

2016

# Knowledge Management and Innovation on Firm Performance of United States Ship Repair

Cynthia Jane Young  
*Walden University*

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# Walden University

College of Management and Technology

This is to certify that the doctoral study by

Cynthia Young

has been found to be complete and satisfactory in all respects,  
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## Review Committee

Dr. Michael Lavelle, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Richard Johnson, Committee Member, Doctor of Business Administration Faculty

Dr. Peter Anthony, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer  
Eric Riedel, Ph.D.

Walden University  
2016

Abstract

Knowledge Management and Innovation on Firm Performance of United States Ship

Repair

by

Cynthia J. Young

MBA, Touro University International, 2007

MBA, Touro University International, 2003

BA, University of Maryland, College Park, 1997

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

March 2016

## Abstract

With the decreasing labor forces throughout the United States, if leadership of the ship repair industry does not incorporate knowledge sharing and innovation into their daily business practices, knowledge will be lost during employee departures and turnover of teams from project-to-project, resulting in decreasing firm performance within their organizations. This was a correlation study to determine if there was a correlation between knowledge management, innovation, and firm performance. Data were collected from 69 CEO/Presidents, Human Resource personnel, or members in leadership positions of the Virginia Ship Repair Association in the mid-Atlantic region of the United States. The theoretical framework for this study was the unified model of dynamic knowledge creation with the key constructs of the socialization, externalization, combination, and internalization process; places of knowledge sharing, whether they are virtual, physical, or mental; and leadership. Data collection occurred through an online survey. Multiple linear regression analyses significantly predicted the dependent variable,  $F(2, 66) = 17.33, p = .000, R^2 = .344$ . Increasing knowledge sharing and innovation practices provides for positive social change for the personnel of these organizations, since the skills they learn within their organizations are immediately usable in their personal endeavors in their churches, neighborhoods, and family relationships and are transferrable to those they interact with outside of their organizations.

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## Dedication

Words do not seem adequate for this enough for this magnitude of a sacrifice by my husband and my daughter. I dedicate this to my loving husband, James Young, and my amazing daughter, Megan Butler. Without their support and sacrifice of time, I would have never gotten past the coursework stages of this endeavor and would have always regretted not finishing this doctoral study. I can only hope they understand that I really could not have done it without them.

I love you both and I can only hope you find me as supportive of your goals as I have found you supportive of mine.

## Acknowledgments

Thank you, again, to my husband, James Young, and my daughter, Megan Butler, for their support of my educational goals and for believing in me.

Thank you to my best friend, Fallon Morey, who has stood beside me throughout this study and has forgiven me for being distracted by it while listening to me kvetch about it over many cups of coffee.

Thank you to my cohorts who have supported me and have allowed me to support them which increased the overall knowledge of this process. I truly appreciate our shared texts and phone calls that started following our residencies and are still occurring regularly. I would not be here without you. The comradery and the knowledge sharing throughout this process has been priceless.

Finally, thank you to my two Chairs. Dr. Maureen Steinwall got me off on a great start with her “Big Six” and ensuring I focused on my alignment. Dr. Michael Lavelle, or Dr. Mike, helped me to not lose sight of the finish line and provided forceful backup when needed while helping me to achieve my ultimate educational goal. I appreciate the faith you had in me and the forceful backup you both provided.

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## Section 1: Foundation of the Study

Within any organization there may be a learning curve where knowledge management and innovation practices can make a difference in the success or failure of the organization. A strong performance of a ship repair organization within the East Coast ship repair industry is necessary since these organizations conduct maintenance on 45 United States Navy East Coast surface ships (Navy Chief of Information, 2015). The U.S. shipbuilding and ship repair industry operates shipyards to include ship construction, repair, conversion, alteration, and other specialized services (Maritime Administration, 2013). Forty of the 45 East Coast surface ships in the U.S. Navy receive maintenance in the mid-Atlantic region (Navy Chief of Information, 2015). These vessels have different configurations that have different maintenance and repair requirements within their own learning curves (Navy Chief of Information, 2015). In this study, I wanted to see if the variables of knowledge management and innovation positively related to firm performance.

### **Background of the Problem**

Much of the corporate knowledge sharing throughout an organization occurs through employee communication. Since 1992 there has been a reduction within the U.S. labor force creating a potential lack of continuity of knowledge flow (Bureau of Labor Statistics, 2014, para. 3). Lack of continuity and management of knowledge affects the ability of an organization to attain or maintain positive firm performance. Additionally, innovation was another aspect of knowledge flow that may affect firm performance. This is a strong potential problem in the U.S. ship repair industry.

The problem of knowledge transfer and firm performance has attracted significant study. Through a multimethods study of surveys and an in-depth case study, Chang and Chuang (2011) studied how knowledge management processes of infrastructure capability and business strategy affected firm performance. Cheng and Huang (2012) determined knowledge management strategy, information technology, and human resource management strategies may be linked to firm performance based on growth and profitability. Researchers have examined firm performance as affected by

- knowledge transfer (Arnett & Wittman, 2014),
- knowledge sharing and innovation (Wang & Wang, 2012), and
- employee mobility and entrepreneurship (Alegre & Chiva, 2013; Campbell, Ganco, Franco, & Agarwal, 2012).

In a study regarding knowledge conversion processes, externalization (tacit-to-explicit) was the only factor that did not show a positive influence on a learning organization (Al-adaileh, Dahou, & Hacini, 2012). Hung and Chou (2013) examined firm performance as affected by open innovation and moderated by the effects of internal research and development, and environmental turbulence. These studies support the need for knowledge management and innovation in support of positive firm performance.

