderson and Sun concluded that when examined in a citation context model, the Walsh and Ungson article (1991) was a “citation classic” (p. 142).

Criticism of Walsh and Ungson's Model

Critics of Walsh and Ungson's (1991) conceptualization of the structure of organizational memory accepted the notion that organizational memory was distributed throughout the organization, but found the idea of a memory stored in a bin as too static a concept to capture the dynamic nature of human interaction (Carlile & Rebentisch, 2003; Corbett, 2000; Olivera, 1999, 2000). Another criticism was that Walsh and Ungson's storage method separated what was stored from the knowledge itself, and then hoped to reunite the knowledge and the organization accurately and appropriately as needed (Spender, 1996). In addition, while Walsh and Ungson (1991) acknowledged the distributive nature of organizational memory and recognized that stored knowledge could be placed in more than one storage bin, they failed to provide a mechanism for choosing what to store and the processes for storage and retrieval.

Anderson and Sun (2010) recognized that Walsh and Ungson (1991) could not have anticipated new organizational forms such as "strategic alliances, collaborative supply chain relationships, and strategic outsourcing" (p. 142) when their seminal work was published. Like Olivera (1999, 2000), they also noted that recent technology has resulted in a dramatic change in how organizations do business. These issues were raised by Anderson and Sun as both criticisms and suggested directions for future organizational memory research. Olivera created an updated model addressing his concerns, as discussed in the next section.

Organizational Memory: Olivera's Model

Olivera (1999, 2000) discussed organizational memory as an interrelated, dynamic, constantly adapting system, with a focus on how organizations store memory

and how stored memories were made available to individuals in the organization. Olivera posited that by understanding an organization's methods for storing and retrieving its memory, one could understand if the organization learns and how that learning occurs. Like Walsh and Ungson (1991), Olivera did not focus on the processes an organization used to decide to store knowledge or how the knowledge was added to organizational memory.

Olivera (2000) acknowledged the difficulties of capturing an individual's tacit knowledge in organizational memory and noted the importance of this individual knowledge: "Although no one particular member of an organization is likely to be the sole repository of an organization's memory, *networks* of individuals can be a powerful means of storage and retrieval of the organization's experiential knowledge" (p. 815).

Olivera (2000) was more concerned about what to do with the organizational memory once it was created than with creating the memory itself. His focus on storage systems, whether computer or people based, centralized or decentralized, assumed the existence of something that required storage for use at some future time. Olivera (2000) noted that the success of an organizational memory system depends on how well the different types of technology work together. This has remained one of the major issues in the study of organizational memory.

Issues in Organizational Memory

Technology

The interlocking nature of people and technology in the formation and use of organizational memory has been a recurring theme in the literature. Ackerman's (1996) research began at the point of implementation of computer-based technology to store

organizational memory. Ackerman first examined an organization's expectations when choosing and implementing software designed to capture organizational memory, and specifically what was ideal versus what was obtainable. Ackerman then included the very human aspects of a large-scale organizational change precipitated by the move to computer storage of organizational memory, such as personal conflicts and power and political relationships, and noted the importance of managing these issues as part of the change process. Ackerman and Halverson (2000) referred to an organizational memory that included a reliance on both people and technology as an "interpersonal memory" (p. 59). Their research focused on the social construction of organizational memory as an organizational member retrieved knowledge and used it to answer questions. Ackerman and Halverson's (2000) and Carlile and Rebentisch's (2003) research supported the work of Cross and Baird (2000) on the creation of organizational memory through sharing organizational knowledge.

In his argument in support of using technology to help maintain organizational memory, Corbett (2000) cited the ability of computer storage to make "social organizations more durable" (p. 286). He noted, however, that the durability provided by computer-based technology has a significant potential downside since a computer can only store whatever humans choose to include, with no innate ability to determine appropriateness or accuracy. In addition to the limitations of the computer, the system users can also negatively influence the use and usefulness of the organizational memory system if their expectations are unrealistic and/or unfulfilled (Ackerman, 1996) or if the system used to capture and store the memory does not permit needed access (Croasdell, 2001).

Corbett's (2000) conclusion that a computer-based organizational memory system must consider the psychological and social processes of its human users supported the conclusions drawn by Campbell-Kelly's (1996) research into the relationship between the structure and functions of organizational memory in a far more "low-tech" environment, namely the British censuses of 1801 to 1911. Even without today's computer capabilities for organizational knowledge and information storage, Campbell-Kelly (1996) concluded that the British census office was successfully reborn every 10 years because individuals provided the needed "interface" (p. 35) between the memories of a core workforce, the new employees hired for the pending census, and stored history.

Relevance and Usefulness

Carlile and Rebentisch (2003) noted a potential downside to the organizational memory creation process inherent in the transfer of knowledge between organizational members. As organizational members become increasingly interdependent in their ongoing need to obtain knowledge, the relevance of the knowledge they share with respect to the current situation may be questioned: "Bad choices can . . . be made even from good memories if the circumstances surrounding the original development have changed" (Carlile & Rebentisch, 2003, p. 1181). Carlile and Rebentisch noted that the successful use of organizational memory required knowledge of what is currently relevant, as well as locating the organizational member who possesses and can share that knowledge. De Weerd-Nederhof et al. (2007) noted that even the most conscientious efforts to consider organizational memory in decision making may be unsuccessful if the individual best equipped to explain the memory and its possible relevance to a current

situation is no longer part of the organization or no longer recalls the relevance of the memory.

Beis et al. (2006) also noted the dangers of failing to capture organizational memory in a way that would make it useful and available to other potential users. The group they studied, the Olympic Organizing Committee for the 2004 Athens Olympics, had a known finite lifetime and planned to disband once the games were finished. Since the date the committee would disband was known, it was able to engage in the purposeful construction of its organizational memory. The committee made conscious and deliberate decisions about what knowledge was relevant and would be stored, how it would be stored so that the context of the knowledge was appropriate and understandable, and how the knowledge would be made available for retrieval. Despite all of committee's thoughtful and deliberate planning, the committee knew it had no control over how or if its organizational memory would be accessed and used in the future by other Olympic committees or planners of other large-scale events, or if the storage choices it had made would be relevant in the future.

While the relevance and storage context of knowledge found in organizational memory are recurring themes in the literature, so also is a concern that lack of recognizable memory context can lead users of organizational memory to poor or inappropriate decision making (De Weerd-Nederhof et al., 2007; Nevo & Wand, 2005). Schwartz (1998) noted that the language used around an organizational memory may add an additional complication for its users. He referred to this issue as the need for "shared semantics" (p. 434). Organizations must have not only recognizable context attached to

an organizational memory, but also a common organizational language to make sense of both what is deposited and what is retrieved.

Personal Interactions

Moorman and Miner (1997, 1998a, 1998b) were also concerned with how human interrelationships and sensemaking influenced and are influenced by organizational memory. In their research on new product development and improvisation in marketing-intensive organizations, Moorman and Miner (1997, 1998a, 1998b) found that higher levels of organizational memory produced better financial and interpersonal results. Their research also supported one of Olivera's (1999, 2000) and Casey and Olivera's (2003) findings on the functions of organizational memory: new knowledge may be created through recombining existing knowledge stored in organizational memory.

Adler and Zirger (1998) also examined the functions of organizational memory and its influence on new product development. While Moorman and Miner (1997, 1998a, 1998b) were concerned with the intersection of organizational memory, technology, and financial performance, Adler and Zirger focused on how team structure influenced product development outcomes, providing an example of the interrelationship between the structure and functions of organizational memory. Adler and Zirger concluded that having a team member in a non-leadership role act as the primary repository of organizational memory for that team was essential to product development that successfully met customer needs. Adler and Zirger's findings supported several of the functions of organizational memory noted by Casey and Olivera (2003): integrating dispersed knowledge, providing a stable framework for the retention and storage of

existing knowledge, and assisting in the decoding of knowledge for use by the organization.

These functions of organizational memory were echoed in the research of Cross and Baird (2000), who focused on how the interactions between individuals in an organization socially construct and distribute organizational memory. The idea of the social construction of memory has its roots in organizational learning research, which posited that organizational learning occurs when organizational members interact and construct meaning from those interactions (Anand et al., 1998; Crossan et al., 1999; Easterby-Smith, Crossan, & Nicolini, 2000; Massingham, 2008; Rodan, 2008). Rodin further posited that organizational learning will increase even more when managers have the autonomy to act outside of accepted organizational constraints, rules, and regulations. The memory of the learning gained in the interactions can then be stored in the organization's memory.

Cross and Baird (2000) saw the starting point for this cycle of the ongoing formation of organizational memory as the individual, and stressed the relationships between the individuals as an essential component in the organizational memory development process. It was not necessary for an individual to be the repository of all of the needed organizational knowledge or information, but it was necessary for the individual to know where to go to get the needed organizational knowledge or information. It is through the processes of communication and expenditure of social capital that individuals access and use organizational memory (Anand et al., 1998; Cross & Baird, 2000). This theme was echoed in the research of Olivera (1999, 2000), who

stressed the acquisition of pointer information as one of the methods used when searching for organizational knowledge or information in organizational memory.

Employee Exploitation and Turnover

Cross and Baird (2000) noted two challenges associated with the processing of organizational knowledge or information to be stored in organizational memory: employee exploitation and employee turnover. Employee exploitation occurs when an employee is “mined” for his or her organizational expertise, effectively cutting the employee off from opportunities for individual growth. Adler and Zirger (1998) also discussed this issue, noting that the team members in their research who acted as the repository for organizational memory were so entrenched in their particular project that they found it difficult to assimilate other events in the organization.

Employee turnover is also disruptive to the functioning of organizational memory because employee knowledge leaves with the employee (De Weerd-Nederhof et al., 2007; Fisher & White, 2000; Massingham, 2008; Myers & Dreachslin, 2007), especially if organizational memory formation efforts have not captured tacit knowledge (Argote, Beckman, & Epple, 1990; Cross & Baird, 2000; Olivera, 2000). Myers and Dreachslin (2007) noted that as the baby boom generation began to retire in 2008, retirees left the workplace with both their contributions to organizational memory and their contributions to organizational performance, so that unprepared organizations faced an unknown knowledge gap. This involuntary loss of organizational knowledge has been referred to as a form of “organizational forgetting” (Martin de Holan et al., 2004, p. 45).

Power

The construct of the power of organizational memory has not received much attention from organizational memory scholars. Nissley and Casey (2002) began to address this issue in their study of corporate museums. The power of historic information from an organization's memory was demonstrated in these institutions by both what was exhibited and what was not. Through the process of selective exhibition of artifacts and the way in which an exhibit was staged, an organization can shape both its current organizational memory and the memory of the public with respect to the organization. Nissley and Casey (2002) referred to this selectivity as "the politics of remembering" (p. 41) and, conversely, "the politics of forgetting" (p. 41). When the public visits a corporate museum, the memories constructed while viewing the exhibits will both form the visitors' perceptions of the organization and contribute to the organization's public legacy.

Organizational Memory Functions and Their Relation to Structure

Walsh and Ungson (1991) suggested three possible roles or functions for organizational memory: an "informational role," "a control function," and a "political role" (p. 73). Casey and Olivera described the primary functions of organizational memory as informing decision making and supporting organizational learning. Various studies have addressed different functions of organizational memory and hinted at the relationship between structure and functions; some examples are shown in Table 2.1.

Table 2.1

Organizational Memory Functions and Their Relation to Structure

| Study | Functions Noted | Relation to Structure |
|---|--|--|
| Adler and Zirger (1998) | Use of organizational memory led to successful product development outcomes and integrated dispersed knowledge, providing a stable framework for the retention and storage of existing knowledge and assisting in the decoding of knowledge for use by the organization. | A team member in a non-leadership role acted as the primary repository of organizational memory. |
| Anand et al. (1998); Cross and Baird (2000) | Individuals accessed and used organizational memory to inform decision making, integrate dispersed knowledge, and decode existing knowledge. | Through use of individual memory and an understanding of organizational culture, the processes of communication and expenditure of social capital were enhanced. |
| Moorman and Miner (1997, 1998a, 1998b) | Use of organizational memory led to better financial and interpersonal results, new knowledge through recombining of existing knowledge, and increased improvisation based on knowledge found in organizational memory. | Organizational memory was mined for knowledge that could be reapplied to a new situation. |
| Campbell-Kelly (1996) | Retrieved knowledge provided a framework from which the organization could build for use in the current situation. Retrieved knowledge was decoded and recombined to refresh memories of longtime employees and train new employees. | Organizational memory held the knowledge of how the organization had completed its job in the past. |
| Nissley and Casey (2002) | Knowledge retrieved from the external archives informed decisions about how the organization would present itself to the public. The knowledge was decoded and recombined to present the organization in the most favorable manner. | Knowledge stored in the external archives contained the public history of the organization. |

The Current Status of Organizational Memory Research

Casey and Olivera (2003) noted that between 1991 and 2003, 476 articles were published that discussed organizational memory in some form; their subsequent search to cover the years 2004 through 2006 found another 387 articles. Thus, the body of recent scholarly literature has largely supported the idea that organizational memory exists, although not all organizational theory scholars agree on this point (Easterby-Smith et al., 2000; Spender, 1996; Walsh & Ungson, 1991). There remains, however, a lack of research regarding the integration of organizational learning, knowledge, and memory (Ackerman & Halverson, 2000; Nilakanta et al., 2006; Spender, 1996), as well as a lack of consensus on why, when, and how organizational memory might be useful to an organization (Kruse, 2003; Olivera, 2000; Spender, 1996; Walsh & Ungson, 1991). A growing body of research has viewed organizational memory as one of many components of an organization's knowledge management process (Anderson & Sun, 2010; Chou, 2005; Gold et al., 2001; Jones, 2006; Nilakanta et al., 2006).

The static nature of Walsh and Ungson's (1991) framework, as well as the proliferation of computer-based information technology capabilities developed since the model was introduced, have led researchers to search for a more dynamic construct for organizational memory. Casey and Olivera (2003) noted three key research trends in the literature since Walsh and Ungson's 1991 article. First, research has been concerned with not only how organizational memory is dispersed throughout the organization, but also with how that dispersion is successfully managed (Adler & Zirger, 1998; Argote et al., 1990; Corbett, 2000; Cross & Baird, 2000; Nevo & Wand, 2005; Olivera, 1999, 2000). Second, there has been more focus on the role of individual memory in organizational

memory (Ackerman & Halverson, 2000; Campbell-Kelly, 1996; Corbett, 2000; Croasdell, 2001; De Weerd-Nederhof et al., 2007; Nissley & Casey, 2002). Third, there has been a much greater emphasis on the role of technology in capturing, storing, and retrieving organizational memory (Ackerman, 1996; Ackerman & Halverson, 2000; Croasdell, 2001; De Weerd-Nederhof et al., 2007; Nevo & Wand, 2005; Olivera, 1999, 2000; Schwartz, 1998; Stein & Zwass, 1995).

Context for This Study: Small, Privately Held Businesses

Project development and the decision-making process related to project development were part of the overall context for this study of a small privately held business. Some information on the context for this study follows in this section.

Small businesses, defined as those that employ less than 500 employees (Small Business Administration [SBA], n.d.), are the most common type of business in the United States. The organization that was the subject of this research was one of 29.6 million small businesses as classified by the U.S. government (SBA, n.d.). Small businesses are a vital component of the U.S. economy. In 2011, the National Economic Council reported that small businesses had created “64 percent of new American private sector jobs generated in the past 15 years” or “40 million net new jobs” (National Economic Council, 2011, p. 1). Small businesses also have a high risk of failure, with 49% failing within the first 5 years, often due to inadequate capitalization (SBA, n.d.).

Small businesses are not subject to the same requirements for providing information as publicly traded companies; thus, obtaining detailed information about small businesses is more challenging. In a 2007 nationwide survey entitled *The American Family Business Survey*, 1,035 small business owners whose companies had been in

business for a minimum of 10 years and had a minimum of \$1,000,000 in annual revenues responded to a series of questions about the current state of their businesses and their outlook for the future (MassMutual, Kennesaw State University, & Family Firm Institute, 2007). The business owner respondents were optimistic about the future of their companies, and most predicted increased revenues and hiring of new employees. Respondents reported that succession planning was a significant concern, since 40.3% planned to retire within the next 10 years, but only 54.5% had identified a successor. The overwhelming preference was for the business to stay in the family; 86.3% of respondents stated that they thought that the business would be owned by the same family for at least the next 5 years.

Chapter Summary

Weick (1979), Spender (1996), Cross and Baird (2000), and Croasdell (2001) recognized that a memory by itself has little value. Croasdell (2001) and Stein and Zwass (1995) further posited that a memory retained but subsequently lost by an organization was just as useless as a memory that had never existed. Weick suggested sensemaking (1979) and heedfulness (Weick & Roberts, 1993) as the components that must be added to the memory to make it useful and useable. Cross and Baird (2000) and Massingham (2008) focused on interrelationships and the appropriate use of social capital to obtain and use organizational memory. De Weerd-Nederhof et al. (2007), Beis et al. (2006), Nevo and Wand (2005), Croasdell (2001), Corbett (2000), and Stein and Zwass (1995) recommended the extensive use of computer-based information systems to both capture and supplement the human component of organizational memory.

Walsh and Ungson (1991) acknowledged that their model of organizational memory was incomplete and suggested three areas that required further study: assessing the structure of organizational memory, parsing the process, and assessing the consequences of organizational memory. This research primarily focuses on the first of the three suggested areas, assessing the structure of organizational memory, with the added goal of understanding its functions and the relationship between structure and functions through the addition of Olivera's (1999, 2000) organizational memory systems framework.

CHAPTER 3:

METHODS

This chapter describes the research methods used to gather the data necessary to answer the research questions. It explains why case study methodology was the chosen research method, describes the organization, and introduces the two projects that serve as the primary frame for the answers to the research questions. Methodology is discussed in detail, including procedures for data collection and analysis. The issues of the trustworthiness and validity of this research are addressed, along with ethical concerns.

Research Questions

This research used case study methodology to answer four research questions:

1. What is the structure of organizational memory used by this organization to make decisions on project development matters?
 - What role does technology play in the way organizational memory is used during decisions involving project development matters?
2. What are the processes the organization uses to store and retrieve the knowledge needed to make project development decisions?
 - What is the role of technology in these processes?
3. What function does organizational memory serve in helping the organization make project development decisions?
4. What is the relationship between the structure and functions of the organizational memory used to make project development decisions in this organization?

Justification for the Use of Case Study Methodology

The goal of this research was to gain an understanding of how the organizational memory of a company was structured, how it functioned, and how the structure and functions were related in the context of project development decisions. The use of case study methodology to complete this research was a natural outgrowth of its intent. The use of qualitative methods allowed entry into the research environment without the preconceived ideas or “predetermined categories of analysis” (Patton, 2002, p. 14) often found in quantitative research. Case study methods permitted a deep and detailed understanding of what was being researched. This depth of knowledge is both a great advantage of qualitative research and a shortcoming, in that generalizability is sacrificed in favor of deep, but narrow, knowledge about a specific situation (Patton, 2002). Since depth of knowledge about the company’s organizational memory was a goal of the research, case study was the appropriate methodology.

The use of qualitative methods, including case study, to understand organizations has a long tradition in social science research. Van Maanen (1979) captured the nature of qualitative research when he wrote, “Qualitative methods represent a mixture of the rational, serendipitous, and intuitive. . . . Qualitative investigators tend . . . to describe the unfolding of social processes rather than the social structures that are often the focus of quantitative researchers” (p. 520). More recently, Siggelkow (2007) suggested three best uses for case study research: to motivate, to inspire, and to illustrate.

Creswell included case study as one of the five “qualitative traditions of inquiry” (1998, p. 47), along with biography, phenomenology, grounded theory, and ethnography. Creswell defined case study as “an exploration of a ‘bounded system’ or a case (or

multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context” (p. 61). Creswell credited Lincoln and Guba (1985) with shaping much of his thinking about qualitative research. Lincoln and Guba classified case study as one of many types of naturalistic inquiry.

Lincoln and Guba (1985) situated all methods of qualitative research in the post-positivistic paradigm. Although they acknowledged that human nature renders all research subject to some sort of value system, Lincoln and Guba stressed that qualitative researchers must adhere to two “prime directives” (p. 8): not manipulating the data or imposing upon what is being studied and having no preconceived ideas about the conclusions that might be reached as a result of the research. Burrell and Morgan (1979) argued that the nature of qualitative research plants it squarely in their interpretivist paradigm, which seeks to explain a person’s worldview and social situation as experienced and interpreted by the person.

Description of the Organization

The organization was an energy consulting and engineering company located in New Jersey. It employs 35 to 40 people in two divisions: program services and consulting services. The program services division provided large-scale energy conservation consulting to government agencies, including states and municipalities, while the consulting services division provided consulting on individual commercial and residential construction projects. For example, the program services division might work with a municipality to make sure that its code enforcement officials were trained in all building regulations pertaining to energy efficiency. The consulting services division might work

with a builder to make sure the planned construction of a new home resulted in a house that was as energy efficient as possible.

The data collection portion of this research began during the most significant economic recession the United States had experienced in many years (NBER, 2010a). The recession had already resulted in the layoff of roughly half of the company's employees, leaving the 35 to 40 employees present during data collection and limited project opportunities. The two projects examined, labeled Project A and Project B, were chosen because of their availability and because both projects were leading the company in new directions that might not have been considered in better economic times.

