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An Exploration of Baby Boomer Mass Retirement Effects on Information Systems Organizations

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The potential knowledge loss from Baby Boomer generation employee retirements can negatively affect information systems organizations. The purpose of this hermeneutic phenomenology study was to explore the lived experiences of the leaders and managers of information systems organizations as they tried to maintain operational continuity after Baby Boomer worker retirements. The impact of this issue was the operational continuity after the Baby Boomer worker retirement. The social impact of this issue was the knowledge loss events that might result in business loss or even bankruptcy. McElroy's knowledge life cycle model was the conceptual framework for this study that included knowledge production and knowledge integration processes within a feedback loop. The lived experiences of 20 knowledgeable participants who had experienced institutional knowledge loss from retired Baby Boomer generation employees were captured through purposeful sampling. Data were collected through individual interviews using either face-to-face or a web conferencing tool such as Skype and analyzed through a modified Van Kaam. Five themes were identified: business climate, delivery practices, work processes, camaraderie, and management response. Significant attributes that added to the body of knowledge were workplace navigation, alternate focus, and outsourcing management. The results of the study may enable organizations to be better able to understand and manage the Baby Boomer knowledge loss effects and subsequently create systems to help maintain their competitive edge and avoid knowledge loss that might result in business loss or even bankruptcy.

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Dedication

To my family, friends, scholars and practitioners who inspired this research and provided encouragement and support.

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Chapter 1: Introduction to the Study

The retirement of the Baby Boomer generation is an economic concern due to the possibility of knowledge loss following the departure of experienced employees (DeLong, 2004). If no one captures the knowledge of retirees before they leave an organization, there is a risk of losing intellectual capital (Morar & Yoong, 2015), a loss that could negatively affect the performance of the organization (Daghfous, Belkhodja, & Angell, 2013). To mitigate the risk of losing intellectual capital, an organization must proactively capture the knowledge of employees before they leave the organization if they are to maintain or enhance both the continuity and profitability of the organization (Tzortzaki & Mihiotis, 2014).

In Chapter 1, I present the background of the problem and the necessity of retaining knowledge from the Baby Boomer generation to make organizational advancements. I also provide the problem statement, the purpose of the study, the nature of the study, and the foundation for conducting the research. Additionally, it includes the research question, significance of the study, definitions of terms, assumptions, limitations, and delimitations.

Background of the Study

The aging Baby Boomer generation workforce is retiring at a rapid pace. According to the Bureau of Labor Statistics, the labor projection for the United States through 2022 indicated a decrease in employment rates in the workforce, primarily due to the aging Baby Boomer population (Toossi, 2012). Knowledge-intensive firms are among the most likely to be affected, as a high proportion of the staff are employees who

exchange their knowledge with others in the firm (Fu, 2015). For example, the software development process is knowledge intensive due to the cross-functional nature of the teams involved (Mehta, Hall, & Byrd, 2014). The knowledge loss of an organization might also negatively affect client trust and lead to revenue loss (Joe, Yoong, & Patel, 2013).

The Baby Boomer generation, the cohort born during the post World War II boom from 1946 to 1964, started to retire in 2010 (Toossi, 2012). This loss of experienced workers left a gap in both experience and knowledge in the workplace (Joe et al., 2013). With 40% of the U.S. population eligible for retirement starting in 2010, organizations became aware of the need to bridge the knowledge gap between these Baby Boomers and next-generation employees (Stevens, 2010). Although a small percentage of Baby Boomers may postpone their retirement for personal preferences or economic needs, the retirement slated to occur over the next 10 to 15 years will continue to affect organizations until the knowledge of these retirees is replaced or transferred (Toossi, 2012). According to data on the potential knowledge loss from the Baby Boomer retirement phenomenon, 68% of the organizations reported the loss of older workers as either an existing or an anticipated problem (Jackson, 2014).

The recognition of the Baby Boomer knowledge loss and the accompanying spectrum of challenges related to retaining that knowledge originated from the seminal work on lost knowledge by DeLong (2004). Researchers also identified a continuum of challenges due to lost knowledge that has become critical in industries such as oil and gas and pharmaceuticals (Parise, Cross, & Davenport, 2006). The economic downturn caused

by the recession of 2007-2009 resulted in the Baby Boomer generation members being employed longer (Burtless & Bosworth, 2013). During this period, the lost knowledge phenomenon was less a problem because this group continued to work despite being eligible for retirement (Martín-de Castro, 2015). Subsequently, Jennex (2014) acknowledged that the loss of knowledge is a problem but described it as a quantified risk because of the value of retaining knowledge of experienced employees. Researchers have started to document the eventual retirement of Baby Boomers and the resulting lost knowledge and acknowledged a lack of framework for the continuity necessary to preserve their knowledge (Biron & Hanuka, 2015). An understanding of the potential lost knowledge due to the Baby Boomer mass retirement has merit for many businesses.

Problem Statement

The problem with the retirement of the Baby Boomer generation employees is losing their knowledge. Jennex (2014) described knowledge loss as a quantified risk because there is value in retaining the knowledge of experienced employees. With 40% of the U.S. population eligible for retirement starting in 2010, the loss of knowledge might create an information gap between Baby Boomers and next-generation employees (Stevens, 2010). Sopko (2010), Herman (2009), and Dzekashu (2009) claimed that the potential problem of Baby Boomers' lost knowledge is significant to study. Consequently, there is a need for a comprehensive understanding of the impact of knowledge loss and how it affects an organization's continuity in the industry. There is little knowledge of the lived experiences of the leaders and managers of information

systems (IS) organizations as they strive to maintain operational continuity after Baby Boomer worker retirement.

The purpose of this study was to explore the potential of lost knowledge caused by the retirement of members of the Baby Boomer generation and how that loss has affected leaders and managers who must provide operational continuity within IS organizations. I used a qualitative, phenomenological design approach to conduct this study with a population of leaders and managers in IS organizations who have experienced knowledge loss due to the retirement of Baby Boomers. I also addressed the problem of lost knowledge due to the Baby Boomer mass retirement and provided contributions to the literature on the lost knowledge phenomenon.

Purpose of the Study

The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. I used the data to determine how and to what degree those managers and leaders perceive the retiring Baby Boomer knowledge loss as a gap in organizational continuity. Investigating the perspectives of managers and leaders within IS provided insights necessary to further analyze the impact of the Baby Boomer retirement and lost knowledge phenomenon.

Research Questions

The interview questions in Appendix A provided responses to the research question: What are the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement?

The research question is an overarching framework for establishing the in-depth perception of leaders and managers. The individual interview questions were structured to elicit the lived experiences of the leaders and managers of information organizations.

Conceptual Framework

I based the conceptual framework on the knowledge life cycle of knowledge production and knowledge integration within multiple feedback loops, as McElroy (2003) suggested. This conceptual framework integrates the aspects of generational differences across the working population (Cogin, 2012), the knowledge life cycle activities (McElroy, 2003), and the knowledge retention solution (DeLong, 2004). The concepts in this section are in the context of similarities and commonalities that represent the foundational information necessary to understand managers' and leaders' experiences with the potential loss of retiree knowledge.

The conceptual framework encompasses lifecycle stages of knowledge management (KM). McElroy (2003) concluded that knowledge life cycle stages contribute to the production and integration of knowledge. The production stage of the KM life cycle begins with the acquisition, learning, and creation of a knowledge claim foundation (Parchoma, 2014). KM integration typically results in sharing, broadcasting, searching, and teaching to disseminate knowledge to be learned and applied throughout the organization (Wu, Ming, He, Li, & Li, 2014). Knowledge production stages overlap with knowledge integration through a two-way interaction that produces new knowledge (McElroy, 2003). The constructs of the knowledge life cycle (McElroy, 2003) illustrate

how to operationalize the information that Baby Boomers provide to organizations from their knowledge and performance over their careers.

Organizations need to preserve Baby Boomer knowledge as a part of a KM strategy if the organization is to sustain a competitive advantage (Wang & Wang, 2012). The Baby Boomer knowledge base includes the tacit dimension (Joe et al., 2013) embedded in explicit knowledge managed through ICT (Hislop, 2013). As the Baby Boomers retire, the knowledge base built over their careers could leave with them if organizations did not capture and learn from that knowledge (DeLong, 2004). As a result, there could be a loss of knowledge that Baby Boomers have accumulated over their careers (Jennex & Durcikova, 2013).

Knowledge loss due to Baby Boomer retirement could influence operational continuity. The phenomenological research method provided the opportunity to delve into the lived experiences of participants in this study. The participants were managers and leaders with the experience of lost knowledge who could draw on their lived experiences. Participants provided the data for the lost knowledge phenomenon through qualitative interviews, and the foundation for data analysis was the transcripts of their responses that identified similarities among keywords they used. Those keywords included *knowledge creation, knowledge sharing, knowledge flow*, and *knowledge hoarding*, which were themes and properties that documented the findings of this study.

Nature of the Study

The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby

Boomer worker retirement. I followed a qualitative, phenomenological research design based on the need to explore the essence and meaning of human experiences (Moustakas, 1994). I based my decision to use a qualitative approach on the need to learn managers' and leaders' specific experiences with retired Baby Boomers or anticipated effects of losing the knowledge of those who would be retiring.

To answer the research question, it was necessary to understand the research paradigm(s) that would guide the planning approach (Lincoln & Guba, 1985). In the social sciences, the major research paradigms are positivism, postpositivism, interpretivism, and pragmatism (Pickard, 2013). The positivist paradigm is influenced by empirical data based on statistical inferences (Allen & Clough, 2015). The postpositivism paradigm is driven by the requirement that a researcher finds evidence to support or disprove a pre-existing theory (Tekin & Kotaman, 2013). An interpretivist's view rejects scientific neutrality and universal truths and works to form relational truths and intense inquiries (Yanchar, 2015). The key values promoted by pragmatism are practicality, quality control, and utility (Baker & Schaltegger, 2015). Each research paradigm has an individualistic value dependent on the direction the research question controls. If the findings are pertinent, useful, unbiased, and genuine (Pickard, 2013), they will have value. Likewise, the quantitative approach demonstrates whether the findings have rigor, the qualitative approach validates the trustworthiness of the findings, and mixed methods combines aspects of both (Pickard, 2013).

I rejected a quantitative approach because the purpose of the study was not to assess the lost knowledge phenomenon but rather to explore the phenomenon from a

management perspective. A quantitative assessment would require gathering and analyzing data to validate a hypothesis using statistical methods (Pickard, 2013). The statistical inferences using quantitative approach would not have been suitable to answer the research question.

Mixed-methods research is used to explore, describe, test, or assess complex inquiries when either qualitative or quantitative approaches are inadequate when used alone (Ponterotto, Mathew, & Raughley, 2013). A mixed-methods approach was rejected because using a quantitative statistical support of the data would weaken the value of the qualitative approach as described by Ponterotto et al. (2013). It was appropriate to use the qualitative approach because participants' experiences were sufficient to explore the Baby Boomer lost knowledge phenomenon.

The qualitative tradition includes many design approaches: (a) grounded theory, (b) ethnography, (c) case study, (d) narrative, and (e) phenomenology (Marshall & Rossman, 2016). I rejected a grounded theory research design because one of the purposes of the study was to explore the lost knowledge phenomenon rather than develop a theory based on the data gathered using an exploratory approach (Viana, Conte, Marczak, Ferreira, & de Souza, 2015). I also rejected ethnography because it emphasizes the importance of culture or investigates how people live, learn, and understand their environments (Maier & Thalmann, 2012), which was not the purpose of the study. The case study research design was also inappropriate because the kinds of research questions used in case study do not reveal the same depth of understanding as participants' lived experiences do (Yin, 2014). I also rejected narrative inquiry because that approach

concentrates on an individual's life related to his or her oral traditions, personal customs, and legends (Marshall & Rossman, 2016). Narrative inquiry focuses on personal journal records, accounting of peoples' cultures, or history told as a story (Marshall & Rossman, 2016), none of which were related to gathering data on the concept of lost knowledge.

I structured the study as a phenomenological research design intended to reveal an understanding of the lived experiences of organizational leaders who have experienced the knowledge loss of Baby Boomers who retired from their companies. Phenomenology as a discipline embraces conscious experiences from a first-person point of view (Moustakas, 1994). Phenomenological studies require the collection and analysis of participants' lived experiences as they relate to the understanding of and the meaning they give to a phenomenon (Heinonen, 2015). Using phenomenology to conduct research enables researchers to understand the value of individual experiences with a particular phenomenon (Moustakas, 1994).

I chose participants using purposeful sampling because the leadership and management expertise of Baby Boomer knowledge loss were the impetus for sharing their experiences. They came from the IS sector; had demonstrated knowledge related to the research question; and had worked as managers and leaders of business, technology, and quality assurance. Twenty participants took part in interviews from approximately 60 minutes to 2 hours each. The number of participants was determined based on Giorgi's (2009) acknowledging that a sufficient number was between 15 and 20. I analyzed the data using a modified Van Kaam method (Moustakas, 1994) to represent the insights and the essence of experiences of the group of managers and leaders as a whole.

Definitions

Baby Boomer: A Baby Boomer is a person born during the baby boom that started after World War II in 1946 and continued through 1964 (Toossi, 2012).

Information and communication technology (ICT): ICT is the diverse set of technical tools used in organizations to collaborate among teams to facilitate decision making and problem solving (Hislop, 2013).

Intellectual capital: Intellectual capital is knowledge assets an organization collectively owns in tacit, explicit, or implicit forms for the benefit of the members of the organization and functional groups. The three elements of knowledge assets are human, structural, and social, which together constitute intellectual capital (Donate, Peña, & Pablo, 2015).

Knowledge creation: Knowledge creation is the process of forming new information to enrich existing knowledge that fosters innovation (Auernhammer & Hall, 2014).

Knowledge harvesting: Knowledge harvesting is the process of eliciting, collecting, and preserving knowledge for access at a future time (Pierson, 2013).

Knowledge life cycle: Knowledge moves through chronological stages—the life cycle--for knowledge creation and consumption in the context of an organization's social setting (McElroy, 2003).

Knowledge management (KM): KM is the strategic approach taken by managers to structure, share, and collaborate using intellectual capital to achieve organizational objectives in an effective and efficient manner (Dalkir, 2011).

Knowledge sharing: Knowledge sharing is the process that enables individuals to exchange an organization's intellectual capital for the benefit of the employees and the organization (Wang, Wang, & Liang, 2014).

Knowledge transfer: Knowledge transfer is the process that provides an employee's knowledge, skills, and expertise to an individual or a group to inform and facilitate their performing the organization's activities (Cummings-White & Diala, 2013).

Lost knowledge: Lost knowledge occurs when an organization loses intellectual capital that leaves a gap in the ability of management to make effective decisions and operate effectively and efficiently (DeLong, 2004).

Assumptions

Several assumptions established the foundation of my research. I employed a phenomenological design, an approach that assumes that participants acknowledge the importance of the lost knowledge phenomenon and have experiential information regarding the significance of its organizational impact. I assumed that participants had experienced the Baby Boomer lost knowledge phenomenon as a result of the retirement of former employees and could respond with authority to the interview questions. Further, it was assumed that their lived experiences would include an understanding of and professional experience related to the content of the interview questions.

Other assumptions were that participants would fully share their experiences related to the preparation and proficiency necessary to perform their current roles as information technology leaders. I anticipated that those who agreed to participate would

answer the interview questions honestly and candidly because I knew them to have experienced the Baby Boomer lost knowledge phenomenon in their IS organizations.

Scope and Delimitations

The scope of the study comprised the lived experiences of managers and leaders who had to deal with the lost knowledge phenomenon caused by Baby Boomers' retirements. The study was delimited to a purposeful sample of 20 leaders and managers chosen for their experiences in IS related to their association with the Baby Boomer lost knowledge phenomenon. Because 40% of Baby Boomers were eligible to retire beginning in 2010 (Stevens, 2010), their lost knowledge may have already influenced an organization's operational continuity if the organization lacked a framework to handle the knowledge loss (Biron & Hanuka, 2015). The Baby Boomers' retirement might also have hampered problem-solving and decision making capabilities of managers and leaders if they did not capture Baby Boomers' knowledge before they retired (DeLong, 2004).

I delimited participants to managers and leaders in IS organizations who were chosen from areas that would be most severely affected by knowledge loss: managerial, technical, business, quality assurance, and software development. I excluded those in operations, sales, marketing, and customer services as well as managers and leaders in IS who had not experienced the knowledge loss from Baby Boomers' retirements.

Limitations

I limited the study to the lived experiences of 20 managers and leaders with supervisory authority within those IS organizations. The lived experiences of participants limited the transferability of phenomenological research design because of the scope of

the inquiry (Marshall & Rossman, 2016). Moustakas (1994) stated that phenomenology is a viable design for conducting research because the researcher delves into the experiences of individuals to learn their life experiences related to the research questions. The resulting outcomes may not be transferable because transferability is something a reader or another researcher must assume as valid (Marshall & Rossman, 2016). A researcher might apply the methodology to a different group to support transferability if desired.

In qualitative research, credibility procedures can affect the dependability of triangulation and member checking (Morse, 2015). For this reason, I used the interview as the only source of data and member checking for verification because of the limitation of using only interviews for data and using those data sources to support credibility. I also used member checking to validate whether my interpretations of participants' responses were what they intended to communicate.

As my professional background is IS, and I understand how knowledge workers use tacit and explicit knowledge in the industry, I recognized the potential for researcher bias. To mitigate the influence of that knowledge, I used bracketing before data collection (Moustakas, 1994) to overcome any preconceived notions about IS organizations with which I have had an association. The process of bracketing or epoche may mitigate personal bias. In addition, I believe using a pilot study helped me to develop interview skills that gave me experience with bracketing.

Significance of the Study

Organizations need to understand the potential effects of lost knowledge on their operations. This study should provide information to help fill the gap in the literature

regarding the potential for lost knowledge that may result from not capturing information from Baby Boomer generation employees. The findings should make managers and leaders aware of the potential detriment of failing to manage and capture the knowledge of their employees before they retire. The results may provide insights into the processes by which increasing numbers of organizations seek to identify, capture, and retain Baby Boomer knowledge for the workforce in new generations.

Significance to Practice

Insights into the lived experience of managers and leaders could help organizations develop strategic approaches to capturing and retaining knowledge, organizational learning, and intellectual capital from employees before they leave the company. Insights based on projected themes and conceptualization of the qualitative information might enable future researchers to conduct empirical studies to generalize the findings for future IS organizations. In addition, the study may influence the operation of different types of organizations affected by lost knowledge in areas such as education, politics, and nonprofits. This study might also be a springboard for other kinds of organizations faced with their own Baby Boomer retirements that need to learn how to capture knowledge before it is lost.

Significance to Theory

The effects of lost knowledge conceptualized through this study addressed the various components of McElroy's (2003) lifecycle and the significance of KM for operational continuity and seamless progress. The significance of managers' and leaders' lived experiences with Baby Boomer colleagues who might be retiring should contribute

to the continuum of research studies beyond this particular topic. Additional research might lead to a new body of knowledge that could fill gaps in the literature of the discipline of information technology. The addition to the body of knowledge on Baby Boomer retirement effects and further empirical studies, especially action research studies, might enable a researcher to test hypotheses and build action plans to put into practice.

Significance to Social Change

The study may contribute to positive social change by establishing a deeper understanding of the influence of Baby Boomer knowledge loss and create systems that help organizations maintain their competitive edge. The organization that is not prepared to mitigate the risk of potential Baby Boomer knowledge loss could face crippling events that could result in business loss or even bankruptcy. As a consequence, the ecosystem supported by those organizations might negatively affect society by increasing unemployment and may affect the social responsibility initiatives of the organization.

Exploring the Baby Boomer lost knowledge phenomenon may lead to the identification of new information for operational continuity. That new information, therefore, may add to the body of knowledge to assist organizations with harnessing the knowledge from their retiring populations. This available knowledge may contribute to the development of processes for the subsequent generational workforces to actively pursue innovative ideas for global competitiveness and contribute to a positive social change benefiting the organization and society as a whole. The information learned from the study could facilitate, help to retain, preserve, and maintain the knowledge of the

retiring Baby Boomers. Insights based on the projected themes could aid future empirical researchers to generalize the findings for IS organizations.

Summary and Transition

The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. The potential knowledge loss of the retiring Baby Boomer generation could both negatively and significantly influence the advancement of the organization. I used a hermeneutic phenomenological design to explore the Baby Boomers' lost knowledge phenomenon because I based my interpretation and analysis of the data on their lived experiences. The qualitative study results should enable managers and leaders in IS organizations to recognize the influence of the Baby Boomer lost knowledge phenomenon. Tangentially, the managers and leaders may consider developing methods for capturing that knowledge before employees leave the organization.

Chapter 2 includes a review of the literature about potential effects of lost knowledge on an organization, particularly as Baby Boomer retirements influence that lost knowledge. It includes, but is not limited to, the following topics: KM, KM strategy, and lost knowledge. In addition, it includes the topics of knowledge production, knowledge integration in the context of knowledge sharing, knowledge transfer, and ICT.

Chapter 2: Literature Review

The problem of knowledge loss due to the retirement of the Baby Boomer generation is likely to negatively affect knowledge-intensive firms such as IS organizations (Fu, 2015). The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. The literature that follows is a comprehensive review of studies of knowledge creation, knowledge integration, and the knowledge lifecycle,

Organizations rely on the knowledge of their employees to provide services to their customers in the most effective way. According to DeLong (2004), lost knowledge may negatively affect the ability of an organization to make decisions or to solve problems in a timely manner. Stevens (2010) extended the lost knowledge concept to the context of capturing Baby Boomer knowledge for Generation X and Generation Y. Trejo-Medina (2015) emphasized the significance of a collective intelligence approach to achieve competitiveness in IS organizations. In the context of the lost knowledge phenomenon within IS organizations, it is necessary to establish a comprehensive understanding of the Baby Boomer generation and its ethical obligation to work as compared to other generations (Cogin, 2012).

Extending DeLong's (2004) seminal work on lost knowledge, several individual scholars have examined the subject of lost knowledge within different disciplines. Sopko (2010) researched lost knowledge in relation to tacit knowledge transfer. Dzekashu (2009) studied the quality management of the knowledge transfer process of retiring

employees. Herman (2009) used the qualitative approach in combination with quantitative data to study the influence of knowledge loss in a contact center. These three examples provided significant evidence to support a need for advancing the research on lost knowledge, knowledge transfer, and the information held by members of a retiring workforce. Using a naturalistic research paradigm and a hermeneutic phenomenological design to extend the body of research, I pursued a comprehensive study of the knowledge loss of retiring employees because of anticipated Baby Boomer mass retirements.

In the following section, I present the literature search strategy, conceptual framework, and the literature related to key concepts. The literature review covered the keywords as they related to the knowledge life cycle and the relevant terms associated with the knowledge loss due to Baby Boomer retirement in IS organizations. The chapter concludes with a discussion of the gaps in the existing literature and how this research study may fill those gaps.