### **Problem Statement**

The largest concentration of the U.S. labor force consists of workers aged 25 to 54 years, who represented 71.4% of the labor force in 1992 and decreased to 65.3% in 2012 (Bureau of Labor Statistics, 2014, para. 3). Based on projections, by 2022, the 25 to 54 age group will continue declining to comprise 63.1% of the total labor force (Bureau of

Labor Statistics, 2014, para. 3). The general business problem was that some ship repair managers may not know how to ensure knowledge management and innovation practices in their organizations to support firm performance. The specific business problem is that knowledge management, innovation, and firm performance are important to businesses, but it is unclear whether ship repair managers in the mid-Atlantic region of the East Coast understand this relationship.

### **Purpose Statement**

The purpose of this quantitative correlation study was to examine the relationship between knowledge management, innovation, and firm performance in the U.S. ship repair industry. The independent variables were knowledge management and innovation and the dependent variable was firm performance. The targeted population consisted of members from 253 organizations of the Virginia Ship Repair Association (VSRA) in the mid-Atlantic, Tidewater region. This population was especially appropriate for studying this topic because Virginia had the largest percent of U.S. private employment in the shipbuilding and ship repair industry at 24.9%, which was significantly more than the closest competing state (12.9%) (Maritime Administration, 2013). This study promoted positive social change by improving organizational knowledge management and innovative practices to counter employee turnover while continuing to execute an organization's strategic plans.

### **Nature of the Study**

The quantitative survey methodology was the most appropriate methodology for this study since it was objective, deductive, and tested a theory (Bryman & Bell, 2011).

The qualitative approach was not appropriate because in a qualitative study a researcher interprets the information gathered to generate a theory (Bryman & Bell, 2011). Based on the above descriptions, a mixed methods approach was also inappropriate because of the incorporation of a qualitative study component.

For the study's design, the intention was to use the correlation design. This design was best for this study since the correlation design is an approach to analyzing relationships between variables for strength and direction (Bryman & Bell, 2011). In this study, I analyzed the strength and directional relationship between knowledge management and organizational innovation culture on firm performance. A case study design was not appropriate since it supports an examination of a single organization rather than a large group of organizations (Bryman & Bell, 2011). An experimental design was also inappropriate since the participants were not exposed to treatments in this study (Charness, Gneezy, & Kuhn, 2012). The correlation study allowed for examination of the research question in order to determine the relationship between the variables.

### **Research Question**

The research question for this quantitative correlation study was what is the relationship between knowledge management, innovation, and firm performance?

### **Hypotheses**

$H_0$ : There is no relationship between knowledge management, innovation, and firm performance.

$H_a$ : There is a statistically significant relationship between knowledge management, innovation, and firm performance.

### **Theoretical Framework**

The theoretical framework for this study was the unified model of dynamic knowledge creation by Nonaka, Toyama, and Konno (2000). This model was an extension of the dynamic theory of organizational knowledge creation (Nonaka, 1994). Von Krogh, Nonaka, and Rechsteiner (2012) surmised organizational learning is a continuous dialogue and that for knowledge to be articulated, knowledge creation should be fundamental to organizational processes. Key constructs underlying the theoretical framework of the unified model of dynamic knowledge creation are: (a) the socialization, externalization, combination, and internalization (SECI) process, (b) *ba*, a physical, mental, or virtual place where shared interactions occur (Von Krogh, Nonaka, & Rechsteiner, 2012), and (c) leadership (Nonaka et al., 2000). The key constructs of the dynamic theory of organizational knowledge creation were analogous with the key constructs of this study.

As applied to this study, I expected the independent variables (a) SECI, (b) *ba*, and (c) leadership (Nonaka et al., 2000), measured by the Strategic Knowledge Management, Innovation, and Performance Questionnaire (López-Nicolás & Meroño-Cerdán, 2011), would support the influence of knowledge management and innovation on firm performance. Based on a sampling of available literature, firm performance measures were primarily financial-based outcomes (Delen, Kuzey, & Uyar, 2013; Singh, Darwish, Costa & Anderson, 2012; Wang & Wang, 2012). In addition to financial

measures, Singh et al.'s (2012) performance measures for organization performance included human resource-oriented factors such as employee turnover and other outcomes from productive and quality. This theoretical framework was appropriate since without forward thinking leadership, knowledge creation, innovative practices, and growth may remain stagnant while negatively affect firm performance (Nonaka et al., 2000).

### **Definition of Terms**

*Ba*: *Ba* is a mental, virtual, or physical space where knowledge creation occurs from information interpretation (Nonaka et al., 2000).

*Explicit knowledge*: Explicit knowledge is the knowledge which can be shared through formal and systematic processes (Nonaka et al., 2000), or knowledge specifically related to an industry (Gilson, Lim, Luciano, & Choi, 2013).

*Tacit knowledge*: Tacit knowledge is knowledge that is difficult to formalize since it is personal knowledge gained through experience, action, or involvement (Nonaka, 1994).

### **Assumptions, Limitations, and Delimitations**

Assumptions are ideas not specifically expressed, but are theoretical points considered by researchers based on how the world is presently (Martin & Parmar, 2012).

Study limitations are facets of the study that a research cannot control or change.

Delimitations are choices or restrictions for this study made at the onset of the study. The following assumptions, limitations, and delimitations set the tone for this study.

## **Assumptions**

An assumption in social science is how researchers should conduct examinations, such as the choice of a methodology (Punch, 2014). For a satisfactory survey response, the first assumption was that the VSRA President would continue supporting this study and associated survey as agreed to within the terms of the signed Letter of Cooperation (Appendix A). The second assumption was that the email list of requested participants would be up to date, accurate, and complete. The third assumption was that the invited participants would not forward their unique survey link to someone not intended to receive the survey. The fourth assumption was that if someone did receive a survey link that should not have that any unintended recipients would not respond to the survey. The fifth assumption was that none of the respondents knew me outside of my professional life and did not have a personal relationship with me. The final assumption was that any participants who completed the survey would respond honestly to all of the survey questions.