The founder had guided the overall vision, direction, and strategy of the organization since he founded the company in 1982. He was in his late 50s at the time of data collection and, prior to the recession, had planned to retire within 2 to 3 years. At the time data were collected, the timetable for his retirement had increased to 5 to 7 years. He had built a strong, capable management team that had allowed him to step back from some of the day-to-day duties of business ownership, but did not believe that his previous retirement timetable was appropriate given the economic conditions. The change in his role was evident both in his actions and in the change in his title. For over 25 years, he was the president and chief executive officer of the company, but he relinquished those roles and became chairperson in 2008. His role in the company during the data collection period was more of a consultant and advisor, although he was consulted before senior management decided to bid on any large project and still had the final approval on whether or not the bid would be submitted. The management of day-to-day business

operations had been moved to a small group of senior managers, most of whom were interviewed for this research.

The organization used the common forms of office technology, such as computers, electronic mail, voicemail, the Internet, cellular phones, and smartphones (i.e., Blackberry, iPhone). The company also had two databases that held the general policies and procedures that the company used to operate, as well as some project development knowledge. Organizational knowledge was added to a database by saving it on one of the company's common computer drives. Some employees were dedicated users of the database, while others used it very little or not at all. This database system and its planned replacement with an enterprise resource planning system are discussed in chapter 4.

The company was located in a building purchased many years ago on a major highway with easy access to other primary roads. The reception area divided the building in half, with the offices of the founder and the office manager on one side. The other side of the office area was located behind the reception area and contained low-walled cubicles in the center and private offices around the perimeter. The offices housed members of the management team, including all managers interviewed for this research. The cubicles were occupied by non-management employees. When comparing the number of employees to the amount of space available, it was obvious that the space once housed many more people. The company rented the excess space to two unrelated small businesses.

Description of Project A and Project B

The two projects that provide the context for the findings of this study are referred to as Project A and Project B. Although Project A and Project B would have been considered anomalies prior to the recession, since they were not typical for the company, it was management's expectation that both would become the norm and lead the company into new markets and business niches.

Project A was a long-term, statewide energy-consulting project for a state in the central United States. It involved energy consulting, program design, administrative support, "green" building training, and building of energy-efficient single and multifamily homes throughout the state. During this project, the company was the sole energy-efficiency service provider for the state. This was the first time the company embarked on a project of this size and with this set of logistical issues.

Project B was in its pilot stage when the data were collected. Unlike Project A, Project B did not require a bid but rather required extensive research and a decision to enter a new market. The implementation of Project B marked the first time that the company worked directly with residential homeowners on a large scale. Before deciding to implement Project B, contact with residential homeowners was usually completed indirectly through a third party, such as a homebuilder or remodeler.

In Project B, the company provided an assessment of energy efficiency strengths and weaknesses in a home, with the goal of making the home as energy efficient as possible. If the homeowner chose to move forward with the recommendations in the report, the company recommended contractors who could complete the work. The company did not provide the contracting services directly. The success of this project

hinged on consumer demand for this type of service and on the company's ability to work successfully with this new customer type.

Methods for Data Collection

Data collection methods included interviews, document analysis, and observations. The use of the three methods allowed for triangulation of data. Patton (2002) noted that triangulation increases both the accuracy and credibility of qualitative research and should be used to confirm agreement or consistency among the various findings. Patton also viewed triangulation as a method for determining inconsistency in findings, which should be viewed not as a problem, but as an opportunity to provide a deeper understanding of the phenomenon being studied.

Interviews

At the beginning of the fieldwork, prior to conducting any interviews, I reviewed the company's organizational chart and discussed the roles and responsibilities of the employees with the founder and the office manager. Written job descriptions were not available. The office manager was my primary contact at the company. Based on these conversations and the office manager's suggestions, nine senior and mid-level company managers, including the founder, were chosen for interviews. Their average tenure with the company at the time of the interviews was 11.5 years, with a low tenure of 20 months and a high tenure of 27 years (since the founding of the company). Table 3.1 summarizes the titles of the research participants and their tenure since the company was founded in 1982.

Table 3.1

Research Participants' Titles and Tenure with the Organization at Time of Interview

| Title | Tenure at time of interview |
|---|--|
| Founder/chief executive officer* | 27 years |
| Chief operating officer/chief financial officer* | 2 years (plus 5 years as a consultant prior to this) |
| Vice president of program development* | 9 years |
| Vice president of operations and chief information officer* | 20 months |
| Vice president of technical services* | 20 years |
| Vice president of sales and marketing* | 4.5 years |
| Manager of special projects | 2 years |
| Business manager | 25 years |
| Office manager | 10 years |

*Senior manager.

The research participants were designated as senior or middle managers based on their position within the company as listed on an organization chart provided by the founder and office manager prior to the data collection. At the time of data collection, this chart had not been updated since the layoff of half of the employees.

The nine research participants represented approximately 23% of the total of 40 company employees. Due to concerns about confidentiality and because of the small size of the organization, research participants are referred to as either a senior manager or middle manager throughout the discussion of the findings without the further assignment of a pseudonym. The exception to this identification scheme is the founder. The research site was referred to as the company or the organization.

Interview questions are listed in Appendix A. I modified the questions as the interviews progressed so that the detailed descriptions needed to complete the research were obtained. Patton (2002) described this type of interview as a “general interview guide approach” (p. 342). In this approach, certain topics must be explored during the

interview, but the researcher can expand or modify the questions to clarify and further understand a topic.

Data collection was completed at the company's office between March and June 2009. Each week during data collection, I provided the office manager with several dates and times when I was available to interview participants, and she used this information to schedule the meetings. The average interview time was 40 to 45 minutes. The shortest interview lasted slightly more than 20 minutes due to the manager's schedule constraints, and the longest interview lasted approximately an hour. The founder was the first participant interviewed. He wanted to be interviewed first to both set a good example for the other managers and to be able to answer any questions they might ask about the process. The last person interviewed was the senior manager responsible for both Project A and Project B. His interview was difficult to schedule and was rescheduled several times because of the time and travel requirements of running the company's two major projects. The other interviews were completed as the schedule of the participant allowed.

With the permission of the research participants, I recorded the interviews on audiotape and also took notes throughout the interviews. Once the interviews were completed, they were transcribed professionally. The interviews totaled 217 transcript pages.

One of the goals of case study research is to gain a thorough understanding of the experience of the research participant (Creswell, 2009). Creswell noted that one of the ways that this experience is captured is through the verbatim descriptions provided by the research participants during interviews. Chapter 4 contains many quotations from the interviews. The quotations were slightly edited to reduce verbal modifiers, such as "you

know” or the repetition of a word or phrase such as “I know,” “maybe,” “like,” or “OK,” but were not changed in any way that would alter the research participants’ meaning.

Document Analysis

Many of the forms used in project development and implementation were customized for the specific project. This was the case with Project A; when the data were collected, the company was developing a key form needed for the implementation phase of the project. The primary form for Project B was the final inspection report delivered to the homeowner. Other forms included the checklists used by the home inspectors. Since Project B was in its pilot phase at the time of data collection, completed examples of these forms were not available for review.

The documents I reviewed consisted of professionally prepared advertising materials targeted to the company’s varied potential clients, such as municipalities, general contractors, and individual homeowners. I also reviewed the company’s website and found it to be a rich source of information.

Observations

During the data collection, I spent 4 hours observing a 3-day trade show in which the company participated. I was able to observe the company’s tradeshow booth and collect data, such as brochures, from the company and its peers and competitors. During the time I attended the trade show, none of the research participants were present. This observation did not pertain directly to either Project A or Project B, but like the document analysis, was useful for providing both background information and information about how the company was regarded by its peers and competitors.

Observations at the company's office were conducted on the same days as the interviews. Interviews were conducted on seven different days, including all weekdays except Thursday. I arrived 15 to 30 minutes early and waited in the office lobby for the agreed-upon interview time. If the office manager was available, we would have a brief informal conversation while I waited, usually about the company or my research. I also went to her office after the interviews were completed to thank her for her help and let her know I was leaving. After the interviews were completed, I sat in the lobby again, reading my notes and jotting down additional thoughts. This strategy allowed me to observe the research participants and other employees in a way that did not interfere with their work. I was also able to observe the many awards the company had received, which were displayed throughout the offices.

In addition, the office manager provided a tour of the building, which took approximately one hour. This gave me a sense of how much the company had scaled back its activities and also provided an additional opportunity to observe research participants' interactions with each other. Like the tradeshow observations, the observations completed at the company's office and the tour did not provide information directly related to either Project A or Project B, but did provide some evidence of how the company's organizational memory was structured and how it functioned. These findings are discussed in chapter 4. Total observation time, including the trade show, observation time prior to, between, and after interviews, and the tour of the facility was approximately 14 hours.

Methods for Data Analysis

I used the “data analysis spiral” (p. 142) suggested by Creswell (1998) when analyzing the data collected through interviews, artifact analysis, and observation. Creswell’s spiral contained five iterative steps: “data collection, data managing, reading and memoing, describing, classifying and interpreting, and representing and visualizing” (p. 143). In addition to the “data analysis spiral” (p. 142), Creswell offered specific data analysis approaches based on the chosen method of inquiry. For “single instance” (p. 154) case studies, Creswell advocated “direct interpretation” (p. 154), which is the dissection and interpretation of data to understand their meaning.

Once the data collection was complete, the research moved into the describing, classifying, and interpreting loop, or what Creswell (1998) referred to as “the heart of qualitative data analysis” (p. 144). Creswell recommended that the data analysis start with reading all of the collected material at least once, but preferably several times, before beginning any analysis. During each of these readings, I took notes to begin an initial sorting of the data. During this phase, the organization of the data began, first within broad themes and then with further classification based on the research questions. For example, data were coded as pertaining to either the structure or functions of organizational memory, or, in some cases, both. I also used my field notes to write descriptions of what was seen and learned during the data collection process.

During the data management phase, I organized the data based on the categories that had emerged during the readings. This was completed using ATLAS.ti qualitative analysis software. Once the transcribed interviews were loaded into ATLAS.ti, I began the coding process. Creswell (1998) cautioned against developing more than five or six

themes when coding. He suggested that researchers develop themes that resemble a family tree, with the overarching five or six themes producing subthemes based on the classified data. With this in mind, I first coded each interview and my notes from the interviews using ATLAS.ti and then checked these codes against my preliminary pencil and paper coding of the same materials. The initial coding in ATLAS.ti resulted in 53 codes and was based on topics or themes that emerged repeatedly throughout the interviews. At this point, I was not trying to find answers to the research questions. I was looking for similarities, differences, and patterns in how the research participants answered the interview questions. I was also not trying to understand or interpret the interviews, but instead just coding within broad categories such as organizational memory's role in project development, organizational memory's role in company policies and procedures, and organizational memory and technology, without specifically considering the research questions. Approaching the interview transcripts in this way allowed me to become comfortable with the information shared by each of the research participants during their interview and understand their unique perspectives on the organization.

An additional round of coding was completed, and the number of codes was increased to 63 later in the data analysis when I realized that I had not adequately captured information needed to answer some of the research questions. Codes were added that made it easier to identify Project A and Project B within the transcripts. I also added codes such as project development (instead of organizational memory's role in project development), which made it easier to identify sections of the interview where a topic

was discussed without referencing organizational memory. A listing of codes appears in Appendix B.

The documents were coded after the interviews and interview notes. Since most of them were promotional materials and none were related to either Project A or Project B, their usefulness in understanding the role of organizational memory in project development decision making was limited. The documents were useful in gaining an overall understanding of the organization, its history, and its reputation within its industry.

The final data analysis phase, representing and visualizing, involves presenting the results of the research (Creswell, 1998). Creswell recommended using diagrams and tables to give the reader the opportunity to gain a broad overview of the research before diving into the body of the work. Where possible, I heeded Creswell's advice and provided tables to present data and findings. For example, chapter 4 includes tables that outlined how coworkers were a source of project development information and how organizational memory both helped and hindered organizational members when making project development decisions. The results of the data analysis are presented in chapter 4.

Trustworthiness and Validity

Lincoln and Guba (1985) were blunt in describing the perception of some nonqualitative researchers about "naturalistic inquiry" (p. 288): "To suggest that persons engage in naturalistic inquiry because it is so much easier and less rigorous than conventional inquiry is to betray ignorance of what is actually involved" (p. 288). To combat this erroneous perception about the lack of rigor in qualitative research, Lincoln and Guba (1985) suggested four areas that each qualitative researcher and reader should

consider when judging the merits of a particular study, in an effort to answer the question: “How can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?” (p. 290).

These four areas were as follows:

1. The “truth value,” or internal validity of the research
2. The extent to which the research might be applied to other research situations
3. Consistency, or the ability to replicate the research
4. Neutrality or objectivity, or the extent to which the research was free of researcher bias

One step used to add to the internal validity of the study was member checks.

Copies of the transcripts were delivered to the office manager in a sealed envelope with the research participant’s name written on the front. The office manager confirmed that she distributed the transcripts to the research participants. I did not receive any feedback on the interview transcripts (including acknowledgment of receipt), from any of the research participants. Since I did not hear from any of the research participants following delivery of the transcripts, I cannot confirm with complete certainty that the participants received them, although I have no reason to doubt the veracity of the office manager.

In terms of applicability, Miles and Huberman (1994) suggested that the trustworthiness and applicability of qualitative research should be judged by its practical significance, or how useful the findings were to both practitioners and academics. The knowledge gained from this research has the potential to influence a large audience of small businesses that had not previously been considered in organizational memory research. My success in achieving the goal of applicability will be determined

retrospectively as the research participants and future consumers of this research judge its usefulness.

Consistency in this study was assessed through triangulation of data sources. Miles and Huberman (1994) compared triangulation to the preponderance of evidence gathered in police investigations. They also stressed that triangulation is not a simple process, an idea that became evident for me as I considered the triangulation of my data. For example, during the interviews, the participants repeatedly spoke about the respect the company has within its industry and the company's position as a leader in its industry. These statements were supported by the number of awards the company has received over the years and the recognition the company received during the trade show, when the founder was inducted into the industry hall of fame. At first this confirmation of the company's historic success did not appear to be directly related to the use of organizational memory in project development decision making. However, once I learned the story of how the company became aware of and was asked to bid on Project A and why the company chose to pilot Project B, the connection to the research questions was obvious and the triangulation of this part of the data was complete.

In terms of neutrality, Miles and Huberman (1994) acknowledged that it is not possible for research to be completely free of researcher bias, but stated that the research should reflect what was researched as it was told or revealed to the researcher, not as the researcher wished it to be. When trying to uncover researcher bias, readers should look for research methods consistent with the research topic, an ability to follow the research through to a logical conclusion, conclusions consistent with the data presented, an acknowledgment of potential researcher bias, consideration of alternative conclusions,

and an ability for readers to reconstruct the research, if they so desired (Miles & Huberman, 1994). Although I was not aware of any biases, I made a very deliberate effort to report the research methods in a transparent manner that would allow another researcher to replicate this work.

Ethical Concerns

This research received exempt approval from the George Washington University Institutional Review Board. Each research participant received an informed consent form (see Appendix C) prior to the start of the interview, and the form was reviewed with the participant. The form did not require a signature. All data collected during the research, including all interview transcripts, were kept confidential, and all personally identifiable information was eliminated. In addition, the research was conducted in a way that respected the humanity and dignity of each research participant. The planned research did not involve any physical or emotional threats to the participants.

CHAPTER 4: FINDINGS

This chapter presents the findings of this research. The first section is an overview and introduction to the chapter, including a brief review of the purpose of the research and the conceptual framework, followed by a list of the research questions. A narrative of Projects A and B then follows; this information serves as both the baseline and a form of evidence in discussing their organizational memory structure, processes, and functions. In line with the four research questions, the findings related to the company in the case study are presented in four sections:

- The structure of organizational memory
- Processes for the storage and retrieval of organizational memory during project development decision making
- The functions of organizational memory in project development decision making
- The relationship between organizational memory structure and functions

Findings are discussed within the context of Project A, Project B, and other projects.

The terms *organizational information* and *organizational knowledge* are used throughout the chapter. Organizational information is defined as a commodity, or “flow of messages” (Nonaka, 1994, p. 15), that may or may not become knowledge if organizational members use the information. Organizational knowledge is defined as the result of continuous individual knowledge sharing (Nonaka, 1994). Nonaka (1994) defined knowledge as a “justified true belief” (p. 15) and described the creation of organizational knowledge as beginning on the individual level with the “mobilizing” (p. 16) of tacit knowledge and formal transmission of explicit or codified knowledge. The

shared knowledge allows individuals to develop “common perspectives” (p. 24) and builds trust within the group. The organization’s role is to manage the ongoing process of organizational knowledge creation to benefit both the “established organizational vision and the newly-created concept” (p. 27).

Brief Review of the Purpose of the Research and Conceptual Framework

The purpose of this research was to gain an understanding of how the structure and functions of organizational memory and the relationship between structure and functions informed decision making in one small business, particularly when the organization was making project development decisions. Also considered was the role of technology in these processes.

The conceptual framework was based on the research of Walsh and Ungson (1991) and Olivera (1999, 2000). A more complete description of the conceptual framework can be found in chapter 1.

The study addressed four research questions:

1. What is the structure of organizational memory used by this organization to make decisions on project development matters?
—What role does technology play in the way organizational memory is used during decisions involving project development matters?
2. What are the processes the organization uses to store and retrieve the knowledge needed to make project development decisions?
—What is the role of technology in these processes?
3. What functions does organizational memory serve in helping the organization make project development decisions?

4. What is the relationship between the structure and functions of the organizational memory used to make project development decisions in this organization?

Narrative of Projects A and B

Project A

Project A was a long-term, statewide energy-consulting project for a state in the central United States. It involved energy consulting, program design, administrative support, “green” building training, and green building of energy-efficient single and multifamily homes throughout the state. During this project, the company was the sole energy-efficiency service provider for the state. This was the first time the company embarked on a project of this size and with this set of logistical issues.

The company first became aware of Project A through a referral from a business peer who did not do the type of work required for the project. Through its long association with the company, the referring organization knew that Project A was the type of project the company could complete successfully: “Actually one of our partners in New Jersey is . . . doing some work for them [the organization responsible for Project A], but does not do new construction, and I believe they . . . mentioned us to the client as a potential target for this, which was a nice referral to have had.” The senior manager did not specify the exact source of the referral, noting only that it came from the business peer. The referring business knew the type of work, including new construction, that the company had completed successfully in the past, the company’s reputation within its industry, and that the company had the capacity to complete Project A. The evidence of the capacity to complete the job was found in the company’s successful record of

accomplishment as one the key energy efficiency service providers for the state of New Jersey.

The same senior manager quoted in the previous paragraph realized that he had met the state project manager for Project A at a conference the previous year: “You know, generally with these things it’s often a convergence of . . . if somebody hears about you from two or three different directions or meets you and so on.” The senior manager’s recollection of a previous meeting with one of the individuals responsible for managing Project A, in combination with the referral from a business peer, were two essential elements that led to the company bidding on Project A.

A different senior manager described how the senior management team worked together to decide to bid on a project and then described how the team decided to bid on Project A:

Now, on a more tactical level there are opportunities that come up. . . . I’ll give you an example of one that we just exploited, . . . which was [Project A], that came up after our strategic planning session. However, during that strategic planning session, we did say we would be looking for, similar to what we do here in New Jersey, opportunities in other parts of the country. And one—well, several have come, but one in particular came up and was of interest. And our business development guy would then pull the senior team together to go over—you know, Is this worthwhile? What’s the pros/cons? And we go through our—you know, a very similar process to what we do on the annual basis, I’ll say, for a very specific project.

The strategic planning sessions were held at least once a year and provided an opportunity for senior managers to meet and discuss long-term business strategy without the pressures inherent in the day-to-day management of an organization. All of the senior managers interviewed for this research attended these meetings. The “business development guy” referred to in the quotation was the senior manager responsible for

bringing both Project A and Project B to fruition. His role in the company is discussed throughout this chapter.

The same senior manager quoted above described the conversation that all of the senior managers had when debating the merits of bidding on Project A:

Do we or don't we want to bid on it? What would this mean? Could we do it? You know, we're looking at [name of the state where Project A is located]: it's a remote operation. I really haven't done that before. The work looks similar. Are we really just being invited because they have somebody else involved there and we're just being brought in to—you know, bring credibility . . . to the program so they can do whatever they want to?

As noted in the quote, there was some concern that the invitation to submit a response to the request for proposal (RFP) was merely a way to use the company's strong reputation in its industry to enhance the importance of the project. A senior manager also explained how the management team considered the financial aspects of Project A:

But even without it being formalized, we still need to talk about . . . How do these revenues flow? How do these expenses flow? What does this really mean, and do we have everything considered in this model? So in terms of the challenges, I think that's a bit of a challenge for the organization in the sense that, again, because it's small and because we have a lot of pretty smart people who know this industry, there's a lot of "this feels right," "this is the gut check," you know, "there's opportunity here," okay. Well, let's have a plan. Let's quantify that . . . because you know what, I don't want to be sitting here 3 years later and say: You know, it feels right, but we still haven't made any money, and in fact . . . we're not going to, and you know the whole idea of—yes, we're losing money on every job, but we'll make it up in volume.