Literature Search Strategy

I began the search for the literature by performing a broad search on the knowledge lifecycle within the context of knowledge loss. Based on the phenomenon of lost knowledge, I narrowed the scope to the aspects of the retiring Baby Boomer workforce. To locate the aspects of knowledge loss relevant to knowledge-intensive organizations such as IS, I applied filters to identify both relevant and contemporary references for this study.

I used the resources at the Walden University online library and the physical and electronic resources at the Boston Public Library, Acton Public Library, and other

libraries in the Greater Boston area for the literature search. I also used the ProQuest dissertation database to examine research on Baby Boomer mass retirement, lost knowledge, KM, the qualitative research approach, and the hermeneutic phenomenological research design. Worldcat.org also yielded books with relevant topics and concepts applicable to this study. I used multiple databases such as ProQuest central, Academic Search Complete, and Science Direct available through the Thoreau system at Walden University to find peer-reviewed KM and Baby Boomer retirement subject areas.

I also used Google Scholar and *Find at Walden* link back to the Walden online databases for keyword searches. Focused searches on qualitative research approaches and designs using Sage Research Methods Online helped in the search for peer-reviewed articles. The digital library subscriptions of IEEE, Association for Computing Machinery, and Association for Information Science and Technology provided additional articles. The Walden library document delivery service provided journal articles and book chapters unavailable through online subscriptions.

During the initial search, I used the full-text search option to obtain a wide set of articles identified by keywords. When searching electronic databases such as Walden Thoreau, I selected the option peer reviewed to obtain scholarly articles and the publication date to limit the sources to a specific time range window. I also limited the search terms to title, author, or keyword to refine subsequent searches. The following terms were used to search electronic databases: *knowledge types, knowledge exchange, tacit knowledge, explicit knowledge, implicit knowledge, intellectual asset, knowledge flows, lost knowledge, KM culture, knowledge harvesting, knowledge identification, Baby*

Boomer retirement, organizational learning, absorptive capacity, knowledge creation, knowledge sharing, intergenerational knowledge transfer, knowledge continuity, software development, software maintenance, software product development, and *knowledge intensive organizations.*

The six major topics included in the literature review are (a) KM, (b) KM strategy, (c) knowledge production, (d) knowledge integration, (e) lost knowledge, and (f) ICT. The knowledge integration topic yielded information about knowledge transfer and knowledge sharing within the context of knowledge loss. The lost knowledge phenomenon provided more in-depth information about Baby Boomer mass retirements in the IS organizations. The ICT topic added a component of the decision framework encompassing KM systems, decision support systems, and social networking tools to support decision making and problem solving.

Conceptual Framework

The conceptual framework for this study was the knowledge lifecycle framework (McElroy, 2003) that integrates aspects of generational work ethics (Cogin, 2012) and the knowledge retention solution (Delong, 2004). McElroy (2003) addressed the knowledge life cycle activities through the operationalization of supply-side and demand-side KM. The concept of knowledge sharing to address the concern for propagating knowledge within the organization dominates the supply side of KM (Wu et al., 2014). Conversely, the demand side focuses on knowledge production facilitated by information acquired through teaching and ICT in order to create and evaluate the validity of new knowledge

(Parchoma, 2014). The integration of the supply and demand sides of KM within the life cycle activities was the foundation of this study.

Employees from different generations have diverse ethical considerations towards work. Stevens (2010) has identified generational traits, such as stability and work commitment that differentiated the Baby Boomers from Generations X and Y. Cogin (2012) studied the attitudes and standards of work-related tasks between generational cohorts and found that Baby Boomers valued hard work. Employees of Generation X, however, indulged themselves in experiences that focused primarily on their own wants and desires. Stevens noted that both Generation X and Generation Y have the tendency for mobility based on career opportunities and the desire to move based on self-fulfillment. Cogin compared the Baby Boomer generation with Generations X and Y and found a wide difference in the ethical considerations of work between these generations. Cogin described Generation X as the *me* generation because the group seemed more concerned with *self* and personal needs than the collective needs of the company.

Knowledge retention is essential for sustaining and growing a knowledge-intensive organization. DeLong (2004) presented the knowledge retention structure within the context of strategy, human resource policies and procedures, and tools and technologies to support knowledge retention. Morar and Yoong (2015) acknowledged that knowledge retention was a human resource issue and emphasized the significance of planning and assessment to retain the knowledge of the retiring employees. One of the components of DeLong's retention structure was an option for rehiring retirees, and, in the event that might not be possible, having the option of subcontracting with external

sources to close the knowledge gap. An additional component of the structure was the reconstruction of knowledge by applying information technology tools and establishing social connections for recovering the lost knowledge.

As a component of organizational competence, leveraging knowledge is important for the continuity and growth of an organization (Tzortzaki & Mihiotis, 2014). KM, especially in the context of knowledge identification, capture, transfer, and use, is the foundation for operationalizing the work of the organization (Narayanan, Swaminathan, & Talluri, 2014). An organization should preserve the intricacies of Baby Boomer knowledge as part of their KM strategy for future use if the organization is to sustain a competitive advantage (Wang & Wang, 2012).

Baby Boomer knowledge is intellectual capital because the generation the term describes participates in the social collectivity of an organization (Morar & Yoong, 2015; Trejo-Medina, 2015). The Baby Boomer knowledge base includes the tacit dimension (Joe et al., 2013) embedded in explicit knowledge managed through ICT (Hislop, 2013). As the Baby Boomers retire, the knowledge base built over their careers could retire with them if the organization does not gain their knowledge (DeLong, 2004; Jennex & Durcikova, 2013). The Baby Boomer generation has accumulated knowledge in the workforce over several decades and has contributed to the competitive advantages of many organizations (Abdul-Jalal, Toulson, & Tweed, 2013). An organization's competitiveness from a practical perspective involves the strategic relationship of know who, know why, know what, and know how, resulting in effective problem solving and decision making about innovative products (Souto, 2014). Although Baby Boomer

knowledge is part of organizational routines such as automated business processes, the tacit knowledge of those in the group is intangible in terms of creation, adoption, and diffusion within the organization (Venkitachalam & Busch, 2012). Choo (2006) elaborated on the explicit knowledge dimensions as rule-based knowledge that facilitates operational efficiency and control. Consequently, these dimensions contribute to the intellectual capital that Baby Boomer generation employees accumulated through their longevity in the organization.

Understanding knowledge and how it is managed encompasses varying concepts that can be formulated into a metaphor of the life cycle of knowledge (Evans, Dalkir, & Bidian, 2014; McElroy, 2003). The knowledge life cycle uses information operationalized through research and transformed through organizational processes and standards (McElroy, 2003). Shehata (2015) identified the following five components that initiate the circulation of knowledge within an organization: (a) knowledge creation, (b) knowledge accumulation, (c) knowledge sharing, (d) knowledge use, and (e) knowledge internalization. An organization's culture influences knowledge sharing (Tong, Tak, & Wong, 2015). Collectively, the diversity of the organizational knowledge positively correlates with organizational performance (Narayanan et al., 2014).

In the context of retiring employees, additional considerations can affect KM (Jennex & Durcikova, 2013). Baby Boomers have contributed to the development of tacit knowledge by posing and solving the problems presented to their organizations (Joe et al., 2013). The retiring employees may want to leave a legacy in the organization that they served or recognized for the contributions they made over the course of their careers

by sharing their knowledge (Cummings-White & Diala, 2013). From the organizational perspective, knowledge absorption is an integral part of knowledge sharing for achieving a competitive advantage (Sawyer, Evans, & Bosua, 2014). Baby Boomer knowledge has enabled Generation X and Y counterparts to advance their products and services to benefit the organization (Joe et al., 2013). The tacit knowledge of Baby Boomers is significant in the creation of new knowledge and is necessary to acknowledge the challenges that are present in the global multigenerational workplace (Souto, 2014). Intergenerational interactions also provide a collaborative communication to facilitate the interaction between Baby Boomers and Gen X and Gen Y workers (Souto, 2014).

Literature Review

This section includes the constructs of interest for this study and the methods and approaches employed by researchers in the discipline. The constructs related to the study are KM, KM strategy, knowledge production and integration, lost knowledge, and the role of ICT. In this section, I explain each construct as it relates to the strengths and weaknesses of different studies about lost, or the potential for losing, knowledge from the retirement of the Baby Boomer generation.

Knowledge Management

KM as a practice allows an organization to recognize valuable information and identify experience transformed into knowledge capital for retention and organizational performance improvement (Daghfous et al., 2013). The elements of KM are comprised of intellectual assets and life cycle activities that promote the flow of knowledge (Evans et al., 2014). According to Dalkir (2011), KM, as an efficient discipline, contributes to an

organization's practice for resolving, developing, and creating a strategic benefit. Knowledge exists in multiple forms within an organization and, therefore, understanding knowledge typology is useful for operationalizing knowledge (Jasimuddin, Connell, & Klein, 2014). High technology environments such as IS organizations typically enjoy the strategic advantage of KM established through knowledge typology (Jasimuddin et al., 2014). In addition, knowledge creation, knowledge transfer, knowledge storage, and knowledge retrieval are the components of the KM framework (Evans et al., 2014). The creation of new knowledge and social interactions results in learning and knowledge sharing (Chandra, Iyer, & Raman, 2015). This new knowledge can be stored using ICT and retrieved for later use (Hislop, 2013).

The typology of tacit, explicit, and implicit knowledge is widely used in the KM literature (Dalkir, 2011). Knowledge takes an explicit form codified in a context-independent way and shared easily using ICT (Hislop, 2013). Castillo and Cazarini (2014) determined that tacit knowledge in the form of intellectual capital is more expansive than knowledge expressed in explicit form. Tacit knowledge is intricate, as it relates to a prelogical phase of knowledge through not only concepts and ideas, but also from personal feelings, individual passions, and commitments (Huang, Hsieh, & He, 2014). An intermediate category of knowledge suggested by Snyder and Wilson (1998) is implicit knowledge, which is tacit knowledge retrieved through contact and inquiry from an individual. Tacit, explicit, and implicit knowledge types are the impetus for the intellectual capital used for sharing and retrieving knowledge (Crane & Bontis, 2014). An employee's education, experience, and expertise also constitute a tacit form of knowledge

(Dalkir, 2011), while documents, processes, and procedures constitute explicit knowledge (Hislop, 2013). Organizations strive to capitalize on employee knowledge and operational data by recognizing intellectual capital and information resources (Crane & Bontis, 2014).

There are additional classifications of knowledge types within the framework of explicit, implicit, and tacit knowledge. In the literature, knowledge typology and different dimensions of knowledge specify different ways to classify knowledge (Dufva & Ahlqvist, 2015). Practical knowledge is concerned with action orientation in contrast to capturing intellectual assets (Dalkir, 2011). Systemic knowledge integrates various knowledge types critical to providing a big picture view of a mental model that provides a foundation for achieving a competitive advantage (da Silva, Guevara, Fernandes, & Rodrigues, 2014). Acknowledging additional knowledge types such as procedural and declarative knowledge, and analyzing the difference between them, has significant implications for KM (Joe et al., 2013).

The aspect of delivering knowledge to the right place at the right time contributes to the individual's commitment to identify the appropriate people and share information and knowledge with them (Tong et al., 2015). The practice of finding the time and the specific individuals who need expert knowledge is an integral part of KM (Alavi & Leidner, 2001). In addition, KM helps organizations to construct new knowledge and enable knowledge flow through the entire organization to achieve overall performance gains over their competitors (Chandra et al., 2015). Kamhawi (2010) presented the flow of information and knowledge within the context of an organizational process that

encompasses learning and information storage. When combined, the tacit knowledge of an individual and the information managed by ICT in a group setting creates implicit knowledge used for problem solving and decision making (Shehata, 2015). The process of implicit knowledge creation helps individuals involved to develop insight, which itself is an impetus for seeking new tacit knowledge (Alavi & Leidner, 2001). Another byproduct of this process is the generation of new information that is the result of coding and storing it in an information-system repository (Kamhawi, 2010). The coding of this new knowledge and the resulting storage of the information in a repository becomes a part of the holistic framework of knowledge (da Silva et al., 2014).

Management might create a knowledge information cycle to transform this knowledge into a strategic asset for the organization (McElroy, 2003). The generalist framework of the knowledge flow and creation cycle (Kamhawi, 2010) is an intersection of tacit and explicit knowledge that develops implicit knowledge, which creates new tacit and explicit knowledge. The knowledge flow and creation cycle explain the process of sharing human knowledge with others in social settings. These shared experiences become the impetus for learning and a source of information that can be stored and shared using ICT (Shehata, 2015). Organizations need to focus on essential elements of intellectual capital and establish knowledge processes using different tools and approaches to help mitigate the complexities presented (Hislop, 2013).

The approaches used to manage tacit knowledge are significantly different from those of explicit knowledge (Dalkir, 2011). Nonaka and Takeuchi (1995) investigated the properties of these knowledge types and integrated them into their KM models. Snyder

and Wilson (1998) brought the focus to eliciting and packaging implicit knowledge so that foundational information from the seasoned worker could be packaged and made available to a novice through knowledge harvesting.

Every organization has a unique culture and, as a result, the different groups within an organization must identify how to best integrate KM into deeper levels of the organization (Tong et al., 2015). As organizations share information and knowledge, all employees can discover what others are doing (Hislop, 2013). This transparency helps to transform and move the organization forward, but not without resistance, because resistance is inherent in organizational transformation (Dalkir, 2011). Management should tie the KM initiative to the organization's mission statement and objectives to be successful (Hansen, Nohria, & Tierney, 1999).

Employees use their cultural orientation and the longevity of their technological experience as a knowledge base for fulfilling their organizations' visions and missions (Tong et al., 2015). They also use the technological processes supported by ICT for the creation, sharing, and reuse of knowledge contributing to the organizations' competitive edge (Shehata, 2015). Hislop (2013) observed that ICT, in conjunction with KM, could foster collaboration for improving collective knowledge and organizational memory, as KM supports the goal of improving innovation through group dynamics of collective knowledge for sustainability (Carayannis, Barth, & Campbell, 2012).

Organizational innovation includes the creation of new ideas, products, services, or processes (Tyagi, Cai, Yang, & Chambers, 2015). With innovation, new knowledge results, and, if it has positive results, it may become a practice (Auernhammer & Hall,

2014). Organizations achieve innovation through a dedication to learning, as learning organizations can establish practices that allow the effective formation and application of new knowledge consistently and efficiently (Dufva & Ahlqvist, 2015). Members of an organization can learn, incorporate, and reconfigure diverse resources to successfully produce and capture knowledge (Hoong & Lim, 2012). Organizations can also achieve a competitive edge through organizational learning using explicit and tacit knowledge and create new knowledge for future advancement (Kamhawi, 2010).

Explicit knowledge and tacit knowledge types are at two ends of the spectrum and have distinct characteristics (Nonaka & Takeuchi, 1995). Tacit knowledge remains tacit until there is recognition of the inherent value of imparting that knowledge to others (Dalkir, 2011). The intersection between tacit and explicit knowledge is implicit knowledge, which includes gaining insight into the value of the tacit knowledge of employees (Kamhawi, 2010). The need to solve a problem or generate innovative ideas for achieving the goals and objectives that support and reflect a company's vision may drive a sequence of events that leads to the transformation from tacit to implicit knowledge (Chandra et al., 2015). Companies apply knowledge harvesting through the continuum of the tacit-to-explicit knowledge spectrum (Snyder & Wilson, 1998).

Knowledge Management Strategy

Many researchers have concluded that there is no best strategy for managing knowledge and that many approaches are recognized and used (Bierly & Chakrabarti, 1996; Jasimuddin et al., 2014). The spectrum of tacit, implicit, and explicit aspects of knowledge, and the deleterious effects of valuable lost knowledge, warrants a strategic

approach to KM (DeLong, 2004). The type of knowledge determines the approach used to strategize the KM in organizations (Denford, 2013). Each approach has individual value that reinforces the direction and usefulness of each strategy. Alavi and Leidner (2001) described two additional types of knowledge: individual and social. Individual knowledge is restricted to the person generating that knowledge, while social knowledge, which results through personalization, is a collaboration of knowledge from various people (Pirkkalainen & Pawlowski, 2014). Knowledge workers in the organization learn the individual tacit knowledge made explicit by codification (Atherton, 2013). To leverage knowledge effectively, organizations should be aware of knowledge types and develop strategies for creating, storing, retrieving, and transferring it (Bloodgood & Chilton, 2012). The organizations derive value based on the personalization and/or the codification of knowledge (Hansen et al., 1999).

Many researchers recommend a strategic approach to KM because of the wide range of intellectual assets, methodologies, and tools applied to capture and disseminate knowledge (Bierly & Chakrabarti, 1996). Hansen (1999) observed that organizations that applied strategy to mass production and operation efficiencies through knowledge reuse rely on codification and personalization. The complexity and diversity of knowledge also necessitates the identification of meta-knowledge to understand the relationship and application of an effective strategy to manage knowledge (Zwiefka & Nycz, 2012).

Meta-knowledge emphasizes various disciplines that provide insights to encompass information and inference rules (Zwiefka & Nycz, 2012). Humans use meta-knowledge to evaluate knowledge through the processes used in the knowledge evolution

(Alavi & Leidner, 2001). Meta-knowledge to be effective is equally distributed among team members to most effectively gain more knowledge individually and achieve better performance as a team (Mell, Van Knippenberg, & Van Ginkel, 2014). With meta-knowledge as the foundation for understanding, individuals can capitalize on their ability to recognize where the expertise is available and who has that expertise. This recognition could be a key success factor in managing knowledge (Zhong, Huang, Davison, Yang, & Chen, 2012). Mell et al. (2014) cautioned that maintaining meta-knowledge could be expensive due to the dynamic nature of that kind of knowledge.

KM, in a knowledge-intensive environment such as the operationalization of information technology, is established through knowledge typology, knowledge creation, knowledge transfer, knowledge storage, and knowledge retrieval (Jasimuddin et al., 2014). Bierly and Chakrabarti (1996) emphasized the need for organizations to emphasize KM at the strategic level to achieve competitive advantage. Acknowledging different knowledge types, procedural and declarative, for example, and analyzing the differences between them has significant implications for KM (Zwiefka & Nycz, 2012). The goal is to ensure that company-wide information and knowledge initiatives are aligned with the overall mission, strategies, and operational needs of the organization (Ngcamu & Sanjana, 2011).

Identifying and mapping intellectual assets generates new knowledge that can sustain a competitive advantage (Morar & Yoong, 2015) for the organization. In addition, creating intellectual assets and enabling knowledge flow promote efficiency and innovation for more effective ways of conducting business (Daghfous et al., 2013).

Kushwaha and Rao (2015) recommended integrating a KM systems infrastructure with intellectual assets for growing the competence of employees and affirmed the importance of this integration to developing a KM strategy. KM systems allow an organization to provide a way to identify domain experts and have access to those experts (Dalkir, 2011). KM systems also provide a forum for the interactive exchange of knowledge among these experts and other entities of an organization (Basten, Michalik, & Yigit, 2015).

Collaboration between various entities of an organization is necessary for it to perform effectively (Bharati, Zhang, & Chaudhury, 2015). Fu (2015) identified features that distinguish knowledge-intensive firms by the markets they serve, the competitive nature of the product and services they offer, and the highly qualified workforce and work processes followed by those firms. The structure of those knowledge-intensive firms tends to be less hierarchical and provides a higher level of autonomy embedded in their work processes (Wang & Wang, 2012). Dynamic organizations rely on employees' abilities to make decisions at the functional and cross-functional levels within the organization that result in knowledge creation that enhances employee's autonomy (Von Krogh, 2012).

Most effective organizations strive to formalize the structure of knowledge workers to achieve efficiency and skillfully perform organizational functions (Caldas, Elkington, O'Connor, & Kim, 2014). In contrast, innovation involves ideas originating from individuals, informal personal networks, and improvisations that ignore standard procedures to discover better ways of doing things (Martín-de Castro, 2015). Dalkir (2011) argued that an organization should try to achieve their objectives by balancing the

knowledge flows across intellectual assets as an impetus for KM strategy (Martín-de Castro, 2015). As the organization faces new competition attributable to environment changes and learns from the current operation, the leaders of the organization need to continuously assess and rebalance intellectual assets and the organizational structure (Dalkir, 2011).

Some organizational leaders are challenged by the need to comprehend the relationships between knowledge types and how they can use them to effectively advance their competitive position (Jasimuddin et al., 2014). The complexities inherent in identifying intellectual capital and managing the flow of knowledge, however, can introduce additional challenges (Han & Li, 2015). New KM strategies that are adopted should have strong relevance to the types of knowledge that are prominent and how they are valued within the organization (Rechberg & Syed, 2014). The practical applications of these types of knowledge are facilitated through the establishment of collaborative norms in order to articulate how to work with others (David & Fahey, 2000). Massingham (2014) promoted creativity and innovation among organizations with interactive dialog to produce information flow. Menolli, Reinehr, and Malucelli (2013) observed that the information flow coming from a variety of sources could result in information overload. The notion of information overload is synonymous with unwanted tangential knowledge that hampers productivity, creativity, morale, and positive results (Narayanan et al., 2014).

Given the different types of knowledge and the potential for unwanted knowledge caused by information overload, systemizing knowledge through life cycles is a logical

step to understanding how knowledge is managed (Evans et al., 2014). McElroy (2003) demonstrated that knowledge life cycle stages contributed to the production and integration of knowledge. The production stage of the KM life cycle begins with the acquisition, learning, and creation of a knowledge claim foundation (Parchoma, 2014). Knowledge production stages overlap with knowledge integration through a two-way interaction that produces new knowledge (McElroy, 2003). KM integration typically results in sharing, broadcasting, searching, and teaching to disseminate knowledge to be learned and applied throughout the organization (Wu et al., 2014).

Knowledge Production

The production stage of the knowledge life cycle begins with knowledge acquisition (McElroy, 2003), a process that involves the identification of knowledge prior to establishing a protocol to transform information into knowledge (Rusly, Sun, & Corner, 2015). An element of knowledge acquisition is the focus on the type of knowledge to be captured (Galati, 2015). Employee learning involves individual perspectives, prior knowledge, cultural background, and sense making as the impetus for knowledge gathering required for putting it into action (Lyles, 2014). Individuals generate knowledge claims based on the acquisition of knowledge in a group setting shared through ICT (Tong et al., 2015). Knowledge acquisition, learning, and knowledge claims may then serve as a foundation for knowledge production (McElroy, 2003).