## **Limitations**

A limitation may be that in a correlation study, there is not a way to determine the cause of a change in the dependent variable (Mitchell & Jolley, 2010). One limitation was that the selected participants would respond since they did not know me on a personal level. Another potential limitation was that the respondents might not be aware that their companies are supporting knowledge management practices and respond that their companies did not support knowledge management practices providing false results. False results were also possible with the survey questions about innovation and firm

performance. A final limitation was that this study examined the perspective of the ship repair community within the mid-Atlantic region of Virginia and therefore, was not generalizable outside of the mid-Atlantic region.

### **Delimitations**

In order to reduce the scope of a study, delimitations are self-imposed restrictions by the researcher (Rovai, Baker, & Ponton, 2014). Requested participants of the ship repair organizations were within the Hampton Roads area of the mid-Atlantic region in order to establish the geographic boundaries of this study. Specifically, the invited participants were managers of the organizational executives as well as human resources and operations department management. Additionally, the survey had Likert scale response selections for managing data and removing the ambiguity that was possible with open-ended responses.

### **Significance of the Study**

The significance of this study was helping organizations justify the organizational investment in capturing knowledge and innovation since this could support firm performance improvements across an organization. The intention was to examine organizational knowledge management and organizational innovation culture to ascertain their relationship with firm performance. This study addressed the expectation that organizational knowledge management and organizational innovation have a positive influence on firm performance. In this study, firm performance was the perceived growth of organizational practices and process improvements as viewed by the CEO/Presidents,

Human Resource, or members in leadership positions in relation to their competing organizations.

### **Contribution to Business Practice**

The primary contribution to business practices was through recognition of opportunities where managing organizational knowledge and innovative practices improve firm performance even in response to employee turnover. I created this study to fill gaps in the understanding and effective practices of how knowledge management and innovation support positive firm performance. Although this study's sample was from a population of Virginia Ship Repair Association members, this study was generalizable outside of the ship repair industry to provide organizations insight on organizational knowledge management tools and processes.

This study's value to business was to improve an organization internally, as well as to support a better product or service to their customers and other external stakeholders. It contributed to the active practice of business because it provided justification to management to invest in the use of knowledge management processes and expose the organization to innovative practices that may improve their firm performance. With these investments and improvements, an organization's support to social change in the venue of personal and professional growth of their workforce organization-wide and provides better support to their customers as their internal processes improve.

### **Implications for Social Change**

As stated earlier, the implication for positive social change is that organizational management would encourage knowledge management and innovation, which in turn

would promote professional development of the workforce. Employee empowerment would become part of an organization's innovative culture. Organizational leadership has the responsibility and accountability of ensuring their innovative practices are ethical and do not subject their workforce to unnecessary distress or force them into unethical practices (Weisenfeld, 2012). Within the realm of social change, organizational leadership can also use innovation to improve the livelihood of their employees as well as their stakeholder knowledge sharing via online communities (Von Krogh, 2012). This study provided empirical rationalization for exploring knowledge management processes and innovation as related to firm performance since there were positive social implications.

### **A Review of the Professional and Academic Literature**

The organization of the review of the professional and academic literature began with the review of the theoretical framework. The literature review continued with a discussion of learning organizations broken down into communities of practice, virtual communities, and other practice-based research. I defined and related the independent variables, knowledge management and innovation, and the dependent variable, firm performance, to the theoretical framework of the unified model of dynamic knowledge creation (Nonaka, 1994).

The search for professional and academic literature included the use of several databases to include Google Scholar, EBSCO, ABI/INFORM, Business Source Complete, and Academic Search Complete. I used peer-reviewed journal articles from 2012 through 2016 to support the requirement for at least 85% of the total sources that

are within 5 years of my expected graduation in 2016. Using Ulrich's Periodical Dictionary, I validated the peer-reviewed status of the sources ensuring at least 85% of the total sources were peer-reviewed with a minimum of 60 peer-reviewed sources in the literature review. Source material also reflected government websites and several textbooks.

After evaluating over 300 references, the total number of references in this study was 154. The total number of peer-reviewed references was 146. The total percentage of peer-reviewed references was 94.8%. The total number of peer-reviewed references that were 5 or fewer years old in anticipation of the Chief Academic Officer's approval in 2016 was 132. The total percentage of peer-reviewed references in anticipation of the Chief Academic Officer's approval in 2016 was 85.7%. The source material breakdown within the literature review 5 year range and outside of the literature review 5 year range is in Table 1.

Table 1

*Source Material*

Sources	Outside of 5 year range (2011 and earlier)	Within 5 year range (2012-2016)	Total of all sources
Peer-reviewed journal articles	14	132	146
Government websites	1	3	4
Books	2	2	4
Total sources by year grouping	17	137	154

## **Theoretical Frameworks**

After scrutinizing several theoretical frameworks that could support this study, one theoretical framework stood out as conclusively best suited for this study. The first theoretical framework for review was the organizational learning theory (Argote & Miron-Spector, 2011). The second theoretical framework for review was the framework of learning orientation as supported by firm innovation quality and performance (Calantone, Cavusgil, & Zhao, 2002). The final theoretical framework, which was the theoretical framework that best fit this study, was the unified model of dynamic knowledge creation (Nonaka et al., 2000).