Prior to the recession, the company's largest client was the state of New Jersey. The company had participated in a program to promote and implement greater energy efficiency throughout the state since the state-sponsored program began in the mid-1990s. One of the reasons that the company decided to bid on Project A was that in many ways it was similar to the work done for the state of New Jersey and similar to a successfully

completed previous project, but allowed the company to diversify outside of its historic business footprint. A senior manager described how the company applied what it had learned in New Jersey when making the decision to bid on Project A and when preparing the response to the RFP:

The idea of running a program for a utility or a state and administering it is a lot of what we do in New Jersey programs, so there were a lot of comparisons to be drawn. . . . Knowing what we do here in New Jersey, I think, allowed us to put together a very solid proposal, and I think one that ultimately got recognized by the fact because it's clear that we've done this before and we can probably handle it. . . . Obviously, the wild card was the geography and not really knowing the players down there. Whereas, in most of the areas we operate in, we know the landscape pretty well, so that was the speculative part, . . . not necessarily what we would do. What we would do we were able to identify and qualitatively articulate pretty easily.

Submission of the response to the RFP was the beginning of the process of bidding on Project A. Once the RFP was accepted, the next step was the submission of a proposal by the company. Once the proposal was accepted, the process of bidding on Project A was complete. The proposal for Project A was followed by the contract and meeting one of the key provisions of the contract, which was the implementation plan. The implementation plan was a written description of exactly how the company would implement the requirements of the contract. The implementation plan was created primarily by one of the senior managers with some input from other organizational members.

At the time of the interviews, the company had just submitted its implementation plan. The next step was the enumeration of the development tasks, or the tasks the company must complete for the successful implementation of the project. The same senior manager responsible for bringing both Project A and Project B to fruition summarized the steps that led to the enumeration of the development tasks for Project A:

RFP, proposal, contract . . . and then the implementation . . . plan. . . . The implementation plan went in, I guess, a week or so ago, and now we're starting to work on the tasks, the development tasks. . . . A lot of the implementation plan is not, "This is how we'll do it," but, you know, task one is to develop . . . this. So, for example, the first thing I just worked on and got completed was a protocol for expanding the program to include multifamily buildings and not just single-family buildings, which is all they had in the program.

Some of the development tasks were generated from client requirements, but most were generated by the company and its need to quantify and codify what it needed to do throughout the project to expand and enhance the project. The senior manager responsible for creating the development tasks described the process the organization would use to complete this part of the project:

Now some of the tasks are required or requested by the client and some of them we create for ourselves—most of them, actually, we create for ourselves. . . . It's just part of implementation. So part of implementation is: Okay. We have to define what information we need from the participants and then we have to create a form for them to fill out for them to give us that information. . . . Or we define the information and then we say: Okay. We're going to have them give this to us online. So then we need to say: Okay, what does that look like? . . . So that becomes kind of an internal task, right? The client doesn't necessarily care how we do it, but we need to have—we need to know how to do it.

Throughout the implementation phase of the project, those employees directly involved were expected to provide ongoing progress reports to both the management of the company and to the client. The development tasks described above formed the framework for these reports. However, at the time the data were collected, progress reporting on Project A was being tracked and stored in the computer of the senior manager responsible for Project A, not on a common drive that would result in storage in the company database. Also at the time the data were collected, many of the processes for how Project A would be run on a day-to-day basis had not yet been finalized.

However, the senior manager with primary responsibility for Project A noted that stored organizational knowledge from Project A might not be applied to future projects:

I do see, certainly for the start-up project for [Project A], absolutely I see getting summary reports out of there, but I want to make sure the summary reports are happening and that somebody is looking at them who will make a meaningful interpretation of what they're reading.

The company also planned to hire several employees to work on site at Project A to help avoid potential logistical issues caused by a company in New Jersey working on a project in the central part of the United States. The hiring for these positions had just started on site at Project A when the data were collected. The company expected to hire at least two employees, but could adjust this number if needed:

We'll have a staff there . . . we're hiring right now . . . initially two full-timers, but they're [the state managers of Project A] already talking to us about other things we can do for them so I could see us hopefully expanding that pretty quickly.

Project B

The process of getting to the pilot phase of Project B took approximately 3 years. In 2007, as the economy was moving into a recession, the same senior manager responsible for identifying Project A began to consider new lines of business that might be profitable in difficult economic conditions. The first line of business he considered was green building and providing consulting services for those in the green building industry.

In Project B, the company worked directly with homeowners to provide an assessment of energy efficiency strengths and weaknesses in their home, with the goal of making the home as energy efficient as possible. If the homeowner chose to move forward with the recommendations in the report, the company recommended contractors

who could complete the work. The company did not provide the contracting services directly. The success of this project hinged on consumer demand for this type of service and on the company's ability to work successfully with this new customer type. Unlike Project A, Project B did not require a bid but rather required extensive research and a decision to enter a new market.

Project B was very similar to a heavily subsidized program in the state of New Jersey to promote energy efficiency in new and existing residential and commercial properties. The company had participated in this program since its inception in the 1990s. Since the state was heavily invested in the program, it did not make economic sense for the company to try to compete with the state. Project B was piloted in a neighboring state and focused on existing owner-occupied residential properties.

During the extensive research that led to Project B, the managers who lived in the state where Project B was piloted shared their individual knowledge of the state's energy efficiency programs. In addition, one senior manager spent much of 2008 traveling to the state capitol every 2 weeks to get to know the decision makers for energy efficiency programs. During this time, he learned about the state's politics with respect to energy efficiency programs and also learned who the key players were in the legislative process. He made himself and the company known to the politicians who controlled the funding for the state's energy efficiency programs. The senior manager focused on learning how the state's political process worked, since funding for any homeowner incentives for Project B were controlled by the legislature:

Some of my role here is to keep track of what's going on. . . . There are a lot of developments in [the state where Project B was piloted] at the state level, so you know last year I was going out to [the state capitol] every 2 weeks and doing the rounds of the state senators and representatives, and I talk a lot with the [state's

secretary for the environment]. And I mean that's how you do it; you've got to be talking to the right people. . . . You've got to make a case. . . . So with the change in administration and with [name]—and I mean she was secretary of the environment of [the state where Project B was piloted]—they moved towards requiring the utilities to create programs, for example. They established the [financing program] and they'd been encouraging the state agencies to create programs for subsidized housing and so on—so, again, all of those things kind of coming together.

The financing program referred to in the previous quotation was a program to offer low-interest financing for energy efficiency improvements in existing homes that was available in the state where Project B was piloted. The senior manager described the available incentive this way:

Between the program identity, which is [name of state program], and the financing, which is [name of financing program], we have something that we can kind of ride in terms of taking it out to customers.

The company was able to reach a point where it felt comfortable starting to pilot a standalone energy efficiency program geared only for the consumer market:

You're going to get a few customers who are your kind of mission-driven, cause-driven customers. In [the state where Project B was piloted] the fact that there's this low-interest financing, I suspect that actually most people will not take advantage of it, but the fact that it's there acts as a catalyst to generating interest, something that we can latch on to.

The pilot phase of Project B began shortly before data collection began. At the time data were collected, the project was still in its pilot phase and the company had not decided if it would be fully implemented:

We're defining the stages of the project, the pilot phase. We had some clear goals and . . . some milestones to meet, and we . . . sat down and we met and we discussed. . . : Did we meet these milestones? How did we do? Are we moving forward? Are we going to pull the plug, you know? So we're—I think we're doing a better job of actually making a conscious effort to discuss . . . the success and failure of [Project B].

The senior managers also discussed more macro-level issues that could influence the decision of whether or not to continue the pilot phase of Project B:

So when things are not so good, it forces you to kind of . . . look inward a bit at how . . . you function as a company and not necessarily rely on what you've always done. You know with [Project B], we're talking about working for . . . consumers, for homeowners, and we've always resisted doing that. . . . It was hard to kind of keep track of little jobs with a lot of different clients. . . . We found that . . . setting up and meeting expectations was a problem when you're working with individuals and getting paid was a problem. . . . What we found, in this development, . . . we've developed a process that allows us to move through small projects. We're still working on it.

This interviewee did not discuss how the company made the project implementation decisions for Project B, but did provide a general overview of how the senior management team made these decisions when considering a new type of project:

We do have some technical support, but we have limited resources. We can't go after everything, so we have to make our choices based on . . . what's the financial—which obviously takes a high, high precedent right now, but we do need to make sure that. . . it puts us heading in the right direction.

The management team had to think in new ways when making the decision to pilot Project B. Project B required the company to use existing technology in ways that it had previously not considered (e.g., client invoicing systems) and to use new technology required for the success of the project (e.g., credit card processing machines).

The Structure of Organizational Memory

The structure of the organizational memory used by this company to make decisions on project development matters had two main components: employees' interactions with each other and employees' interactions with technology. The stories of Project A and Project B also indicate a reliance on several of the organizational memory storage structures proposed by Walsh and Ungson (1991) (Table 4.1).

Table 4.1
Definitions of Storage Structures from Walsh and Ungson (1991)

| Storage Area | Definition |
|---------------------|--|
| Individuals | Memory stored in an individual's memory that may be available to the organization. |
| Culture | How organizational members perceive, think, and feel about the organization and how these perceptions, thoughts, and feelings are transmitted throughout the organization. |
| Transformations | The organization's rules, regulations, and standard operating procedures. |
| Structures | How organizational members behave in their individual social roles within the organization. Walsh and Ungson (1991) also referred to this as the "formal and informal codifications" (p. 66) of appropriate organizational behavior. |
| Ecology | The physical appearance and setting of the organization, which has a direct influence on the behavior of organizational members. |
| External archives | The only structure outside the direct control of the organization, which contains memories about the organization that do not belong to organizational members, such as memories of former employees, customers, peers, and competitors. |

This section begins with a discussion of the two technology-based organizational memory storage locations: the existing database system and the planned enterprise resource planning (ERP) system. An understanding of how the company currently captured organizational knowledge and its plans to change this process provide a foundation for understanding the structure and functions of the company's organizational memory. This section is followed by a description of the role the structure of organizational memory played in the decision to bid on Project A, pilot Project B, and implement both projects. The last part of the discussion of the structure of organizational memory describes the use of pointer and substantive information in making project development decisions. Substantive information was an actual answer to the question asked, while pointer information, as the name implies, pointed the questioner to someone who might have the information needed (Olivera, 1999, 2000).

The Existing Company Database System

The database system was designed to act as a repository for organizational knowledge, which made it a component of the structure of organizational memory. To add organizational knowledge to the database system, employees saved what they wanted to add to common computer drives accessible to all organizational members. In this way, the saved organizational knowledge was available throughout the company. The existing database system received mixed reviews; some employees were consistent users, while others did not use it at all or used it to a very limited extent. When asked how useful the existing database system was, one heavy user stated:

It's where we store everything. It's important documents that you don't want to store on your own personal drive in case it crashes. . . . I want someplace where I can make sure that it's safe, keep it, so to speak. . . . I'm always talking with somebody about an existing proposal that's out on the street . . . or working on a new one, [and] that's where that information is stored.

Another user acknowledged the existing database system's shortcomings:

It doesn't . . . give you everything; it never will. . . . It would be great if you could capture every aspect, but it's impossible; . . . there would be so many questions. . . . To even create a database like that, what particulars would apply? . . . The company database doesn't help me with my [job]. I've set up my own database and so if you want to call that the company database for previous history. . . . I pull from that all the time. I've had to create spreadsheets in order to capture the history and . . . to do . . . a lot of the work.

She also expressed her hope that the planned ERP system would eliminate the need for her to keep her own standalone, single-user system.

One of the senior managers responsible for project implementation stated that he rarely used the existing database to find project-related knowledge:

We've had it, we've developed it, we spent quite a bit of money doing it. . . . I use it to track jobs and hours spent on jobs, but I tend not to go into it as a source of information about the project. . . . We should be using it for more.

The founder did not use the existing database, referring to it as a “good idea, bad execution.” However, like several of the other research participants, his expectations for the utility of the new ERP system were high, as the company made its best effort to eliminate gaps in knowledge capture and codification.

The Planned Implementation of an ERP System

The company planned to introduce an ERP system in late 2010. An ERP system is an integrated, comprehensive, large-scale, computer-based method for managing the many aspects of a business, such as accounting, human resources, purchasing, distribution, and project management (Kallinikos, 2004; Shebab, Sharp, Supramaniam, & Spedding, 2004). This system would provide an additional location to capture and store organizational knowledge and would eventually replace the existing company database system.

The primary task of one of the research participants was to develop and implement the new ERP system to capture all types of organizational knowledge, including organizational knowledge related to project development. The manager responsible for developing the ERP system described it as “a brand new enterprise resource planning system, which will incorporate every aspect of running the business.” When asked what the new ERP system would do that the existing database did not, a senior manager explained:

Well, a number of things. One, it will track our projects much better than what we have now. We're very limited in how we can access the data in the system;

everything is very hard-coded, so there's very little ability to pull out customized information or ad hoc information, so it will allow all of that. And the other part is it will be an enterprise-wide system, meaning it now links together other pieces, so it will link together the financial pieces, it will link together a HR [human resources] piece, it will have . . . a customer service piece, if you will, or sales piece. . . . Right now the management information system is really only used by a third of our workforce, . . . whereas the new system will be used by 100% of the workers.

There were no plans to integrate the company's project-related databases into the ERP system. The ERP would not have a module dedicated to project development, but would have the capacity to store project development knowledge. A senior manager, asked how the new ERP system would assist with project development, responded: "It's going to have a skeleton that people will be able to use, and it will allow us to have a lot more information about the status of any given project." He indicated that eventually there may be a project management shell, "but, I mean, we're biting off more—way too large a mouthful all the time."

The ERP system would provide the organization with the ability to retain larger amounts of project development knowledge in a centralized location and in a standardized format, but organizational members must still add the project development knowledge to the system. One of the expectations for the new system was that employees would be more proactive in entering real-time project development knowledge so that the knowledge would be available while a project was under way.

Project A: Structure

In coming to know about the project, several structures of organizational memory were evident. First, interactions of people outside of the company with the company's external archives (Walsh & Ungson, 1991) led to the referral of the company to the

organization responsible for Project A. External archives, as defined by Walsh and Ungson (1991), are a repository of knowledge about an organization that is beyond the direct control of the organization. In this case, the external archive contained a business peer's understanding of the organization's strengths and capabilities developed during the many years the two companies had worked together. Second, the company relied on the individual memory of the senior manager responsible for bringing the project to fruition.

The decision to embark on Project A also showed a reliance on existing organizational knowledge and past experience of how projects were implemented and completed. While the project was new to the company, it contained elements of previous successfully completed projects. It also caused the company to reconsider how it defined a successful project. As they compared Project A to other projects, managers and employees accessed existing projects' policies and procedures, which were stored in the company databases, making them a part of the structure of organizational memory that was available for retrieval as needed. The recognition that the company had existing skills and standard operating policies and procedures that could be applied to Project A demonstrated the use of organizational knowledge stored in the transformations section of organizational memory, another structure of organizational memory proposed by Walsh and Ungson (1991).

Finally, the decision-making process that led the company to bid on Project A illustrated employee interactions with each other, one of the main components of the structure of organizational memory in this company. For example, during the bidding process, managers discussed their concerns that the company was being used for its expertise and industry reputation.

In his role as the organization's primary business development person, the same senior manager discovered the opportunities that became Project A and Project B. Once the senior manager identified the opportunity that became Project A, he shared his individual knowledge with his colleagues. The managers then discussed the pros and cons of the project and decided to present it to the founder for his final approval. The founder approved his managers' decision to respond to the RFP for Project A. If the founder had not approved the project and the senior managers still wanted to move forward with it, the senior managers would have "repackaged" and re-presented the project in a manner that addressed the founder's concerns, with the goal of obtaining his approval to move forward with the project.

Completion of the bidding process drew on the structure of organizational memory through its reliance on both the memories of individual employees and the organizational knowledge stored in technology systems, such as the company database. Evidence that the company's process of bidding on a project in general, and bidding on Project A in particular, was based on the interaction between individuals and the interaction of individuals with technology can be found in this quote from a senior manager:

So a lot of our RFPs are: Tell us how you would go about doing this. And so the proposal will often—is the starting point for the development of what our procedures are. . . . That written record becomes a collection of the proposal, an operations manual. It could be a collection of technical procedures that are not written by me but written by the technical folks. We're often required to. . . . For example [for Project A], where we're starting up a program, you know, one of the requirements of the contract was that we would develop a program implementation plan. And then that happens—and that's a written document and that becomes the starting point [for project implementation].

The quotation also demonstrated the manager's use of pointer information (Olivera, 1999). He knew an RFP required technical knowledge that he could not produce but did know where to find. By consulting with the "technical folks" within the company he was able to obtain the knowledge he needed to include in the proposal. In this case, the manager acted as his own source of pointer information (he knew who to ask for the needed technical knowledge) and obtained the needed substantive information (the technical knowledge) from the "technical folks."

Further on in the implementation process, the creation of the development tasks, like the creation of the implementation plan, was a collaborative, interactive effort directed by a senior manager. The development tasks were stored in the company databases so that all employees involved with Project A had access to the information.

The issue of how the out-of-state employees who were being hired would store their individual knowledge so it was available for use at the organizational level had not yet been addressed. When the data were collected, minimal information related to Project A, such as contact information for early program participants, had been collected and was stored in the existing company database: "As we get participants, their information will be tracked in our database." When the ERP system was implemented, information and organizational knowledge about Project A would be one of the first data sets transferred to the new system:

It's a great way to start actually because the scope of [Project A] is much smaller than the program in New Jersey and [another state], so it will be a way for us to break our teeth on that.

Table 4.2 summarizes the structure of organizational memory used by the company when making the decision to bid, preparing and submitting the bid, and

implementing Project A. The structures described are based on Olivera (1999, 2000) and Walsh and Ungson (1991).

Table 4.2
The Structure of Organizational Memory for Project A

| The decision to bid | Bid preparation and submission | Implementation process |
|--|--|--|
| <p><i>External archives</i></p> <ul style="list-style-type: none"> • A peer recommended the company for Project A. • The accumulation of organizational knowledge that led to the referral required interactions of people outside of the organization with people inside the organization. <p><i>Individual memory</i></p> <ul style="list-style-type: none"> • A senior manager met with one of the managers of Project A. • The senior manager shared his experience of this meeting with other managers so it could be considered in the decision to bid. <p><i>Transformations</i></p> <ul style="list-style-type: none"> • Managers recognized that skills, policies, and procedures used in other successfully completed projects could be applied to Project A. | <p><i>Employee interactions with each other</i></p> <p>Managers discussed their concern that the company was being “used” when asked to bid on Project A and were concerned about whether the project would be a good fit for the company.</p> <p><i>Sharing of knowledge stored in individual memory</i></p> <ul style="list-style-type: none"> • Managers relied on knowledge from previous projects when preparing the bid for Project A. <p><i>Employee interactions with technology</i></p> <ul style="list-style-type: none"> • Employees used stored knowledge gained from working with the state of New Jersey to prepare the bid for Project A. | <p><i>Pointer information</i></p> <ul style="list-style-type: none"> • Manager consulted with technical experts within the company and developed an implementation plan using substantive information found through use of pointer information. <p><i>Employee interactions with each other and with technology</i></p> <ul style="list-style-type: none"> • Enumeration of development tasks was a collaborative effort, with the result stored in company databases. • Stored knowledge gained from working with the state of New Jersey was used in project implementation. • Project knowledge would be stored on the existing database and would eventually be moved to the ERP system. |

Figure 4.1 is a representation of how project development tasks were created, including possible storage locations, and Table 4.3 summarizes these project development tasks completed at the time of data collection.

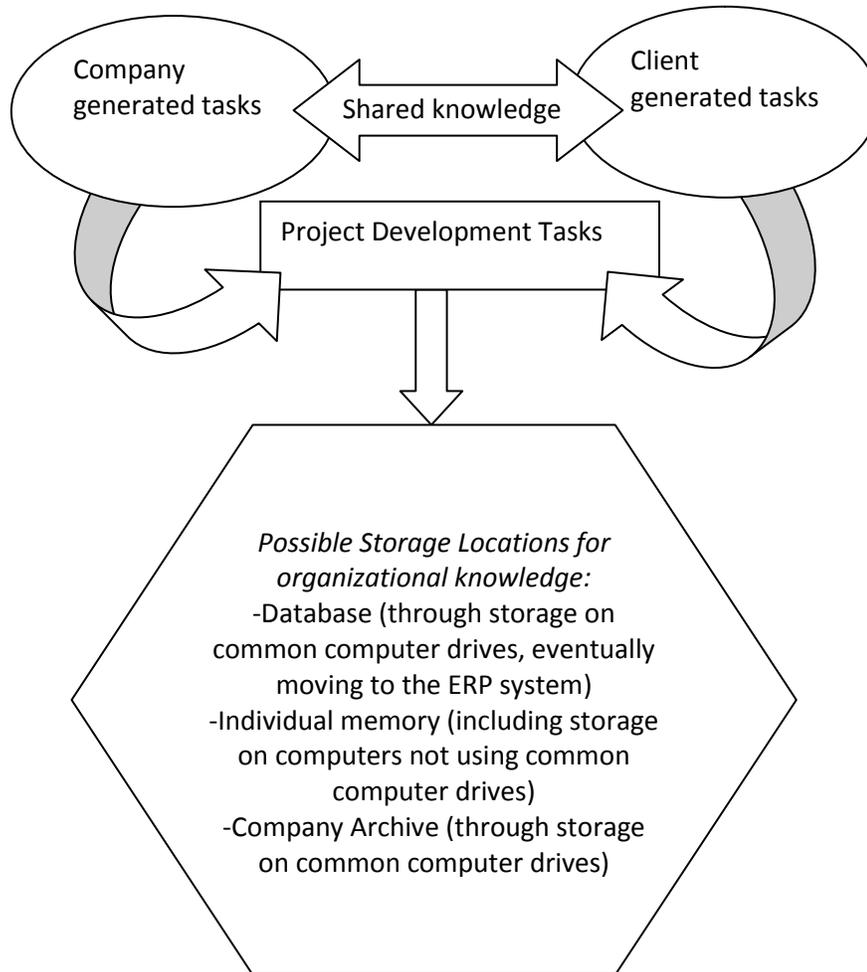


Figure 4.1. How project development tasks for Project A were created, including possible storage locations.