Knowledge production is an organizational endeavor that encompasses the four stages of knowledge evolution defined by Nonaka and Takeuchi (1995): socialization, externalization, combination, and internalization (p. 72). This model, called SECI,

represents the life cycle stages of knowledge transformation derived from the work of Nonaka and Takeuchi, who worked as consultants to corporations in Japan. The model is the foundation for knowledge creation using designated processes for transforming knowledge from the tacit and explicit dimensions, which transform knowledge into different forms that create new knowledge (Dalkir, 2011). Socialization occurs through a dialogue between individuals who share tacit knowledge for effective communication that establishes a shared understanding (Hansen et al., 1999). Hislop (2013) acknowledged the need for trust and shared identity for facilitating sociocultural interactions. Souto (2014) emphasized the significance of using Baby Boomer tacit knowledge to create new knowledge and overcome challenges in the global multigenerational workplace. The framework proposed by Souto (2014) emphasized the significance of intergenerational interactions and provides a communication approach to facilitate interaction between Baby Boomers, Gen X, and Gen Y.

Externalization in the SECI model involves explicating tacit knowledge to transform it into an explicit form that can be stored as information in reports, executive briefings, and best practices (Nonaka & Takeuchi, 1995). The common approach to explicating tacit knowledge is through codification, a process that systematizes knowledge to make it available to the rest of the organization (Hansen et al., 1999). Li, Yuan, Ning, and Li-Ying (2015) acknowledged the significance of sharing tacit knowledge for employee innovation. The systematic approach to externalizing proprietary knowledge is to build a KM system that provides the capability to capture, codify, share, transfer, and measure knowledge (Shehata, 2015). Once externalized, the

knowledge becomes tangible and permanent and can be made accessible throughout the organization using ICT (Hislop, 2013).

During the combination process, there is no new knowledge created, but rather knowledge is represented in a more actionable form (Jennex, 2014). The combination process involves linking discrete pieces of explicit knowledge into a new synthesized form (Dalkir, 2011). According to Hislop (2013), companies must integrate concepts from the diverse fields of organizational KM in order to help solve complex problems.

The need for securing an agreement within the organization to edit and process the explicit knowledge is essential to make it more useable (Crane & Bontis, 2014). For example, Baby Boomers have operationalized their knowledge through work experience and positioned themselves as experts to integrate discrete pieces of explicit knowledge to produce new knowledge (Joe et al., 2013). In this way, the new explicit knowledge generated through the combination process is both sustained and transferable (Sabri, Haron, Jamil, & Ibrahim, 2014) within and outside of the organization.

Internalization is a process through which an employee absorbs explicit knowledge, transforms it into tacit form, and applies it to his or her work tasks (Hislop, 2013). Employees integrate this new knowledge into their mental model, which is influenced by their personal beliefs and values (Dalkir, 2011). An example of this transformation is applicable to the Baby Boomer generation because they have developed expertise, unique insights, and idiosyncrasies about their organization's culture, beliefs, and values (Joe et al., 2013). The successful internalization of new knowledge is demonstrated through an observable change in operationalizing their work tasks as

compared to their performance prior to the internalization of the new explicit knowledge (Kuyken, 2012).

During the SECI process, new knowledge ascends from the individual to the organization level and is justified and validated as intellectual capital (Wang et al., 2014). Intellectual capital comprises knowledge, reflection, ingenuity, strategic decision making, and organizational wisdom as attributes of human resourcefulness (Carayannis, Samara, & Bakouros, 2015). Dalkir (2011) acknowledged that the internalization and externalization of knowledge requires a higher degree of commitment from individuals. As suggested in this section, the Baby Boomers' expertise has a major role in the creation of new knowledge that fosters innovation and sustainability (Joe et al., 2013).

Knowledge Integration

When the new knowledge production is completed, it is integrated in several different ways for the purpose of sharing, broadcasting, searching, and teaching (Evans et al., 2014).

1. Knowledge-sharing involves the individual thoughts and ideas exchanged through collaboration (Ritala, Olander, Michailova, & Husted, 2015).
2. Broadcasting knowledge requires explication of the knowledge exchanged through collaboration (McElroy, 2003).
3. ICT as a communication forum is used as a means to broadcast knowledge to a wider audience than the employees who were part of that collaboration (Shehata, 2015).

4. Searching is an effective tool to retrieve knowledge through various pathways or approaches to examine a specific aspect of knowledge for the verification, problem solving, and introduction of new concepts (Ale, Toledo, Chiotti, & Galli, 2014).

5. Teaching as a part of knowledge integration can take many shapes or forms (McElroy, 2003). The aspects of teaching within the knowledge life cycle include one-to-one mentoring and teaching to a group (Evans et al., 2014). Through knowledge integration, people learn to make decisions, solve problems, or apply new information in ways that result in the development of intellectual capital (Crane & Bontis, 2014).

Knowledge Sharing

The goal of any organization is to connect the right people to the best practices, knowledge, and expertise they need to create value through knowledge sharing (Aribi & Dupouët, 2015). By learning which individuals have what specific knowledge, the management of a corporation can capitalize on the power of using knowledge efficiently because informed and skilled employees are more effective (Dalkir, 2011). One of the challenges of either tacit or explicit knowledge is turning it into implicit knowledge that employees across the organization can learn easily and correctly (Kamhawi, 2010).

In a hierarchical organization, knowledge flows along organizational lines in a unidirectional way, limiting the ability of those not directly privy to it to acquire the information (Islam, Jassimuddin, & Hasan, 2015). That knowledge may be unavailable to those who need to access it for problem solving or decision making in a timely fashion

(Hislop, 2013). One of the key components of KM is to support and/or increase knowledge sharing across the organization by enabling knowledge flows across boundaries through effective teamwork while promoting the organization's goals (Dalkir, 2011).

Knowledge-sharing enables companies to adopt, adapt, and apply knowledge in a way that effectively carries out the organizational vision (Dalkir, 2011). To have effective knowledge sharing among employees, organizations can establish a management structure with specific roles such as knowledge manager, knowledge broker, and chief knowledge officer (Castillo & Cazarini, 2014). Key KM programs can provide advocacy for knowledge sharing by soliciting best practices and systematizing information for mutual exchange between knowledge workers (Shehata, 2015).

A community of practice is an action-learning environment in which people collaborate to fulfill an organization's objectives (Bharati et al., 2015). In this type of environment, employees often have opportunities to learn from others' social interactions (Venkitachalam & Bosua, 2014). The community of practice may not be an aspect of the organizational culture; therefore, there is a potential disconnect between how people communicate to share knowledge (Auernhammer & Hall, 2014).

Knowledge-sharing as a part of organizational culture may be affected because of this deficiency in communication between groups within the organization (Ho, Hsieh, & Hung, 2014). Related cultural aspects include (a) tolerance of mistakes while experimenting with innovative practices, (b) motivation to share knowledge, and (c)

exploration of individual ideas developed in a dedicated free space for the individual (Auernhammer & Hall, 2014).

An organization's objectives are often related to effective communication that promotes knowledge-sharing and collaboration among the various teams (Dalkir, 2011). Sharing knowledge may be a problem in a social setting and is one reason for cultural differences within an organization (Ho et al., 2014). Using Web 2.0, an information system can change the work habits through the facilitation of the communication and collaboration between teams using wikis and blogs (Pirkkalainen & Pawlowski, 2014). If people do not mutually understand the knowledge and awareness needed by the collaborative teams, technology cannot not solve the problem (Massingham & Massingham, 2014). When individuals share knowledge and understand the interaction of their insights, a transformation occurs as the impetus for knowledge transfer (Burnett & Williams, 2014). As discussed below, knowledge transfer is the action individuals take to operationalize the consequences of meeting and interacting (Agarwal & Islam, 2015).

Knowledge Transfer

During knowledge transfer, one employee's skills and expertise are shared with an individual or a group to inform and facilitate performing the organization's activities (Cummings-White & Diala, 2013).The concept of teaching is the foundation of knowledge transfer (Chang, Luh, Kung, & Ueda, 2014). As information is disseminated, those receiving the knowledge are actively involved in conceptualizing and mentally changing operational routines (Schulze, Brojerdi, & Von Krogh, 2014). Jasimuddin, Connell, and Klein (2012) specified that knowledge transfers have a specific focus on an

intended consequence that is unidirectional and has a precise goal. Organizations faced with the Baby Boomer generation mass retirement might need to prepare to retain the knowledge that Baby Boomers have accumulated and share it through knowledge transfer (Cummings-White & Diala, 2013). According to DeLong (2004), knowledge transfer involves socialization and change directed towards decision making and improving organizational routines.

Tacit knowledge, the foundation of individual expertise in organizations, is an impetus for understanding knowledge transfer (Kuyken, 2012). The requirements for knowledge transfer vary based on a specific situation such as supporting a customer or designing a new product (Burnett & Williams, 2014). One of the most notable knowledge transfer strategies is mentoring (Harvey, 2012). Eby, Butts, Hoffman, and Sauer (2015) found a positive correlation between mentoring and the behavior of an employee and supervisor. What solidifies the mentoring variable is the relationship created between employee and supervisor (Eby et al., 2015).

Baby Boomers' experiences with knowledge accumulation and the knowledge transfer process before their retirement was explored by Cummings-White and Diala (2013). The qualitative study of these researchers revealed several themes ranging from the definition of institutional knowledge to the impact of employees leaving the organization (Cummings-White & Diala, 2013). In addition, Cummings-White and Diala (2013) found that Baby Boomers were concerned about how the organization would retain and use their knowledge after they left the organization. Concern about the use of

or loss of their knowledge might help future generations in an organization to share what they have learned and experienced in their careers (Cummings-White & Diala, 2013).

Intergenerational knowledge transfer poses distinct challenges to both the senior employees leaving the organization and the younger ones remaining (Harvey, 2012; Kuyken, 2012; Wang et al., 2014). According to Cummings-White and Diala (2013), the declining cognitive ability and knowledge recall by the senior worker can lead to difficulties with information accuracy. Technology such as Web 2.0 can assist older workers to improve transitive memory (Sabri et al., 2014). Jasimuddin et al. (2012) observed that a knowledge-sharing culture and management support in an organization are also factors needed to support actively retaining potential retirees' information.

Gen X employees value face-to-face communication during knowledge transfer, as openness and trust can be established through this process (Wang et al., 2014). Gen X participants indicated that knowledge transfer might enable employees to have an open dialogue, generate new ideas, and learn from mistakes (Cogin, 2012). Consequently, the knowledge flow from senior employees to Gen X and Gen Y workers might be improved through intergenerational knowledge transfer (Kuyken, 2012).

In addition to the recipient's perspective of the knowledge transfer process, the mentor-protégé relationship is important to successful knowledge transfer (Starks, 2013). Mutual liking, positive mutual feelings, and smoother communication can lead to a more positive knowledge transfer experience. Harvey (2012) observed the significance of the learner taking responsibility for the mentoring situation as necessary for knowledge transfer. Stevens (2010) emphasized the significance of the impact of intergenerational

perspectives on knowledge transfer as a component of a KM strategy. Understanding intergenerational knowledge transfer challenges should enable leaders to create solutions to the potential of lost knowledge posed by a mass retirement of Baby Boomers (DeLong, 2004).

Although intergenerational knowledge is beneficial to the KM process, that knowledge must be used only to supplement the organization's knowledge transfer strategy (Alavi & Leinder, 2001). In considering technology's role in KM, Jennex, Smolnik, and Croasdell (2014) argued that KM technology could provide quicker access to knowledge for a global workforce. At the same time, Jennex et al. (2014) warned against placing too much emphasis on technology alone due to the transient and explicit nature of the knowledge that can be managed through KM technology.

Lost Knowledge

One concept of lost knowledge from a global perspective is that it is any knowledge an employee does not provide to the organization before he or she leaves (Joe et al., 2013). Knowledge that is not learned, shared, or transferred, therefore, is lost (Massingham, 2014). There is no difference in the purpose of organizations in regards to lost knowledge. Whether it is manufacturing, construction, retail, or pharmaceuticals, lost knowledge has the same negative consequences (Aggestam, Durst, & Persson, 2014). When individuals exit a company, either by choice, being fired, or by retirement, their knowledge is usually lost (Jennex, 2014). This lost knowledge does not apply to any specific company or industry but is a global concept that can influence decisions unless organizations have taken steps to capture or harvest that knowledge (Wensley & Navarro,

2015). The amount of knowledge loss could be attributed to the longevity of an individual's employment (Joe et al., 2013). The aspects of lost knowledge become recognized as organizations are confronted with the threat of their long-term employees no longer being available for consultation (Morar & Yoong, 2015). After employees leave, knowledge is lost unless transferred, captured, or an employee is retained as a consultant (DeLong, 2004). Although lost knowledge is not specific to a particular age group, the current exodus of the Baby Boomer generation is contributing disproportionately to the loss of knowledge (Cumming-White & Diala, 2013).

Baby Boomer Mass Retirements

The current trend of a declining labor force in the United States and in the world has been a significant factor affecting the global economy (Grice, Peer, & Morris, 2011). Several factors have contributed to this decline, including the growing number of retirees belonging to the Baby Boomer generation (Toossi, 2012). The main problem of organizations faced with a retiring Baby Boomer population is how to determine the knowledge loss and the impact of that loss on an organization's progress and productivity (Morar & Yoong, 2015). The soon-to-be retiring workers are part of the surge in American births from 1946 and 1964, when 76 million babies were born (Toossi, 2012); therefore, they comprise an inordinately large amount of the labor force.

Baby Boomers value their accumulated knowledge, as it contributes to operational continuity and supports innovation at their organizations (Agarwal & Islam, 2015). The rigor applied to understanding the Baby Boomers' experience and expertise developed throughout their careers helps enable an understanding of the significance of

the potential for lost knowledge and the reasons it must be captured for posterity (DeLong, 2004). Technology has advanced in the 21st century, causing jobs to become more specialized and complex (Caldas et al., 2014). When Baby Boomers retire, they will have worked with and may take with them new types of knowledge that did not exist in previous generations (DeLong, 2004). In addition, the Baby Boomer workforce population is retiring more quickly than it is being replaced (Toossi, 2012). According to Jackson (2014), the negative impact of Baby Boomer retirements was that 68% of the organizations reported the loss of older workers as an existing or potential problem.

Data from several studies have shown that the influence of the Baby Boomer generation is widespread across various industries (Aggestam et al., 2014). For example, in the healthcare industry, the retirement rate of registered nurses is anticipated to increase fourfold--from 20,000 to 80,000 per year--in just the next 10 years (Auerbach, Buerhaus, & Staiger, 2014). The construction industry is facing similar challenges, as the average age of their workers is reaching 50, and there is a greater potential for losing their Baby Boomer expertise sooner and faster than in other industries (Challenger, 2003). The effect of retirees on talent is significantly greater in the technology, management consulting, educational, and health services sectors (Cappelli, 2014). According to Challenger (2003), 50% of the information technology workers in the United States government are eligible for retirement in 2016.

Organizations are responding to this crisis through a variety of means that include cross training, succession planning, knowledge capture, increased recruitment, and the creation of new roles to fill the skill gaps (Joe et al., 2013). The potential negative impact

of the Baby Boomer retirement phenomenon study data reflected that 68% of the organizations reported the loss of older workers as a problem or a potential problem (Jackson, 2014). Only 35% of the respondents had conducted the workforce planning analysis necessary to counter a mass Baby Boomer retirement (Jackson, 2014).

Attempts to preserve the baby-boomer knowledge base in many industries has been an expensive proposition, as it has required explicating tacit knowledge and utilizing other socializing processes and tools to share knowledge and skills with the remaining workforce (Trugman-Nikol, 2011). DeLong (2004) proposed that companies must be encouraged to plan for higher attrition to prepare for retaining the knowledge of the Baby Boomers to circumvent the potential of lost knowledge. The knowledge-harvesting process (Snyder & Wilson, 1998) provides the foundational information from senior employees to act as a springboard upon which younger employees may apply their own creativity.

The Lost Knowledge Phenomenon

In the context of retiring employees, there are additional considerations that affect KM (Wang, Zuo, & Bo, 2014). For example, many Baby Boomers have contributed to the development of tacit knowledge by posing and solving their organization's problems (Agarwal & Islam, 2015). The retiring employees may want to leave a legacy in the organization that they served or may want to be recognized for the contributions made over the course of their careers (Cummings-White & Diala, 2013). Any innovative task begins with problem identification, problem formulation, and potential solution process (Burnett & Williams, 2014). Preparation for knowledge transfer from retiring employees

to develop a technological foundation is an aspect that needs to be preserved because any innovative tasks requires prior knowledge, and future generation technologists need a way to access that knowledge if it is lost with the Baby Boomers' retirements (Stevens, 2010).

The current generation workforce can use the Baby Boomer knowledge base, so a new generation workforce does not need to begin again without previously developed ideas (Pak, Ra, & Lee, 2015). The significance of studying Baby Boomer knowledge is to understand that without recognizing and capturing their knowledge, an organization may not be able to advance in a highly competitive environment (Siltaoja, 2014). Knowledge that remains private could result in lost knowledge that could be a disadvantage for organizations competing in a global marketplace (Abdul-Jalal et al., 2013). Although several researchers criticized the knowledge creation theory of Nonaka and Takeuchi (1995), the life cycle stages of the SECI model continue to be used to create new knowledge typology, including both public and private knowledge that fosters innovation (Tyagi et al., 2015). Daghfous et al. (2013) emphasized that employee participation is a key success factor for discovering and using expertise to create new knowledge.

The Baby Boomer generation has accumulated knowledge over the past several decades in the workforce and has been a significant contributor to the competitive advantages sustained by many organizations (Siltaoja, 2014). Venkitachalam and Busch (2012) argued that although the Baby Boomer knowledge base can be observed in organizational routines such as automated business processes, the tacit knowledge of the group is intangible in terms of creation, adoption, and diffusion within an organization

(Venkitachalam & Bosua, 2014) . As new technology is rapidly being created, the rapid acquisition and sharing of knowledge will continue to be essential to organizational success (Venkitachalam & Bosua, 2014). Castillo and Cazarini (2014) supported this argument of globally expanding technology by affirming that the different ways of generating knowledge is due to an individual's approach to internalize and use tacit knowledge. As a result, their approach to problem solving is based on their individual perspectives. Tacit knowledge affects an organization's value-creation efforts and is a significant component of their organizational learning through formal knowledge transfer (Tounkara, 2013).

Lost Knowledge Within the Information Systems Industry

The software development process is knowledge-intensive and uses domain experts, technology architects, and business operations staff (Mehta et al., 2014). Software developers are cognizant of working effectively on projects when they have collaborative efforts and expertise for accomplishing their individual tasks (Reich, Gemino, & Sauer, 2014). An additional consideration for an effective software development structure is to review and apply the lessons learned from previous projects (Dingsoyr & Smite, 2014). The lessons learned from previous experiences present an opportunity to create product innovation and improve customer satisfaction (Birasnav, 2014).

The concept of the experience factory (Basili, Caldiera, & Rombach, 1994) related to software projects was described and explained by Janes and Succi (2014), who noted the need to capture learning in an experience base. Software project teams using

ICT to synthesize and preserve it for future use could collect these experiences (Menolli et al., 2013). Several types of project experiences such as lessons learned, project financials, issues, and risks could be captured as raw data (Janes & Succi, 2014). Following that capture, it would then be necessary to apply the context for transformation to produce useful outputs (Basten et al., 2015).

An organization-wide experience base is needed for each type of project for entire lifecycle stages as defined by the software engineering body of knowledge (Bourque & Fairley, 2014). In the absence of an organization-wide experience base, a project manager may underestimate the development efforts if project information from previous projects has not been properly captured and made available to subsequent project development teams (Basili et al., 1994). The experience factory model can also help to catalog the skills of retiring employees (Janes & Succi, 2014). When employees leave the workforce, the company can then establish processes to capture the knowledge quickly rather than trying to first identify the type of knowledge the individuals possess (Basten et al., 2015).

Within the software engineering profession, the KM has a unique position since it is used throughout all lifecycle stages (Gemino, Reich, & Sauer, 2015). Gemino et al. cautioned that knowledge could be a double-edged sword: Having too little information available could result in expensive mistakes, such as estimation errors, while too much knowledge could lead to unwanted accountability. For example, software project managers were asked frequently to document the lessons learned from their project experience (Reich et al., 2014). Lessons learned are vehicles to capture the experiences of the project team and synthesize and package them in ways to improve future processes

(Basten et al., 2015). Oftentimes, these lessons are captured following the completion of the project and can be outdated as changes to technology occur more often (Gemino et al., 2015).

In addition, project participants may lose the desire to share project knowledge informally (O'Brien, 2015). Gemino et al. (2015) emphasized the significance of capturing both formal and informal knowledge as sharing efforts among software professionals. Wang et al. (2014) hypothesized that the intent to transfer knowledge from a retiring employee to the younger generation is less likely to occur when the cognitive gap is wider; therefore, ICT may be a useful tool to facilitate harvesting the knowledge of the Baby Boomer generation for future workforces (Pierson, 2013).

Information and Communication Technology

KM initiatives involve knowledge creation, knowledge seeking, and knowledge sharing (Alavi & Leidner, 2001) and use ICT to manage knowledge by supporting the capture of technical information from organizational and personal perspectives to classify, index, and contextualize those perspectives to share and enhance the knowledge (Carayannis et al., 2012). Kamhawi (2010) observed that human interaction contributes as a source of knowledge and influences the flow of information, while ICT is an enabler for managing that knowledge. Bagheri, Hamidizadeh, and Sabbagh (2015) acknowledged that KM positively influences organizational learning by improving organizational memory and the flow of knowledge with ICT.

ICT is a key enabler for automating business processes and is a valuable tool for planning, decision making, performance measurement, and management (García-

Álvarez, 2014). Information technology, in conjunction with the latest advances in communication technologies, including the Internet, has become more powerful for supporting KM processes (Hislop, 2013). ICT represents a diverse set of technologies that includes computer networks, data storage, and software applications (Shehata, 2015). ICT can facilitate the management and sharing of knowledge and information within the context of KM (Hislop, 2013). ICT is also an integral component of KM, providing the ability to codify, store, and disseminate knowledge (García-Álvarez, 2014).

ICT can also be a motivator for knowledge transfer in different settings because it lowers the temporal and spatial barriers between knowledge workers and improves access to their informal knowledge (Burnett & Williams, 2014). This is especially true in the context of the global workforce in which knowledge owners give (codify, show, describe) knowledge, but face barriers preventing knowledge reconstructors from absorbing (learn by doing, read, interpret) that knowledge (Jasimuddin et al., 2012). The barriers also include social distance, culture, language, and mental or conceptual frameworks (Dufva & Ahlqvist, 2015). ICT can be an enabler for knowledge sharing, but for knowledge transfer to be effective, the knowledge owners must formulate explicit knowledge before they can transfer it to knowledge reconstructors (Jasimuddin et al., 2012). The foundation for reconstructing knowledge has much broader outreach because of the intricate structure of knowledge taxonomies.