**Theoretical framework for analyzing organizational learning.** The theoretical framework for analyzing organizational learning involved the environmental context surrounding the latent organizational context as part of the cycle of task performance experience leading to knowledge creation (Argote & Miron-Spector, 2011). The organizational learning theory was a theory started through an interest in organizational learning and knowledge as necessary to both organizational performance and success (Argote & Miron-Spector, 2011). Garcia-Morales, Jimenez-Barrionuevo, and Gutierrez-Gutierrez (2012) further defined this as the process where the individuals of the organization improve an organization's knowledge system. While this theoretical framework addressed employee turnover and knowledge retention, it was not appropriate since it did not identify a place where knowledge creation occurred nor innovation as fundamental constructs (Argote & Miron-Spector, 2011).

**Theoretical framework of learning orientation, innovation, and performance.**

The learning orientation with innovation capability and firm performance as supports for learning commitments and an ability to share vision, open-mindedness, and intraorganizational knowledge was the second framework considered (Calantone et al., 2002). These factors were learning orientation fundamentals supporting firm innovativeness and performance to account for the organizational age effects (Calantone et al., 2002). Calantone, Cavusgil, and Zhao (2002) defined learning orientation as supporting knowledge creation at an organization-wide level, which was also essential for organizational innovation and firm performance. This model had both knowledge creation and knowledge sharing within the framework, but was not suitable since it did not specify tacit or explicit knowledge transfer practices for the full breadth of knowledge sharing. Additionally, this framework was not suitable because age was not a consideration as a variable for this study.

**Unified model of dynamic knowledge creation.** The unified model of dynamic knowledge creation best addressed this organizational challenge and required continuous work and leadership to maintain and improve organizational knowledge (Nonaka, 1994; Nonaka et al., 2000). With this model, knowledge creation was at the foundation of an organization's success and with that, knowledge sharing and transfer must occur (Nonaka, 1994). Knowledge creation occurs as the interaction between tacit and explicit knowledge churns through the SECI process (Nonaka, 1994; Nonaka et al., 2000). This theory was the most appropriate framework for this study since it addressed knowledge creation as it works with organizational changes in a dynamic environment (Nonaka,

1994; Von Krogh et al., 2012). It was also an appropriate theoretical framework since it recognized various types of knowledge sharing that provided support for organizational growth.

The aspect of *ba* addressed the location or theoretical place where knowledge creation occurred in support of knowledge sharing (Nonaka et al., 2000; Von Krogh et al., 2012). The four types of *ba* fell into two categories: media and type of interaction (Nonaka et al., 2000). Nonaka et al. (2000) divided media *ba* into visual, exercising *ba* and systemizing *ba*, and face-to-face, originating *ba* and dialoguing *ba*. Nonaka et al. (2000) also divided the individual interactions involving the exercising *ba* and originating *ba* and the collective interactions involving dialoguing *ba* and systemizing *ba*.

This theoretical framework supported employee-wide knowledge sharing and the loss of knowledge due to employee turnover when business planning did not account for firm performance in strategic planning and execution (Von Krogh et al., 2012). This leadership supported innovation as leadership guided the knowledge creation cycle, which in turn prompted more innovation and innovative practices (Nonaka et al., 2000). Knowledge creation supports organization's capability to sustain a competitive advantage, which lends itself to a positive firm performance relationship using knowledge management and innovation (Nonaka et al., 2000). Knowledge creation within learning organizations strengthens knowledge sharing, especially as part of a learning organization.

## Learning Organizations

Learning organizations are present through various environments and represent different styles of organizational culture. A learning organization is an organization capable of working with and through circumstances with dynamic knowledge management practices (Al-adaileh et al., 2012). Learning organizations also have a capability of capturing trend-specific information as a method of anticipating the need to adapt (Santos-Vijande, Lopez-Sanchez, & Trespalacios, 2012). Within a learning organization, knowledge can occur in several venues and within varying levels of the workforce.

Systemizing *ba* is a *ba* where sharing of explicit knowledge occurs such as in a learning organization (Nonaka et al., 2000). Other researchers have determined that a learning organization can support intellectual capital and innovation while not using knowledge management practices (Hsu & Sabherwal, 2012). Learning organization employees may learn using communities of practice (Musa & Ismail, 2011), virtual communities (Sultan, 2013), and practice-based research such as knowledge-in-practice (McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran, 2013; Nilsen, Nordström, & Ellström, 2012) and knowledge-intensive firms (Casimir, Lee, & Loon, 2012). Organizational learning requires time for effective knowledge management maturity (Argote & Miron-Spektor, 2011). Military units represent learning organizations due to their inspiring leadership and development of followers (Di Schiena, Letens, Van Aken, & Farris, 2013). While military units do not normally have Project Management Offices (PMOs), PMOs are present as part of many successful organizations.

PMOs are organizational networks for project, program, and portfolio support capable of sharing knowledge and supporting innovative practices (Muller, Gluckler, Aubry, & Shao, 2013). Pemsel and Wiewiora (2013) conducted a qualitative cross-case analysis of seven organizations exploring how PMOs support the needs of project manager knowledge sharing perspectives. Pemsel and Wiewiora (2013) found PMOs do not have the function to provide tacit knowledge sharing information needed by the project managers; therefore, organizations cannot rely on their PMOs for knowledge sharing. While the function to provide tacit knowledge is not in PMOs, this does not mean that PMOs do not have a role in knowledge management.

A PMO does have the capability of positively contributing to knowledge creation and innovation within an organization through the dedication of human resources and partnering (Muller, Gluckler, & Aubry, 2013). Towards learning organizations, Karkoulin, Messarra, and McCarthy (2013) examined whether or not knowledge management enhances learning organizations and found that they did improve learning organizations. Wu and Chen (2014) used the moderating variable of organizational learning as a key to bridging knowledge management to organizational performance, which included operational and financial achievement factors. PMOs may function as a community of practice if the knowledge sharing between PMOs, project teams, and management is a component of the organizational culture.