Table 4.3

Project Development Tasks for Project A Completed at the Time of Data Collection and Their Relationship to the Structure of Organizational Memory

| Project development step | Structure of organizational memory | Storage structures* |
|---|--|----------------------------|
| <i>The decision to bid</i> <ul style="list-style-type: none"> • Request for RFP • Decision to bid (submit response to RFP) | <i>Employee interactions with individuals outside of the organization:</i> A business peer recommended the company for Project A based on its positive history with the company and knowledge of the company's capabilities. | External archives |
| <i>Bid preparation and submission</i> <ul style="list-style-type: none"> • Win bid • Submit proposal • Proposal accepted • Sign contract | <i>Employee interactions with each other:</i> Discussion of management's concerns about why the company was asked to bid and the decision to recommend the project to the founder. | Individual memory, Culture |
| <i>Implementation process</i> <ul style="list-style-type: none"> • Submit implementation plan • Implementation plan accepted • Enumerate development tasks | For the implementation plan, management relied on one organizational member to direct and store knowledge of this part of the process. Development tasks were stored in a shared location. | Individual memory |

*From Walsh and Ungson, 1991.

Project B: Structure

The example of the development of Project B showed a reliance on the use of both stored organizational knowledge, such as the company's long-term experience with the state of New Jersey energy efficiency program, and stored individual knowledge, such as the individual knowledge of state energy efficiency programs shared by the managers who lived in the state where Project B was piloted, to make a project development decision. These sources of stored knowledge were combined with the new knowledge gained by the manager who spent time at the state capitol. This knowledge was stored primarily in the manager's memory, although he kept the other senior managers updated on his progress in understanding how the political process might

influence the decision of whether or not to continue to develop Project B. Together these sources of knowledge resulted in the decision to develop and pilot Project B.

In terms of technology, when working directly with individual homeowners, the company realized that some of its systems would need to be adapted for the project, while others would need to be added. For example, the company implemented a new billing system for this project, adding credit card acceptance to its list of services provided. When working with other businesses, the company would typically send an invoice for services rendered and follow up for payment. The consumer fees were considerably smaller and did not warrant the time, effort, and expense needed to produce invoices, mail the invoices, process the payments, and follow up to collect delinquent payments. The company decided to collect all fees from consumers via credit or debit cards. The fee was collected when the final report was delivered, eliminating any accounts receivable associated with Project B.

The company also relied on electronic mail as the primary method of communicating with homeowners. This method was chosen because of ease of use for the company, and because it provided the necessary written record should any disputes occur. This was also one of the usual methods for communicating with business clients. A senior manager described the thought process behind the administrative decisions for Project B:

We have no aged accounts with our individual home business [Project B] because we get a credit card and we charge it at the time we deliver the report. . . . So our receivables are better on that than they are with our other clients. And then as far as expectations, . . . we've made a lot of effort to kind of set up those expectations. This is exactly what we are going to give to you, here's what we are going to charge you. So there are not a lot of questions about: Well, why didn't you do this for me or you know why can't I call you . . . 15 times and spend 10 hours of your time to answer my questions? So . . . these are things that are not necessarily . . . rocket science kind of problems, but we'd never really looked at it.

The process of evaluating and adapting existing billing and communication systems to work with the requirements of Project B demonstrated consideration of knowledge stored in the transformations area of organizational memory. The existing systems were not a perfect fit for Project B, but did provide a foundation from which management could develop systems that worked in the new situation.

Table 4.4 summarizes the structure of organizational memory used by the company when deciding to pilot and implementing the pilot of Project B. The structures described are based on Olivera (1999, 2000) and Walsh and Ungson (1991).

Table 4.4
The Structure of Organizational Memory Used by the Company When Deciding Whether to Pilot Project B

| Stage | Structure of organizational memory | Description |
|-----------------------------|--|--|
| Deciding to pilot Project B | Shared individual knowledge | <ol style="list-style-type: none"> 1. Senior manager shared knowledge of state's support for energy efficiency programs gained during time spent at state capitol. 2. Managers shared their knowledge of state support for energy efficiency programs, which they acquired because they lived in the state where Project B was piloted. |
| | Employee interactions with technology, consideration of knowledge stored in the transformation area of organizational memory | Employees recognized the need to use new types of technology (e.g., credit card acceptance) or use existing technology in a different manner (e.g., using email as the primary means of communication with homeowners, using the existing commercial client invoicing system to produce invoices for homeowners) due to a new customer type (individual homeowners). |
| Implementing the pilot | Employee interactions with technology | <ol style="list-style-type: none"> 1. A new technology was implemented because of the new customer type: the ability to accept credit cards from homeowners for payment for the Project B final report. 2. Employees used electronic mail as the primary method for communicating with clients. 3. The existing commercial client invoicing system was adapted to produce bills for homeowners. |

All Projects: Use of Pointer and Substantive Information

Participants discussed examples of pointer and substantive information (Olivera, 1999, 2000) when describing aspects of project development more broadly. For example, one manager discussed seeking and using pointer and substantive information (Olivera, 1999, 2000), along with organizational knowledge, in project development decision making:

I think a lot of times with project development we tend to do things as a group. . . . [We] kind of sit around and there's some brainstorming going on. Here's . . . what we need. And . . . kind of as a group people offer up . . . different information that is part of the solution or . . . somebody will say: Well—you know, [another senior manager], didn't you do this? Is this—does this apply to this project? So I think it's kind of a collaborative effort and some brainstorming that starts things off, and then we tend to kind of identify the existing resources.

. . . I don't find that we do too many things where we're starting from scratch in terms of development. And then . . . people go off and develop their pieces of . . . what we need to do . . . according to their kind of strengths and expertise. On a smaller basis, I think we tend to know who to go to. . . . We don't always hit the right person first, but it's kind of here's what I need and you go find somebody. Yes, I've got it or, no, I don't have it, but you might . . . and I think because of the size [of the organization], it's not too tortured a path.

In this example, knowledge of who had worked on a similar project was the pointer information (Olivera, 1999, 2000) gathered during the brainstorming portion of the discussion that led the group to identify the appropriate person for a particular aspect of the new project. Once the individual was identified, the pointer information that assisted in locating the right person shifted to substantive information (Olivera, 1999, 2000) as the subject matter expert shared his or her knowledge or expertise. The process of identifying and sharing pointer and substantive information, knowledge, and expertise is illustrated in Figure 4.2.

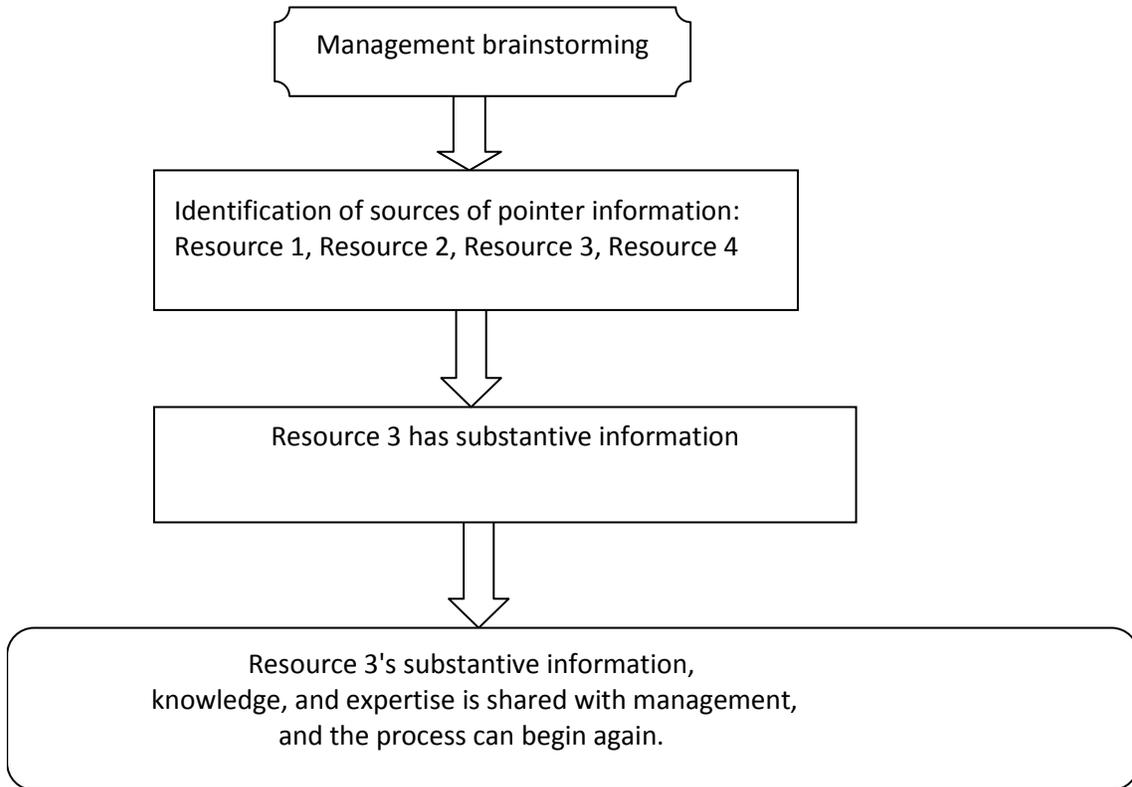


Figure 4.2. Identification of sources of pointer and substantive information and organizational knowledge and how these are shared within the organization.

In the next example, a senior manager discussed how he began the process of analyzing a potential project with pointer information and then applied his expertise and experience to convert the pointer information into substantive information applicable to the project under consideration:

There is no real process with what I do. I've been doing this for 35 years. I treat every opportunity as its own custom opportunity. . . . The thing that I think is critical is with each one being different is the upfront discovery. Really drill down, up front, as quickly as possible and as thoroughly as possible everything that you need to know that's unique about that opportunity and then customize it. So there's no template, there's no—yes, there's things that I beg, borrow, and steal from, because if an opportunity comes up I can say, "This is like . . . something else that happened before."

In this example, the manager demonstrated both a reliance on and respect for the substantive information of others. The manager’s willingness to “beg, borrow, and steal” from previous proposals, as well as his recognition that “this is like . . . something else that happened before” demonstrated his reliance on stored knowledge. This stored knowledge then became pointer information as the manager retrieved it, assessed its usefulness in the current situation, and recombined it with what he had retrieved so that it was appropriate in the current situation, again converting the pointer information to knowledge. This repurposing of the stored knowledge to make it applicable to the current situation also demonstrated the use of one of the functions of organizational memory.

Figure 4.3 illustrates how the manager accessed the structure of organizational memory to retrieve organizational knowledge that may be applicable to the current situation.

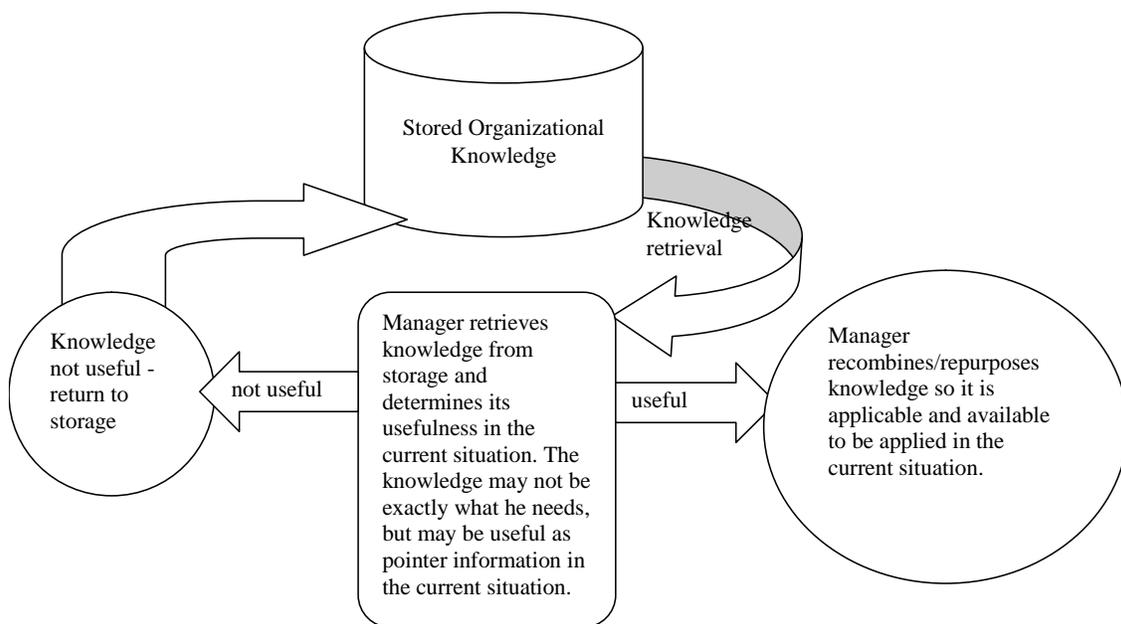


Figure 4.3. How a manager accessed stored knowledge to assist with current decision making.

Section Summary

This section discussed the key components of the structure of this company's organizational memory and how those components were formed and accessed. Examples drawn from the company's work on Project A, Project B, and other projects illustrated that the structure of organizational memory relied on employee interactions with each other and with technology. This section also discussed how and where organizational knowledge was stored within the structure of organizational memory, including possible storage locations, and how both pointer and substantive information (Olivera, 1999, 2000) were shared within the organization.

The Processes of Storage and Retrieval of Organizational Memory

This section discusses the processes used by the company to store and retrieve the organizational knowledge needed to make project development decisions. Using examples from Project A, Project B, and other project development examples, this section addresses how the many process-related components of organizational memory worked together in the company to store and retrieve organizational knowledge to support project development. These components included communication between organizational members, use of various forms of technology such as the company database and the Internet, and a formal retention program for both information and organizational knowledge. How one research participant chose to store and retrieve project development knowledge was very different from another research participant's choices. For example, where electronic mail was an annoyance to one research participant, another found it to be the perfect way to track and store historic organizational knowledge.

The final section provides other examples of how the organization stored and retrieved project development knowledge, including deciding what to store in organizational memory. This part of the organizational memory storage process was addressed by one of the research participants in her role as the person responsible for retaining and storing organizational knowledge. Her description of the need for and value of the organizational memory storage process indicated that the company had decided that its organizational knowledge was worth saving. However, she also highlighted the difficulties inherent in determining the differences between organizational information and organizational knowledge when making storage decisions.

Project A: Process

The story of how the company came to bid on Project A demonstrated the retrieval of stored knowledge and the processes used to store knowledge. The story also demonstrated the benefits of building a strong external archive, a type of stored knowledge (Walsh & Ungson, 1991). Figure 4.4 provides an overview of the process used by management when making the decision to bid on Project A.

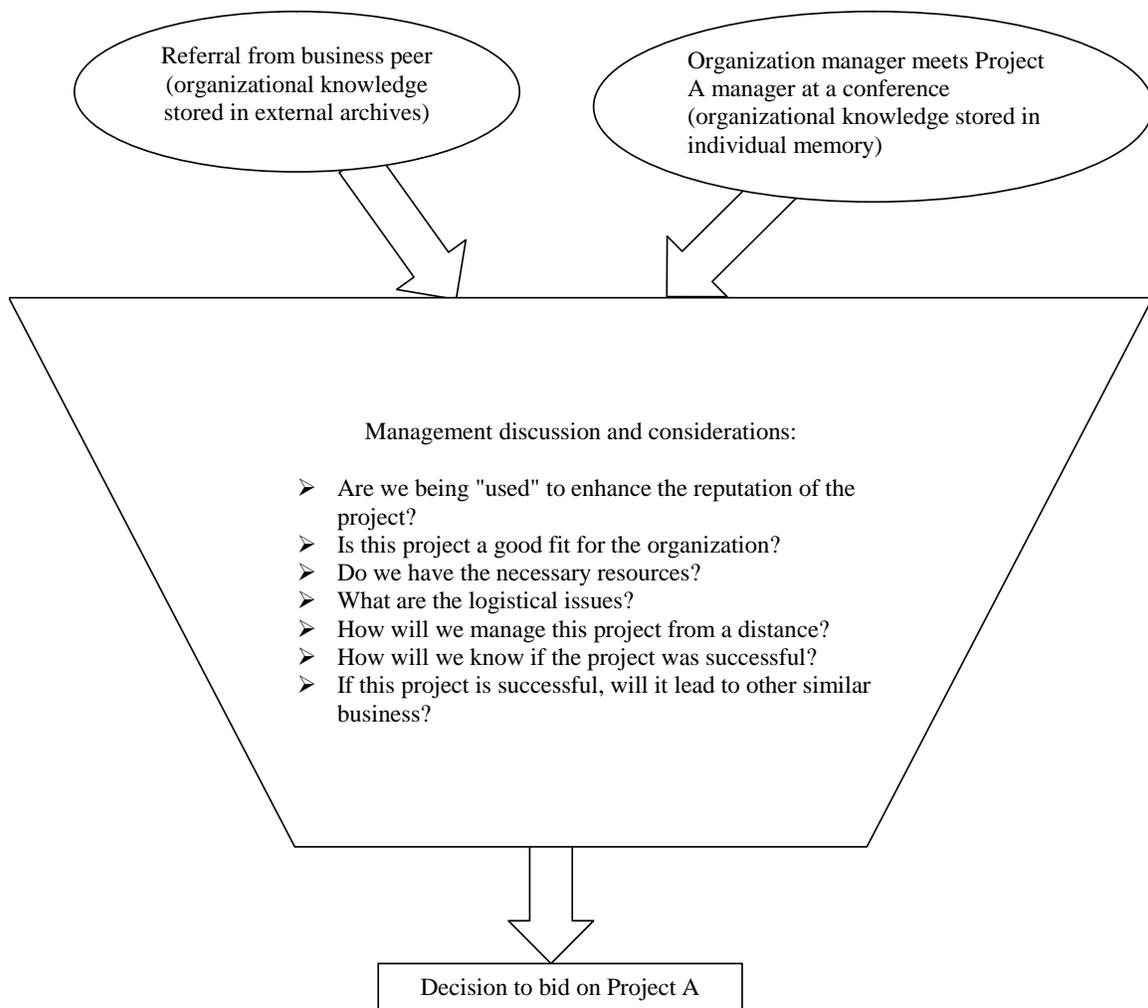


Figure 4.4. The process used by the management team when deciding whether to bid on Project A. Walsh and Ungson (1991) noted that external archives and individual memory are two of the structural components of organizational memory.

Project B: Process

An example of how the company gathered knowledge for storage, then stored, retrieved, and used the knowledge to make a project development decision was found in the story of how the company decided to develop Project B. From its many years of working on a similar program for the state of New Jersey, the management team knew

that a standalone consumer-based energy efficiency program would not be successful in New Jersey, since a single private organization would not have the financial and human resources of the state-sponsored program. Additionally, a private organization would not be able to offer the participation subsidies provided by the state. The company's history contained evidence that it had been successful in delivering a consumer-based energy efficiency program, even if it had not been dealing directly with consumers. The evidence was found in its long-term participation in the New Jersey energy efficiency program and the many awards for excellence the company had earned during that participation. These achievements were posted on the company's website, and the plaques, trophies, and other awards were displayed throughout the company's office. Figure 4.5 illustrates the process management used when deciding to pilot Project B.

Other Examples of Storage and Retrieval of Project Development Knowledge

In addition to the specific examples of the processes used by the organization for storage and retrieval of project development knowledge provided by Project A and Project B, other nonproject-specific examples were discussed throughout the interviews.