Within knowledge taxonomies, Dingsoyr and Smite (2014) identified three views of KM as (a) systems, (b) cartography, and (c) engineering. The purpose of the systems' approach to KM is to focus on the codification and personalization of knowledge

(Hansen et al., 1999). ICT enables the dissemination of this codified and personalized knowledge using computer application systems for storing and retrieving data (Jasimuddin et al., 2012). In a dynamic environment in which changes are occurring rapidly, the technologies and systems that support KM must be more adaptable to changing situations (Nonaka & Takeuchi, 1995). Currently, networks created and structured to communicate shared technical knowledge and relational content can enable better problem solving and decisions (Dalkir, 2011).

The cartographic view of KM focuses on knowledge-mapping tools and knowledge directories (Dingsoyr & Smite, 2014). Linking the knowledge content and context enables the transformation of knowledge that is learned and applied (Angeli & Valanides, 2013). The critical knowledge assets in an organization are linked for mapping knowledge at the functional and process levels (Brahami, Atmani, & Matta, 2013). Nonaka and Takeuchi (1995) acknowledged that the transparency provided by the cartographic view of knowledge enables knowledge elicitation and highlights critical knowledge resources of an organization. Knowledge mapping is applied for a variety of KM functions, including the assessment of potential knowledge loss (Ghrab, Saad, Gargouri, & Kassel, 2014).

The focus of the engineering view of KM is operationalized by an organization's ability to implement an analytical framework to aid in the creation and the flow of knowledge (García-Fernández, 2014). The framework components of the engineering view provide tools to assist in decision support, team collaboration, and computer intelligence for solving complex problems (Dingsoyr & Smite, 2014). More specifically,

the framework tool for decision making is the decision support system, while the team collaboration relates to the Web 2.0 platform, and the predictive analytics are facilitated through computer intelligence (Hoffman & Ward, 2015). The following sections describe and explain how the framework tools are integrated into KM lifecycle processes and enhance decision making.

Decision Support Systems

To solve real-world problems, organizations must use internal knowledge, customer knowledge, and archived historical knowledge (Hislop, 2013). Zavadskas, Turskis, and Kildienė (2014) observed that the solution to real-world problems involves multi-criteria and multi-objective decision approaches for group decision making. Researchers tabulated a set of DSS that could apply the multi-objective decision making, nonlinear programming, and fuzzy linear programming models to support a decision outcome (Alshibly, 2015). In order to apply DSS calculations, there is a need for both foundational knowledge and prior knowledge of the solution (Karimi, Papamichail, & Holland, 2015). DSS are more flexible in their ability to keep the decision makers abreast of changing situations, and, hence, enable the agency to apply the decision maker's mental model of competence to solve the challenges of making the decision (Clemen & Reilly, 2014).

Traditionally, organizations have relied upon analytical tools to mine the myriad of data for performance management, planning, forecasting, and decision support (Alshibly, 2015). Turban, Sharda, and Delen (2014) argued that using enhanced analytical capabilities to gain insights from data are of paramount importance to compete

in the global marketplace. Using DSS and historical data, organizations know how and what their customers have done in the past, but they are not, however, able to predict how they might behave in the future without enhanced business analytics capabilities (Holsapple, Lee-Post, & Pakath, 2014).

The concept of personal decision support systems to create a roadmap of the DSS field was used by Arnott and Pervan (2014) as a systematic approach to support systems used from the 1970s through today. The specific components include negotiation support systems for group decision making (Shyur & Shih, 2015), online analytical processing for executive IS (Phillips-Wren, Iyer, Kulkarni, & Ariyachandra, 2015), and artificial intelligence and expert systems for drawing intelligent and knowledge-based inferences (Davis & Marcus, 2015). The decision support system must be capable of handling soft information such as stakeholder perspectives, mental models, and the analytical results of that information (Minhas & Berger, 2014).

As a part of organizational decision making, the one making the decision must choose the option from among the alternatives that will yield the best possible results (Anderson, Sweeney, Williams, Camm, & Cochran, 2015). Decision tools such as optimization and simulation provide multiple alternatives for the decision maker based on user inputs (Anderson et al., 2015). Optimization and simulation toolboxes provide sophisticated techniques such as pattern search and algorithms to solve for a variety of conditions that lead to the resolution of optimization problems (Nguyen, Reiter, & Rigo, 2014). The capabilities of the toolbox can expand management science to provide a meaningful aid to solve a wide range of decision problems (Anderson et al., 2015).

As a technology enabler, a DSS can assist organizations in making decisions (Castillo & Cazarini, 2014). Organizational decision making has become complex because of the demand to make more informed decisions to stay competitive in a timely manner (Kushwaha & Rao, 2015). A DSS is an extendable system used for semistructured and unstructured problems in conjunction with interactive decision-modeling activities (Ilie-Zudor et al., 2015). Computers operationalize decision making processes and assist managers with technological systems to share information and perform managerial tasks efficiently (García-Álvarez, 2014).

The original impetus for DSS began with the concept of utilizing computer technology to support managerial decisions with models that provide choices (Alshibly, 2015). As computer systems have evolved, they have provided increasing flexibility through interactivity (Ölmez & Lindemann, 2014). Additionally, the mathematical, algorithmic, and logical methods, in conjunction with optimization and simulation approaches, have enabled the development of additional tools (Alshibly, 2015). These tools, in turn, have enabled managers to make more predictable and better-informed decisions (Kushwaha & Rao, 2015).

Decision-support models are either static or dynamic (Turban et al., 2014). A static model takes a single snapshot of the situation such as the decision to buy or build a product (Clemen & Reilly, 2014). The inputs to dynamic models vary based on the time and should be more flexible to support decision making (Castillo & Cazarini, 2014). Another classification of decision models is based on the decision maker's awareness of environmental influences and potential outcomes (Clemen & Reilly, 2014). Regardless of

the complexity of the models, the decision maker is ultimately responsible for the decisions (Alshibly, 2015).

The recent trends in DSS research were reported by Hosack, Hall, Paradice, and Courtney (2012), who studied the improvements that focused on the Internet, social computing, and mobile technologies. Hosack et al. (2012) also observed the growing significance of KM and knowledge engineering systems as integral parts of DSS that have since branched off into their own disciplines. Integrated into the decision-support model is the Web 2.0 collaboration platform that provides interactivity and a social workplace for virtual teams (Sultan, 2013). Web 2.0 enhances decision making and problem-solving capabilities by providing a collaborative platform and tools to support the interactions across virtual teams in a global community (Pirkkalainen & Pawlowski, 2014).

Web 2.0 Technologies

The social networks are major sources of social capital development (Mehta et al., 2014). Social networks such as forums, blogs, chat, and social bookmarking emerged from Web 2.0, a collection of Internet technology applications (Turban et al., 2014). Mehta et al. recommended implementing KM systems in conjunction with social networks, as better communication between members of an organization can make the organization more collaborative and innovative (Ale et al., 2014). Blogs, social networking sites used for sharing information in a relatively shorter form to exchange knowledge (Sigala & Chalkiti, 2014), are often used for teaching, receiving confirmation, or providing reflective responses from colleagues (Turban et al., 2014). Wikis enable

collaboration between employees to collectively create content that focuses on knowledge and has the ability to add or edit the content to maintain the latest knowledge (Von Krogh, 2012).

Web 2.0 also exploits the network effect of the social interaction of users to tap into their collective intelligence (Sigala & Chalkiti, 2014). Web 2.0 tools support the web-based user interface functionality with rich graphical capabilities in addition to providing collaborative platforms using wikis and blogs (Sołtysik-Piorunkiewicz, 2015). It also provides capabilities for combining information and knowledge in a number of ways to deliver a richer user experience through a browser (Turban et al., 2014). Web 2.0 offers a lightweight programming language, Ajax, and configuration tools that enable almost anyone to assume the role of a developer and support a personalized experience with the disruptive technology of Web 2.0 (Mata & Quesada, 2014).

Social media, an integral component of Web 2.0, is comprised of a combination of platforms and tools that enable users to share their opinions and experiences using a number of media in the form of text, photos, videos, and voice (Sigala & Chalkiti, 2014). In social media, users control the content, while the role of the network structure is to enable communication and collaboration on a larger scale (Turban et al., 2014). The Web 2.0 platform provides a way to gather the collective intelligence of stakeholders and create a platform for collaboration (Lau, Liao, Wong, & Chiu, 2012). The individual viewpoints expressed using social media constitute the collective wisdom of a virtual community (Sołtysik-Piorunkiewicz, 2015). Mata and Quesada (2014) and Turban et al. (2008), however, expressed caution and acknowledged that Web 2.0 leads to challenges

regarding the accuracy and authenticity of the content published by the virtual community.

The tools of Web 2.0 are gaining widespread acceptance across enterprises (Liu, Kim & Sun, 2012), as these tools are augmented by security controls and archival and identity-management capabilities to bring industry strength to these applications (Mata & Quesada, 2014). Wikis, blogs, and chat are even replacing e-mail, which was once considered the indispensable form of communication (Mata & Quesada, 2014). All participants can see Wikis and blogs, including the edits and responses of individual users. This process also allows more open communication within larger groups (Turban et al., 2014). Organizations, however, can build a hierarchy of communities to limit access to information shared in blogs and wikis at various levels (Turban et al., 2014).

Web technologies and tools continue to evolve to provide support for the growing needs of meaningful content with a rich set of data and visual analytics capabilities (Sigala & Chalkiti, 2014). According to Turban et al. (2014), Web 3.0, a natural evolution from Web 2.0, will enable the expression of content in natural language and associate rich meaning with the content. Not only will users understand the content, but the software agents that work behind the scenes to integrate information more easily will also understand it (Sołtysik-Piorunkiewicz, 2015). Web 3.0 could aid organizational decision making by serving as a universal medium for collaborative working groups (Sołtysik-Piorunkiewicz, 2015).

Predictive Analytics

Organizations use predictive analytics methods to augment DSS and Web 2.0/3.0 related to a business transaction (Ilie-Zudor et al., 2015). For example, predictive analytics is used to analyze the knowledge of past performance to predict the likelihood of customers or other stakeholders exhibiting the same or different behavior in the future (Sharma & Danhich, 2014). Predictive models can apply mathematical functions such as scorecards or statistical tools to cluster the identical attributes for customer segmentation (Babu & Sastry, 2014). To handle complex relationships and a high volume of data, an organization commonly uses neural network approaches (Tsai & Hung, 2014). In the context of the software industry, predictive analytics can be applied for development of effort estimation (Whigham, Owen, & Macdonell, 2015), reliability of the software product (Jin & Jin, 2014), and software quality management functions (Breu, Kuntzmann-Combelles, & Felderer, 2014).

Predictive analytics models are built to make empirical predictions and are assessed by prediction power in contrast to inference models built to establish a causal relationship between the variables (Tsai & Hung, 2014). Predictive models require an interpretation of the association and causality between the variables to explain the underlying logic to the users and stakeholders (Sharma & Dadhich, 2014). Experts should understand the tension between the goals of these approaches and any trade-off(s) then applied to satisfy the model by sacrificing some level of predictive power (Ilie-Zudor et al., 2015).

Software development resources in an IS organization are often limited and may thus affect the organization's ability to develop new features for software while they maintain existing application systems (Mehta et al., 2014). The ability to determine the need for what additional resources are needed is vital, especially if the resources have corresponding monetary values attached to the acquisition of different skill resources (Poston & Dhaliwal, 2015). Consequently, for the case of acquiring resources with corresponding monetary values, algorithmic models such as benefit/cost analysis and risk analysis are used as criteria for decision making (Anderson et al., 2015).

Users can employ algorithmic models as long as all the alternatives are expressed numerically in common measures such as a dollar amount to facilitate comparisons (Anderson et al., 2015). For example, project-scheduling software could use software-development resources to achieve project objectives (Bourque & Fairley, 2014). Users can employ artificial intelligence techniques such as an expert system if the objectives are expressed as fuzzy variables (Herrera-Viedma, 2015). Expert systems are used to make automatic inferences based on the knowledge base and inference rules programmed into computer systems (Aggarwal & Thakur, 2014). The expert systems can be used as an alternative to human expertise (Hoffman & Ward, 2015) and could potentially mitigate the risk of knowledge loss due to a Baby Boomer mass retirement.

In the preceding sections, I elaborated upon the various components of ICT that organizations leverage to achieve competitive advantages in a global marketplace (Chen & Fong, 2015). One of the significant contributions of ICT is to aid organizational decision making (Van Knippenberg, Dahlander, Haas, & George, 2015). As stated, the

advent of intelligent systems and predictive analytics has enabled organizations to achieve higher levels of automation in decision making (Hoffman & Ward, 2015). DeLong (2004) observed that the knowledge loss of the Baby Boomer generation would hamper the problem-solving and decision making capabilities of an organization if it did not make necessary preparations before the Baby Boomers retired. Managers must understand the significance of ICT as it relates to an overall KM strategy to comprehend potential challenges if organizations lose Baby Boomer knowledge (Biron & Hanuka, 2015).

The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. It provided the impetus for understanding the importance of KM, KM strategy, knowledge life cycle, lost knowledge, and ICT. These concepts serve as a basis of understanding why preventing loss of knowledge is important and can contribute to positive social change. The constructs of the knowledge life cycle (McElroy, 2003) explained how to operationalize the information Baby Boomers provide to organizations from their knowledge and performance over many years. If this knowledge is not preserved or captured before Baby Boomers leave a company, that lost knowledge becomes a liability and a weakness of the organization (Wang & Wang, 2012). This weakness might result in knowledge that the younger generation workforce will not have for developing future IS (Stevens, 2010).

Research that addresses addressed the Baby Boomers' experiences with their organization's advancement after their retirement, as well as research discussing how the

organizations' ICT will be able to facilitate knowledge capture and flow to the new generational workforce, provided an essential supplement to the literature. Without learning how to solve potential problems that may result if organizations lose Baby Boomers' knowledge, the organization might suffer a void that could become a weakness after Baby Boomers retire (DeLong, 2004).

Summary and Conclusions

The review of the literature included synopses of the pertinent literature about the potential of significant lost knowledge of the Baby Boomer generation if there are no measures in place to capture their knowledge before they retire. It also included discussions of knowledge typology, knowledge strategy, KM life cycle activities, as well as information and communication technologies that might enable automating KM.

Chapter 3 includes the methodology selected to understand lost knowledge and the importance of capturing that knowledge. In addition, Chapter 3 includes an explanation of the qualitative approach and hermeneutic phenomenological research design I used as well as a description of the participants, the settings, instrumentation, data collection, and analysis.

Chapter 3: Research Method

The purpose of this study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer workers' retirements. The chapter includes the following sections: the role of the researcher, the methodology, issues of trustworthiness, and a summary. The research design and rationale section includes a justification for the qualitative approach and the hermeneutic phenomenological design. The section on methodology includes recruitment method, choice of participants, data collection, and an explanation of the plan for data coding and analysis. It also includes discussions of credibility, transferability, dependability, confirmability, and ethical procedures as well as issues of trustworthiness.

Research Design and Rationale

To explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement, I used the following research question to direct the study: What are the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomers retire? The study included a focus on how an organization might continue to operate and be in a position to advance when the Baby Boomer lost knowledge phenomenon occurs. Based on leaders' and managers' perspectives, the responses to the overarching research question may provide information about operational continuity after Baby Boomers retire. These data also provide a greater understanding of the lived experiences of the supervisors or managers who may have lost information or anticipate losing it following the retirement of Baby Boomers.

I explored the naturalistic paradigm, which encompasses quantitative, qualitative, and mixed-methods approaches to determine the best method to answer the research question. Adopting a mixed-methods approach requires qualitative data to support quantitative data and, conversely, using quantitative data to support qualitative data (Pickard, 2013). It was not necessary to use a mixed-methods approach or quantitative approach because the research questions concerned the participants' lived experiences. Using a quantitative component for statistical information would not add clarity to responses to the question about the Baby Boomer retirement phenomenon.

I selected the qualitative approach because it was most appropriate to answer the research questions. The decision originated with my research interest in how organizational leaders might advance without the knowledge of the Baby Boomers to how organizational leaders plan to capture Baby Boomers' knowledge after those employees have retired. Both are equally significant components of the study. Qualitative researchers typically use information from participants to guide a conceptual framework to answer the research question (Marshall & Rossman, 2016).

There were many design options to choose from in the qualitative tradition: grounded theory, ethnography, case study, narrative, and phenomenology (Marshall & Rossman, 2016). I considered all of them to determine the appropriate research design. Grounded theory is not based on the traditional aspects of research, thus, it is not built upon a theory or conceptual framework (Pickard, 2013). Rather, grounded theory requires study results to develop a theory (Walsh et al., 2015). With grounded theory research, the researcher does not specify a particular theory or framework because of the evolution of a

developing theory based on the data explained by grounded theory seminal researchers (Walsh et al., 2015). As I based the study on the conceptual framework of the knowledge life cycle, I did not choose to use a grounded theory approach because it was not an appropriate qualitative method.

Another qualitative approach is ethnography, but this study had no connection to a particular culture or group (Maier & Thalmann, 2012). The case study research design is applied to answer research questions to understand distinctions about a group (Yin, 2014), but that was not the interest here. I chose the phenomenological design because the research questions evolved from the lived experiences of managers and leaders striving to maintain operational continuity after Baby Boomer workers' retirements. Phenomenological design provides the foundation to explore the conscious experiences of the participant from a first-person point of view (Heinonen, 2015). Phenomenological studies require the collection and analyses of participants' lived experiences as they relate to the understanding of and meaning they give to a phenomenon (Moustakas, 1994).

Role of the Researcher

The phenomenological approach was a viable means for research on this topic because the researcher's role is that of a listener and not of a reactor or responder (Marshall & Rossman, 2016). Xu and Storr (2012) described the researcher as one who does not know the answers to questions, enabling him or her to embark upon a new investigation with interest but without having formed an opinion. Chenail (2011) discussed the researcher's role as a listener and learner who strives to receive information in an unbiased way. As an investigator, the researcher is in the position of clarifying the

knowledge being shared (Chenail, 2011). Marshall and Rossman (2016) based this perspective on the assumption that a researcher would be objective and that this objectivity would assure more accurate data collection. Therefore, the role of the researcher was to be an objective observer and listener who gathers the data in a nonbiased way.

Prior to data collection, I used bracketing, as discussed by Moustakas (1994), to overcome any preconceived notions about an IS organization with which I have had an association. Using bracketing to identify the issues that may cause bias allowed me to be aware of predispositions about interviewees' responses. This process of bracketing is self-reflection (also known as epoche), which is a questioning of an interviewer's bias (Marshall & Rossman, 2016). I facilitated the epoche process by journaling my ideas prior to interviewing the participants. According to the phenomenological model described by Moustakas (1994), I separated myself from previous knowledge of the lost knowledge phenomenon.

My role was as an observer because of the phenomenological design method I used and because I maintained a neutral position within a naturalistic setting. I conducted research using a hermeneutic design that included interpretive phenomenology whereby the researcher is a cocreator with the participant in developing the themes and perspectives from the participants' knowledge. In terms of interpreting the text, the researcher is embedded in and is not separate from the information he or she is reading (Heinonen, 2015).

I had no supervisory or instructional relationship with participants and ensured that the 20 participants I selected had the experience, knowledge, and technical background necessary to answer the interview questions with authority. The criteria specified that the participants be managers and leaders in the field of IS and that their subordinates included members of the Baby Boomer generation. My role was dependent on the information and knowledge from participants.

Methodology

Participant Selection Logic

To select participants for a qualitative research design, specifically phenomenology, I used purposeful sampling from a variety of potential participants who had experienced the phenomenon. I contacted each person individually through e-mail to invite him or her to participate in the study. I selected those who met the criteria and were interested in the study as noted by Marshall and Rossman (2016). They were leaders and managers who had the specific knowledge and understanding of how Baby Boomer retirements related to the concept of potential lost knowledge.

As the study would be too narrow if it were comprised of participants from a single organization, I selected managers and leaders in a large number of IS organizations who had experienced the phenomenon. Participants held a variety of positions, either as a manager or in a leadership role, and I sought a wide range of representation from different organizations to gain the broadest perspective. The population had knowledge of software development and generalist supervisory skills and experience. Those identified

as potential participants were each sent a letter specifying those criteria, and I selected them based on their acknowledging that they met the criteria and agreed to participate.

I chose participants using purposeful sampling from the pool of managers and leaders I contacted who had experienced Baby Boomer knowledge loss in IS organizations. Purposeful sampling is the process of choosing individuals who have direct knowledge of the problem a researcher plans to study (Patton, 1990). I chose managers and leaders who had not only significant experience in IS but also experiences with Baby Boomers who have retired. Their perspective of how Baby Boomer retirements influence knowledge loss and how knowledge loss contributed to operational continuity of their business was the focus of this study.

The sample size of participants is not as important as the choice of the participants who have the experience and expertise to answer the research questions with authority (Marshall & Rossman, 2016). Participants had first-hand knowledge of how Baby Boomer retirement had affected both them and their organizations and had background knowledge related to the research questions. Harwood, Gapp, and Stewart (2015) emphasized the need for selecting participants who have experience relevant to the topic, are articulate, and are willing to report and reflect on their experience. Ultimately, the goal of data collection is to acquire enough reliable information to accurately describe the experience of the phenomenon under study, not to generalize to established theories or models (Marshall & Rossman, 2016). From the responses of potential participants to my query messages, I was able to ascertain that they had the requisite knowledge and experience to provide expert information.

The number of participants determined to be adequate comes from Giorgi (2009), who noted that a sufficient number for a phenomenological design is usually between 15 and 20. For that reason, I began with an initial sample size of 20 and analyzed the data. There being no new information generated, I considered the data to be saturated, as discussed by Fusch and Ness (2015).

Instrumentation

As the instrument, I created and disseminated the interview protocol and prepared an interview guide with three components, including discussions to help establish rapport to ensure that participants felt comfortable, knew that I would keep the information confidential, and would feel open to share their beliefs honestly. The second component was the interview questions. If a participant seemed unsure of the meaning of a question, I elaborated on it to further explain the question. The interviews also included my asking participants to clarify any of their answers that were not clear to me. The additional questions for clarification are a part of the evolutionary process of collecting data instead of another set of formulated questions. The third component of the interviews was a closing statement to solicit any general comments a participant may want to add.

A part of the instrumentation was a pilot test related to the interview questions to be sure participants would understand what they were being asked and could clearly articulate answers to the interview questions (Turner, 2010). The objective of the pilot test was not to generate properties and themes using interview data but to determine whether my questions were clear and appropriate for the study. Conducting a pilot test with two persons who met the same criteria as actual participants enabled me to be

comfortable and familiar with the knowledge and depth of the questions and how best to communicate with potential participants. Pilot test participants understood the questions, could articulate their answers with authority, and verified the content validity of the interview questions.