**Communities of Practice.** A learning organization may use communities of practice to encourage creative thinking through knowledge management, specifically through knowledge sharing and transfer practices (Musa & Ismail, 2011). A community

of practice differs from *ba* as a method of knowledge sharing in that *ba* is a place of knowledge creation (Nonaka et al., 2000). Learning organizations use communities of practice to support knowledge retention to prevent loss of knowledge during employee departures (Musa & Ismail, 2011). They also use communities of practice in support of collaboration through conversational knowledge management (Hong, Suh, & Koo, 2011). Organizations may use this practice to break knowledge sharing barriers as the community learns more about the knowledge they work with inside the organization (Hong et al., 2011; Musa & Ismail, 2011). Communities of practice can be used for multitudes of topics whether in government or private industry.

Catney et al. (2013) proposed a community knowledge network, similar to a community of practice, where the government supported knowledge sharing for energy and justice issues. Pollack (2012) determined that 6 months after the launch of a knowledge management program focused on future performance through mentoring and community of practice projects, 94% of coaches noticed an improvement in knowledge sharing. Hong et al. (2011) stated the limitations of communities of practice of the fading or withdrawing of individuals to contributing to knowledge sharing and superficial discussions are capable of mitigation with social networking dynamic processes. Another type of knowledge sharing community is a virtual community where the majority of the knowledge sharing occurs online.

**Virtual communities.** Cloud computing and Web 2.0 are beneficial capabilities for organizational knowledge sharing (Sultan, 2013). Virtual communities help to define exercising *ba* in that tacit knowledge conversion to explicit knowledge occurs in virtual

communities through knowledge sharing (Nonaka et al., 2000). Online sites, such as social media, are accessible areas for knowledge sharing (Bharati, Zhang, & Chaudhury, 2015). Majchrzak, Wagner, and Yates (2013) examined the use of Wikis in shaping behavior of knowledge sharing. It was determined that the use of organizational intranets and contributor knowledge resources and shaping positively supported knowledge sharing through Wikis (Majchrzak, Wagner, & Yates, 2013). Virtual communities require a strong contribution from team members.

Virtual team members perform duties usually in addition to their regular duties as far as effort, time, and performance, which add to the benefits of virtual communities (Hoch & Kozlowski, 2014). A challenge to knowledge sharing in a virtual community is the level of trust between members of the virtual communities in support of collaboration (Boon, Pitt, & Salehi-Sangari, 2015). This is especially important when in a competitive marketplace where a lack of trust may negatively affect an organization's market standing if there is opportunistic behavior within the community (Boon et al., 2015). Teams may function more efficiently in a virtual community due to documentation accessibility.

Knowledge sharing occurs within virtual communities due to the ease of access of information for improving job performance (Hung & Cheng, 2013). Hung and Cheng (2013) investigated knowledge sharing intentions among technology members of virtual communities and found that the ease of use positively supported technology-based knowledge sharing intentions and improved the content of the knowledge within the community if it did not delay progress in the sharer's work. In short, virtual communities

drive knowledge creation leading to organizational innovation through user contributions supporting problem solving, performance design, and functionality (Mahr & Lievens, 2012). Virtual communities allow for knowledge creation without the need for the same physical location while supporting task requirements.

**Other practice-based research.** There are other versions of practice-based research such as knowledge-in-practice (McIver et al., 2013; Nilsen et al., 2012) and knowledge-intensive firms (Casimir et al., 2012). A practice-based organization is an organization where the workforce uses hands-on activities to work with the knowledge that is unique, personal, and difficult to access (Nilsen et al., 2012). Durst and Wilhelm (2011) explored management's process for addressing knowledge loss due to turnover or extended absences of employees. Durst and Wilhelm (2011) found during their exploration that while the organizations under examination were aware of the potential knowledge loss, there were no measures in place to mitigate the risk of knowledge loss. McIver, Lengnick-Hall, Lengnick-Hall, and Ramachandran (2013) explored a proposed framework called knowledge-in-practice suggesting learnability scales and knowledge management activities that positively affect the organizational performance. Knowledge-intensive firms rely on employee commitment to the organization for the prevention of knowledge loss (Casimir et al., 2012). Knowledge-in-practice and knowledge-intensive firms are just two examples of knowledge integration in organizational culture.

### **Knowledge Management**

In the organizational realm, management of knowledge is a conceptual tool for managers to ensure knowledge capture, creation, transference, and sharing occurs in

support of positive firm performance (Massingham & Massingham, 2014). Knowledge management is also for evaluating value as it applies to future investment of organizational knowledge (Massingham & Massingham, 2014). Some organizations may have physical tools or software used for organizational knowledge management while others rely on sharing lessons learned and training.

Basu (2014) defined knowledge management to include several areas such as education and sharing of best practices as well as employee training and development and communication media. Masa'deh, Obeidat, Al-Dmour, and Tarhini (2015) stated one opportunity of managing knowledge is through the capture of tacit knowledge for use by an organizational practice. Management may also consider knowledge management a management philosophy within their organizations (Andreeva & Kianto, 2012). It is important to account for the differences in managing tacit and explicit knowledge since these types of knowledge capture, creation, transferal, and sharing occur via different methods (Bloodgood & Chilton, 2012; Nonaka, 1994; Suppiah & Sandhu, 2011). Knowledge capture, creation, transfer, and sharing are all important aspects of organizational knowledge for ensuring knowledge remains an organizational asset.