Capturing and storing best practices. The employees of the organization stored and retrieved knowledge needed to make project development decisions in various locations and using various methods. A senior manager noted that internal processes for knowledge storage usually had their roots in one of two needs: the desire to capture best practices and the need to respond to RFPs. He reported that the organization did its best to capture project development best practices either during or shortly after a project was completed:

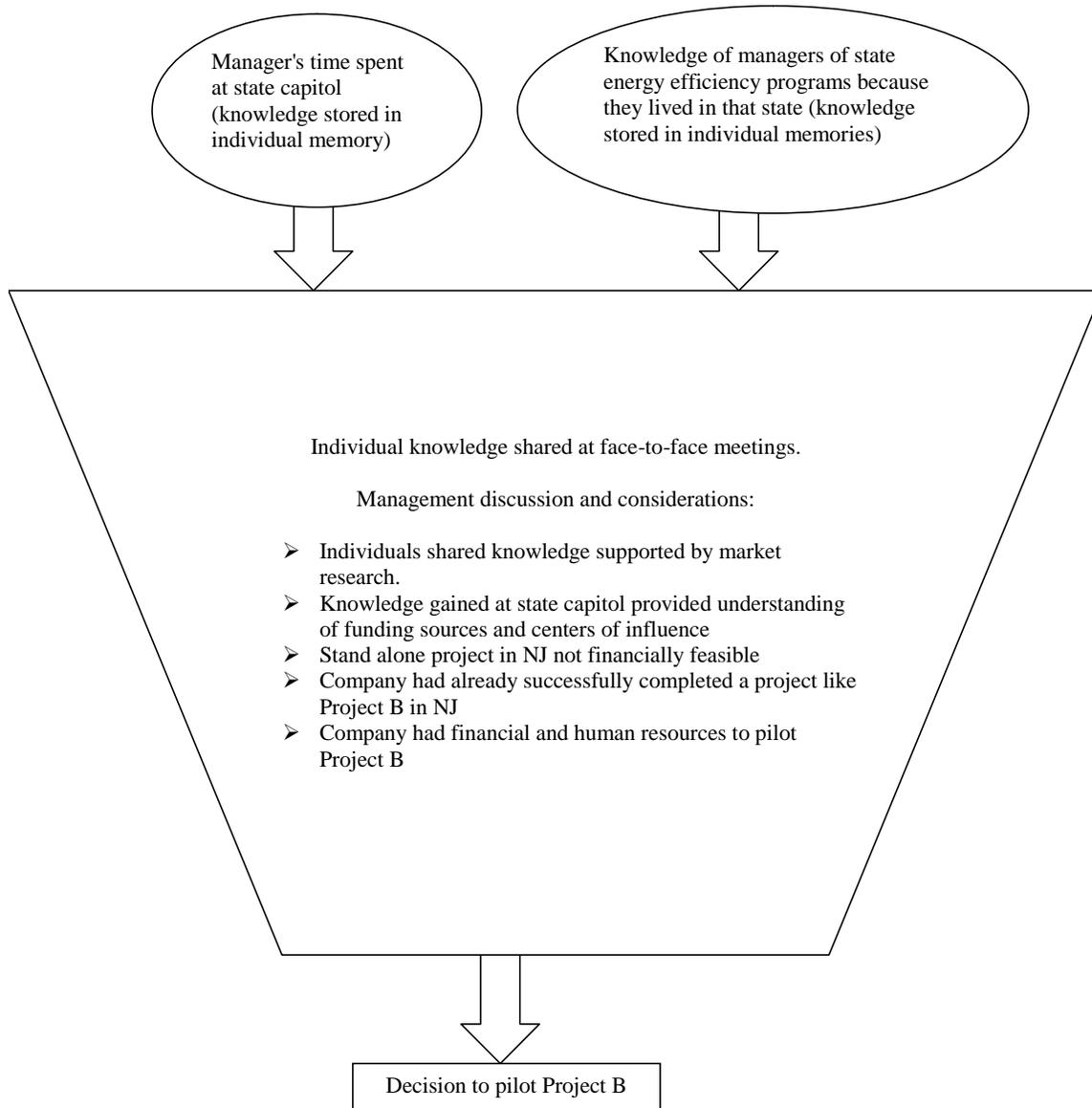


Figure 4.5. The process used by management to decide to pilot Project B.

I'd like to take credit for this, but I think that it is really imposed on us as much as it is something that we do of our own initiative, which is that we create written manuals or protocol documents for pretty much everything we do. As soon as . . . it's finalized and sometimes during the development process, we will have many iterations and then there will be a final and then it's like: Okay. This represents the protocol for what we're doing in this program.

Since Project B was in the pilot phase, the process described in the previous quotation had not been implemented. The process described in the previous quotation had also not been implemented with Project A. After winning the bid, the company did not formalize the process it used, citing the unique nature of each project development opportunity:

But I can also understand how opportunities are fairly unique as they come up. . . . To have a process that would be useful that would work and we would use, I guess the jury is out. I guess if I or—I just really never thought of it being tremendously valuable or we would have done it by now. I mean, we've tried. We've said—you know, we should have some criteria. What's that criteria look like? But I can tell you each evaluation we do, there's different criteria that weigh in that you wouldn't have thought of.

This comment was in direct contrast to previous comments by this senior manager and other senior managers who described the many common elements in each project development decision and how organizational memory was accessed to capture, recombine, and reuse this knowledge.

RFPs as a source of project development knowledge. Another process to capture project development knowledge was inherent in the company's business model, which usually required that the company respond to an RFP before being awarded a contract. Although each RFP response was customized, certain elements of the RFP response remained unchanged from project to project. For example, all of the information about the company and its history did not change in RFP responses, except when the history needed to be updated to reflect recent events, such as the success of a project or a change in the management team. If a different type of project, such as Project A or Project B, became a typical or regular type of project for the company, then the new knowledge gained through the bidding process for the new project type and the project

implementation had the potential to become standardized and be reused for the next RFP response. A senior manager noted that the organization's history resided in the RFPs:

I think the history [of the organization] exists in . . . prior responses to RFPs and RFQs [requests for quotations] . . . and prior contracts, but you've got to do a little hunting to . . . get to it.

The existing database system and standalone databases. There were several locations for retaining project-related organizational knowledge, from the existing database system accessed through common computer drives, to standalone databases created and maintained by single users to track projects or tasks to which they were assigned. Each employee had his or her own computer that was linked to the company-wide database system, but each employee did not create and maintain his or her own standalone databases. A middle manager reported:

We have a web-based—two web-based—databases [this refers to the database system accessed through common computer drives] that are very similar that we use to track . . . most of our projects, our residential new projects. . . . They're not perfect, but they do a pretty good job. And we're trying to turn them into something that's new and more functional. . . . As an interim, I did a database [this refers to a standalone database used by only one employee], I actually did an Access database for this [name of project] . . . because those projects get really complicated.

This user of a self-created standalone database was very aware of the future need to integrate his database with the planned ERP system and designed his database accordingly. At the time the data were collected, he stored project development knowledge (not related to Projects A and B) in his database.

The intent is that [his standalone database] will get rolled into the new [ERP] system. . . . Having created it, it should be relatively easy to duplicate it in other databases. . . . I knew we needed this tool, but we talked about: All right. We don't want to go too far with it because this really needs to be part of the larger [ERP] system. . . . We talked about it all . . . pretty extensively, . . . so we can hand that database to the ERP developers and they can look at it and say: Okay.

Here's how it functions and just . . . roll those functions in. Hopefully. . . That sounds easy, right?

When the ERP system is introduced, it will run in tandem with the existing company database system until the company is comfortable with the new ERP system and until the transfer of all of the necessary information and organizational knowledge has taken place. At that point, the existing database will be taken offline.

The Internet. Research participants also reported using the Internet when searching for information for responses to RFPs and retrieving other information for project development decisions. Internet searches were for both specific information (e.g., pricing) and general information. A manager identified the four Internet sources he most often searched for information to help him with project development decisions: Google, an industry trade organization website, nonlocal competitors' websites, and his colleagues at other companies. These sources were also cited by most of the other research participants, with the Internet as a general source and Google mentioned as a specific source. A typical comment was: "I use the Internet fairly frequently. . . . Typically Google is my first stop to try to find information about anything."

Specifications and technical manuals for equipment used in projects were also accessed through the Internet:

I'm more likely to go and find the company on the Internet. . . . You can find pricing on stuff that you didn't use to, . . . because no matter what you want, somebody is selling it through the Internet. It may not be the manufacturer; they may still work for the reps, but you can buy it somewhere. . . . It's neat to be able to have that stuff basically at your fingertips. Some things, you know, you might wait 2 days to get a phone call back from somebody, and now it takes you 2 minutes.

Interactions with coworkers: in person, by phone, and electronically. A

primary method chosen by the research participants to help them with project development decisions was discussions with their coworkers. Their comments about using coworkers as a source of organizational knowledge, including project development knowledge, are summarized in Table 4.5.

Table 4.5

Coworkers as a Source of Project Development Knowledge

- I draw a lot on the other people in the organization to try to figure out what they've seen because there are a lot of people here with pretty diverse experience from related and completely unrelated businesses. . . . I go to [my direct manager] when I need him to help make decisions and to set direction.
- It's more the senior management because of the work that I'm doing to assist them. So questions like that, you . . . couldn't find them, always, not necessarily in a database for what I need to do.
- As senior managers here at this company, what we do is we have routine updates and reviews. You're very close, you're a small organization, you communicate with your people almost on a daily basis, you're retaining on a daily basis . . . what their knowledge base is. So if, in fact, the time comes when they're leaving, it's not like you have to sit down . . . and gather everything at that point.

Coworkers used many methods to contact each other, including the telephone, instant messaging, electronic mail, and simply getting up from their desks to ask another person. The small size of the organization and the way the workplace was configured (low-walled cubicles in the center and private offices around the perimeter in the main office where most employees were located) tended to make the interactions informal. If the parties to the conversation were in the office, the conversations were usually conducted face-to-face. The parties to the conversations did not appear to be bound by an organizational hierarchy and could speak with a peer just as easily as they could speak with their manager.

One senior manager commented on his use of the different communication tools. He reported that he used instant messaging for short questions that had easy answers. He might use instant messaging to communicate with a supervisor at a construction site. He used electronic mail both internally and to communicate with clients when the communication was more involved than an instant message would allow. He used Skype for conference calls and to attend the meetings of the boards of which he was a member. He also stressed that although there were many ways to communicate, if the communication was urgent and the parties could not connect, a face-to-face meeting was both important and necessary:

I put my cell phone number on my card and I will go and see somebody in order to get the information or make the case. I'll get in the car and drive for 2 hours if I need to. . . . You know, people will play phone tag for weeks, and I don't get it. If it's that important, go see them!

This approach to communication was evident during the development of Project B, when the senior manager spent extensive time at the state capitol gaining the knowledge the company needed to make the decision to pilot Project B.

Several participants characterized another primary communication tool, electronic mail, as necessary and unavoidable, but with an annoying ubiquity that often distracted them from tasks that they viewed as more important. This comment was typical:

Email is a problem. I mean, it's a wonderful communication tool. . . . Obviously, I use it all the time, but email is our own worst—especially for somebody like me who [is] trying to monitor a lot of different activities, lots of outside contacts—keeping up with email can be such a distraction. I mean, frankly, I could do nothing but email all day. I could easily do nothing else.

Other participants found a good fit between their job responsibilities, their communication style, and electronic mail. A senior manager noted that some technology,

electronic mail for example, could be very useful in tracking and retaining project information:

One of the reasons I use email, I know I'm not the talkative person. Some people live to talk on the phone; the first thing they do when they get in the car is they pick up the phone. That's not me. But . . . email provides a much more reliable kind of trail, . . . and sometimes . . . we have to rely and go back and say: Well what happened with this project, how do we track it? . . . So, it's easier for me to document things that way so that we don't have a client that says: Well, I didn't authorize you to do that. Why are you sending me a bill? And I'll say: Yeah, in fact you did. So it's kind of a belts and suspenders thing as well.

The company's electronic mail system saved all of the company messages on its computer servers, making this type of communication available to others in the organization.

Processes for storing organizational knowledge. The company had a very specific and consistent policy and process for retaining and archiving organizational knowledge, both on site and in off-site storage. The organizational knowledge that was retained and archived included project development knowledge, records that the company was legally obligated to retain, and any records the company chose to retain. This organizational knowledge was stored at the company's office on computer servers using common storage locations or drives, and in paper files. Organizational knowledge stored in standalone databases was available to all employees if the knowledge was saved in one of the common computer drives.

In addition to the on-site storage of organizational knowledge on the company's computer servers or in paper files, organizational knowledge was also retained in offsite storage. The company had a formal off-site retention policy, and one of the research participants was responsible for implementing it. Each week, she retrieved tapes of all organizational knowledge saved on the company's computer servers and took them to

one of two climate-controlled offsite public storage facilities rented by the company. She stressed the value of following the retention policy and program:

If you kept something on your desktop [i.e., not saved in a common drive] because you were just working with it, . . . unfortunately, . . . if your computer crashed then you're not going to be able to capture that. So we try to really emphasize: Keep everything on [the company's common drives] because we can always recapture it.

In this way, anything saved on the company's common drives, which included all knowledge in the existing company database system, any standalone databases saved on the common drives, and all company electronic mail, was still accessible in the event of a technology failure at the organization's site.

The company also had a formal retention policy for paper-based organizational knowledge, including project development knowledge, which was also stored offsite at one of the public storage facilities. The retention decisions for paper-based organizational knowledge were the responsibility of the same employee. She described an ongoing struggle with what to keep and what to discard and was the only person interviewed who discussed how she decided that a particular piece of information was valuable enough to be considered organizational knowledge that should be moved to the archives:

The most important thing that I have to do is to make sure where everything is filed, where it's captured and to know how to get to it immediately. And you have to take the time to put it away properly. So just as you're finishing a project, what I'll do is I'll go through the files and clean up and keep the most prominent information that I have in the front of the folder because when . . . we first start to meet or when we first start to consider a project, they [the management team] may think of something and then they decide: No, that's not going to work. We're not going to use such and such. So we want to get rid of that information, not necessarily destroy it. . . . You have to purge and you have to make sure that you're dealing with the actual content as you go forward. . . . I think my hardest job . . . is deciding on what to purge. Because over a period of time, you know, your legal obligation will pass and you no longer have to hold onto that, but that real estate you hold onto that longer, if not forever.

Section Summary

This section addressed the processes the organization used to store and retrieve the organizational knowledge needed to make project development decisions. The processes were illustrated through the stories of how knowledge was managed during the development and implementation of Projects A and B, as well as through other projects.

The need to capture and retain organizational knowledge was often rooted in either a need to capture best practices and/or a need to respond to an RFP. Organizational members relied on many methods to facilitate this knowledge retention and retrieval, including conversations with other organizational members and extensive use of various technologies, such as the company database and the Internet. Each organizational member found his or her own way to work with organizational knowledge. Most found technology useful, necessary, and unavoidable, but a simple conversation was still cited by some as their preferred process for accessing organizational knowledge.

This section also described the formal process by which the organization captured and retained organizational knowledge, including the ongoing struggle of the manager responsible for this process with deciding what organizational knowledge should be stored and persuading organizational members of the importance of the formal retention process.

The Functions of Organizational Memory in Project Development Decision-Making

The primary function of organizational memory in this company was to provide a foundation or structure for the organization to use when making project development decisions. For each new project, including Projects A and B, some element of the

company’s previous work was usually applicable. This experience was available for retrieval from the structure of organizational memory and could be applied to the current project development situation. This decoding and recombining of existing organizational knowledge to assist with decision making in a new situation is a key function of organizational memory (Casey & Olivera, 2003).

When the project under consideration was dissimilar to organizational knowledge found in organizational memory, organizational memory hindered project development decision making because the retrieved organizational knowledge could not be applied to the current situation. Organizational memory also hindered project development decision making when the needed memory was not accessible because it was stored in individual memory, when the memory caused the company to doubt its abilities, or when a memory of past failures caused the company to reject viable projects.

Table 4.6 lists, explains, and gives examples for each function identified in this study; the next section provides more detail on the functions in relationship to structure.

Table 4.6
Functions of Organizational Memory in the Organization

| Function | Example |
|--|--|
| Informing decision making | Management’s consideration of available and needed resources when deciding to bid on Project A and pilot Project B |
| Assisting in the decoding of knowledge | Management’s discussion about being “used” when asked to bid on Project A |
| Integrating dispersed knowledge | Management’s consideration of several sources of research when deciding to pilot Project B |
| Helping the organization recombine existing knowledge in new ways | Management’s consideration of its long-term successful participation in NJ energy efficiency programs when considering both Project A and Project B and how this historic success could assist in the new projects |
| Providing a stable framework for the retention and storage of existing knowledge | Management’s recognition that new projects, such as Projects A and B, had elements that were both similar and dissimilar to previous projects |

Relationship Between Structure and Functions of Organizational Memory

Table 4.7 outlines the structures (based on Walsh & Ungson, 1991) and functions (based on Casey & Olivera, 2003) of organizational memory accessed by management when making the decision to pursue Projects A and B, highlighting the relationships between structure and functions.

Table 4.7

How the Structure and Functions of Organizational Memory Were Accessed and Applied when Making Project Development Decisions

| Management considerations | Structures accessed | Functions applied |
|--|---|--|
| Project A | | |
| Are we being “used” to enhance the reputation of the project? | Individual memory, culture, external archives | Informing decision making, assisting in the decoding of knowledge |
| Is this project a good fit for the organization? | Individual memory, transformations | Informing decision making, integrating of dispersed knowledge, helping the organization recombine existing knowledge in new ways |
| Do we have the necessary resources? | Transformations | Informing decision making, helping the organization recombine existing knowledge in new ways, assisting in the decoding of knowledge |
| What are the logistical issues? | External archives, individual memory, transformations | Informing decision making, integrating dispersed knowledge, helping the organization recombine existing knowledge, decoding knowledge |
| How will we know if this project was successful? | Individual memory | Informing decision making |
| Project B | | |
| Individual knowledge, supported by market research | Individual memory, external archives | Informing decision making, assisting in the decoding of knowledge, integrating dispersed knowledge, helping the organization recombine knowledge in new ways |
| Knowledge gained at state capitol providing an understanding of funding sources and centers of influence | Individual memory, external archives | Informing decision making, assisting in the decoding of knowledge, integrating dispersed knowledge, helping the organization recombine knowledge in new ways |
| The fact that a stand-alone project in New Jersey was not financially feasible | Individual memory, transformations, external archives | Informing decision making, providing a stable framework for existing knowledge |
| Completion of a project similar to Project B in New Jersey | Individual memory, transformations, external archives | Informing decision making, providing a stable framework for existing knowledge |
| The company’s financial and human resources available to pilot Project B | Transformations | Informing decision making, providing a stable framework for existing knowledge, helping the organization recombine knowledge in new ways |

The interactions observed between employees and the responses provided during the interviews provided evidence of the relationship between organizational memory structure and functions during the process of searching for and locating information and organizational knowledge of all types, including project development information and knowledge. For example, one senior manager described how he found the technical knowledge he needed when making project development decisions:

I'm only a source of information partially at [the company] . . . so I try not to make any technical assumptions without running them by the people who I know, know those issues intimately, . . . and I very much respect [another senior manager] in his role as the ultimate technical word. . . . I try very hard never to be in a position where I'm making a statement on behalf of the company about a technical issue that I don't know that I have his backing for. . . . Certainly if I'm not confident in my answer, I won't even give one; . . . I'll go to [the other senior manager] and get [him] to follow up.

This example illustrated a search for organizational knowledge and a desire for a stable foundation from which knowledge can be retrieved. The relationship between organizational memory structure and functions and its usefulness in project-related decision making varied depending on how the source of the knowledge chose to make it accessible. Those who consistently shared their knowledge either placed the knowledge in a location that was accessible to others (e.g., in the company database system) or were available to share information. This behavior demonstrated a link between organizational memory structure (knowing where knowledge should be stored and placing it in that location) and function (others retrieving the knowledge and using it in a different situation).

Those who kept their knowledge to themselves demonstrated the link between organizational memory structure and functions on a case-by-case basis as asked, or

shared their knowledge if they were aware that it might be useful. For example, the senior manager who was responsible for developing Project A and Project B did not use the existing company database system. If he was not in the office or available by phone, his project development knowledge was inaccessible: “So actually I’m probably the person in the company who uses that [the existing database system] the least.” Others did not use the existing database because of its perceived limitations and were hopeful that the new ERP system would be a useful replacement. One manager described the new ERP system as replacing “a mishmash of nothing.”

Other situations in which organizational memory could hinder decision making in project development decisions occurred when the organizational knowledge retrieved from memory was not exactly the type of organizational knowledge needed for the new situation, or if a past failure was similar to a project under consideration.

Table 4.8 outlines the structures (based on Walsh & Ungson, 1991) and functions (based on Casey & Olivera, 2003) of organizational memory accessed by management for project development decisions and provides examples of how organizational memory helped or hindered decision making.