The instrumentation included audiotaping the actual interviews for accurate data collection. I tested the audio equipment to make sure it was operating so I could capture information from those who agreed to be recorded. This procedure ensured accuracy of content and enabled me to review the transcript for further analysis. Field notes were my reflections on each interview to recap or note points from participants. I recreated the open-ended questions for clarity, as needed, after reexamining the research agenda in the literature.

Procedures for Recruitment, Participation, and Data Collection

I purposefully selected participants because of their expertise as managers and leaders and their knowledge of IS. I based my choices on my knowledge of those in management or leadership positions who had personal experience watching the Baby Boomers retire from their organizations. To begin recruiting, I sent a letter to potential participants explaining the purpose of the study and what their involvement might be. The letter also contained information about what was required of them from the time the process began through any follow-up interviews that may be necessary to clarify information. I sent the letter by e-mail to potential participants.

I asked those who had agreed to participate to sign a consent form acknowledging that they would participate. When I received the form, I contacted them by e-mail or

telephone to request a meeting place or to determine whether they preferred an Internet web conference such as Skype, a viable web conferencing tool used in phenomenological interviews (Carter, 2012; Clancy, 2013; DeFelice & Janesick, 2015). The participant could choose to withdraw from participation at any time for any reason, as the most important aspect was the comfort level of the participant to mitigate any anxiety or privacy concerns.

I began the interview process by engaging with the participants so they would become comfortable and experience an environment of trust. I interviewed each one for approximately 60 minutes to 2 hours, the time depending on what information they chose to provide for each question. With participants' permission, I recorded all interviews.

According to the phenomenological model described by Moustakas (1994), I separated myself from previous knowledge of the lost knowledge phenomenon using bracketing. I listened attentively to the participant's lived experiences regarding lost knowledge without any preconceived beliefs. During this process, for each statement made by the participant, I asked probing questions so the participants could elaborate and provide a richer description of all their lived experiences.

Hermeneutic research provides an opportunity to check a researcher's interpretations through the process of member checking with participants (Lincoln & Guba, 1985). Member checking assists the researcher by confirming the categorization and interpretation of the meaning conveyed by the participants (Lincoln & Guba, 1985). I used member checking with participants to make sure the meaning I attributed to their statements was accurate and correctly presented in my preliminary data analysis. Using

member checking allows participants to substantiate the meaning I derived based on the interviews. I carried out member checking in real time either by telephone or using a web conferencing tool such as Skype. The participants exited the study when they had completely answered each interview question and I had completed the member checking with them. If they wished to discontinue participation in the study at any time or for any reason, they were free to do so.

Data Analysis Plan

The analysis began with the transcription of the interview recordings, followed by phenomenological reduction suggested by Bevan (2014), a process that gives meaning and structure to the information. I analyzed the data using a modified Van Kaam method as discussed by Moustakas (1994) to represent the insights and the essence of experience for the group of managers and leaders as a whole. During the reading of the transcriptions, I noted the participants' expressions related to their experiences and underlined the keywords for each of their transcriptions.

I analyzed and coded individual words and phrases for the creation of categories and patterns using a systematic approach for a phenomenological analysis of the data. The analysis continued with clustering to reach the subsumed meaning through an iterative procedure in which a researcher goes back and forth through each participant's transcript to identify similar words or phrases to categorize commonalities for themes and patterns of the ideas (Moustakas, 1994). I contextualized the categories elicited from the interviews and developed a composite summary of all observed categories. I used the

words in the category to create themes and properties from participants' language to provide support for conclusions and to answer the research questions.

The detailed data analysis included reading each transcript a minimum of five times. As I read each transcript line-by-line, I noted repeated individual words. This identification began the process of open coding, the first step in identifying key words and phrases in transcriptions that are similar among all participants. I identified the key words and verified them as concepts. The key words were color coded systematically as they were created to develop various themes and properties. Properties were double color coded; the first color related to the theme, and the second color was specific to the property. For example, the theme leaving a legacy (LAL) would be coded purple. The property under LAL, personal recognition (PR) would be coded purple for LAL and blue for recognizing the individual property of PR.

The concepts served as themes, and the data were analyzed either within a global perspective or within a specific perspective based on the particular influence the keywords and phrases had for designating each as a property or a theme. The themes and properties were then created within a thematic framework; therefore, the similarities of the comments determined the categories that became themes and properties. Each theme and property was defined, and the definitions were generated from direct transcriptions of the interviews. After the themes and properties were designated, the participant's transcriptions were used as supporting data.

Qualitative research data interpretation is not a literal interpretation of the language of interviews (Marshall & Rossman, 2016). Rather, the concepts that become

themes for the themes and properties are viewed as ideas, visions, and possible projections of what participants have shared. These data were interpreted through the participants' values and beliefs as their themes and properties related or responded to the meaning of the research questions. Qualitative interpretations are not determined by how often or by how many times a key word or a phrase is used, but become a conceptualization of and meaning attached to the words and phrases that are presented similarly by most of them (Marshall & Rossman, 2016). When I reread the transcriptions but no longer found anything new, I determined that saturation had occurred, and the themes and properties created became the result and analysis of the data.

I considered and handled discrepant cases as they were found in the process of creating the themes that arose from the properties and themes from the data. These cases were recognized as specific to the individual participants who may have either opposed or taken another position regarding the conceptual understanding of how the data are interpreted. Discrepant cases were included as separate themes that presented a different perspective of an interview question. It was important to acknowledge participants who had alternative views and recognize their perspectives in the data presentation.

Issues of Trustworthiness

Researchers believe that the qualitative method has tenets of rigor based on the trustworthiness of research participants (Marshall & Rossman, 2016). The qualitative approach is judged on the value from four perspectives for trustworthiness: (a) credibility, (b) transferability, (c) dependability, and (d) confirmability (Lincoln & Guba, 1985). The validity and reliability in a qualitative research framework are represented by

the credibility and trustworthiness of the participants and the methods used for data collection (Cope, 2014). I purposefully chose participants based on my personal knowledge of their employment and work experience and considered them credible sources of information and accepted their responses without question, as discussed by Marshall and Rossman (2016).

Credibility

I managed the aspects of credibility from multiple perspectives: participant selection in purposeful sampling, researcher bias, and interview process. Participants were all responsible for the accountability of an organizational function and had experienced the loss of Baby Boomer knowledge, factors that establish them as experts. In addition, I requested that they present verifiable documentation that they are both managers and have experienced the retirement of Baby Boomer employees.

In qualitative research, credibility procedures strengthen dependability and their relationships to the process of triangulation (Morse, 2015). For this study, using a phenomenological research design uses the interview as the only source of data. Triangulation was not applicable to the data analysis process, and I used member checking because of the limitation of using only the interviews for data and using those data sources to support credibility. An additional aspect of credibility is that data saturation occurs when the data yield no new information and themes become repetitive (Fusch & Ness, 2015; Rowlands, Waddell, & McKenna, 2015).

Transferability

Those who read the study will determine if it has transferability to their situations (Marshall & Rossman, 2016). The research data should yield a rich, thick description of the phenomenon of managers' lived experiences with Baby Boomers who are retiring or have retired from their organizations. The participants' insights into information technology and creative knowledge of software development will contribute to contextualizing their experiences, expanding the literature, and creating greater transferability of the study.

Holistic research regarding the lost knowledge phenomenon may be transferable to other settings in knowledge-intensive professions such as education, healthcare, and construction. Transferability is also interpreted from the readers' perspectives (King & Horrocks, 2010). Readers can draw inferences through personal interpretation of whether the results are applicable to their situations (Marshall & Rossman, 2016).

Dependability

The construct of dependability in a qualitative study includes the recognition that a researcher will note there are changing circumstances as a phenomenon is studied (Marshall & Rossman, 2016). Van Manen (2012) specified that participants' knowledge reflected in their conversations with a researcher is the foundation of the dependability of the data. The strength of participants' knowledge adds a rich perspective to understanding the lived experiences of participants that contributed to the dependability of the data (Kafle, 2013).

As the interview was the only source of data for this study, the intensity of participants' lived experiences shared during interviews in real time provided a depth of understanding that can equate with dependability (Kafle, 2013; McConnell-Henry, Chapman, & Francis, 2011). In addition, I used member checking because of the limitation of using only interviews for data and using those data sources to support credibility.

Confirmability

Confirmability is a process whereby the researcher articulates and records his or her thoughts and demonstrates the findings to establish objectivity (Marshall & Rossman, 2016). The process of a researcher developing themes from applying the reflection and repeated reviews of interview transcripts assists in identifying similar words and concepts (Moustakas, 1994). I listened to audio tapes repeatedly to establish confirmability.

I mitigated researcher bias through a written statement of what I believe about Baby Boomer retirement and lost knowledge in the IS organization. Reflections on this statement provided confirmation that my background and beliefs did not interfere with data collection. I used bracketing to mitigate the influence of my personal experience and how it may influence the study results.

Using transcriptions and noting similarities among the participants, I also kept field notes to support confirming the data. Field notes were personal observations that I made during interviews and wrote immediately after the interviews with each participant. These included personal observations and nonverbal cues that are not part of the transcriptions: body language, tone of voice, pauses, or hesitations. This process helped

me to reflect upon the concepts participants specified that I could track and describe in an audit trail. I noted the thoroughness and degree of detail of their descriptions and listened attentively to their perspectives.

Following this process, I used an audit trail to mitigate researcher bias and support confirmability as noted by Lincoln and Guba (1985). An audit trail can contain a description of how the data evolved from the commonality of remarks among the participants (Ben-Ari & Enosh, 2011). I followed the audit trail as I moved through different levels of reading the transcriptions, member checking, and developing the conceptualized themes and properties for data analysis. In addition, I established an objective relationship between interview data and findings by providing transcriptions that linked directly with emerging themes to ensure confirmability, as suggested by Cope (2014).

Ethical Procedures

To ensure ethical practices for the protection of human participants, I secured the approval of the Walden University Institutional Review Board before I undertook any research activities. I protected the identity of all participants by assigning alpha codes in place of their actual names for confidentiality. Each participant signed an informed consent form that includes the purpose of the study, the risks, the time commitments, interview process, benefits of the study, that there is no compensation for participation, and that each can withdraw from the study at any time and for any reason. During the initial contact with participants, I made sure they understand the concept of informed consent. To address the issue of early withdrawal, I emphasized that they were free to

withdraw any time for any reason. I archived the collected data on a memory card I have stored in a locked cabinet. After 5 years, as required by the IRB, I will destroy the archived memory card and all field notes from the research.

Summary

In Chapter 3, I presented the qualitative research method and hermeneutic phenomenological research design as appropriate for answering the research questions. In addition, I presented the criteria for participant selection as a purposeful sample related to their employment and experience, since the problem of a supervisor who is responsible for maintaining organizational information was the impetus for participant selection. Another criterion was participants' association with Baby Boomer employee retirements. I also explained the data collection method, data analysis procedures, and the structure chosen to organize the data and create concepts that became the results of the study. I secured the data and removed any information that identified participants in any way.

The results of data analysis provide a foundation for Chapter 4, which presents how the results answer the research question. These results include properties, themes, definitions for each property, and transcriptions and field notes from each participant's interview.

Chapter 4: Results

The purpose of this study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer workers' retirements. I followed a qualitative approach using a phenomenological research design based on the need to explore the essence and meaning of human experiences. The design included hermeneutic interpretive phenomenology in which I was a cocreator with the participants in developing their themes and perspectives. The research process originated from the following research question: What are the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomers retire?

Chapter 4 includes the description of the pilot test, participant demographics, data collection approach, and data analysis and includes the implementation of trustworthiness related to the characteristics of credibility, dependability, transferability, and confirmability. The chapter concludes with a summary of the findings and a brief introduction to Chapter 5.

Pilot Test

The purpose of the pilot test was to explore whether those in the pilot test understood and could clearly articulate answers to the interview questions. The objective was not to generate properties and themes using interview data but to determine whether my questions were clearly written and appropriate for the study. The test helped to verify that participants had the knowledge base and experience to clearly articulate the interview questions but was not conducted to generate properties and themes or produce results.

Sample

I chose one manager and one leader in IS who matched the criteria for participants in the full study. I conducted the face-to-face interview with the IS executive and a Skype interview with the IS manager. The average interview time with each participant was 45 minutes. Participant demographics are in Table 1.

Table 1

Demographic Table of Pilot Participants

Participant	Role	IS area	Interview setting
Pilot 1	Manager	Systems manager	Skype
Pilot 2	Leader	Systems executive	Face-to-face

Data Collection

I collected data from six semistructured interview questions. I completed the Pilot 1 interview in 42 minutes and Pilot 2 interview in 58 minutes. I was comfortable with asking those questions to the participants. After the interview, I asked the participants whether the interview questions were clear and if they felt comfortable articulating their responses about their lived experiences.

Results

The participants verified that the interview questions were clearly phrased and understandable. There was no question of confusion from their perspectives, and they did not express unease with the questions. They confirmed that the questions were also clear and invoked their lived experiences.

Demographics

The participants were managers or leaders in their organizations, and their positions were defined as systems manager or systems executive. The interview settings were specified as either face-to-face or through Skype for real-time interaction. Table 2 presents the demographic information for the 20 participants.

Table 2

Demographic Table of Participants, Roles, IS Areas, and Interview Settings

Participant	Role	IS area	Interview setting
Participant 1	Manager	Systems manager	Face-to-face
Participant 2	Manager	Systems manager	Skype
Participant 3	Manager	Systems manager	Face-to-face
Participant 4	Manager	Systems manager	Face-to-face
Participant 5	Leader	Systems executive	Skype
Participant 6	Manager	Systems manager	Face-to-face
Participant 7	Manager	Systems manager	Skype
Participant 8	Leader	Systems executive	Skype
Participant 9	Manager	Systems manager	Skype
Participant 10	Manager	Systems manager	Face-to-face
Participant 11	Manager	Systems manager	Skype
Participant 12	Manager	Systems manager	Skype
Participant 13	Leader	Systems executive	Skype
Participant 14	Manager	Systems manager	Skype
Participant 15	Manager	Systems manager	Skype
Participant 16	Manager	Systems manager	Skype
Participant 17	Leader	Systems executive	Skype
Participant 18	Leader	Systems executive	Skype
Participant 19	Leader	Systems manager	Skype
Participant 20	Leader	Systems executive	Face-to-face

Data Collection

I determined the number of participants at 20 through purposeful sampling. The number of participants determined to be adequate came from Giorgi (2009), who noted that a sufficient number for a phenomenological design is usually between 15 and 20. I

identified the initial set based upon my knowledge of those in management or leadership positions who had personal experience watching the Baby Boomers retire from their organizations. This approach yielded 12 participants. Using the snowball effect, I recruited the additional eight participants after confirming that they met the criteria for participation.

Interview Process

The interview guide had three sections: biographical questions to build rapport, six semistructured interview questions to answer the research question, and one section that enabled a participant to share additional information relevant to the study. The closing section also included the overview of the subsequent interaction with the participant. This section was created for member checking and any additional feedback.

With their consent, I asked participants about their schedule and their preference for a face-to-face interview or through Skype and scheduled interviews at a mutually convenient time at their preferred settings. The duration of the interviews varied from 45 to 62 minutes. During the interviews using Skype, the voice quality degraded considerably for three of the participants, and I switched over to voice mode. Although I was not privy to their body language, as I had been using Skype, I used their voice quality as a parallel to their body language as suggested by Clancy (2013) and DeFelice and Janesick (2015).

The interviews occurred over 4 weeks. I asked the same questions in the same sequence of all participants and recorded their responses using the digital recording device that had an interface to the computer system. I used Call Note software to record

the interviews using Skype software. During the interviews, I asked the participants to elaborate on information they shared to clarify the details in order to provide the richest descriptions of their Baby Boomer retirement experiences. I conducted the preliminary analysis of themes and properties using the transcriptions generated from recorded interviews. I carried out member checking in real time using face-to-face or Skype to seek confirmation of my analysis of their responses. All participants confirmed the accuracy of my analysis, and I did not need to make any corrections to my preliminary analysis of individual transcriptions.

Bracketing

Prior to data collection, I used bracketing as discussed by King and Horrocks (2010), Marshall and Rossman (2016), and Moustakas (1994) to overcome any preconceived notions about Baby Boomer knowledge loss in IS organization with which I have had an association. The purpose of using bracketing was to identify the issues that might cause bias and might allow me to be aware of any predisposition toward interviewees' responses. Through self-reflection, I deliberately separated myself from my previous knowledge of lost knowledge phenomenon. Through bracketing, I listened attentively to the participants' lived experiences regarding lost knowledge without preconceived beliefs.

Data Saturation

The data were considered saturated when there was no new information that occurred as the data were analyzed. After I had interviewed the 20 participants, I analyzed the first 10 transcripts to identify the commonalities across themes within the

individual transcriptions. I continued the process with two additional transcripts at a time and analyzed their transcripts for any change to the preliminary properties and themes that might have presented new information. I repeated the same process with two additional participants at a time. After analysis of all 20 transcripts, I found no new information and achieved data saturation.

Data Analysis

After the transcripts were prepared, I started data analysis by reading them several times to identify key word and phrases among the 20 participants. The objective was to find similarities and identify them as concepts among all participants. Once I identified the similar concepts, I determined which had a global context and which had a narrower focus. The concepts I identified as narrow focus were properties that related to the themes. Once I identified each theme, I chose a different color to organize those themes. For example, I color-coded the first theme in blue then double color-coded properties related to the first theme in blue and red to specify the relationship with each of the themes. Each property was supported with a minimum of two transcripts to verify the formation of themes. Table 3 presents themes that evolved from the data analysis. Tables 4 through 9 present each of the themes and associated properties with their individual definitions.

Table 3

Themes and Definitions

Themes	Definition
Business climate (BC)	Impact caused by competitive pressures caused by technology, policy, and procedural changes
Delivery practices (DP)	Establishing a new way of working to deliver solutions better, faster, and efficient
Work processes (WP)	Redefinition of workplace processes for achieving organizational agility
Camaraderie (CAM)	Long-term relationships built across business partners of the organizations: vendors, and external service providers
Management response (MR)	Emotional and rational responses to a disruption
Retention of an employee (RE)	Approach to retaining the knowledge of an employee

Table 4

Theme 1: Business Climate

Property	Definition
Business on the go (BOG)	Enabling digital business and embrace mobile and technological advances to foster growth
People-to-process (P2P)	Organizational transformation to streamline the roles and establish performance metrics and measurements
Regulatory compliance (RC)	Enforcement of regulatory policies and procedures mandated by a governing body
New way of working (NWW)	Workplace dynamics caused by the global workforce and the new operations model

Table 5

Theme 2: Delivery Practices

Property	Definition
Outsourcing management (OM)	Turning over the maintenance and enhancement tasks of application systems to the external service provider resources
Retirement of systems (RoS)	Elimination of the system from the IS portfolio that are no longer needed to support the business operations
Solution design (SD)	Architectural blue print for integration of people, process, and technologies to deliver business value

Table 6

Theme 3: Work Processes

Property	Definition
Mentoring guidance (MG)	In-depth coaching in their area of expertise for developing skills and solving critical problems
Workplace navigation (WN)	Ability to connect with the right resources for performing the tasks effectively
Lifecycle activities (LA)	Encompassing the analysis design, development, implementation, and support of IS solutions

Table 7

Theme 4: Camaraderie

Property	Definition
Lost relationship (LR)	A pre-established relationship that is no longer visible or may be forgotten by the employees and organizations.
Relationship gap (RG)	Loss of the pre-established emotional connection that needs to be recreated.
Business partners re-engagement (BPR)	A new model for engaging with business partners to define and deliver IS solutions.

Table 8

Theme 5: Management Response

Property	Definition
Fear of the unknown (FOU)	Uncertainty caused by the timing of the retirement of Baby Boomer retirement
Alternate focus (AF)	Embracing the strengths of the multi-generational workforce and preparing the organization to develop focus on the newer generation capabilities
Reliable documentation (RD)	Documentation that can be relied upon as a source of knowledge

Table 9

Theme 6: Retention of an Employee

Property	Definition
Green card processing (GCP)	A method of securing permanent resident status

Evidence of Trustworthiness

Credibility

I managed the aspects of credibility from multiple perspectives: participant selection using purposeful sampling, researcher bias using bracketing, and conducting long interviews. Participants were leaders and managers of information system functions who had experienced the loss of Baby Boomer knowledge. Their backgrounds and experiences were the factors that established them as experts. As a part of the interview protocol, I asked the participants to confirm that they had experienced the retirement of Baby Boomer employees.

In this phenomenological research design, I used the interview as the only source of data. I used member checking because of the limitation of using only interviews for data and using those data sources to support credibility. An additional aspect of credibility is that data saturation occurs when the data yielded no new information and themes became repetitive (Fusch & Ness, 2015; Rowlands, Waddell, & McKenna, 2015); I found this to be the case in my study.

Transferability

Those who read this study will determine if it has transferability to their situations; transferability is left up to the reader to decide (Marshall & Rossman, 2016). The research data included thick description of the phenomenon of managers' lived experiences with Baby Boomers who had retired from their organizations. The participants' insights into information technology and creative knowledge of software

development contributed to contextualizing their experiences, expanding the literature, and creating greater potential for transferability of the study.

Holistic research regarding the lost knowledge phenomenon may be transferable to other settings in knowledge-intensive professions such as education, health care, and construction. Transferability is also interpreted from the readers' perspectives (King & Horrocks, 2010). Readers may draw inferences through personal interpretation of whether the results are applicable to their situations (Marshall & Rossman, 2016).

Dependability

The construct of dependability in a qualitative study includes the recognition that a researcher will note any changing circumstances as a phenomenon is studied (Marshall & Rossman, 2016). Van Manen (2012) specified that participants' knowledge reflected in their conversations with a researcher is the foundation of the dependability of the data. The strength of participants' knowledge added a rich perspective to understanding the lived experiences of participants that should contribute to the dependability of the data (Kafle, 2013).

As the interview was the only source of data for this study, the intensity of participants' lived experiences shared during interviews in real time provided a depth of understanding that equates with dependability of data (Kafle, 2013; McConnell-Henry, Chapman, & Francis, 2011). In addition, I used member checking because of the limitation of using only the interviews for data and using those data sources to support credibility. Member checking ensures that I have captured the meaning of what was said and not just the words that were used.

Confirmability

Confirmability is a process whereby the researcher articulates and records his or her thoughts and demonstrates the findings to establish objectivity (Marshall & Rossman, 2016). The process of a researcher developing themes from applying the reflection and repeated reviews of interview transcripts assists in identifying similar words and concepts (Moustakas, 1994). I listened to audio recording repeatedly to establish confirmability. I mitigated researcher bias through a written statement of what I believed about Baby Boomer retirement and lost knowledge in the IS organization. Reflections on this statement provided confirmation that my background and beliefs did not interfere with data understanding and interpretation. I used bracketing to mitigate the influence of my personal experience and the impact on the study results.