**Knowledge capture.** Two categories of knowledge differ in that tacit knowledge is personal and difficult to capture while explicit knowledge is easier to capture and manage (Bloodgood & Chilton, 2012; Nonaka, 1994). Bloodgood and Chilton (2012) identified knowledge capture of facts through documents, concepts through instruction, and procedures through examples and experience as referenced in Bloom's taxonomy. It is important to minimize knowledge losses at the knowledge capture stage to prevent loss

of knowledge at later stages (Shankar, Mittal, Rabinowitz, Baveja, & Acharia, 2013).

Ensuring a knowledge management risk and mitigation plan is in place prevents loss of knowledge while supporting the knowledge capture processes.

Jabar et al. (2011) proposed a knowledge management framework for capturing tacit knowledge. The framework that Jabar et al. (2011) suggested encompassed knowledge of people, knowledge processes, and the organization's product knowledge to formalize the organization's knowledge as inventory for use by the workforce. The researchers also proposed this framework as a method to assess employee competency and productivity (Jabar et al., 2011). Dzekashu and McCollum (2014) conducted a study exploring the impact of quality management integration into the tacit knowledge process due to knowledge loss from an aging workforce. Similar to Jabar et al. (2011), Dzekashu and McCollum (2014) proposed a tacit knowledge capture process moving from identification to acquisition to refinement to storage of the knowledge. Knowledge capture enables knowledge creation as an extension of the capture process, which increases organizational knowledge.

**Knowledge creation.** The SECI process is the process of knowledge creation and is spiral in nature (Nonaka, 1994; Nonaka et al., 2000). As the conversion flows from (a) socialization (tacit-to-tacit) to externalization (tacit-to-explicit), (b) externalization to combination (explicit-to-explicit), (c) combination to internalization (explicit-to-tacit), and (d) internalization to socialization, it continues cycling without stopping (Nonaka, 1994; Nonaka et al., 2000). This knowledge creation process can flow inside or outside

organizations while supporting both internal and external stakeholders of an organization, potentially increasing firm performance (Nonaka et al., 2000).

The SECI model is a connection between social media and knowledge creation (Wagner, Vollmar, & Wagner, 2014). New behaviors with social media, such as (a) authoring, (b) reviewability, (c) editability, (d) recombining, (e) association, and (f) experimentation, support organizational knowledge creation (Wagner et al., 2014). Wagner, Vollmar, and Wagner (2014) concluded that investments of organizational knowledge assets ultimately increasing organizational competitive advantage.

Llora and Moreno-Luzon (2014) used the concept of organizational learning to relate to knowledge creation through dimensions of learning, knowledge, and information as they relate to each other. Similarly, Argote and Miron-Spektor (2011) examined organizational learning via factors of task performance experience, knowledge, and active member participation. Through this framework, Argote and Miron-Spektor (2011) found parsing of organizational learning supported knowledge creation, knowledge transfer, and knowledge retention. This framework is similar Nonaka's (1994) dynamic theory of organizational knowledge creation, yet it does not include a consideration of space or *ba* (Argote & Miron-Spektor, 2011).

Sankowska (2013) conducted a study to examine the relationship between knowledge transfer, knowledge creation, organizational trust, and innovativeness determining that knowledge creation provides partial mediation regarding the trust-innovativeness association. Martelo-Landroguez and Cegarra-Navarro (2014) support Argote and Miron-Spektor's (2011) concepts that using knowledge implies that

knowledge creation retention for integration into transfer and storage/retrieval phases is necessary. Mahr and Lievens (2012) examined innovation-related knowledge creation in virtual communities finding the creation of knowledge differed between the different virtual communities based on the individual focus areas. The created knowledge requires transference to others to be effective for the organization.

**Knowledge transfer.** Knowledge transfer provides a method of providing forgetfulness rectification in projects across industries (Cacciatori, Tamoschus, & Grabher, 2012). Knowledge transfer practices support strategic implementation within a learning organization (Al-adaileh et al., 2012). Donate and de Pablo's (2015) research regarding knowledge application practices supported knowledge transfer as a means of organizational learning. Transformation of tacit-to-explicit knowledge occurs through training or through experience (Okoroafor, 2014). Specifically, tacit knowledge may be harder to attain than explicit, making the transfer and utilization of knowledge more critical to understand throughout the organization (Teo & Bhattacharjee, 2014). Building knowledge transfers into strategic planning as well as project planning and execution is a method of support goal planning and communication.

Knowledge transfers across projects may occur more frequently in engineering and high-tech industries rather than creative organizations (Cacciatori et al., 2012). Blome, Schoenherr, and Eckstein (2014) found through a study of knowledge transfer in a German supplier that knowledge transfer is positively moderating in supply chain flexibility. Features of knowledge transfer within organizations include innovation and bonding of workforce through common activities (Martelo-Landroguez & Cegarra-

Navarro, 2014; Sankowska, 2013). Some specific modes of knowledge transfer include: (a) storytelling (Venkitchalam & Busch, 2012; Whyte & Classen, 2012; Wijetunge, 2012), (b) mentorship (Appelbaum et al., 2012), (c) narration (Ventichalam & Busch, 2012), and (d) job engagement (Li, 2013). The different modes of knowledge transfer occur through differing types of *ba* or places of knowledge creation.