Table 4.8
How Organizational Memory Helps and Hinders Project Development Decision Making

| Helps or hinders | Quotation | Relationship to organizational memory | |
|-------------------------|--|---|--|
| | | Structure | Function |
| <i>Helps</i> | I guess like most organizations, we tend to go after new work that is somehow similar to work that we’ve already done. So knowing how we’ve approached projects in the past and what we’ve succeeded and not succeeded at and why can be really helpful in | Access to individual, and transformation areas of organizational memory | Informing decision making, integrating dispersed knowledge, recombining existing knowledge in new ways |

| Helps or hinders | Quotation | Relationship to organizational memory | |
|-------------------------|--|---|---|
| | | Structure | Function |
| | assessing how much effort it's going to take to do something, whether we have the skill set in house, whether we're likely to get a lot of clients or not. | | |
| <i>Helps</i> | Tremendously . . . because it [organizational memory] just gives me the ability to be able to look at certain areas. . . . I have to look at cost sometimes and the building block of that. I have to look at some designs, logos, what's the proper one to use? So mine is a little bit more into the detail. | Access to individual and transformation areas of organizational memory | Informing decision making, assisting in the decoding of knowledge |
| <i>Helps</i> | I know what works. I know what doesn't work. I know my job well enough that I can accomplish a whole lot more in a day than if I didn't have that background [access to the organization's memory]. | Access to individual memory | Informing decision making, providing a stable framework for the retention and storage of existing knowledge |
| <i>Helps</i> | If you know the . . . genesis of a . . . technical decision or a policy decision, if you know on what it was based, that can help you to explain it or . . . build on it. You know, good decisions or good policies, I think, are policies that have evolved from . . . some initial starting point and then the impact of experience. . . . That's always an issue when you lose people; the institutional memory goes with them, whether you like it or not. | Access to individual, structures, and transformation areas of organizational memory | Informing decision making, providing a stable framework for the retention and storage of existing knowledge, helping the organization to recombine existing knowledge in new ways |

| Helps or hinders | Quotation | Relationship to organizational memory | |
|-------------------------|---|--|--|
| | | Structure | Function |
| <i>Hinders</i> | It [organizational memory] hinders me in the sense that when I've seen us not do well at something, that's going to make me inclined to not take us in that direction again, . . . and that's not always the right answer. The right answer sometimes is fix the reason why it didn't work last time and try it again. [referring to information about unsuccessful projects stored in his memory that might keep him from considering a project similar to the unsuccessful project] | Access to individual memory | Informing decision making |
| <i>Hinders</i> | Nobody likes change, so if you're set in your ways, it's maybe—you have to think twice before you say no or that's not how we do it, you know? This is the way we do it. Well, somebody came on new and they found a better way to do it. Great. . . . It's always a learning process, but I think it's more positive than it is negative. [referring to the policies and procedures she uses to complete many of the back office tasks associated with project development, such as payroll and human resource issues] | Access to transformation area of organizational memory | Informing decision making, helping the organization recombine existing knowledge in new ways, assisting in the decoding of knowledge |
| <i>Hinders</i> | We're finally getting to where . . . our geography is not limited, but I think it's our history that has kept us very focused here. We know the market, we know the business, we know the players, and we know how to make money here, so it does require risk to try something else and I don't say . . . frivolous risk, I mean well thought-out plans, . . . but it's taken us a while to get | Demonstrates an understanding of the company's external archives and its culture | Informing decision making, providing a stable framework for the retention and storage of existing knowledge |

| Helps or hinders | Quotation | Relationship to organizational memory | |
|-------------------------|---|---|---|
| | | Structure | Function |
| | there. . . . The company history has both helped in a lot of ways, but it has also restricted some things too obviously. | | |
| <i>Hinders</i> | In some cases as we kind of refocus or try to go in different paths, there's always—"well, we've never done that before." . . . Usually there are reasons for why we've never done that . . . which may or may not apply to our current thing today. So sometimes I think it [organizational memory] kind of limits our—it puts blinders on our thinking sometimes. . . . If times were good, we wouldn't necessarily be looking at doing things any differently, . . . so this is kind of forcing us to re-evaluate who we are and what we're going to be in the future. | Access to individual memory, culture, and transformation areas of organizational memory | Informing decision making, providing a stable framework for the retention and storage of existing knowledge |

Section Summary

This section cited examples from Project A, Project B, and other decisions related to project development to describe the functions of organizational memory used by this company and their influence on project development decisions. This section also described and provided examples of the relationship between the structure and functions of organizational memory used to make project development decisions. The research participants indicated a willingness to allow the past to assist in informing project development decisions in the present. The past was viewed as one tool in an arsenal that included reliance on technology and individual memory.

Additional Finding: The Role of the Founder

A topic that emerged repeatedly during the interviews was the key role of the founder in both the past success and the anticipated future success of the company, including his role in project development decisions. The discussion of the role of the founder did not relate directly to the research questions, but its persistent recurrence meant that it could not be ignored. The founder's tenure and role with the company made him a self-contained repository of organizational memory from which other participants regularly retrieved knowledge, including project development knowledge. The founder had clearly earned the strong loyalty of many employees. When asked about the influence of the founder on the company, this was a typical reply:

I think [the founder] has left a legacy or he's built a legacy. . . . He's somebody that you want to please. He instills a work ethic that you're part of—you're part of the growth. . . . He's not in this alone; we're building something together, and there's a lot of—loyalty is the word I was thinking. I would do—I would, a lot of times I put . . . what I had to do for the company ahead of my family just because I wanted to—not just to please him, but I wanted to do a good job. I wanted to be—I wanted to be successful, and I think that's something that [the founder] just gave that sense to.

Several research participants spoke of the founder's influence outside of the company within the business community and with competitors. The founder was also referred to as a brand. This quotation demonstrated how the role of the founder influenced the company's reputation, a part of the external archives of organizational memory (Walsh & Ungson, 1991):

[Competitors] want to be [the company], they want to look like [the company], they want to steal some of the [the company's] ideas—that's fine, companies do that. They, as part of that they try and structure their pricing and their costing the same way that we do. . . . Knowing that they need to overcome our brand recognition, they undercut us from a pricing standpoint.

From the perspective of some of the participants, the role of the founder in project development decisions was less clear, although the founder reported that he made the final decision on whether or not to bid on a project. One senior manager stated that the founder did not have an active role in project development decisions, but he did describe the founder's overall strong influence on the tone and direction of the organization:

[The founder] does not have a lot of day-to-day influence on the organization. . . . He does have a lot of influence on the organization from a vision perspective and from a general tone—not quite culture, but sort of he's very good at accessing what's urgent and what's not, and that has an effect. He's more effective when he's looking at the vision and medium-range stuff than when he tries to look at day-to-day stuff. He loses his effectiveness as he gets down to the more granular levels.

Another senior manager concurred with this response:

I was struggling to answer your question initially because I thought you were talking more about day-to-day [influence]. [The founder] has not a lot of influence on day-to-day. The senior management team runs day-to-day. We keep him abreast of what we're doing.

A middle manager perceived the founder's role in project development decisions as inconsistent: "It's not in a necessarily consistent and structured way. It tends to be a little more sporadic."

A senior manager described the founder's role in project development decisions as "open to be convinced":

I don't feel like we've gotten to a point where it's come down to either he can't convince the rest of the staff that it's not . . . a good idea or they can't convince him that it's worth pursuing, at least to some degree.

The founder saw his role as a consultant who provided a final decision on whether or not to accept a project, but then left the day-to-day project management issues to his staff:

I think I . . . still have substantial influence on . . . the company. It's been diminished as the company grows, but I still think that if I really put my foot down and say no, I don't think this is a good idea, that's what's going to happen or not going to happen.

A senior manager agreed with this perspective:

In the project development and in some cases he is—he's actively involved, but in all cases he's at least . . . the sounding board. We've got to take whatever we do in development . . . through [the founder] and say: Here's our proposal. Here's what we want to do. And then as we do move forward obviously he's looking at our . . . progress . . . and to see if we're meeting our goals, and ultimately he's going to give us a thumbs up or a thumbs down as far as how something—whether it continues or not.

Chapter Summary

Chapter 4 reported the findings in answer to the research questions and findings in answer to a topic that emerged consistently throughout the interviews: the role of the founder. The chapter began with an overview that included a brief review of the conceptual framework and the purpose of the research, followed by a description of Project A and Project B. This section was followed by four sections that directly addressed the findings in answer to the research questions. Each section cited Projects A and B as primary examples, but also cited other project development decisions to describe and illustrate the findings.

The first section discussed the structure of organizational memory in the company, noting that the structure consisted of employee interactions with each other and employee interactions with technology. Evidence of the reliance on each other's experience was implicit and was seen in the participants' willingness to search for and obtain pointer and substantive information (Olivera, 1999, 2000) and organizational knowledge from each other and other organizational members.

The second section discussed the processes used to store, retrieve, and utilize organizational memory, including the mechanisms, such as various forms of technology, which assist in these processes.

The third section discussed the primary functions of organizational memory utilized in the company and the relationship between the structure and the functions of organizational memory. The primary function of organizational memory was to inform decision making by providing a stable foundation from which organizational knowledge was retrieved (Casey & Olivera, 2003).

The relationship between the structure and functions of organizational memory was addressed in a discussion of management's considerations when deciding to move forward with Projects A and B and also in the context of organizational members' comments about how organizational memory both helped and hindered them as they did their jobs.

A final section reported on the role of the founder, an additional finding not directly related to the research questions. This section highlighted differences in how managers and the founder viewed his role in project development decisions, as well as how the founder's individual knowledge of the organization made him an integral part of the structure of its organizational memory.

Interpretation of the findings, conclusions, and implications for future research are discussed in chapter 5.

CHAPTER 5:

INTERPRETATIONS, RECOMMENDATIONS, AND CONCLUSIONS

This first part of this chapter presents and briefly discusses the most significant findings from this study in relationship to the organizational memory literature. Next, conclusions drawn from these findings are discussed in the context of the revised conceptual framework formed by this research, the work of Walsh and Ungson (1991), Olivera (1999, 2000), and Morgeson and Hofmann (1999). The recommendations for future theory, practice, and research are then presented.

The purpose of this research was to understand how organizational memory influenced project development decision making in a small business, with special consideration of the role of technology in the decision-making process. The organization studied was an energy consulting and engineering company classified as a small business according to the guidelines of the U.S. Small Business Administration (SBA, n.d.).

The exploration of the structure of organizational memory had its roots in Walsh and Ungson (1991). They described the structure of organizational memory as a series of bins that stored what the organization had chosen to save. Their model's shortcomings were the lack of a process to decide what to store and move to storage, and the lack of a process for retrieving stored organizational knowledge. Olivera's (1999, 2000) characterization of organizational memory as a system provided the perspective needed to view organizational memory as more flexible and emergent than implied by Walsh and Ungson. Olivera's framework also explicitly considered how and why organizational members chose to interact with technology and with each other, and how these interactions influenced the formation and use of organizational memory. Olivera (1999)

noted that organizational memory systems also contributed to organizational learning, since they provided a place where organizational members could “store, share, and use knowledge about the organization’s experience” (p. 3). This characterization of organizational memory as a system was also supported by the work of Morgeson and Hofmann (1999), who described organizational memory as a collective construct “composed of the actions and interactions of organizational members” (p. 256).

The findings in answer to the research questions were gathered through three sources: interviews with organizational employees, including the founder, document review, and observations. The data from these sources were triangulated to develop the findings related to the research questions for this study.

Significant Findings and Their Interpretation

The significant findings are presented in three parts. The first section discusses the structure of organizational memory and how its components influenced the overall structure. The second section discusses the processes used to store and retrieve organizational memory, and the third section discusses the relationship between the structure and functions of organizational memory.

The Structure of Organizational Memory

The structure of organizational memory in this company relied upon the sharing of individual memories of both employees and others with access to the company’s external archives (Walsh & Ungson, 1991), various forms of technology, and the interactions of the employees with technology.

Sharing individual memories. One of the key components of the structure of organizational memory was the interaction of organizational members and their sharing of their individual memories. Organizational members' implicit reliance on individual memory (Walsh & Ungson, 1991) was demonstrated when participants discussed the people in the organization with whom they consulted when making project development decisions. This comment was typical: "I draw a lot on the other people in the organization to try to figure out what they've seen because there are a lot . . . of people here with pretty diverse experience from related and completely unrelated . . . businesses." Morgeson and Hofmann (1999) argued that through ongoing interactions and interrelationships such as these, organizational memory is actually created and sustained. Fisher and White (2000) supported this reasoning, describing the unseen and unnoticed interrelationships that one employee might have within an organization as a component of organizational memory.

The company had few employees (approximately 35 to 40), so it was easy to access organizational memory by simply walking over to the desk of another employee and asking for the needed help. For example, one employee might walk over to the cubicle of another employee and ask a question. The employee being asked the question may or may not know the answer and could provide either pointer information or substantive knowledge (Olivera, 1999, 2000) by accessing the structure of organizational memory through conversation with a third employee and/or by searching for the response using technology. Once the organizational knowledge needed for the reply was retrieved from its storage location, one or more of the functions of organizational memory could assist in completing the search for organizational knowledge. For example, functions of

organizational memory, such as assisting in the decoding of knowledge, informing decision making, or integrating dispersed knowledge (Casey & Olivera, 2003), may have contributed to a response that was both accurate and understandable.

The research of Baxter, Connolly, and Stansfield (2009) also supported the value of the organizational members' sharing of their individual knowledge. They found that in project-based organizations, the contributions of individuals to the group allowed "collective learning to occur" (p. 39). In the example provided above, the interactions between employees and technology were considered significant components of the structure of organizational memory. The function that the interactions facilitated was learning or new knowledge creation, which was the "collective learning" (p. 39) to which Baxter et al. referred. The research of Baxter et al. (2009) was further supported by Martin de Holan (2011) who described organizational memories created by employees' ongoing interactions as not just shared knowledge, but also as a way for employees to understand each other's roles within the organization. In turn, this understanding or "new knowledge" of employee roles is stored and embedded in organizational memory, creating "stable patterns of behavior" (Martin de Holan, 2011, p. 319) that facilitate and influence the function of learning.

Project A. The story of how the company won the bid for Project A demonstrated the interaction of employees and external business peers. Parise et al. (2006) noted that outside interactions, such as those with customers, suppliers, and "colleagues from previous jobs" (p. 38), that were critical to the company's successful bid for Project A are important sources of market and customer knowledge for an organization. Through organizational members' contact with outside sources, relationships develop that can

encourage the outside sources to “keep the best interests of the organization in mind” (Parise et al., 2006, p. 38).

Project B. Project B also relied on shared individual memories. Cross and Baird (2000) described these shared communications as a way to build “social capital” (p. 71) in order for coworkers to develop a relationship based on trust and knowledge of each other’s skills. Cross and Baird (2000) defined social capital as “the sense of reciprocity and trust among colleagues” (p. 71) which develops as they spend time with each other completing work-related tasks. They also described a process of “social interaction” (p. 70) that occurred in the workplace each day that facilitated the sharing of individual knowledge through simply working with other people. If this individual knowledge is captured and retained, it has the potential to become part of organizational memory. The group of managers who had to make the decision about whether to pilot Project B had worked together for many years on many different projects and had a high level of trust and confidence in each other’s skills and abilities. This facilitated the social interaction and social capital needed to make the decision to pilot Project B.

Technology and the interaction of organization members with technology.

The organization operated in a dynamic, knowledge-intensive environment. The methods organizational members used to find the organizational knowledge they needed to do their jobs reflected this complexity. Organizational members used many different sources, both people-based and technology-based, to find the knowledge they needed in organizational memory. These sources were sometimes used separately and sometimes used simultaneously. Organizational members did not have any difficulty switching between the various sources as their knowledge needs evolved. This supports Olivera’s

(1999) finding that “models of information search that assume individuals select a single information source for a given task inadequately represent how individuals currently search for information” (p. 140).

The use of technology in business has evolved significantly over the last two centuries. Volti (2009) noted that organizations in the late 1800s used technology to improve efficiency. Technology such as filing systems and standardized forms made organizations more effective and also led to increased production. Smith (1990) found that technological developments in the United States in the early part of the 20th century centered on innovation and adapting ideas developed throughout the world for use in American industry. He noted that World War II fueled the invention and innovation of products not previously considered by business or society, but with broad societal applications (i.e., atomic weapons and penicillin). Smith described the period after World War II as the era of basic science, or the development of new technology without consideration for how the technology might be used. In the last 50 years, American business turned its attention to the application of new technology (Smith, 1990). Technology that can both store and share information and organizational knowledge is common in today’s businesses. Volti (2009) cited technologies such as computers, electronic mail, cellular telephones, voicemail, facsimile machines, copy machines, and the Internet as a few examples.

For purposes of this research, technology was defined as the common office devices and equipment used by the company, such as computers, electronic mail, voicemail, the Internet, cellular phones, telephones, facsimile machines, and smart phones (i.e., iPhone, Blackberry). The company also had two databases that held the

general policies and procedures that the company used to operate, as well as some project development knowledge. Also included were the standalone databases created and maintained by some organizational members, the planned enterprise resource planning (ERP) system, and the process used to archive organizational knowledge.

Technology was a key structure of organizational memory and was used extensively throughout the organization to support individual interactions and assist in the ongoing formation of the structure of organizational memory. Technology provided a stable location to store organizational memory, as well as a stable foundation from which organizational memory could be retrieved. Technology was useful when project development decisions were under consideration and during project implementation. For example, maintaining a reliable connection to the out-of-state office opened to support Project A and establishing its policies and procedures would not have been possible without common office technology, such as computers, electronic mail, telephones, and facsimile machines.

The participants reported that the existing database system did not consistently serve the company well as part of the structure of organizational memory. Based on interview responses, employees expected that the planned ERP system would be easy to use (or at least easier to use than the current database system) and that all employees would store knowledge in and retrieve knowledge from the new system. As one research participant stated:

Everybody will have input in it, which is, on one hand, a good thing but on the [other] hand very scary . . . because I know I can—you know I can make mistakes, but now we're going to have mistakes that each individual will be doing.

This opinion was supported by Kallinikos (2004), who discussed how the implementation and usage of an ERP system, as well as its inherent purpose, connect all parts of an organization, whether or not they had previously been connected or want to be connected. He stressed the importance of ERP system users recognizing these “transactional interdependencies” (p. 9) and noted that when an organization implements an ERP system, “there are no isolated acts” (p. 9). Kallinikos also reviewed the power of an ERP system to join and integrate organizational factions, both removing and reforming functional and operational silos, while providing uniformity to processes, procedures, and systems. At this point, the organization is so small that Kallinikos’ concerns are not an issue. However, as the company recovers from the recession and begins to grow again, the ERP system may have an unintended influence and impact on the organization.

Organization members interacted with technology in three ways. First, technology facilitated their interactions through their use of common office technology such as electronic mail, text messages, telephones, cellular phones, and facsimile messages. Second, technology facilitated storage of organizational knowledge in organizational memory. For example, all work saved to one of the company’s common computer drives was available to all organizational members and was eventually added to the company archives. Third, technology, such as the database system, the standalone databases, and company archives, provided a location to store organizational memory.

During their interactions with each other and technology, employees contributed and withdrew “social capital” (Cross & Baird, 2000, p. 70) and “structured knowledge” (Aiman-Smith et al., 2006, p. 18) from organizational memory. Cross and Baird (2000)

described social capital as the sense of trust and confidence in each other and willingness to reciprocate when assistance was needed that developed between coworkers as they interacted over time, while Aiman-Smith et al. (2006) described structured knowledge as knowledge of policies, procedures, and routines. The sharing of social capital and structured knowledge helped form the overall structure of organizational memory. Morgeson and Hofmann's (1999) theorizing on collective constructs, such as organizational memory, supported this finding. They posited that it is through the interactions of individuals within an organization that organizational memory structure is formed. As the organizational memory structure is formed, the individuals' ongoing interactions provide the "meaning and structure" (p. 256) necessary to sustain and update the organizational memory. The sustained organizational memory is maintained through the interactions of its components, in this case, people and technology, and has the potential to influence the interactions of organizational members.

Both Project A and Project B benefitted from the interface of the company's employees with technology, a key feature of organizational memory systems (Nilakanta et al., 2006; Stein & Zwass, 1995). Logistics and an unknown market were two key concerns when the company bid on Project A. The use of common office technology both improved the company's ability to communicate with the client and bridged the logistical concerns.

Project B was very similar to an existing project under way in New Jersey. The managers used technology, such as the Internet, to gather information from the state's website and retrieved organizational memory about past participation in a similar program to help inform their decision making. This knowledge was added to new

knowledge gathered by the company about the state where they planned to introduce the program. The new knowledge was gathered from the managers who lived in the state where Project B was piloted and knew which programs were available, and by the manager who spent time at the state capitol learning about the legislative and political issues that could affect the project. These sources of knowledge were discussed by the managers, considered, and stored as they made the decision to pilot Project B. Walsh and Ungson (1991) noted the difficulty with determining how knowledge gathered and stored in individual memory is used to make organizational decisions: “Only individuals by themselves or as part of a social collectivity have the ability to retain information about the events that triggered a decision response, as well as information about the organization’s response” (p. 67), because only individuals have the cognitive abilities needed to understand why a decision was made.

Ackerman and Halverson (2000), Cross and Baird (2000), and Olivera (2000) recognized the utility and necessity of technology as part of an organizational memory system, but also noted its limitations and the preference of many employees for obtaining organizational knowledge from their colleagues. Cross and Baird noted: “Technology is only one form of memory that employees tap when solving problems—and its use is limited” (p. 71).

Processes for the Storage and Retrieval of Organizational Memory During Project Development Decision Making

The processes used to store and retrieve organizational memory when making project-related decisions were inconsistent and not codified, but appeared to be very well understood by those who used them. Some participants stated that the company had no

processes or only minimal processes for making project development decisions, and others stated that the company had clearly defined processes for making project development decisions. One manager thought that the company had adequate policies and procedures for making all of the technical decisions inherent in the process of project development, but thought that long-term project development planning was lacking. Another manager provided a hybrid response, describing a process for making project development decisions that was routinely followed and understood by all, yet had never been recording in writing.

This inconsistency in responses provided insight into how different members of the management team perceived this aspect of project development, how they perceived their role in project development as a management team, and the link between organizational memory and project development processes. The diverse responses also indicated that the managers were comfortable with their level of “cultural knowledge” (Aiman-Smith et al., 2006, p. 17). Aiman-Smith et al. defined cultural knowledge as “the collective understanding of ‘how we do things’ in a particular organization” (p. 17).

An understanding of the processes for project development was retained primarily at the individual level with some reliance on organizational memory stored in technology-based storage, such as the company databases. Argote and Miron-Spektor (2011) noted that organizational knowledge, in this case project-development knowledge, retained in the individual memories of managers is not “sufficient for group or organizational learning” (p. 1126) and may decay and become unavailable to the organization if not transferred to a more formal storage structure, or “supraindividual repository” (p. 1126), such as organizational memory.

The purpose for gaining an understanding about the processes used for storing and retrieving organizational memory during project development decision making was twofold. The first purpose was to determine if processes, including policies and procedures for making project development decisions, provided a framework within which project development knowledge could be retained, stored, and made available to inform decision making, key functions of organizational memory (Casey & Olivera, 2003). The second purpose was to discover if and where organizational memory of processes for making project development decisions was stored and how this knowledge was retrieved when needed.