Using the transcriptions and noting similarities among the participants, I kept field notes to support confirming the data. Field notes were personal observations I made during the interviews and wrote write immediately after the interviews with each participant. These included nonverbal cues that are not part of the transcriptions such as body language, tone of voice, or pauses or hesitations. This helped me to reflect upon the concepts participants specified to track and describe in an audit trail. I noted the thoroughness and degree of detail of their descriptions and listened attentively to their perspectives.

Following this process, I used an audit trail to mitigate researcher bias and support confirmability as noted by Lincoln and Guba (1985). The audit trail contained a description of how the data evolved from the commonality of remarks among the

participants as discussed by Ben-Ari and Enosh (2011). The study contained an audit trail as I moved through different levels of reading the transcriptions, member checking, and developing the conceptualized themes and properties for data analysis. In addition, I established an objective relationship between the interview data and findings by providing transcriptions that linked directly with the emerging themes to ensure confirmability, as noted by Cope (2014).

Study Results

I identified the following themes of business climate (BC), delivery practices (DP), work processes (WP), camaraderie (CAM), management response (MR), and retention of an employee (RE) from participants' responses to interview questions. The research question was answered for each theme. I used a variety of participant comments as support for individual properties related to each theme, which was created using data analysis. These comments are explained according to their relationship with themes and properties. In addition, a discrepant case, Theme 6 RE, is described recognizing participants' interview transcripts as support for determining the reason the case was discrepant.

Emergent Theme 1: Business Climate

In this theme, I identified four properties of the business climate (BC) related to the Baby Boomer retirement influences from participants' data: (a) BOG, enabling digital business and embrace mobile and technological advances to foster growth, (b) P2P, organizational transformation to streamline the roles and establish performance metrics and measurements, (c) RC, enforcement of regulatory policies and procedures mandated

by a governing body, and (d) NWW, workplace dynamics caused by a global workforce and new operations model. These properties and their associations to lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees is demonstrated through the explanation of each property and subsequent transcription support.

Theme 1, data analysis of BC, reported that organizations have responded to the business disruptions in different ways through detailed planning and preparations. These organizations had to develop new IS capabilities to build and support BOG in order to respond to competitive pressures. Some organizations responded to the BOG by modernizing their IS capabilities. Other organizations, according to the data, had not made adequate preparations and made fewer changes by retaining a significant part of the legacy technologies and processes to deliver the BOG capabilities.

Participant 14 said,

> Retailers have seen a lot of disruption from companies like Amazon and eBay, but if you look at the banking sector, there is no such disruptor out there. Yes, the banking sector has had to adapt to mobile technologies and things like that, but at the back end, they still are running the same old machines; they're running the same old processes.

A similar viewpoint was expressed by Participant 15 from a different industry sector, "Cell phone technology changes every 2 years, but, overall, the business process hasn't changed, and it's just that we are doing it in a new fashion, retooling and retraining

the knowledge." In spite of some organizations not wanting to make significant technological and process changes, these organizations realized BOG capabilities.

The way different organizations responded to the BOG had different implications for IS managers' and leaders' lived experiences of Baby Boomer retirements. For example, many retail organizations had gone through significant disruption and had transitioned themselves to the new technology systems and the workforce to support them. Participant 17 acknowledged the benefits of replacing systems by stating, "We are benefiting from some of those directives in replacing systems because now we have new resources involved that can pick up that new system, and we're less reliant on the legacy knowledge."

Some managers and leaders believed the Baby Boomer generation retiring from their organizations did not influence their operations significantly. Participants14 stated the following, "I think probably because of technology changes, the whole IT industry has evolved to a point where the loss of the Baby Boomers' generation is incidental." The participants viewed knowledge loss as marginally significant because they were already making significant changes in their technologies and processes.

Other industries that continue to rely on legacy technologies found Baby Boomer retirement significant. Participant 7 said, "The part that really becomes a concern, especially when you speak of Baby Boomers, are the legacy systems that have been around for years that have not changed no matter how much the technology has changed." The longevity of the Baby Boomers in IS organizations has had a strong

association with legacy systems, which is causing concerns to IS managers and leaders who have started to see them retire.

The P2P is defined as organizational transformation to streamline the roles and establish performance metrics and measurements. The leaders and managers have seen the Baby Boomer generations step up to take on multiple roles like business analyst and developer due to their longevity and work ethic. As Baby Boomers started to retire, organizations have had to apply transformations to move from people-focused to process-focused to streamline operations to avoid a single point of failure. This resulted in an economic impact on organizations since they needed to bring in multiple resources to replace one Baby Boomer who was skilled enough to perform multiple roles.

Participant 16 said, "But . . . two folks would tag-team with him for about 3 to 4 months, and then they would take on his work." This option did not have economic viability, especially in situations where the work had to be performed on site at the client's location. Participant 18 reflected that by stating, "In a couple of instances, we actually had to hire two millennials to cover one Baby Boomer." The managers' and leaders' decisions to use multiple employees to replace a Baby Boomer employee is driven by the fact that Baby Boomer employees had undertaken and experienced a breadth and depth of work across multiple areas and technologies.

The property of RC, the enforcement of regulatory policies and procedures mandated by a governing body, was noted by Participant 15, who reinforced RC, citing rigor introduced by the compliance process: "So they do come and do medical audits to these organizations, so obviously, it puts some rigor in terms of making sure that they've

fully documented." The organizations are emphasizing the enforcement of RC that the systems must be upgraded to be compliant with the security policies to combat cybersecurity threats. Participants 13 emphasized the importance of RC by stating, "The organizations need to implement consistent practices across various groups within IS organizations to be compliant and upgrade their software to stay current." Participant 14 also stated, "The provider came to us and said, 'We have to upgrade the software. We have a new version now, and you cannot stay on the old version, because that's going out of compliance'." Where processes are mature, the company that was very much tuned in to regulation and can adapt to the compliance requirements is open to change. Adapting to the change reinforced the newness of the technology and processes, resulting in organizations having less reliance on legacy knowledge and not being significantly impacted by the Baby Boomers' retirements.

The NWW is the workplace dynamic caused by the global workforce and the new operations model. This property is related to adopting new technologies and getting used to new ways of solving problems. A key element of NWW is the collaboration between the intergenerational teams, as participants referred to both Baby Boomers and millennials as a challenge due to their actions and new operations model.

Participant 2 said of Baby Boomers,

> This is trying to solve a problem in a collaborative manner. Now people are more like working in silos actually. Or we have to call for a meeting to solve something instead of working offline and posting questions, and people could answer whenever they get the time.

Participant 9 said about a specific incident related to a Baby Boomer, "We had to kind of coach him, talk to him, and all that--well, he did it, but it was reluctantly." The difficulty of NWW is the choice of the Baby Boomer to adapt to the changes or to retire. One participant expressed fear that he as a manager would lose Baby Boomers to retirement if he made the change toward NWW. He was reluctant to make that change and said, "We want to bring huge changes in the organization, but we are afraid that if we push change too fast, these folks can just opt to retire." That participant chose not to make the change, and as a consequence of his decision, the Baby Boomer decided not to retire. NWW was also expressed regarding the millennial generation's openness to adapt to new technologies and engage with people to collaborate. Participant 8 said of millennials

> The soft skills are less, but the hard skills, for example, they are really adaptive to technology and running some things. Getting on mobile, starting to engage with people, using Instant Messenger and other things, social insight, business social network. In addition, millennials are great conversationalists and learn quickly about the business processes.

Millennials also demonstrated a higher degree of agility according to Participant 15, who observed,

> They are quick in terms of learning, they have a little more additional capability in terms of--whether it's documentation, with the tools, whether it's--you know, they are very good note-takers and all, when it comes to Note One and all, and they would capture all the e-mail screens.

The key factors that contribute to millennial's effective engagement in NWW is their collaborative ability and adapting technology to socialize with the workforce of the organization in a way similar to using their personal social networks. The millennials had a downside, suggested by the observation that they are impatient and see a limitation to their growth since there is not much opportunity to learn new things after the initial learning. Participant 15 observed of them,

> New people didn't have that patience because they want to grow faster, to be honest, compared to this person who was content with whatever they did . . . The new person, hey, now it's getting almost like, you know, initial learning rate. Fine, then it became almost like, "Ok, I don't see an opportunity to learn anything beyond what I've learned for the last 2 months . . . . I don't think there's anything else for me to stretch."

The NWW is causing the millennials to seek opportunities elsewhere since they are interested in advancing their personal learning of new technologies and processes. Participant 1 presented an alternate view of millennials:

> From what I have seen, they tend to work their 8 hours per day. If it is a generational thing or the kind of work that we give them to do, I do not know. One of the reasons we hired them is that we expect them to become vice presidents or run the company. In order to get to that kind of a position, they are going to do their 18-hour days and make some extraordinary contributions. But they have to be given an opportunity so they can do that. I am not always sure we are very good at giving them such opportunities.

That participant saw the challenge as providing appropriate opportunities for the millennials that related to NWW.

The overall theme of BC is supported by Caldas et al. (2014), who emphasized that jobs are becoming more specialized and complex because of the technological innovations. The advancement of technology is also embedded in aspects of McElroy's (2003) evolutionary knowledge lifecycle. The theme BC relates to the existing body of knowledge of knowledge retention strategies outlined by DeLong (2004) to mitigate loss of knowledge after Baby Boomers retire.

Emergent Theme 2: Delivery Practices

In Theme 2, I identified three properties for delivery practices (DP) related to the Baby Boomer retirement influences: OM, turning over the maintenance and enhancement tasks of application systems to the external service provider resources; ROS, elimination of the systems from the IS portfolio that are no longer needed to support business operations; and SD, the architectural blueprint for integration of people, processes, and technology to deliver business value. These properties and their relationships to leaders and managers lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees is demonstrated through the explanation of each property and subsequent transcription support.

The property OM, turning over the maintenance and enhancement tasks of application systems to external service provider resources. The management of knowledge to support the outsourced systems now becomes the responsibility of the organization that is performing those functions. These organizations recruit young

professionals out of college, train them in several legacy technologies such as common business-oriented language (COBOL), and position them to support several clients' IS. As observed by Participant 20, "It's a different experience because it's providing that to, in most cases, very young individuals with very strong technical skills," OM has enabled organizations to mitigate the Baby Boomer retirement risk. As Participant 1 said, "If we hadn't done outsourcing starting in 1995, this would have been a real problem when the developers left since we wouldn't have any backups for them." The managers and leaders felt a strong commitment to turn over the maintenance and enhancement tasks of application systems to external service provider resources because of their greater operational efficiencies.

ROS is the elimination of a system from the IS portfolio that is no longer needed to support business operations. Through ROS, organizations can move certain system functionality to newer systems that enable them to eliminate systems that are no longer needed. By keeping current technologies and eliminating legacy technologies, the organizations are able to minimize the impact of various roles performed by Baby Boomer employees. Participant 4 said,

> Retiring applications is good, even from your retiring business analyst or developer situation, because as people retire, you bring in newer applications. The knowledge of those applications is fresher than people are, especially if you pick something that's more current.

Many other participants believed ROS to be an important consideration to keep pace with technologies such as Software as a Service (SaaS) and business process changes.

The ROS through cloud platform migration is a DP that could be used to eliminate the infrastructure footprint and associated support activities at individual organizations. The cloud infrastructure is managed centrally by an external vendor using a pool of technical experts who can maintain these systems from several remote locations on the Internet. Migration of these systems to a cloud platform has had some short-term implications for the teams, but has delivered long-term benefits.

Participant 13 said,

> I think everybody realized that here was an opportunity to transform what they did. We would have to take some short-term pain, but it was not that much. I think people picked up things quickly, and we were able to make a lot of changes very quickly.

Some companies are taking an aggressive approach to align the newer workforce with newer technologies to drive organizational objectives. For example, Participant 5 said, “You have a 15-year-old system? Get rid of it. I have a brand new cloud system. Let’s go with that.” Many participants acknowledged the emergence of cloud platform migration and the importance of incorporating new systems for greater business productivity.

Participants also noted that two challenges to ROS are timing and cost. For example, the timing of the system retirement may not coincide with the timing of the

Baby Boomer retirement and are consequently posing risks to operational continuity. Participant 14 said, "Those companies are at risk, at some point, unless they are able to quickly hire some new talent and . . . modernize the same way as other companies." Organizations need to carefully evaluate their options for ROS in alignment with the Baby Boomer retirement to minimize risk to operational continuity.

The research data presented a scenario to explain the cost of ROS and associated business risks. Participant 7 said,

> If I had to try to replace a [technology] in an organization that I had worked in, it would [cost] millions or hundreds of millions of dollars to do it. And the business sees the risk mitigation of that and would prefer to say, "OK, it is an acceptable risk that a Baby Boomer will eventually go, and I might be able to get someone to backfill that gap for maybe 80% of the knowledge. And I'll take the risk that the 20% is risk-mitigated itself." So I think . . . most companies that still have those types of legacy platforms in place have [decided] to use that philosophy as a means of extending beyond the retirement of the Baby Boomers.

SD is the architectural blueprint for integration of people, processes, and technologies to deliver business value. The impetus for the SD encompasses the aspects of acknowledging team dynamics as a verification of managers' and leaders' recognitions of working collaboratively. For example, Participant 19 said,

> It was always a highly engaged, highly focused organization. And just after the senior people leave, it became more so. But everybody picked up the pieces, and we continued. In retrospect, [it] became a more effective organization as a result.

This example related to solution design from the aspect of team dynamics, especially after Baby Boomers retire. The rest of the team reinforced cohesiveness because of their awareness of picking up the pieces and completing the tasks to benefit the organization.

The overall theme of DP is supported by Hislop (2013), who discussed tools and approaches needed to establish knowledge processes to manage intellectual capital. As a DP, Venkitachalam and Busch (2012) recognized that Baby Boomers' tacit knowledge is intangible in terms of creation, adoption, and diffusion within the organization to support business processes. The complexities of DP is also supported and noted by DeLong (2004) and by Jennex and Durcikova (2013), who acknowledged that, as the Baby Boomers retire, the knowledge base built over their careers and time could be lost with them if the organization does not retain their knowledge.

Emergent Theme 3: Work Processes

In Theme 3, I identified three properties for work processes (WP) related to the Baby Boomer retirement influences from participant data: MG, recognizing the expertise for developing skills and solving critical problems; WN, the ability to connect with the right resources for performing tasks effectively; and LA, which encompasses the analysis, design, development, implementation, and support of IS solutions. These properties and relationships to leaders and managers lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees is demonstrated through the explanation of each property and subsequent transcription support.

MG is in-depth coaching for developing skills and solving critical problems. The participants acknowledged their personal interest in and expertise for becoming mentors. Since managers and leaders have expertise in operational areas such as budgeting, appraisals, and financials, there is a tendency to become mentors to groom successors. When it comes to mentoring technical knowledge, there is a reliance on experienced Baby Boomer employees to provide such guidance. Participant 7 noted the significance of MG stating, "You can probably put conservatively, 60% to 70% of that down on paper. The rest comes just from your experience and what you have in your head that can only be imparted organically in a mentorship role." When Baby Boomer employees retire, there will be a gap in tacit knowledge without MG, and that would result in decreased productivity.

The key aspect of MG is to enable the sharing of tacit knowledge by helping mentees to understand the foundation using examples and breaking them into smaller units that have value to them. This process is the impetus for understanding the context for comprehending the situation for transitioning work to new employees. Participant 5 stated

> From day one, I looked at mentoring--what needs to get done next or what the background--you don't give them the solution, but you describe the environment to them; you describe the landscape to them. So if that is done, then I think you have a pretty good transition plan.

Participant 18 noted, "They would go through the process of doing the analysis, coming up with a solution, and then [the Baby Boomer would] run it by their mentor." If

they understand the foundations and the context through MG, employees are able to handle complex scenarios and be more productive. The property of MG helps the organizations mitigate knowledge loss risk and fulfill the aspects of business continuity.

WN is the ability to connect with the right resources for performing tasks effectively. Within a context of deciding where to go when circumstances change is an impetus for performance and productivity in the workplace. One participant explained that finding directions within different situations enables Baby Boomers to have implicit knowledge of the WN that needs to be explicated for the new generational workforce coming into the organization. Participant 3 stated, "As long as your people have the foundational knowledge of the technology or the business function, they will have direction and know where to go, who to ask." As long as employees know where to go and take the initiative to ask, the task may be completed satisfactorily.

Within the principle of WN, Participant 4 emphasized another aspect of knowledge distribution across vendor systems, which relates to and will have a bearing on productivity after the Baby Boomer generation workforce retires. Consequently, it is important for new employees to understand the navigational aspects within and outside of the organization to acquire knowledge. Participant 4 stated,

> As things come up, you know where to go look for information and then build out from there. So, that's really what you do. People have to go look at it, and sometimes the work just takes double, triple the time.

In addition to knowing where to go, participants explained how workplace navigation has been structured from a practical perspective to an emphasis on where to go

as opposed to stressing technical skills. Participant 12 acknowledged that change by stating, “And it’s the ability to navigate that change that’s more critical than just having the technical skillset. Because reality is, especially nowadays, the technical skillset is . . . a commodity more than anything else.” It is important to recognize that WN encompasses more than a technical skill set for an employee and is now seen as a much-needed capability for performing work effectively.

Participants reported the need to connect with the right resources for performing their tasks effectively, a connection verified by Participant 14:

> Contracting companies had limited visibility in the organization since they were focused on what they were contracted to do, and it put pressure on me to provide all the navigational guidance they needed. It had an impact on other leadership activities in terms of the focus on making strategic decisions, which impacted the decision making process.

The need to provide navigational guidance to the new team demanded the manager to spend more time with it, which put a temporary hold on strategic decisions that needed their focus and attention.

LA encompasses the analysis, design, development, implementation, and support of IS solutions. Implementation of IS solutions is based on how employers want their employees to function in their roles to maintain the quality as before the Baby Boomers retired. It also includes the realization that managers acknowledge the voids they must fill and make adequate changes to maintain operational continuity after the Baby Boomers retired.

The realization was evident from Participant 6, who noted the void created by a solution architect role as,

> They perform the role like a solution architect; it is not technical. It is more involved in functionality and some technology to bring together. It is almost like a realization that the quality is not going to be good in terms of the solution that we are putting together as well as the presentation we need to give.

Participant 15 also supports the realization, but refers to multiple impacts related to the speed as well as decision making by stating,

> So the amount of time it takes to figure out what the customer really needs or what is needed or what the solution fits takes much, much longer than before. At the same time, getting their buy-in to our solutions also takes much, much longer because now you have to go from relations-based to fact-based decisions, which is a big change. It affects productivity, products, satisfaction. It affects a lot of softer metrics.

Participants noted that life cycle activities for delivering IS solutions were influenced by Baby Boomer retirements in the areas of solution design, quality, timeliness, presentation, and buy-in.

The development of IS solutions as a part of LA requires changes to the application functionality that are being maintained in addition to designing and delivering new capabilities. For example, Participant 3 stated,

> Because these things were here for a longer period, they were almost like band aids over things done to the system. When you try to change the whole

> architecture of the system and the ways things [were done], we want to shuffle it, and so that's where [his] knowledge was bigger. Even though we had other subject matter experts, that's when I think we have to fall back on [him]. Any time, if he had to do any things like this, that's when [he] will be missed.

Managers and leaders now have to face uncertainty and intermittent struggle based on lacking adequate knowledge. As a consequence, their ability to make informed decisions was hampered.

Participants acknowledged that the business analyst role was difficult to replace, indicating the interruption to the LA to deliver IS solutions. Participant 14 said,

> So, one of the things that suffered was, we had to . . . put a hold on any new requirements that came through that required the business analyst's role. So, one of the things we did was, we focused a lot on some of the technical stuff, so behind the scenes stuff in terms of batch processing, and things. We didn't take on any new projects that required new capabilities that would impact the UI--user interface--for our application.

Participant 18 also reported,

> The role that, I think, the most impact for Baby Boomers leaving the organization is the developer and the business analyst role. It is much simpler to transfer the role of the project management and the employee manager role, just because it's more process oriented, in my opinion.

The transition of the business analysts' role from Baby Boomer generation employees presented challenges to leaders and managers due to the breadth and depth of

functional knowledge required to perform their jobs. Managers' reflections on the situations they faced within LA showed the significance of the how the retirement of a business analyst's role blocked the delivery of IS solutions, which in turn impeded organizational progress and productivity.

The overall theme of WP was supported through the explanation of KM as a WP for transforming into knowledge capital for organizational performance improvement (Daghfous et al., 2013). Snyder and Wilson (1998) also supported the data related to WP and referenced knowledge harvesting as essential for senior employees to act as a springboard upon which younger employees may apply their own creativity. The WP comprises the aspects of McElroy's (2003) knowledge lifecycle of knowledge production and integration with multiple feedback loops.

Emergent Theme 4: Camaraderie

In Theme 4, three properties were identified to be significant to the theme of camaraderie (CAM). They are LR, the pre-established relationship that is no longer visible to the organization; RG, which is the loss of the pre-established emotional connection that needs to be recreated; and BPR, a new model for engaging with business partners to define and deliver IS solutions. These particular properties and their relationships to leaders and managers lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees are demonstrated through the explanation of each property and subsequent interview support.

When the Baby Boomers retire, the relationships they had built within their organizational teams, external vendors, and service providers are lost. The notion of trust

was the foundation for the relationships they had built with their longevity in the organization. The responsibility of the remaining managers and leaders is to rebuild the relationships so as not to lose any continuity of their operations.

The property LR is a pre-established relationship that is no longer visible or may be forgotten by both employees and organizations. The concept of LR is that relationships built by Baby Boomers who have retired have been broken and need to be rebuilt. Participant 5 said,

> Now what we have is these people have moved off. In the process, the impact is that because organizations in a geographical area are very heavily dependent on networking and relationships, it is more who you know rather than what you know in this space. So those relationships have been entirely broken.

This broken relationship may never be rebuilt, resulting in the loss of continuity. As these connections are within many areas of a business, cohesive relationships with business partners could be broken.

LR with vendors was articulated by Participant 11, who experienced challenges with a troubleshooting situation in which the significant external vendor's needed participation did not occur. Participant 11 stated,

> You know, [he] did not--there's one area of transfer that [he] did not really foresee needing to do, and that was turn over his relationships outside of the organization, those vendor relationships, the technical support relationships. He did not think about that and did not introduce the people that were taking over for him to the outside world, the external contact. So that was very difficult.

> Consequently, the LR resulted in operational inefficiencies and business interruptions.

RG is the loss of a pre-established emotional connection that needs to be recreated after Baby Boomers have retired. An example of acknowledgement of this emotional connection was stated by Participant 5 as,

> The trust comes with relationship-building, and that goes away. So once you get the trust and now you have a loyal customer that is someone you have been doing business with for 10 years, they have gone through a whole lot of growing pains to build that trust and relationship. That goes away.