Dialoguing *ba* supports the externalization portion of SECI where individuals convert tacit knowledge to explicit knowledge. With distributed work arrangements, the globalization of work sites, and inter-organizational efforts in accomplishing work, knowledge retention relies heavily on the transfer of knowledge due to employee retirement and turnover (Argote & Miron-Spektor, 2011). Without solid knowledge transfer practices and knowledge ownership, knowledge losses are also possible at the knowledge transfer stage (Shankar et al., 2013). Additionally, when the transfer of knowledge occurs, the value of the knowledge increases productivity and interconnection of knowledge can occur (Tuan, 2012). While researchers may be able to measure productivity, the measurement of knowledge transfer may have several approaches (Islam, Low, & Rahman, 2012). These proposed measures are: (a) number of transfers over time, (b) knowledge transfers within time and budget, (c) customer satisfaction, (d) recipient-level knowledge replication, and (e) recipient ownership of the knowledge (Islam et al., 2012). Measurement of knowledge transfer provides organizations feedback regarding the best methods to meet their overall performance objectives.

Arnett and Wittman (2014) conducted a study regarding the role of tacit knowledge exchange as it related to organizational performance of sales and marketing. The tacit knowledge exchange factors examined were

- interfunctional communication quality,
- coworker trust,
- socialization opportunities,
- interfunctional conflict, and
- top management support (Arnett & Wittman, 2014).

The only factor that did was not significantly related to tacit knowledge exchange was interfunctional conflict (Arnett & Wittman, 2014). Knowledge transfer and exchange is important to productivity, but once the transfer or exchange is complete knowledge sharing must continue to support information flow throughout an organization.

**Knowledge sharing.** Knowledge sharing occurs when employees are open to sharing their knowledge, both explicit and tacit, which can increase an organization's competitive advantage (Wang & Wang, 2012). Since explicit knowledge appears less expensive and easier to transfer, tacit knowledge is viewed as higher in value due to its complexity and ability to share (Hau, Kim, Lee, & Kim, 2013). Jain and Moreno (2015) stated an accumulation of knowledge occurs when shared within the organization, which is important to consider when building knowledge to support improving firm performance. While Wang and Wang (2012) found that while tacit knowledge sharing had negative associations with the speed of innovation and firm financial performance, they did find tacit knowledge had positive associations with innovation quality and firm

operational performance. Wang and Wang (2012) found the opposite with explicit knowledge sharing since knowledge sharing was positively associated with innovation speed and firm financial performance. The organizational culture may influence the frequency of knowledge sharing between employees.

Nilsen et al. (2012) theorized that employees share researched-based knowledge, or explicit knowledge, more easily than experienced-based knowledge, or tacit knowledge. Knowledge flow among individual employees, organizational decision makers, and firm units yield positive associations in radical innovation (Zhou & Li, 2012). Zhang, de Pablos, and Xu (2014) found cultural values in a virtual environment, which may directly affect knowledge sharing and have interactive effects on knowledge sharing motivations as well as complex effects on knowledge sharing. Understanding and usage of knowledge management practices requires solid organizational leadership.

### **Leadership**

Donate and Guadamillas (2011) defined leadership as an organizational factor as considered influential to knowledge exploration, exploitation, and innovation. Two particular types of leadership are transformational and transactional are influential within an organization. Transformational leadership is charismatic, can stimulate intellectual thought, and includes personal interaction (Antonakis & House, 2014; Tse, Xu, & Lam, 2013). Transactional leadership is a relationship of realizing self-interests between leadership and the workforce (Strom, Sears, & Kelly, 2014). Garcia-Morales et al. (2012) examined the influences of (a) organizational learning and innovation by transformational leadership, (b) innovation by organizational learning, and (c) firm performance by both

organizational learning and innovation. This study resulted in supporting significant and positive correlations between all influences (Garcia-Morales et al., 2012). Positive leadership, whether transformation or transactional, supports organizational knowledge management through shaping a culture for learning and innovative relationships.

Magnier-Watanabe, Benton, and Senoo (2011) examined the effects on the knowledge management terms of SECI by leadership, *ba*, organizational culture and control, and work style. Magnier-Watanabe et al. (2011) found deliberate training in knowledge management yielded a better balance in tacit and explicit knowledge conversions (SECI). Von Krogh et al. (2012) conducted a study focusing on leadership as an essential component of their theoretical framework in an attempt to determine how leadership affects organizational knowledge creation. These studies support the importance of leadership in organizational knowledge management practices.

Martins and Meyer (2012) identified leadership as one of nine factors that influenced knowledge retention, specifically, tacit knowledge retention. Even in the realm of human resource management systems, there is a need for knowledge-centric teamwork in that empowering leadership yielded knowledge acquisition and knowledge sharing (Chuang, Jackson, & Jiang, 2013). While innovation has been historically product based, organizational process innovation is growing and requires organizational socialization at the management level (Damanpour & Aravind, 2012). Overall, different leadership methods may lead to different innovative practices and processes within an organization (Bloodgood & Chilton, 2012). Leadership may lead to a positive innovation culture when using solid knowledge management practices.

## **Innovation Culture**

Barriers to knowledge management can be individual or organizational (Hong et al., 2011). Hong et al. (2011) cited four individual barriers: (a) internal resistance, (b) trust, (c) motivation, and (d) a gap in awareness and knowledge within communities of practice of a financial company. Hong et al. (2011) also cited four organizational barriers: (a) language, (b) conflict avoidance, (c) bureaucracy, and (d) distance in their study of knowledge sharing barriers. Barrier examination and identification of knowledge gaps of an organization are two areas that leaders must address in ensuring knowledge management supports innovation and corporate culture.

Two frequently examined barriers to organizational knowledge management are trust (Cumberland & Githens, 2012; Lin, Wu, & Yen, 2012) and corporate culture (Musa & Ismail, 2011; Suppiah & Sandhu, 2011). Bolivar-Ramos, Garcia-Morales, and Garcia-Sanchez (2012) found a positive relationship between organizational innovation and performance. Furthermore, organizational learning, as positively supported by top management, was one of the factors proven as positively promoting organizational innovation (Bolivar-Ramos, Garcia-Morales, & Garcia-Sanchez, 2012). Organizations with strong innovative processes have a potential to increase a sustainable competitive advantage (Urgal, Quintas, & Arevalo-Tome, 2013). Innovation relies on critical thinking within an organization.