The stories of Project A and Project B contained evidence that the processes were driven by the requirements of the project and that each project had its own unique process. The project requirements and resulting processes for both projects were described in detail in chapter 4.

The Relationship Between the Structure and Functions of Organizational Memory

Organizational memory structure was defined as the ongoing actions and interactions of organizational members with each other, with individuals outside of the company, and with technology that led to the emergence and formation of organizational memory (based on Morgeson & Hofmann, 1999). The organizational memory structure proposed by Walsh and Ungson (1991) consisted of six locations, or bins, used to store organizational memory: individual memory, culture, transformations, structures, ecology, and external archives. Organizational memory functions were defined as informing decision making, helping the organization learn by integrating dispersed knowledge, providing a stable framework for the retention and storage of existing knowledge,

assisting in the decoding of knowledge so that it can be used by the organization, assisting in organizational innovation, and assisting in organizational improvisation by helping the organization recombine existing knowledge in new ways (Casey & Olivera, 2003). Although all of the functions of organizational memory discussed by Casey and Olivera were present to some degree within the organization, the primary functions of organizational memory utilized when making project development decisions were informing decision making and providing a stable source of past experiences that the company could consider in present situations.

The relationship between the structure and functions of organizational memory was most evident when organizational members relied on each other and shared organizational knowledge stored in their individual memories to inform decision making, a key function of organizational memory, and in their reliance on technology to facilitate and store organizational memory. The reliance on organizational memory stored in technology also demonstrated a link to another function of organizational memory, providing a stable source of past experiences that the company could consider in present situations (Casey & Olivera, 2003).

Garud, Dunbar, and Bartel (2011) referred to retained stories of past experiences as embedded narratives that have the potential to provide organizational members with a source of organizational knowledge that might be useful in a current situation. Garud et al. (2011) found that, over time, embedded narratives provide managers with a source of organizational knowledge that is useful when making decisions about unusual current situations that mirror unusual past situations. Garud et al. did not suggest that managers simply choose the same solution chosen in the past. Instead, they suggested allowing the

past solution to inform current decision making, one of the functions of organizational memory (Casey & Olivera, 2003). Past projects of a similar type were considered when management decided to move forward with both Projects A and B. However, some aspects of each project were dissimilar to previously completed projects. For example, the location of each project was in a state where the company had not worked before. Where the company could draw upon its memory, or embedded narratives, it did so, but it also had to create new narratives when history was not available.

This reliance on the past to inform current decision making (Walsh & Ungson, 1991) also indicated a consideration of the organization's "cultural knowledge" (Aiman-Smith et al., 2006, p. 17), or how things are done in an organization. Schein (2004) defined organizational culture as a group-level construct. The group shares a common history, which is formed through ongoing interactions of the group members over time. As the group interacts and makes decisions, the results of the decisions are judged by the group. If the group believes that the decisions have been correct, this decision-making process is shared with other organizational members and becomes the norm for how the organization operates on a day-to-day basis. Consideration of the organization's culture also implies a consideration of the structure of its organizational memory, specifically memories stored in the bin Walsh and Ungson (1991) labeled "culture." Walsh and Ungson described culture as embodying "past experiences that can be useful in dealing with the future" (p. 63).

Since both projects were still under way when the data were collected, it was not possible to determine if the newly created narratives would become embedded in the organization's memory and be made available for consideration in the future. Easterby-

Smith and Lyles (2011) argued that “it may not be in our best interests to use lessons from the past to control the future” (p. 312). Easterby-Smith and Lyles also posited that “organizational forgetting” (p. 312) may work to an organization’s advantage by forcing innovation and new thinking in decision making when solutions from the past are not available.

Management’s ability to draw on its stored organizational knowledge, including embedded narratives (Garud et al., 2011) and cultural knowledge (Aiman-Smith et al., 2006), dissect it, and recombine it in ways applicable to new projects, including Projects A and B, was evidence of reliance on both the structure and functions of organizational memory. The ability to locate, retrieve, and apply organizational memory in a new context supported one of Fiedler and Welpé’s (2010) arguments for standardization in the process an organization uses to store its organizational memory. Fiedler and Welpé relied on Fredrickson (1986) for their definition of standardization. Fredrickson described standardization as an organization’s reliance on rules, policies, and procedures to determine how employees should behave and act in their organizational roles.

Fiedler and Welpé (2010) found that when organizational knowledge is standardized for storage, the result is codification of organizational knowledge, which in turn influences organizational memory. The nature of the influence was not specified. Fiedler and Welpé’s finding argued in favor of continuing the organizational knowledge retention process already in place.

Project A and Project B. Table 4.7 outlined management’s primary considerations when making the project development decisions related to Project A and Project B. For example, both projects were located in states where the company had not

previously completed projects, but both projects were similar to projects successfully completed in the past. When considering these issues and the other issues outlined in Table 4.7, management relied on organizational knowledge stored in its organizational memory to address the concerns. Management accessed that knowledge to inform current decision making. Once retrieved, the dispersed organizational knowledge was decoded and recombined to make it relevant for Project A and Project B. If the storage locations, such as individual memory, were not available, then the stored knowledge was not available for consideration during the decision-making process. Although the success or failure of both projects was not known at the time of data collection, Walsh and Ungson (1991) noted that decisions that consider an organization's history have the potential to be better decisions than those that do not.

Project B provided an example of the connection between the structure and functions of organizational memory in the story of the manager who spent significant time at the state capitol of the state where Project B was piloted. He did this in an effort to understand how state politics worked and what that would mean for Project B. First, prior to beginning his efforts, he had to find out with whom to meet and where to go to do this. This implied accessing stored knowledge (Casey & Olivera, 2003), perhaps from a source external to the organization, such as the Internet, or through a conversation with one or more of his colleagues. This interaction of people and technology demonstrated accessing the structure of organizational memory. Second, his discussion of his efforts with his colleagues demonstrated an ability to locate and retrieve the stored knowledge and subsequently apply it in a new situation. This ability to adapt existing knowledge to a new situation demonstrated the use of a function of organizational memory. Third, to be

successful at the state capitol, he had to integrate what he had learned from his colleagues and other sources while adapting and applying the stored knowledge in a manner appropriate for the new situation. This integration of the organizational memory structure and functions implied the use of organizational memory as a system (Olivera, 1999, 2000).

Conclusions

In their discussion of organizational memory and organizational forgetting, Casey and Olivera (2011) described a construct that is at once both durable and fragile. Organizational memory lives on through the individuals who work in an organization and their collective sharing of knowledge, yet can be easily forgotten as individuals leave the organization or more current, demanding events require employees' attention. Casey and Olivera also noted that what the organization chooses to store and not to store, and how that knowledge is retrieved and used, is influenced by the politics and power relationships of the times.

It is possible that the organizational memories formed in this company during the difficult economic times it experienced while this research was completed may not be chosen for retention by the organization, or may form the basis for a difficult but valuable organizational story. Memories of difficult times in an organization may not always be the best choice for retention: "There may be passages in the history of the organization that are better forgotten if people are to be able to build a positive vision for the future" (Easterby-Smith & Lyles, 2011, p. 314).

Conclusion 1

Since organizational memory is a collective construct (Morgeson & Hofmann, 1999), the storage location of organizational memory and access to organizational memory in that location were interconnected.

In this company, organizational memory was stored primarily in the individual memories of employees and the interactions of employees with each other and with technology. Individual memories not added to organizational memory had the potential to decay, or lose their value (Argote et al., 1990, Argote & Miron-Spektor, 2011), since they were not available to other organizational members. Olivera (2000) noted that when knowledge of an experience is available only to the individual who has had the experience, the knowledge cannot be part of organizational memory.

Hansen et al. (1999) emphasized the problems of inconsistent use of a knowledge management strategy that implicitly included organizational memory. They suggested that successful knowledge management relied on how organizational members accessed and used organizational knowledge. A “codification strategy” (p. 107) relied on information stored in databases, while a “personalization strategy” (p. 107) relied on interpersonal communication to share knowledge. A company could choose a hybrid strategy, but Hansen et al. found that successful companies relied primarily on one type of strategy. The chosen strategy was driven by competitive factors such as the uniqueness of the company’s product, the product’s place in its lifecycle, and the level of employee reliance on tacit or explicit knowledge. The data collected in support of this research indicated the use of a hybrid system for knowledge management, including the use of organizational memory, which appeared to give slightly more weight to a personalization

strategy (Hansen et al., 1999). The potential downside of relying on a personalization strategy was captured in this comment:

If I've exhausted all means of figuring out myself and I've learned that I have to really be sure that I've done that because everybody is overworked, so why take my problems to somebody else?

Martin de Holan (2011) described the retention of organizational knowledge as an “effortful, attention-requiring process that is prone to errors and mishaps” (p. 318). In his research on organizational memory in project-based companies, Koskinen (2010) noted, “Unless the experience gained in one project is transmitted to subsequent projects, learning may be dissipated and the same mistakes repeated” (p. 151). He argued that just capturing and storing organizational knowledge in organizational memory is not enough. The organization must also find some way to make the knowledge easy to retrieve and apply. If not, employees may have difficulty sorting through the stored knowledge to retrieve what is most useful and applicable in a current situation.

As noted previously, the databases were not consistently the best choice to retain organizational knowledge. This situation may improve when the company implements its ERP system. The goal in the company's decision to implement an ERP system was to improve its ability to capture historic and real-time organizational knowledge, including project development knowledge, and make it available to employees as needed. If the implementation of the ERP system is successful, the company may find that it has a more complete integration of the structure and functions of its organizational memory and that this new technology has made the organization “more durable” (Corbett, 2000, para. 28).

Conclusion 2

The formation and use of organizational memory was influenced by organizational members' interrelationships and shared social capital.

The management team in this organization demonstrated a strong, ongoing exchange of social capital (Cross & Baird, 2000) in their project-development decision making. One senior manager was the primary person responsible for developing and implementing both Project A and Project B. The other managers placed a high level of trust in this individual and the social capital he accumulated and shared with them during project development and implementation. This was evident in the story of the time he spent at the state capitol gaining the knowledge needed to make a decision about piloting Project B. In turn, he relied on the social capital expended by the managers who lived in the state where Project B was piloted when they shared their knowledge of available energy efficiency programs with him. This joint expenditure of knowledge and social capital provided a comfort level that led to the pilot of Project B.

Nahapiet and Ghoshal (1998) described social capital as a “social-structural resource” (p. 244) which “inheres in the relationships between persons and among persons” (p. 244). This description was supported by the research of Cross and Baird (2000), who defined “social capital” (p. 70) as coworkers’ mutual trust, willingness to provide reciprocal assistance, and willingness to share individual knowledge which develops over time through work-related social interactions.

Leana and Van Buren (1999) posited that social capital could not develop or be maintained without interrelationships between people. They described social capital as “embedded” (p. 538) in work relationships and noted that it ceased to exist when the

work relationship upon which it was based ceased to exist. Leana and Van Buren also noted that social capital differed from the many other assets owned by an organization in that it is truly jointly owned by the organization and its employees. An unstable employment relationship, such as downsizing, can undermine employees' ability to form the meaningful work relationships that lead to the formation of social capital. Employees with an uncertain work future may also be reluctant to expend their stored social capital when the possibility of reciprocity or reward is unknown (Leana & Van Buren, 1999).

Fisher and White (2000) noted that organizational members often establish informal work groups to supplement the knowledge that can be gained from working within an assigned group. If these informal groups and their interactions are not considered when organizational members leave an organization, the loss to the organization may be significant. The value of an individual to an organization is "directly related to the quantity and value of the information held in that individual's memory and not retained elsewhere in the organization" (Fisher & White, 2000, p. 245). Olivera (2000) described these informal work groups as part of the organization's social networks. In turn, the social networks are part of the organization's organizational memory system that collects the knowledge gained through the experiences of its members. If this collected knowledge is made available to others in the social network and/or organization, it may contain "pointers to expertise within the firm" (Olivera, 2000, p. 820) that can help lead an organizational member to the substantive knowledge he or she is seeking.

Conclusion 3

The organization lacked a codified, explicit process for project development decision making, but this lack of a formal process did not impede the project development process.

In response to a question about processes for making project development decisions, one respondent stated that there was a “foundation” in place, but that the company had not developed an overall plan for addressing common project development issues. This may indicate that the company did have a source of organizational knowledge about project development from which it could draw as needed, but that the source required further refinement. The “senior team consensus” described in another response indicated a reliance on organizational knowledge stored in the individual memories of the managers and retrieved during the process of making project development decisions. This response also implied an integration of dispersed knowledge, a function of organizational memory described by Casey and Olivera (2003). Both responses also implied that the processes for making project development decisions satisfied Olivera’s requirement for organizational memory to be regarded as a system by providing a mechanism to “collect, store, and provide access to information” (1999, p. ii).

The participants’ responses to questions about project development decision making indicated that the company lacked a clear, codified process for making project development decisions, although unwritten policies and procedures appeared to guide the process in a manner understood by and acceptable to those involved. Martin de Holan (2011) referred to this type of institutionalized knowledge as “collective understandings” (p. 320). The lack of a codified project development process was related to the small size

and historically entrepreneurial spirit of the organization whose resources were focused on project development itself, leaving little time to focus on non-revenue-producing efforts such as reducing implicit knowledge to written policies and procedures. As one manager explained:

How much time do you put into developing documents? Some are more necessary than others, and before you know it, the writing of the document and procedures can be the project instead of actually working on the work itself, so it's a balance.

Given the scarce resources of the organization, the poor economic conditions at the time of data collection, and the extensive project development experience of many of the employees, the implicit nature of existing policies and procedures did not appear to have a negative impact on the processes the organization used to store and retrieve the organizational memory needed to make project development decisions. However, this failure to capture and retain individual memories and knowledge limited the ability of organizational memory to inform decision making (Casey & Olivera, 2003). Nilakanta et al. (2006) noted that failure to capture and retain organizational memory had the potential to make an organization less efficient and increase its costs of doing business, since the organization lacked a stored knowledge base from which it could draw in routine situations. Echoing Stein and Zwass (1995), Nilakanta et al. (2006) suggested using technology as the primary retention location for organizational memory. Since codifying project development knowledge was not a priority of the planned ERP system, this situation would not change without the deliberate intervention of senior management.

Conclusion 4

Organizational memory functioned as a system in this organization, serving as a repository of organizational knowledge that was accessible to organizational members through their interactions with each other and with technology.

Olivera (1999) described an organizational memory system as a “set of interrelated knowledge retention devices, such as people and documents, that serve to collect, store, and provide access to the organization’s experience” (p. 25). He stated that memory systems have three key features: “structure, content, and process” (p. 25). Olivera described the final characteristics of an organizational memory system as how knowledge is chosen for storage, stored, and then made available to organizational members.

In this organization, the “interrelated knowledge retention devices” (Olivera, 1999, p. 25) required for an organizational memory system were the interactions of organizational members with each other, with others outside of the organization, and with the various forms of technology used in the organization. Through these interactions of people and technology, organizational members gained access to the history and experiences of the organization, the “content” of its organizational memory system. However, with the exception of the formal organizational knowledge retention policies, it was not clear how the organization chose knowledge for storage, yet knowledge was stored and retrieved. The retention of knowledge of past project successes and failures was evident in the discussions of how past projects and events influenced the decisions to implement Project A and pilot Project B.

Both Olivera's (1999, 2000) organizational memory system and Walsh and Ungson's (1991) retention bins are repositories of organizational memory. However, an organizational memory system differs from the bins framework in four ways. First, both an organizational memory system and the bins are designed to collect knowledge. The difference is that the organizational memory system is designed to make the knowledge accessible to its users, not maintain knowledge in a static repository. Second, organizational members access an organizational memory system with "the explicit intent of accessing their organization's experience" (Olivera, 2000, p. 817), while the storage bins merely categorize organizational knowledge, making accessing organizational experience more difficult. Third, an organizational memory system provides an organization with tools to recognize and account for the dispersed nature of organizational knowledge. The storage bins framework recognizes that organizational knowledge is dispersed, but does not take into account how it might be dispersed within a bin or how the same knowledge might be stored in one or more bins. The fourth way that the organizational memory system framework and the bins framework differ from each other is in their consideration of the role of technology. The storage bins framework does not explicitly consider technology as a component of organizational memory. The organizational memory systems framework "recognizes the role of information technologies and other knowledge management initiatives as specific forms of organizational memory" (Olivera, 2000, p. 817).

One area where organizational memory did not consistently act as a system was in the organization's use of technology. Organization members consistently used common office technology (i.e., computers, electronic mail, cellular phones, telephones, facsimile

machines) to assist in their daily work. The database system was also a part of the organizational memory system, and organizational members recognized its potential value; however, it was not used consistently or frequently for its intended purpose as a primary repository of organizational knowledge. The reason for this was very simple: the database system had not been developed or implemented in a user-friendly manner.

Contributions to Theory

This research makes three contributions to organizational memory research. This research lends empirical support to the Walsh and Ungson (1991) and Olivera (1999, 2000) models that form the basis for the conceptual framework. The findings and conclusions supported both Walsh and Ungson's (1991) characterization of the structure of organizational memory as a series of storage bins, and Olivera's (1999, 2000) characterization of organizational memory as a system. The third contribution to organizational memory research was empirical support of Morgeson and Hofmann's (1999) explanation of how individual-level constructs become collective constructs. This research also supported Morgeson and Hofmann's contention that although individual and group memory are structured differently, both serve the same basic function (i.e., remembering the past). The support for the Walsh and Ungson and Olivera models and for Morgeson and Hofmann's research is presented in this section, followed by a revised conceptual framework.

The stories of Project A and Project B contained many examples of extensive use of shared individual memory and indicated that individual memory was a key organizational memory structure for this company. Walsh and Ungson (1991) noted that only individuals, either by themselves or as part of a group, can understand the reasons

why an organization made a decision. Thus, the storage bins can contain only what individuals have chosen to remember and store. Walsh and Ungson (1991) noted that, in addition to the individual experiences stored in individual memory, each person also stores “their organization’s memory in the capacity to remember and articulate experience” (p. 63).

The individual memory bin (Walsh & Ungson, 1991) also held knowledge that was critical in the company’s decision to respond to the request for proposal for Project A. A senior manager’s memory of a prior meeting with the project manager for Project A and knowledge derived from the external archives bin were combined to assist the organization in making the decision to bid on Project A. As noted by Walsh and Ungson (1991), a company has no control over what is stored in its external archives. In this case, the individuals employed by the business peer who made the referral that led to Project A had high positive regard for the organization and its employees, built through years of working together.

Two of the three functions or “roles” (p. 73) of organizational memory described by Walsh and Ungson (1991) were apparent in the organization. First, organizational memory was a source of organizational information and knowledge, which assisted the company while making project-related decisions. Second, organizational memory provided a “control function” (p. 73), reducing the cost of decision making by providing a source of background information. The third function of organizational memory proposed by Walsh and Ungson, the political role, was not observed in the interactions of the research participants or in their descriptions of how they made project development decisions.

Morgeson and Hofmann (1999) relied on Weick's (1979) double interact to describe how interactions between individuals become a collective construct (i.e., organizational memory). Morgeson and Hofmann posited that individuals need to interact with each other to accomplish certain tasks. While the interactions are taking place, the individuals develop acceptable ways of behaving that facilitate completion of the task. One of the acceptable ways of behaving may be sharing individual memories of similar experiences. The interactions have the potential to create norms for the group that may influence how the group behaves in future situations. The interaction of individuals provides the "social structure" (p. 256) necessary for the formation of a collective construct. As collective behaviors occur throughout an organization, "a structure of collective actions emerges that transcends the individuals who constitute the collective" (Morgeson & Hofmann, 1999, p. 252).

Morgeson and Hofmann (1999) noted that although the structure of collective constructs and the structure of individual-level constructs differ, they find common ground within their functions. For example, the basic function of memory at either the individual or group level is remembering a past experience. Morgeson and Hofmann cited Walsh and Ungson's (1991) organizational memory framework when describing how differences in the structure of individual memory and organizational memory can still result in the same use of organizational memory functions. Through their interactions when making the decision to move forward with both Project A and Project B, the managers in this organization demonstrated their willingness to share individual memories in a manner that was acceptable to the group, allowing those memories to become part of the collective construct of organizational memory.

Olivera's (2000) description of organizational memory as a system was also supported in this research. He described an organizational memory system as a "knowledge retention device" (p. 815) that contains and connects parts of an organization to form a system for the retention of organizational memory. Olivera (2000) found that an organization may have several organizational memory systems, such as social networks and various forms of technology, that both compete with and complement each other. Organizational memory systems compete with each other because the content in different parts of the system overlaps, so that an organizational member can obtain similar knowledge from different parts of the system. This finding was supported in this research. Organizational members preferred asking a colleague for information, but also searched for organizational knowledge using technology-based sources. This willingness to search for knowledge in a variety of sources supported Olivera's contention that organizational memory systems also complement each other. He found that through pointer knowledge, various repositories of organizational knowledge were interconnected, so that if an organization member could not find what he or she was looking for in one location, another organization member or a technology-based source could point the person in the right direction.

Olivera (1999) also found that social interactions affect a person's willingness to use different aspects of an organizational memory system to obtain organizational knowledge. For example, if coworkers are willing to help or the technology is easy to use, an individual may use these sources in the future. Conversely, if a coworker is not helpful or the technology is not user-friendly, the individual will choose another

alternative when seeking pointer or substantive knowledge in the future. The overall negative opinion about the existing company databases supported this finding.