The need is to recreate the relationship by establishing a new emotional connection with the business partners to replace what previously existed in order to maintain organizational continuity.

Another RG situation outlined by Participant 3 was the trust factor in building relationships, especially with a person having a critical role. Participant 3 stated,

> The hard thing to replace is the personalities. Like anybody within a few months, like you just go through building a relationship and things like that, where you would lose a go to person all of a sudden. That is where you as a resource manager or somebody managing a team, you kind of then need to start to find that go to person and who you can trust and to get that.

The managers' and leaders' objective is to identify an individual resource to maintain the long-term relationships established prior to the Baby Boomer retirements.

Emotional connections have been established with outside vendors because of the longevity of the Baby Boomers and their ability to build rapport. When Baby Boomers retire, vendors and external service providers lose their emotional connections, and they need to be rebuilt. Participant 11 said,

> When things would break, and we absolutely needed the help of the external organizations to [repair them] . . . and we need somebody to analyze it because we've done everything we can absolutely do on our end, and we're coming up short, we really had a hard time getting people to be as responsive as they were when [he] was in that position.

The managers' objective is to be cognizant of the RG and working towards the millennials making new connections with vendors.

The next property, BPR, is a new model for engaging with business partners to define and deliver IS solutions. As a part of their roles, managers and leaders need to manage expectation of business partners who are accustomed to getting services in a certain way. Participant 15 stated,

> It takes time for them to get comfortable with a new person and adapt to a new person. They are more comfortable with the people they knew really well, so it was certainly a little disadvantage to that front, because they wouldn't trust the new person.

A new model for engaging these business partners is needed to maintain CAM for operational continuity. In addition to engaging business partners to maintain CAM, participants stressed the importance of the managers and leaders responsible to know

their people well enough to become more involved in their relationship with their customers. Participant 19 said,

> When the senior people leave that they were relying on, you know, as the person at the top, I can't replace them with junior level people. When the senior people leave, [the business partners] may not be happy. So, you know, it's pretty much, I had to be the guy in front of them.

Managers and leaders, then, took the initiative to be involved more with their business partners to maintain continuity after Baby Boomer employees retired.

Managers' and leaders' roles within the context of BPR are influenced by organizational strategy on personal engagement. Participant 7 expressed connectivity to the employees within their teams and business partners stating,

> So the longevity was pretty significant. That longevity, especially with the leadership teams, inclusive of the Baby Boomers, built a tight bond with the teams. They were looked on as the mentors, the leaders, the go-to experience. When you build that, it goes beyond just a working relationship. It's almost a second family. When you lose that portion of your family, it's akin to losing a member of your personal family. It's not just the knowledge that's imparted, but it's the relationships that have been torn. It's a gap. It's a hole that takes time to actually either heal or to replace. In some cases, I don't think it's ever replaceable.

The participants' understanding of how the CAM between their business partners and themselves was not just losing that part of a team but acknowledging a void that had a long-lasting impact in more than daily operations or business connections. The creation

of a new model for reengaging business partners will help implement and maintain IS solutions effectively after the Baby Boomers retired. They believed the change due to the loss of these relationships resulting in needing to replace people in order to continue with their operations but expressed their deep concern for how changes affected them.

The participants recognized that involving new employees in deeper personalization was the impetus for reengagement with their business partners. For example, Participant 17 said,

> We went face-to-face, and I took my people face-to-face as often as I could. That is something that I think is successful because I think there is such a barrier with communication today that it has been depersonalized. And I think . . . in my experience, when I've taken people there, they meet people; they're real; their problems are real; what they're doing is real, especially when you're in the healthcare field. You can see decisions that you are making away from somewhere are impacting this person who's real, who's talking to you. So, I think that direct interaction--I can say that I've successfully established those relationships that people get concerned about.

The participant was highly focused and chose to establish the relationships between the employee of his team and business partners. His choice of personalization fostered the relationship with the business partners that resulted in improved operational outcomes.

The overall theme of CAM was supported by Biron and Hanuka (2015) as an element of the framework for operational continuity after Baby Boomer retirement.

DeLong (2004) presented the concept related to CAM by explaining the need for establishing relationships for recovering lost knowledge. These strong associations were developed over the longevity of the Baby Boomers' work history and their capacity to form strong collaborative and cohesive connections among members of a multigenerational workforce (Cogin, 2012).

Emergent Theme 5: Management Response

In Theme 5, three properties were identified to be significant to the theme of management response (MR): FOU, the uncertainty caused by the timing of the retirement of Baby Boomer retirement; AF, which is the difference in concentration between Baby Boomers and other generations, and RD, which is the documentation that can be relied upon as a source of knowledge. These particular properties and their relationship to leaders and managers lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees is demonstrated through the explanation of each property and subsequent transcript support.

The property of FOU is the uncertainty caused by the timing of the retirement of Baby Boomers. The FOU occurs because of participants' sudden realization that the Baby Boomers are retiring but new employees lack the skill set of the Baby Boomers. Participant 12 said, "I have difficult time finding skillsets that the Baby Boomers have that people just are not learning today, or as a job function that young people either don't have or are not interested in." The participant questioned himself and acknowledged his own fear because of the uncertainty he experienced due to skill gaps, which he observed are not taught in college or does not seem to appeal to the new generation workforce.

FOU property is attributed to the team's perception of Baby Boomer retirement. Participant 18 stated,

> I think the initial reaction was one of fear that there was going to be so much more pressure put upon them to try and pick up the slack. I also think that there was some resentment against the organization, because they felt that the organization hadn't done enough to prepare for this.

Though the FOU was an initial reaction to the news about a Baby Boomer retirement, once they knew about and planned the actual transition of the Baby Boomer's tasks, it was no longer an issue.

From the managers' and leaders' perspectives, FOU was the initial reaction to the news that the Baby Boomer was retiring. Participant 20 said,

> The initial reaction is panic. "How can [he] leave? He's been here forever. He's the only one that knows how to do x, y, and z." And they might be right. So I think, what I've seen, is that reaction--that initial reaction from customers of, "Oh my goodness. How are we ever going to survive without you?" And that's great, because that shows the value that that person has and how much people rely on him for success in their roles. But once that initial shock is past, everybody gets down to the task of, "OK, [he] is leaving. We've got 2 months. Let's get to it."

Participant 11 said,

> We had a panic attack at first. And then we had to quickly do a kind of skills search to find out what other people in our organization possessed the skills that [he] used to do his job. And then I had to start having conversations with their

> managers about the whole retirement situation and seeing if we could get some of [his] work to be absorbed into some of those other organizations where the experts were.

This immediate panic was offset with a realization that the managers and leaders recovered quickly, recognizing that they had team support to continue with their operations in spite of Baby Boomer retirements.

The next property of AF, is embracing the strengths of the multi-generational workforce and preparing the organization to develop focus on the newer generation capabilities. Participants explained that the managers and leaders of the organization had to have an AF to advance their organization and create a comfort zone between the newer generations and the Baby Boomers in order to foster collaboration. Participant 12 said, "The Gen X and eventually the millennials are more IT-focused, more about their skillset, maybe Java or .NET or whatever, and then are just moving to wherever the work is." Organizations need to be cognizant of the fact that there is a gap left by the Baby Boomer generation, and that organizations need to fill the gap by complementing the new generational technical resources with supplemental organization resources.

This AF was supported by Participant 20, who said, "But in the future--much more technical experts, and less business experts. And looking to cover that business expertise from our business analysts so that we have that--those resources to complement the technical expertise with the business expertise." The managers and leaders acknowledged these differences and embraced the AF from the new generation's perspective to achieve operational continuity.

Another perspective of AF is the acknowledgement the managers and leaders have for the Baby Boomers to act in the position of an expert while the next generation assumes leadership roles. Participant 15 said

> So the high potentials were certainly always considered, but as people get into this retirement age and all, then they wouldn't be put into the high potential, but they would be used more to what we call subject matter experts, or certain contributor's role, rather than driver roles.

The advantages of putting the newer generations into leadership roles are recognizing their abilities to groom them for organizational advancement.

The next property, RD, is documentation that can be relied upon as a source of knowledge. RD is one of the key sources of reference for either supporting existing applications or making enhancements to the application and interfaces. Organizations are acknowledging the critical need for capturing knowledge through reliable documentation. Participant 10 observed,

> There was not a lot of documentation. She got [him] to document the whole process, so that he--so they'd have documentation, and so that he would understand, you know, what was--what was going on before this [person] left. And I would say that this started a good 6 months before he was leaving.

Participant 1 observed,

> You never know when somebody is going to retire, so it is good as a team to have reliable documentation. It is better to have the mindset to keep things documented day-to-day so that we don't find ourselves in a situation of having to scramble to

> get documentation together pending departure of an employee for whatever reason.

Participant 12 also observed the significance of RD and identified it to be a potential risk if it is not kept current,

> When it comes to things like documenting knowledge and documenting experience, building out guides and training materials, frankly, we have never really prioritized that . . . and I think that's definitely going to be an issue long-term for us, as more and more Baby Boomers and experienced people retire.

The issue of documentation is a challenge to managers who face these risks when Baby Boomers retire. The need and importance of reliable documentation is a proactive step to make sure that the team does not need to scramble to have materials available since managers and leaders are unaware of when the Baby Boomers will retire.

The overall theme of MR is supported by Joe et al. (2013) from the perspective of the amount of knowledge loss when the Baby Boomers retire that could be attributed to the longevity of an individual's employment. The data from MR present a change in the way leaders and managers are making decisions for an organization's advancement after the Baby Boomers retire (Kamhawi, 2010). Understanding intergenerational knowledge transfer challenges should enable leaders to create solutions to the potential of lost knowledge posed by a mass retirement of Baby Boomers (DeLong, 2004).

Discrepant Case: Retention of an Employee

The theme of retention of an employee (RE) is designated as a discrepant case. The property of GCP is a way of getting permanent-resident status for an employee. One

participant specified the interest in retaining an employee who was preparing to leave after he received knowledge transfer from a Baby Boomer. Participant 2 stated, "Actually, he was about to leave for another company, and then we told him that we [will] expedite his green card processing [if] he will stay with [this] company." This approach to knowledge retention was nonconforming with the rest of the data, which resulted in classifying this theme as a discrepant case.

Summary

The individual interviews helped to create the five themes and subsequent properties to address the research question: What are the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. The themes of business climate, delivery practices, work processes, camaraderie, and management response, and the one discrepant theme retention of an employee relates to a comprehensive understanding of the impact of knowledge loss and how it affects an organization's continuity in the IS organizations. The changes the participants noted from their lived experiences for recreating relationships and transforming the systems and roles of their employees may contribute to social change by restructuring the IS organizations' life cycle activities for supporting the business outcome in an ever-changing business climate.

In Chapter 5, I explain how the various themes and properties related to the literature. The data resulted in the exploration of the lived experiences of the leaders and managers of IS organizations that have experienced the loss of Baby Boomer knowledge due to their retirement. My interpretation of the findings, implications, recommendations

of the study, and the relationship between the results and social change are explained in the chapter.

Chapter 5: Discussion, Conclusions, and Recommendations

This chapter includes the following information: interpretation of the findings, summary of the findings, limitations of the study, implications for social change, recommendations for action, and recommendations for further study. The purpose of the study was to explore the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer worker retirement. I followed a qualitative methodological approach using a phenomenological study design based on the need to explore the essence and meaning of human experiences. The research question was the following: What are the lived experiences of the leaders and managers of IS organizations as they strive to maintain operational continuity after Baby Boomer workers' retirements. I conducted the research study to explore how and to what degree those managers and leaders perceived the retiring Baby Boomer knowledge loss as a gap in organizational continuity.

I collected data from 20 participants through face-to-face interviews or by using Skype, transcribed, and analyzed the interview data to produce themes and properties. The findings involved identifying five themes and subsequent properties that addressed the participants' lived experiences in the area of IS. The properties that represented the broad spectrum of identifying what the managers and leaders specified as contributing factors when Baby Boomers retired included business climate (BC), delivery practices (DP), work processes (WP), camaraderie (CAM), and management response (MR). These properties addressed the issue of knowledge loss from Baby Boomers' retirements that influence managers and leaders regarding the operational continuity of IS organizations.

Interpretation of Findings

Five themes were supported by the literature: (a) BC, (b) DP, (c) WP, (d) CAM, and (e) MR.

Theme 1: Business Climate

In Theme 1, I identified four properties of business climate (BC) from participants' responses related to the Baby Boomer retirement influences: business on-the-go (BOG), which enabled digital business and embraced mobile and technological advances to foster growth; people to process (P2P), organizational transformation to streamline the roles and establish performance metrics and measurements; regulatory compliance (RC), enforcement of regulatory policies and procedures mandated by a governing body; and new way of working (NWW), the workplace dynamics caused by the global workforce and the new operations model. These properties were directly related to managers' and leaders' lived experiences to maintain operational continuity after the retirement of Baby Boomer generation employees.

The property BOG was the indicative of the participants' experiences with enabling digital business and mobile and technology to foster business growth. This concept was supported by Caldas et al. (2014), who emphasized that technology advancements in the 21st century is causing jobs to become more specialized and complex. In addition, organizations achieve a competitive edge, as expressed by Kamhawi (2010), through organizational learning using explicit and tacit knowledge to create new knowledge for future advancement. Morar and Yoong (2015) specified that identifying and mapping intellectual assets generates new knowledge that can sustain a

competitive advantage. The participants expressed those views from the literature by elaborating on the concepts of mapping, retooling, and retraining employees to keep up with the evolution of the BOG. Participants acknowledged the experience of having association with legacy system as a kind of knowledge that needed to be leveraged.

Participants noted that BOG capabilities were delivered by embracing the technological advances while continuing to use legacy systems. The participants' observations were supported by DeLong (2004), who explained that when Baby Boomers retire, they would have worked with and may take with them new types of knowledge that did not exist in previous generations. One participant verified the importance of the knowledge that Baby Boomers bring to the table because of their longevity and knowledge base through their association with legacy system. Retaining the Baby Boomer knowledge was an important aspect of lived experiences of managers and leaders, and added to the body of knowledge.

The next property, P2P, was related to the aspects of streamlining the roles of employees and establishing performance metrics and measurements. Joe et al. (2013) supported the P2P concept by acknowledging that increased recruitment and the creation of new roles to fill the skill gaps are key components for responding to Baby Boomer mass retirements. Two participants confirmed the increased recruitment because they had to hire two employees to replace one Baby Boomer. Additionally, two different participants reiterated the need to fill skill gaps because universities are not teaching students the legacy technical skills and expressed their fear of not been able to replace the Baby Boomer skillset. Another factor of P2P was the economic demand in needing to

hire two Millennials to replace one Baby Boomer, which caused budgetary impact to the managers and leaders. This results in paying the employees more than Baby Boomers who have retired because of having to pay two employees instead of one. The aspect of budgetary concern within the concept of P2P was not addressed in the literature; therefore, these data added to the body of knowledge and filled the gap in literature.

NWW was created as the working environment for the group involved with the intergenerational workforce. NWW is also a reformation of the ways employees worked in their particular business climates. Tong et al. (2015) concurred with the current research in discussing employees' use of their cultural orientation and the longevity of their technological experience as a knowledge base for fulfilling their organizations' visions and missions. The longevity of the Baby Boomers helped them to acknowledge their value and their accumulated knowledge, as it contributed to operational continuity and supports innovation at their organizations (Agarwal & Islam, 2015), which also supports current research data as a NWW.

Another aspect of NWW was supported by Souto (2014), who expressed the significance of the tacit knowledge of the Baby Boomer related to the creation of new knowledge. Martín-de Castro (2015) reinforced the notion that these innovations involve ideas originating from Baby Boomers' tacit knowledge, informal personal networks, and improvisations that ignore standard procedures to discover better ways of doing things.

Participants shared their experiences with social networking as a part of their KM to support NWW. Mehta et al. (2014) recommended implementing KM systems in conjunction with social networking, which confirmed many participants' views. Souto

(2004) also acknowledged that challenges were present in the global multigenerational workplace, a factor reflected in participants' discussions. Another example of the challenge for the multigenerational workforce was the adaptation of Web 2.0, which was more difficult for Baby Boomers than it was for Generations X and Y. As Pirkkalainen and Pawlowski (2014) indicated, an information system that Generation X and Y are familiar with can change the work habits through communication and collaboration between teams using wikis and blogs.

Theme 2: Delivery Practices

In Theme 2, I identified three properties for delivery practices (DP) related to the Baby Boomer retirement influences from participants' data outsourcing management (OM), turning over the maintenance and enhancement tasks of application systems to the external service provider resources: retirement of systems (ROS), elimination of the systems from the IS portfolio that are no longer needed to support the business operations; and solution design (SD), an architectural blueprint for integration of people, processes, and technology to deliver business value.

The property OM relates to managing the external service provider relationship after turning over the maintenance and enhancement of application systems tasks. The participants discussed their organizations' need to outsource as a DP for achieving efficiencies and providing support during off hours. The complexities of the OM as a DP was supported by Hislop (2013) who discussed tools and approaches needed to establish knowledge processes to manage intellectual capital. The participants acknowledged that OM had been effective as a risk mitigation approach for Baby Boomer retirements

phenomenon because the service provider organization takes over the responsibility of managing new resources. Under the OM, Baby Boomers transfer their knowledge to service providers, and the knowledge resides with the service provider employees. The shift in knowledge base, therefore, creates a new risk to the organizations because intellectual capital is no longer within the company and will have to be essentially shared with the service provider organizations. The concept of sharing intellectual capital with the outsourcing service provider was not present in the literature; therefore, the current study data adds to the body of knowledge.

The participants observed that service provider employees had strong technical knowledge and established an understanding of the day-to-day tasks from the retiring Baby Boomers. Tong et al. (2015) emphasized that every organization has a unique culture, and, as a result, the different groups within an organization must identify how to best integrate KM into deeper levels to achieve their vision and mission. A new dimension of the culture is established between the organization that is outsourcing work and the service providers who carry forward the work of the retiring Baby Boomers. The relationship between the management of the organization and OM adds to the body of knowledge and fills a gap in the literature with aspects of understanding the culture of both organizations to achieve the vision and missions of the organization outsourcing the work.

The next property, retirement of systems (ROS), encompasses the elimination of systems from the IS portfolio that are no longer needed to support business operations. The participants indicated that the core of the ROS is time and cost. The time of the

retiring the system may not coincide with the timing of when the Baby Boomers choose to retire. The aspect of time is also supported and noted by DeLong (2004) and by Jennex and Durcikova (2013) who reported that, as the Baby Boomers retire, the knowledge base built over their careers could retire with them if the organization does not retain their knowledge. The timing of the Baby Boomer retirement needs to be anticipated by management to prepare for the time of ROS as well as to capture the Baby Boomer' knowledge of legacy systems that the organizations choose not to retire or are unable to retire due to cost, complexity, or other business priorities.

Solution design (SD) relates to the integration of people, processes, and technologies to deliver business value. Venkitachalam and Busch (2012) recognized that Baby Boomers' tacit knowledge is intangible in terms of creation, adoption, and diffusion within the organization as part of the organizational routines to support business processes. The recognition of tacit knowledge as an intangible relates to the integration of people, processes, and technologies. The participants focused on delivering business value, while the literature focused on the creation, adoption, and diffusion of knowledge. The literature supported the property of SD as related to DP. Since there is limited literature and no reference to architecture blueprint delivering business solutions for creating business value, the property of SD adds to the body of knowledge and helps to fill a gap in the literature.

Theme 3: Work Processes

In Theme 3, I identified three properties for work processes (WP) related to the Baby Boomer retirement influences from participants' data: mentoring guidance (MG),

recognizing the expertise for developing skills and solving critical problems; workplace navigation (WN), the ability to connect with the right resources for performing the tasks effectively; and lifecycle activities (LA), encompassing the analysis, design, development, implementation, and support of IS solutions.

Mentorship guidance (MG) is the ability to provide in-depth coaching for developing skills and solving critical problems. The Baby Boomers use their expertise organically as an approach for others to create the environment needed to learn how to solve problems. Daghfous et al. (2013) supported the data through the explanation of KM as a practice for transforming into knowledge capital for retention and organizational performance improvement. Since Baby Boomers have an innate ability through their longevity to share their expertise through MG, the result is that other employees within the organization are able to develop their capabilities for problem solving. Snyder and Wilson (1998) also supported the data related to MG but reference knowledge harvesting as essential for senior employees to act as a springboard upon which younger employees may apply their own creativity.

The participants explained that Baby Boomers provided MG through their longevity, experience, and the ability to apply that knowledge to new situations, but that they also intuitively know where to seek the needed expertise. Zhong, Huang, Davison, Yang, and Chen (2012) supported the conclusion with their reinforcement of meta-knowledge as the foundation for understanding those who can capitalize on their ability to recognize where the expertise is and who has that expertise. According to participants, Baby Boomers have both that expertise and the willingness and interest to mentor others.

The next property of lifecycle activities (LA) is a process for encompassing the analysis, design, development, implementation, and support for delivering IS solutions. The participants explained the influence of Baby Boomer retirement in relation to various roles performed by their staffs to deliver software solutions. Da Silva, Guevara, Fernandes, and Rodrigues (2014) supported the property of LA within the WP by explaining how systemic knowledge integrates various knowledge types critical to providing a big picture view of a mental model that provides a foundation for delivering effective IS solution. Reich, Gemino, and Sauer (2014) acknowledged that software developers are cognizant of working effectively on projects by seeing the big picture when they have collaborative efforts and expertise for accomplishing their individual tasks. In addition, the results were supported with the information that ICT may be a useful tool to facilitate harvesting the knowledge of the Baby Boomer generation for future workforces (Pierson, 2013). The participants' recognition of LA in support of the literature results in achieving a competitive advantage that advances the organization.

The property of workplace navigation (WN) is the ability to connect with the right resources for performing the work tasks effectively. The participants noted that WN is the application of the overall action of performing the tasks without overemphasizing the importance of specific skills. Mell, Van Knippenberg, and Van Ginkel (2014) also supported the current data with their recognition of meta-knowledge as an effective way to be equally distributed among team members to gain more knowledge individually and achieve better performance as a team—as evident in their ability to navigate within the organization, vendor, and service provider organizations. The general sense of knowing

how something works to complete the work tasks successfully was verified by participants as they discussed being able to find their ways within the myriad of documentation and organizational hierarchies.

The application of WN property was formulated from participants' discussions that after the Baby Boomers retire new employees would need the practice of navigating through documentation and organizational hierarchies to fulfill their roles to deliver software solutions. Fu (2015) supported the current data through the identification of features that distinguished knowledge-intensive firms depending on the highly qualified workforce and work processes followed by those firms. In addition, Mehta et al. (2014) noted that software development resources in an IS organization are often limited and may thus affect the organization's ability to develop new features for software while they maintain existing application systems. Ale et al. (2014) noted that to navigate within the workplace to fulfill their roles, employees must use the process of searching as a tool to retrieve knowledge through various pathways or approaches to examine a specific aspect of knowledge for verification, problem solving, and introduction of new concepts. This, too, is supported by the present data. According to participants' explanations, navigating without the direction of the Baby Boomers is a new term that was introduced through participants' explanation of how WN is significant after Baby Boomers' retirement. Although the current literature supports the workplace and the work processes for accessing the organizational resources to acquire knowledge, the current study adds to the body of knowledge because it introduces a new term for WN and describes implications for operational continuity.

Theme 4: Camaraderie

In Theme 4, three properties are significant to the theme of camaraderie (CAM): the property of the lost relationship (LR), a pre-established relationship that is no longer visible to the organization, the property of the relationship gap (RG), which is the loss of a pre-established emotional connection that needs to be redefined, and the business partner reengagement (BPR), a new model for engaging with others to define and deliver IS solutions.

The property of lost relationships (LR) represents the pre-established relationship that is no longer visible and may be forgotten by both employees and organizations. The participants explained that when Baby Boomers retired, the relationships they built between other employees, vendors, and service providers were severed. Aggestam, Durst, and Persson (2014) supported this property of LR through data that indicated there are no distinctions among the purposes of organizations in regards to lost knowledge across industries, since lost knowledge has the same negative consequences. The operational continuity is impacted because of the LR. Additionally, participants emphasized that Baby Boomer relationships were built on knowing their business partners for a long time and having strong working relationships with vendors and external service providers. This concept has not appeared in the literature, and, therefore, adds to the body of knowledge.

The relationship gap (RG) is the loss of pre-established emotional connections that need to be re-created. The participants discussed pre-established relationships that Baby Boomers had within and outside of their organizations that, over the years,

solidified and created strong emotional connections. Hislop (2013) supported the need to recognize sociocultural interactions because of the shared identity that enables trust between employees and their business partners. Several participants emphasized the emotional gap caused by Baby Boomers' retirements that created positions that will have to be filled, but which has not been addressed in the literature and adds to the body of knowledge.

The property of business partner reengagement (BPR) emphasizes a new model for engaging with business partners to define and implement IS solutions. Several participants held a strong belief that managing the expectation of their business partners who were used to receiving services in a certain way needs to be redefined. With the Baby Boomer retirement, they have to collaborate with their business partners to structure the way the services will be delivered without compromising service levels that could damage operational continuity. Pirkkalainen and Pawlowski (2014) supported the data, since social knowledge, which results through personalization, is a collaboration of knowledge from various people. Within that redefinition, creation of new knowledge and social interactions results in learning and knowledge sharing (Chandra, Iyer, & Raman, 2015), which supports the current data.

Although there was support in the literature for the properties of LR, LG, and BPR, participants stressed the effects of long-term relationships from the longevity of the Baby Boomers. These relationships were built across the business partners, vendors, and external service providers through strong emotional connections. Participant data illustrated how CAM contributed to an organization's operational continuity after Baby

Boomer retirements. Biron and Hanuka (2015) noted the need for literature to have a framework for the continuity necessary to preserve Baby Boomers' knowledge because their eventual retirement might lead to lost knowledge. The theme of CAM and associated properties add to the body of knowledge and help to fill the gap in the literature. This addition to the body of knowledge regarding operational continuity provide a framework that Biron and Hanuka (2015) noted was missing.

Theme 5: Management Response

In Theme 5, three properties were identified to be significant to management response (MR): fear of the unknown (FOU), the uncertainty caused by the timing of Baby Boomer retirements; the property of alternate focus (AF), which is embracing the strengths of the multi-generational workforce and preparing the organization to develop a focus on the newer generation workforce to drive the direction of the organization; and documentation (RD) as a reliable source of knowledge.

The property of fear of the unknown (FOU) is the uncertainty caused by the timing of the Baby Boomers' retirements. Participants reported that fear resulted from the sudden realization of Baby Boomers reporting their retirement timeline was being driven by their personal situations. Joe et al. (2013) supported the data from the perspective of the amount of knowledge loss when the Baby Boomers retire that could be attributed to the longevity of an individual's employment. DeLong's (2004) research augments the fact that when Baby Boomers retire, they will have worked with and may take with them new types of knowledge that did not exist in previous generations. Consequently, the participants shared their resolve to move forward despite their initial emotional reaction

of fear, knowing new knowledge that was needed to carry on would reside with the remaining employees.

The property of alternate focus (AF) explains the differences in concentration between Baby Boomers and other generations. The participants explained that the newer generation of developers is more focused on the technical side and emphasized their interest is more towards advancing their knowledge in new technologies than understanding the business domain. Their need for business expertise will be complemented using other organizational resources having strong business knowledge. Shehata (2015) supports the current data, acknowledging that key KM programs can provide advocacy for knowledge sharing by soliciting best practices and systematizing knowledge for mutual exchange between knowledge workers by the business side complementing the technical side. The alternative focus adds to body of knowledge and fills the gap in the literature since participants articulated that their practice emphasizes the new generation at the forefront of advancing their organizations.

The next property reliable documentation (RD), which is the documentation that can be relied upon as a source of knowledge. The participants explained documentation within two perspectives: the first related to documenting routine activities and other abilities of Baby Boomer employees when the latter announce their retirements and the other the need to be sure documentation is updated daily. Hansen et al. (1999) supports the current data verifying that tacit knowledge needs to be systematically codified and documented for later reference. The participants observed that managing different forms of communications might become cumbersome for the next generation workforce. The

study of Menolli, Reinehr, and Malucelli (2013) supported the current data that the flow of information coming from a variety of sources could result in information overload. RD can be considered a vital aspect of operational continuity for the organization within the context of Baby Boomer retirement.

Summary of Findings

The summary of findings and how they supported the conceptual framework is outlined below. I based the conceptual framework on the knowledge life cycle constituting knowledge production and knowledge integration within multiple feedback loops, as McElroy (2003) suggested. The conceptual framework integrated the aspects of generational differences across the working population (Cogin, 2012), as well as knowledge life cycle activities, including knowledge production and integration (McElroy, 2003) and the knowledge retention solution (DeLong, 2004). The findings in this section are the results of my interviewing managers and leaders about their lived experiences observing Baby Boomer retirements as they related to the conceptual framework.

The creation of the theme of DP, with subsequent property WN developed from the data, showed integration with the components of the conceptual framework. The participants reported their team's need to navigate through documentation and organizational hierarchies to prepare to take on the role of the Baby Boomers when they retired. The constructs of the knowledge life cycle (McElroy, 2003) illustrated how to operationalize the information Baby Boomers provided to organizations from their knowledge and performance over their careers. Knowledge production stages overlap

with knowledge integration through two-way interaction that produces new knowledge (McElroy, 2003). The new generational workforce has to operationalize the information from the Baby Boomers to continue with the production of new knowledge to support operational continuity.

The creation of the theme of BC, with its subsequent property of NWW, was developed from the data and showed integration with the ideas from the conceptual framework. NWW identified how Generation X members refer to themselves as self-centered and having too little concern with the company to make a commitment. Cogin (2012) supported this notion by comparing the Baby Boomer generation with Generations X and Y and found a wide difference in the ethical considerations of work between the generations. Cogin described Generation X as a *me* generation because the group seemed more concerned with *self* and personal needs than the collective needs of the company (2012). One participant in the current study also acknowledged that as managers and leaders, they might not have given Generations X and Y an opportunity to demonstrate their skill and willingness to work long hours. The literature, as well, does not suggest any particular agility and willingness of Gen X and Gen Y to learn to become future leaders. The current study, therefore, should add to the body of knowledge regarding the NWW related to the BC.

The creation of the themes of BC, DP, and CAM, with subsequent properties of P2P, OM, and RG and developed from the data, showed integration with the components of the conceptual framework. The participants explained how organizational transformation has streamlined employees' roles while encouraging Baby Boomers to

either stay longer or return as consultants. DeLong (2004) presented the knowledge retention structure within the context of strategy, human resource policies and procedures, and tools and technologies to support knowledge retention. The property of OM was created from participants reporting that by moving the application maintenance and support to an external service provider there is a reduction in risk caused by Baby Boomer retirements. One of the elements of DeLong's (2004) retention structure was an option to explore rehiring retirees, and, in the event that is not possible, the choice to subcontract using external sources to close the knowledge gap. The property of RG based on the participants' lived experiences was presented as a loss of established emotional social connections that needed to be re-created after the Baby Boomers retired. DeLong (2004) presented the concept related to RG by explaining the need for reconstructing knowledge by applying information technology tools and establishing social connections for recovering lost knowledge.

Limitations of the Study

I limited the study to the lived experiences of 20 managers and leaders with supervisory authority in IS organizations. The lived experiences of participants limited the transferability of phenomenological research design because of the scope of the inquiry (Marshall & Rossman, 2016). Moustakas (1994) stated that phenomenology is a viable design for conducting research because the researcher delves deeply into the experiences of individuals to learn their life experiences related to the research questions. The resulting outcomes of the study may not be transferable because transferability is something a reader or another researcher must assume as valid (Marshall & Rossman,

2016). A researcher might apply the methodology to a different group, however, to support transferability. The decision is left up to other researchers to determine the applicability of the findings for their research.

For this study, the interview was the only source of data, and I used member checking because of the limitations of using only interviews for data and using those data sources to support credibility. I contacted all 20 participants for member checking and only 18 responded. Another limitation of the study was the use of member checking from 18 out of 20 participants validated my interpretation.

As my professional background is IS, and I understand how knowledge workers use tacit and explicit knowledge in the industry, researcher bias was conceivable. To mitigate the influence of that experience, I used bracketing before data collection (Moustakas, 1994) to overcome any preconceived notions about Baby Boomer knowledge loss in IS organizations with which I have had an association. The process of bracketing or epoche mitigated my personal bias. In addition, the pilot test with two participants helped me to develop interview skills that reinforced the practice of bracketing.

Recommendations

The value of the information produced through the phenomenological methodology of this study suggests the value of similar studies with participants from industries such as education, healthcare, and manufacturing. The potential knowledge loss in these fields might be equally as valuable to those areas as it was to IS. Similar phenomenological studies can be conducted for other industries that rely on knowledge

workers of Baby Boomer generation through the lived experiences of managers and leaders.

In a broader sense, results suggest the value of exploring the topic of Baby Boomers' lost knowledge caused by retirement using grounded theory methodology. The themes developed from this phenomenological study might be used as an impetus to develop grounded theory through the relationship of the constructs and emergent ideas. Using the constructs of DP and WP, other researchers might develop grounded theory to contribute new information to the literature.

The research data illustrated how the properties of OM, ROS, and SD influences the theme of DP; therefore, it is recommended that future researchers develop hypotheses to correlate, quantify, and assess the direction of influence of their chosen variables. Intellectual capital and OM, for example, might be used as variables for studying correlations of Likert-type response surveys.

In addition, the body of knowledge generated about Baby Boomer retirement effects through this study could also be used for conducting action research, a pragmatic approach to examining a problem that has a reflective and collaborative component that itself can produce change. In 2016, there is limited time before the Baby Boomer generation will retire and no longer be available for capturing their knowledge, so it is recommended that any such inquiry using an action research approach and design be undertaken expeditiously with an eye toward making intervention an immediate and continuous improvement process.

Another recommendation for using action research based on the current study findings could be in education and might involve interviewing and videotaping educators nearing retirement to identify and observe their teaching methods that appear to be consistently effective across academic fields and ages of students. The research design could include using the themes from the study such as WP and identifying where the teacher uses or follows that theme in classroom practices. In addition, collaborations could be developed among those up and down the line—central office administration, building principals or managers, and instructors—to improve education. So often, these disparate areas that affect students and learning are conducted separately, and research data from the areas is not shared across areas, with retirees leaving before their information is captured.

One recommendation for using action research in healthcare would be to interview Baby Boomer healthcare professionals and ask them to share their knowledge with other professionals about the changes in policies and practices in their specific fields. These changes should be scrupulously captured before Baby Boomer healthcare professionals retire because of the need for continuity. Continuity is particularly important because of the critical nature of healthcare, since any mishaps or inconsistencies in policies and practices might result in serious consequences.

Conducting action research as a recommendation in the manufacturing industry would include interviewing Baby Boomers about solving WP and their troubleshooting experience, which becomes the application of how Baby Boomer knowledge and practical experience could provide insights needed for the next generations. Examples of

action research studies that might enable a researcher to test responsiveness and decision-making processes in a changing environment could result in corporations becoming more socially responsible and proactive in the processes they follow.

The research data that presented the properties of LR, RG, and BPR as characteristics of the theme CAM are usually incorporated into the fabric of any modern organization as a matter of habit. Based on the data, the study created CAM, which could be used as a question of inquiry to address how CAM is a contributing factor for operational continuity. Since no organization can function effectively without CAM, one recommendation is to study CAM using the Baby Boomer generation, as participants would enable education, healthcare, manufacturing, and government to strengthen organizational competitiveness. A relationship among healthcare professionals has the potential for building CAM in areas such as hospitals, urgent care, and pharmacies. It is suggested that incorporating CAM among healthcare professionals might both support reinforcement of current practices as well as introduce valuable novel practices. CAM might provide an opportunity for healthcare professionals for collaborating and serving clients effectively within individual areas if training from Baby Boomers could be provided for sharing knowledge before those employees retire.

The theme of CAM opened a new opportunity not only for understanding how the loss of the Baby Boomers would affect the relationships in IS organizations but presented an opportunity for millennials and other generations to be aware of what they may need to do to maintain CAM in their organizations. Relationship-building begins with understanding the expectations of those working together to achieve the same goals. The

recommendations for training and providing opportunities to closing the RG in all facets of CAM may provide a foundation for building operational continuity. Once CAM is established, the value of it is in employees' work resulting in collaborative understanding. CAM can broaden the scope collectively for business partners, vendors, and service providers across industries. Another recommendation is to study the effects of CAM and examine how to broaden CAM to other industries.

Recommendations for disseminating the findings of this study would include information specific to sharing intellectual capital with outsourcing service providers in IS, solution design, and camaraderie, as findings in those fields were not revealed in the available literature. The objective of recommending the development of articles to contribute to the literature on these three specific findings would enable other researchers to examine these results and possibly replicate the study.

Another recommendation would be to present the results of the study at a conference that emphasizes the themes that support the literature and introduce the sub-themes that have contributed worthwhile information to the literature. A conference presentation could offer an avenue for other managers and leaders to gain knowledge for practice in their own organizations through preparing for the retirement of their Baby Boomers. The findings might also be disseminated through blogs that allow the responses of professionals that might encourage dialogue and open up opportunities for change.

Whatever the specific recommendations for any area of corporate or nonprofit enterprises the results of this study might be applied to, every avenue to capture and preserve learning should be pursued. It might be that in 20 or 30 years, it will appear that

little of value will be found in the details of the literature of a particular endeavor, but it is more likely that any learning will contribute meaningfully to the body of knowledge and will have been incorporated—for benefit or detriment—to that knowledge.

Implications

The study may contribute to positive social change by establishing a deeper understanding of the influence of Baby Boomer knowledge loss and create systems that help organizations maintain their competitive edge. One example is changes due to the BC in the area of P2P necessitates the development of new systems for automating operational processes that include the knowledge Baby Boomers have because of the length of their careers. Once P2P has been established, the implications of social change might be used to established relationships with Baby Boomers before their retirement and restore them after that retirement. The formation of these relationships is the social change that may transform individual communications that are recreated from process perspectives to establish operational continuity.

The organization that is not prepared to mitigate the risk of potential Baby Boomer knowledge loss may face crippling events that could result in business loss or even bankruptcy. Potential changes in the DP with a mass exodus of the Baby Boomer generation, for example, suggest that the WN needs to be established for a new workforce to effectively perform the tasks. This effort will require a continuous evolution of approaches to problem solving, innovation, and decision making resulting in social change in the field of IS. The ecosystem supported by those organizations might negatively affect society by increasing unemployment and may affect the social

responsibility initiatives of the organization. The recognition of CAM, for example, reinforces the need for social and emotional connections in the ecosystem between IS organizations, vendors, business partners, and external service providers. Without the reinforcement of these relationships, organizations will most likely be less effective in their communications and business associations and will not be able to bring about positive social change in their business organizations.

The results strongly suggest that managers and leaders should be prepared to reengage with their business partners in rebuilding the relationships of their teams as a result of Baby Boomer retirements. If teams fail to maintain relationships among their members as a results of retirements, there is a potential loss of relationships that must be recreated with the team members that remain. To maintain cohesiveness, the remaining members must assist in the recreation of the relationships by finding commonalities among new team members and working toward team objectives to achieve the goal of organizational advancement.

Recommendations for Practice

The lived experience of leaders and managers as a result of lost knowledge after Baby Boomers retired created five themes that deal with understanding what can happen to an organization's operational continuity after Baby Boomers retire. The theme of BC relates to competitive pressure caused by technology, policy, and procedural changes within various industries. The theme of DP establishes a new way of working to deliver IS solutions better, faster, and more efficiently. The next theme is the redefinition of work processes for achieving organizational agility. The theme CAM is the establishment

of long-term relationships built across the business partners of the organizations, vendors, and external service providers, and the final theme, MR, are the emotional and rational responses to a disruption. The recommendations are addressed as a part of the findings through each of these themes.

The research data presented how the properties of BOG, P2P, and NWW impact the theme of BC; therefore, it is recommended that organizations embrace new technologies and align their DP and WP to foster growth to support BOG. A few participants acknowledged that business process orientation skills of millennials can be leveraged as needed for the transformation of P2P. It is recommended that organizations embrace the millennial skills for furthering their business processes to contribute to effectively implement P2P. The data represented the property NWW that focuses on the millennial and other generations that are left after Baby Boomers retire. Organizations need to recognize millennials' superior technical skills and place them in the forefront of their workforce while the Baby Boomers support them as subject-matter experts. It is recommended that the millennium generation be provided opportunities to develop leadership skills to help steer their organizations towards greater achievement.

The research data also showed how the properties of OM, ROS, and SD influence the theme of DP; therefore, it is recommended that organizations align their delivery practices to endorse multiple avenues to mitigate Baby Boomer retirement risks. Since there is a shift of intellectual capital moving to the outsourced organization because of Baby Boomer retirement, organizations need to be cognizant of the shift and establish balance between their employees and outsourced organizations to sustain competitiveness

after Baby Boomer retirements. The research data also presented the urgency of the need to retire legacy systems that are no longer adding unique business value by transforming the capabilities to Cloud and SaaS environments, which new generations have the capability to develop and support. The research data presented SD as an integration of the practices and the need for managers and leaders to adapt integration of people, processes, and technology. Integration must be a continuous activity to deliver organizational design that can help maintain operational continuity even when the entire Baby Boomer generation has retired from the organization. I recommend that more research be conducted in the area of SD for understanding the new concepts of architectural blueprints that were created from participant's lived experiences in order to deliver business solutions for creating business value.

The research data illustrated how the properties of MG, WN, and LA redefine the theme of WP; therefore, it is recommended that organizations reevaluate their work processes for achieving organizational agility. There needs to be an understanding that MG will continue to decline, should be replaced with alternate approaches, and that the operational data and the semantic information gleaned from the social interactions should be used as a knowledge base to provide MG after Baby Boomer retirements. The data suggested that one of the foundational aspects is the WN, which is based on meta knowledge and, therefore, a concerted effort is recommended for developing a meta knowledge repository and maintaining it to facilitate WN. The data supported the need for individual employees who are trained in specific skills to collaborate to benefit organizational advancement by creating superior products, services, and support.

Consequently, it is recommended that organizations provide opportunities for collaboration among their employees and the flexibility to support the strengths of individual skill sets to deliver IS solutions.

The research data presented the property of LR, RG, and BPR as characteristics of the theme CAM are incorporated into the fabric of the organization, and it is recommended that these areas be carefully examined for building relationships on a day-to-day basis, as they are as important as technological skills for completing tasks efficiently. It is recommended that organizations acknowledge the loss and the gap in relationships and strive to reestablish new relationships through active reengagement with business partners, vendors, and external service providers. Additionally, BPR should be initiated well in advance of coming changes to inform business customers about the potential influence of Baby Boomer retirements so as to jointly define a new way of delivering IS solutions as those retirements occur. CAM needs to be viewed holistically as a relationship-building effort that involves social and emotional aspects at both the employee and leadership levels.

The research data presented the property of FOU, AF, and RD as characteristics of the theme of MR and provided greater insight into emotional and rational aspects of leaders' and managers' responses to the Baby Boomer retirement phenomenon. Since the data recognized FOU and how quickly managers and leaders overcome that fear, it might be wise to acknowledge that uncertainty exists, that it is temporary, and that there is a need to be aware of the possibility of that fear being manifested. Organizations need to

acknowledge millennials as future contributors and shift the focus on retention strategies that provide opportunities for them to demonstrate their technical and leadership skills.

Most millennials will choose to develop technical skills and continue with the development of those skills, an approach needed by their organizations for operational continuity--particularly if the company anticipates that Baby Boomers will soon be retiring. The data also led to the conclusion that RD is a safeguard for employees, managers, and organizations and that RD should be established as a continuous process for the exchange of current information between team members as a source of knowledge needed to achieve those operational efficiencies that are essential to operational continuity.

Conclusions

The study of Baby Boomer retirements from an IS organization as shown through the lived experience of managers and leaders illustrated several factors as important additions to the body of knowledge as that relates to operational continuity. The attribute of CAM, which encompasses emotional connection between employees, business partners, vendors, and service providers adds to the body of knowledge since it contributes to the operational continuity to fulfill the objective of providing a framework that Biron and Hanuka (2015) acknowledged was absent in the literature. The attribute of OM adds to the body of knowledge and contributes to the literature about understanding how intellectual capital must be shared as part of outsourcing management. Although the available literature supports the workplace and the work practices of the application of workplace navigation, this study adds to the body of knowledge because it introduces the

new term for WN and describes the processes for operational continuity. Another attribute of AF also adds to the body of knowledge and contributes to the literature through the findings that emphasized the need for the new generation to be at the forefront of advancing their organizations from both workforce and leadership perspectives for organizational advancement.

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Appendix A: Interview Questions

I asked the following initial interview questions to each participant.

IQ1. What kind of functions performed by your team support the organizations' advancement?

IQ2. How has the Baby Boomer retirement influenced you as a leader?

IQ3. What steps has your organization taken to retain the knowledge of retiring Baby Boomers?

IQ4. How is the new generation workforce prepared to absorb the work performed by the Baby Boomers?

IQ5. What kind of influence does the Baby Boomer retirement have on your team?

IQ6. What kind of systems and processes were put in place to influence the capture of Baby Boomer knowledge?