The revised conceptual framework presented in Figure 5.1 reflects the contributions to theory discussed in this section. It is based on the findings of this research, the two models included in the original conceptual framework (Olivera, 1999, 2000; Walsh & Ungson, 1991), and the work of Morgeson and Hofmann (1999) on collective constructs. The conceptual framework also allows for the consideration of how social capital (Cross & Baird, 2000) might influence organizational memory and decision-making. Willingness to expend social capital implies a degree of trust between the parties involved, since choosing to share social capital requires giving a co-worker a personal asset that has grown and accrued over time through workplace interactions. Since social capital accrues over time, tenure in the organization could also influence willingness to share organizational knowledge, including knowledge needed for project development decision-making.

The role of the founder is also included conceptual framework, but may not apply in all situations, since his involvement in making project related decisions depended on the type of decision being made. The founder was more likely to be involved at the beginning of the project development process when the organization was deciding to respond to an RFP.

The model begins with organizational members collecting information and knowledge through social interaction and interactions with technology, then examining this information and knowledge and determining if it should be stored in organizational memory. Information and knowledge not chosen for storage is discarded. What remains

and is stored becomes organizational knowledge. The shared knowledge could be retained in individual memory or in technology-based memory, or both. Stored knowledge is then available for retrieval, and the process may begin again. As noted earlier in this chapter, with the exception of the formal retention and archiving process, it was not clear how organizational knowledge was chosen for storage, yet organizational knowledge was stored in and retrieved from organizational memory to assist in project development decision making.

Contributions to Practice

Practitioners rely on past experiences to make today's decisions. They may rely on past experiences to persuade them not to choose a certain path, or may search for memories that support a current decision. If practitioners can understand how the past affects the present and how the memories of individuals affect the collective memory of an organization, they may not make better decisions, but they may make decisions that are better informed.

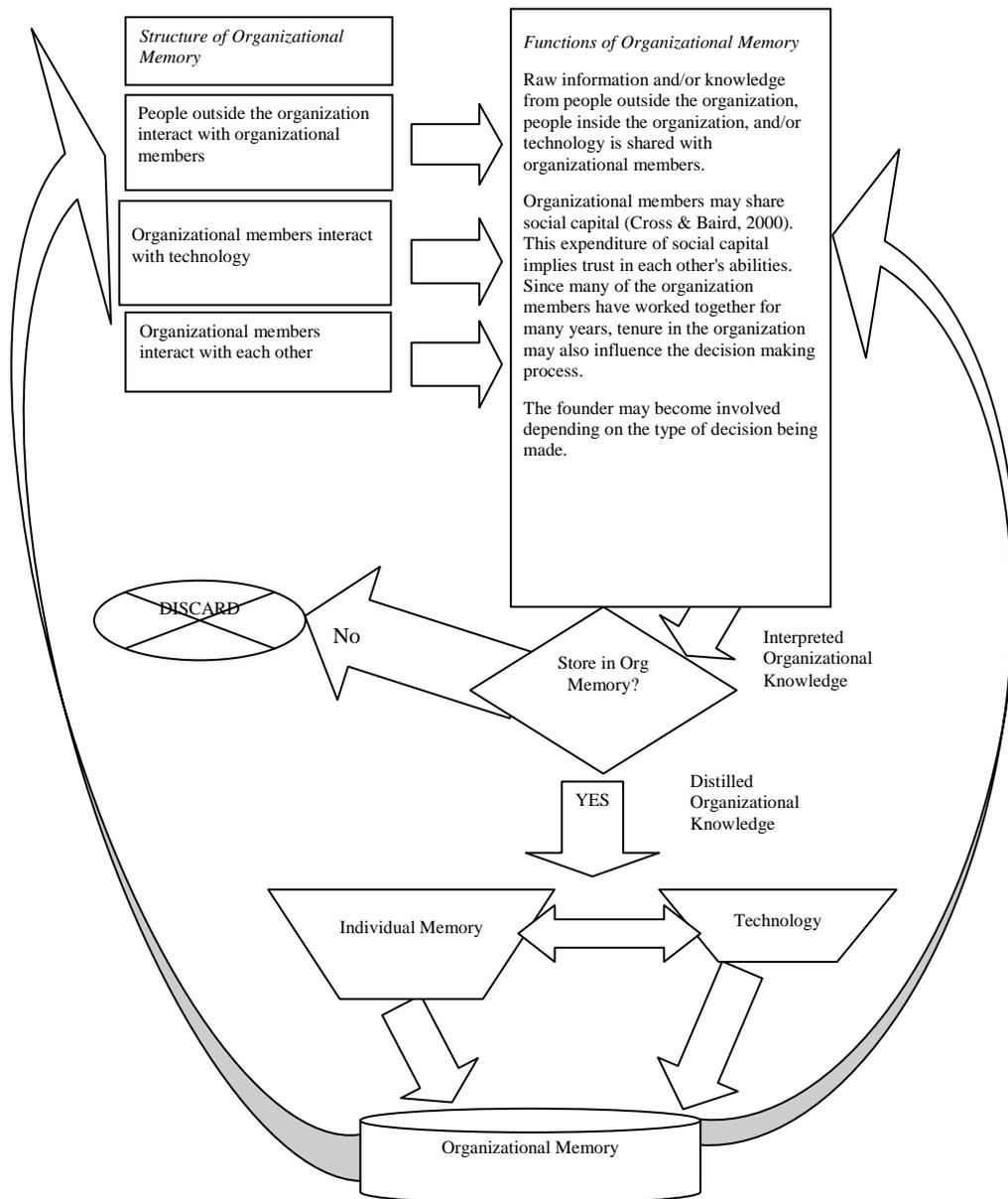


Figure 5.1. Revised conceptual framework based on this research, Morgeson and Hofmann (1999), Olivera (1999, 2000), and Walsh and Ungson (1991).

Practitioners in small businesses may find a case study about the organizational memory of a small business that has survived difficult economic times a realistic and approachable example that they are comfortable taking the time to understand and apply to their situation. Practitioners in larger businesses may find this case study helpful in understanding how organizational memory influences decision making for their colleagues and clients in smaller businesses.

Practitioners may find it useful to compare the findings of this research conducted in an organization with few employees to organizational memory research conducted in a very different type of organization. For example, Olivera's (1999, 2000) research was completed in a large, multinational consultancy, but several of his findings were similar to findings in this research. First, in both organizations, organizational memory operated as a system with multiple organizational memory systems that interacted and overlapped to the overall benefit of the organization. Second, even with multiple technology-based resources for accessing organizational memory, organizational members in both organizations still preferred to obtain their organizational knowledge from each other. Third, in both organizations, organizational members were willing to expend social capital (Cross & Baird, 2000; Fisher & White, 2000; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998) and share structured knowledge (Aimen-Smith et al., 2006) to obtain the organizational knowledge they sought.

When a project is successful, management may choose to add the stories of the success to organizational memory through the use of embedded narratives (Garud et al., 2011), providing a rich source of knowledge to assist in future decision making. When an organization chooses to create an embedded narrative, it is simply developing,

maintaining, and storing in its memory a formal record of an event that was significant in the life of the organization. Embedded narratives are particularly useful when a company must deal with an unusual event. When the embedded narrative is retrieved from organizational memory, it can be used as a guide for the present situation, but not as an example of the perfect response, since unusual situations are not unusual in exactly the same way.

If the projects are not successful, management may choose organizational forgetting as its preferred course of action. Easterby-Smith and Lyles (2011) noted that sometimes organizational forgetting is a desired outcome, since forgetting the past may allow the organization to move forward without consideration of past failures. This “clean slate” may lead to new innovations and routines that better serve the organization. Martin de Holan et al. (2004) acknowledged that organizational forgetting may be a useful skill in certain situations, such as when management is trying to initiate significant change in an organization. However, they also noted that organizational forgetting may have a significant cost for the organization: “When a company finds itself in the situation of having to reinvent or buy knowledge it once had, resources are wasted. . . . Not only is the time and money spent developing these skills lost, but there is also an opportunity cost” (p. 45).

The opportunity cost of organizational forgetting is less tangible, but just as important as the financial cost. Intentional forgetting implies breaking ties with the past. These broken ties may have relied not only on organizational knowledge stored in organizational memory, but also on the social capital (Cross & Baird, 2000; Fisher & White, 2000; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998) and cultural

knowledge (Aiman-Smith et al., 2006; Schein, 2004) of organizational members. If the historic relationships that fed the social capital and cultural knowledge were dysfunctional and unproductive, the break with the past can be a wise management decision. However, if management does not give adequate consideration to the informal relationships inherent in the formation and expenditure of social capital and the knowledge of “how we do things around here” inherent in an understanding of an organization’s culture, the loss of this organizational knowledge can be destabilizing and detrimental for the organization (Easterby-Smith & Lyles, 2011). While the organization relearns what it once knew, competitors who have not lost their organizational memory may move forward, leaving the organization that forgot trying to regain what was lost.

Since Projects A and B were not complete at the time of data collection, it is not possible to determine if management chose to retain the stories of these projects through the use of embedded narratives (Garud et al., 2011) or discard the stories through the use of organizational forgetting (Aiman-Smith et al., 2006; Casey & Olivera, 2011; Easterby-Smith & Lyles, 2011; Martin de Holan, 2011; Martin de Holan et al., 2004; Myers & Dreachslin, 2007). Even in the absence of this knowledge, practitioners may find value in the constructs of embedded narratives and organizational forgetting. In very different ways, both constructs allow for deliberate consideration of how knowledge is managed in an organization, which may lead practitioners to enhanced awareness of how the past influences current decision making (Walsh & Ungson, 1991).

Recommendations for Future Research

This section provides three suggested areas for future research. The first area is additional research on small business and organizational memory. The second area

speculates on how the choice of which projects to review might influence research in project-focused organizations. The third area speculates on how a different research method would have shifted the focus of this research and might have resulted in different findings and conclusions.

Organizational Memory and Small Businesses

There is limited research on the role organizational memory plays in small businesses and how, or if, it influences the daily life of these organizations. Since there is a dearth of organizational memory research that has utilized small businesses as its setting, it is not possible to draw any conclusions about what challenges researchers may face when seeking permission to study organizations of this type. Nor is it possible to determine if organizational memory scholars have any interest in understanding the organizational memory of small businesses.

To begin to address these gaps, four recommendations for further research about small businesses and organizational memory are offered:

1. Make the effort to locate and conduct empirical research at small businesses of all types.
2. Focus on how small businesses use their organizational memory in the day-to-day life of their organization, in contrast to this research, which focused on the use of organizational memory in making project development decisions.
3. Examine how small businesses forget or lose organizational memories.
4. Consider how small businesses make decisions when they do not have organizational memory to guide them, either because the memory has been lost or because a situation is new to the organization.

Small businesses such as the one described in this research are the most common type of business in the U.S. and are vital to the economy's ongoing growth and success (SBA, n.d.). The contribution of their organizational stories to the existing body of scholarly research can only enhance our understanding of organizational memory. This also applies to the second recommendation of more organizational memory research in all types of small business settings, since an added benefit of pursuing a new type of research venue may be fresh intellectual curiosity about organizational memory and all other aspects of organizational life.

The third recommendation was for more research on small businesses that considered the effects of organizational forgetting (Aiman-Smith et al., 2006; Casey & Olivera, 2011; Easterby-Smith & Lyles, 2011; Martin de Holan, 2011; Martin de Holan et al., 2004; Myers & Dreachslin, 2007), while the fourth recommendation was for more research that examined decision making in the absence of organizational memory or when organizational memory has decayed to the point where it is no longer useful. This research took place during 2007 to 2009, when the United States was in the midst of a recession. The primary negative effect of the economy was the layoff of roughly half of the company's employees. Findings showed that participants were uncertain how successful the company was in capturing the organizational memory of those who were laid off. Some were certain that the individual memories had been captured; others were less certain. Ironically, the founder was the least sure of the company's ability to retain the organizational memory of departing employees: "People say whatever they want in an exit interview."

Empirical research in a small business setting on the effects of layoffs on organizational memory would help to validate or repudiate the opinions recorded in this research. From a broader and more practical perspective, a better understanding of what is lost to the organization as a result of layoffs, or when an employee leaves voluntarily, could help small business owners make better decisions when faced with these situations. Understanding small business decision making when organizational memory is not available to provide context would also enhance scholars' and practitioners' understanding of the influence of organizational memory on all types of decision making in these organizations.

Project Choice and Its Possible Influence on the Findings

When choosing projects for future research on organizational memory and project development, researchers may wish to consider where a project is in its lifecycle and if that influences the use of organizational memory in making project-development decisions.

As noted in Chapter 1, the choice to focus on Project A and Project B was a limitation of this research since the nature of the project might produce different findings. For Project A, the company was still finalizing all of the background tasks that had to be completed before the project could actually begin (i.e., the implementation plan and the development tasks) and setting up its office at the site. A few homeowners had participated in Project B, but not enough for the company to know if they were on the right track or needed to make further refinements to the program. If the projects had been fully underway (i.e., construction completed on some homes and underway on others in Project A, more homeowners having participated in and provided feedback on Project B),

the knowledge gained through these experiences may have been stored in organizational memory and been to available inform decision making on other these and other projects.

An additional consideration for future research is following a project in a small business from start to finish to determine how or if the entire project development process influences organizational memory differently than each piece of the process. When looking a project as a whole, researchers may also be able to determine how or if the story of the project changes after it is completed and which parts of the story become part of organizational memory.

Consideration of a Different Research Method

The reasons for using case study methodology were discussed in chapter 3. This research might also have been completed using a different research method, such as ethnography. Gall et al. (2005) defined ethnography as "the firsthand intensive study of the features of a given culture and the patterns in those features" (p. 348). The use of ethnographic methods would still have allowed for consideration of how organizational memory was used in making project development decisions, but would have shifted the focus to the influence of culture (Schein, 2004) on the process. The findings indicated that the managers considered organizational culture when making project development decisions.

Ethnographic research was not chosen because the hallmark of this research method, long-term engagement with the research participants in their environment, was not feasible in this situation for two reasons. In addition, the focus of this study was organizational memory and not specifically its relationship to organizational culture. In a small organization such as the one described in this research, the ongoing presence of a

researcher could have had the potential to influence the organizational members as they went about their day-to-day work. The configuration of the facility and the informal ways in which organizational members interacted would have made it very difficult to be an unobtrusive observer. The methodology was also not feasible for the researcher since the time commitment was not conducive to the timely completion of dissertation research.

Even with these two limiting issues, researchers should consider how ethnographic research could be completed in similar settings. One suggestion might be a team research approach that would allow for ongoing observation without allowing the research participants or researcher to lose his or her objectivity due to prolonged contact with the research participants.

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APPENDIX A:
INTERVIEW QUESTIONS

Based on Olivera (1999, 2000) and Casey (1994, 1997)

I. Introduction

1. Introduce myself and explain why I am there.
2. Describe the purpose of the research.
—Explain and define organizational memory.
3. Explain confidentiality of responses.
4. Ask to audiotape the interview.
5. Ask if the employee has any questions (ask this again at the end of the interview).
6. Give employee the consent form and review it with him/her.

II. Demographic information

1. How long have you worked for the organization?
2. How long have you worked in your current position?
3. What other positions have you held in the organization?
4. Describe your daily job responsibilities and routines.
—What do you do every day and how do you do it?

III. General questions about the organization

1. Does this organization have clearly defined policies and procedures for making project development decisions?
— What are the consequences for not following the policies and procedures?
— If not, would having clearly defined policies and procedures for making project development decisions be helpful for the organization? Why/why not?
2. With respect to project development decisions, what are the major challenges facing the organization?
3. How do you know if a project is successful? Can you provide examples from several projects?
4. How much influence does the founder have on the organization? Describe.
— How much influence does the founder have on the project development process?
5. How would the organization be different without the founder? Describe.
— How would the project development process be different without the founder? Describe.

IV. More specific questions about the project management process in the organization

1. If you need project development information (for example, to prepare a bid or to get an update on an existing bid), how do you obtain it?
— Do you try to find it yourself? Why/why not?
— Where do you look? Why do you look there?

- Describe a situation when you tried to find information yourself and whether that effort was successful or unsuccessful.
 - Do you ask your manager for information? Why/why not? If so, describe a situation when you asked your manager for help in finding information that you could not find yourself and whether that effort was successful or unsuccessful.
 - Do you ask a coworker? Why/why not? If so, describe a situation when you asked a coworker for help in finding information that you could not find yourself and whether that effort was successful or unsuccessful.
2. If there is someone in the organization that you go to for help in finding project development information and I have not asked you about them, please tell me who that person is.
 - Why do you go to him/her for help?
 3. Does your knowledge about the history of this organization help you to do your job? Describe.
 4. Does your knowledge about the history of this organization hinder your ability to do your job? Describe.
 5. When someone leaves the organization, does the organization retain his/her knowledge?
 - If so, how?
 - If not, why not?

V. *Job characteristics and use of technology*

1. How many hours of a typical work day do you spend using a computer?
2. How many hours of a typical work day do you spend talking on your desk phone on work-related business?
3. How many hours of a typical work day do you spend talking on your cell phone on work-related business?
4. How many work-related emails have you sent in the last week?
 - How many to internal sources?
 - How many to external sources?
5. How many work-related emails have you received in the last week?
 - How many from internal sources?
 - How many from external sources?
6. How many work-related voicemail messages have you sent in the last week?
 - How many to internal sources?
 - How many to external sources?
7. How many work-related voicemail messages have you received in the last week?
 - How many from internal sources?
 - How many from external sources?
8. How many times in the last week have you used the company database to look for project development information?
 - What were you looking for?
 - Did you find it?
 - Was the information helpful?
 - If not, how might the information have been more helpful?

9. How many times in the last week have you used the company intranet to look for project development information?
 - What were you looking for?
 - Did you find it?
 - Was the information helpful?
 - If not, how might the information have been more helpful?
10. How many times in the last week have you used the Internet for a project development reason?
 - What were you looking for?
 - Did you find it?
 - Was the information helpful?
 - If not, how might the information have been more helpful?
11. How many hours of a typical work day do you spend going to meetings that are related to project development?
 - Did you attend these meetings in person?
 - If not, how did you attend? (by telephone or video conference, for example)

VI. *Wrap-up*

1. Review description of research from beginning of the interview. Based on my description of the research, is there anything I should have asked you that I missed?
2. Is there anything else that you would like to tell me about the company?
3. Is there anything else that you would like to tell me about the project development management process?
4. Thank employee for his/her time and end interview.

APPENDIX B:

LIST OF CODES

Challenges facing organization
Competition
Counting - attending meetings
Counting - email sent/received
Counting - hours spent on cell phone
Counting - hours spent on desk phone
Counting - hours spent using computer
Counting - time spent using company database
Counting - using Internet
Counting - voicemail sent/received
Database
Defining a successful project
Downsizing - capturing OM
Economic conditions
Founder as brand
Founder's perceived strengths & weaknesses
Help
Hinder
Implementation
Influence of founder
Job & OM
Job responsibilities
Job title
Knowledge evolution
Knowledge transfer
Memory help
[Name of state where another project was located]
New Jersey
OM & [Project B]
OM & future jobs
OM & technology
OM & technology (new database)
OM as process
OM in current job (how used)
OM influence in getting current job
OM influence on company from outside
OM influence on current job
OM role in project selection
OM's role at company
OM's role in project management
Other jobs in the company
Person as technology

Policies & procedures - good & bad
Policies and procedures
Project
[Project A]
[Project B]
Project development
Project development/project
Project management
RFP
Role of founder
Strategic planning
Talent gap
Technology use
Tenure at company
Tenure in position
Using OM for current job

APPENDIX C:
CONSENT FORM

**A Case Study of the Structure and Function of the Organizational Memory
of a Small For-Profit Business**

| | | |
|-------------------------|--------------------|-------------------|
| GW IRB number: | 090626 | |
| Principal Investigator: | Andrea Casey | Telephone number: |
| Sub-Investigator: | Stephanie Berridge | Telephone number: |
| Sponsor: | N/A | |

You are invited to take part in my research study being conducted through The Graduate School of Education and Human Development at The George Washington University. This research will fulfill part of the requirement for me to earn a doctorate degree.

You are being asked if you want to participate in this study because your job description indicates that the work you do may help to answer some or all of the research questions. Please read this form carefully and ask any questions you may have before agreeing to be in the study.

Talk to me if you have questions, including questions about your rights, if you have concerns or complaints, or if you think you have been harmed. You can contact me at _____ or contact the principal investigator, Dr. Andrea Casey, at _____. If you want to talk with someone else, please call the Office of Human Research at 202.994.2715.

Taking part is up to you. You can refuse to take part. You can join now and quit later. Either way, it won't affect how we treat you. Your employment will not be affected in any way should you choose not to participate or withdraw at any time.

The purpose of the research is to understand how your company uses its organizational memory when making project development decisions. Organizational memory is how the company uses its past to make current decisions.

If you choose to participate in this study, we will meet once for 60 to 90 minutes, and I will ask you some questions about how you do your job. Shortly after the interview, I will give you a printed transcript of the interview for you to review. If you find any factual errors in the transcript, I will correct them. I may also ask to observe you as you go through your work day.

This study does not have any significant physical, legal, economic, or social risks to you. There is no cost for you to participate in this study. You may benefit from the study by

gaining a better understanding of how your company makes project development decisions. You will not be compensated for your participation in this study.

The records of this study will be kept private. In any publications or presentations, we will not include any information that will make it possible to identify you as a subject. Research records will be stored securely and only researchers will have access to the records.

Thank you.