An innovative organizational culture supports critical thinking throughout an organization (Musa & Ismail, 2011). More importantly, employees carry knowledge across organizational lines, which can support the transfer of innovative ideas (Ganco,

2013). It is important to allow employees to put these creative ideas into practice in hopes of encouraging employee retention, employee professional growth, and knowledge sharing (Bhatnagar, 2012; Fernandez & Moldogaziev, 2013). Damanpour and Aravind (2012) explored managerial innovations noting business and practitioner-based innovation was gaining popularity over research and development while facilitating organizational culture changes and reinforcing the need for performance sustainment through continuous innovation.

Walker, Chen, and Aravind (2015) examined 44 peer-reviewed published articles from 52 samples to ascertain how managerial and technological innovation affects firm performance. Factors considered in this examination were (a) level of analysis, (b) US or EU, (c) industry, (d) performance type, (e) innovation measurement, and (f) performance measure (Walker, Chen, & Aravind, 2015). It was determined managerial and technological innovation positively affects firm performance (Walker et al., 2015). With the positive relationship between innovation and firm performance, an organizational culture with strong leadership can support continued success.

**Organizational culture.** Organizations tend to base the organizational cultures on the actions of organization's leaders (O'Reilly, Caldwell, Chatman, & Doerr, 2014) as well as assumptions for guiding life values (Schneider, Ehrhart, & Macey, 2013). Corporate culture also leads to innovation creation through the creation of knowledge (Nonaka et al., 2000). Within an organizational culture of active knowledge management, originating *ba* is present as individuals feel free to share information and insights gained throughout their learning processes (Nonaka et al., 2000). Vaara, Sarala, Stahl, and

Bjorkman (2012) found through a study examining effects of cultural differences, both organizational and national, regarding knowledge transfer that social conflicts adversely affect knowledge transfer. An organizational culture must be healthy enough to support knowledge management, mitigate social conflicts stemming from employee cultural differences, and prevent knowledge loss.

In a study exploring knowledge loss prevention, the researchers found organizational culture played a vital role in organizational knowledge transfer and prevention of knowledge loss (Shankar et al., 2013). Active drivers of knowledge sharing within an organization, as created by the corporate culture, are organizational climate and leadership (Bautista-Frias, Romero-Gonzalez, & Morgan-Beltran, 2012). When an organization lacks the culture of knowledge sharing, an organizational barrier to knowledge management exists due to the time required ensuring employees are capable of supporting the existing work (Musa & Ismail, 2011). More so, when team diversity is part of an organization's culture, knowledge sharing increases (Kessel, Kratzer, & Schultz, 2012). Organizational culture must include supporting organization knowledge management processes and procedures.

Sharifirad and Ataei (2012) conducted a quantitative study examining the relationship between organizational culture and innovation culture of Iranian auto companies. Findings included that an organizational culture of employee empowerment led to a culture of increased participation and innovation commitment (Sharifirad & Ataei, 2012). It is especially important when the organizational culture includes a climate of trust, encouraging employee innovation (Martin-de Castro, Delgado-Verde, Navas-

Lopez, & Cruz-Gonzalez, 2013). Uzokurt, Kumar, Kimzan, and Eminoglu (2013) determined that organizational culture significantly and positively affected overall firm performance in banking. Uzokurt et al. (2013) found organizational culture did not explain the differences of (a) firm performance of profitability, (b) market share, or (c) market value; however, they also found innovation supported a significant amount in these same dimensions. Organizational culture is not only how employees work together, but the outcome of the work accomplished together.

In a mixed-methods study, Zhang et al. (2014) found cultural values had a direct effect on knowledge sharing with cultural values interactively affecting the motivation of the workforce knowledge sharing. Suppiah and Sandhu (2011) explored clan, adhocracy, market, and hierarchy organizational culture and found clan culture positive influenced tacit knowledge sharing while market and hierarchy cultures did not. Suppiah and Sandhu (2011) eliminated adhocracy due to statistical insignificance during initial testing of the model used in their research. The cultures will need strong leadership to address the varying effects on knowledge management practices and innovation and to prevent negative firm performance.

Knowledge management and innovative culture are critical to supporting business strategy (Chang & Chuang, 2011). Organizational culture links knowledge management processes and firm performance through the trust between those in the employee workforce (Nold, 2012). Donate and Guadamillas (2011) hypothesized that the greater of a knowledge-centered culture, the higher the level of influence of knowledge and the exploitation practices on innovation results. Lack of culture of knowledge sharing may

also restrict creative growth within an organization (Donate & Guadamillas, 2011).

Leadership should ensure employees feel empowered to share knowledge and innovative practices as part of the organizational culture.

Bhatnagar (2012) found psychological empowerment was statistically significant in affecting work engagement leading to high innovation and lower turnover rates among workers in Indian industrial sectors. Employees who engage in achieving a solution are more apt to work harder finding or creating a solution (Bhatnagar, 2012). Empowerment also allows employees to make corrective actions without requiring micromanagement, which frees their co-workers and supervisors for other organizational requirements (Fernandez & Moldogaziev, 2013). Employee empowerment encourages innovation since an employee or team may feel part of a solution or part of progress for their organization.

**Innovation.** Innovation is creating value through more effective processes, products, or pricing to create a competitive advantage for an organization (Hinterhuber & Liozu, 2014). Alegre and Chiva (2013) defined innovation performance as three different dimensions involving product and process effectiveness and innovation efficiency. Crespi and Zuniga (2012) found through a study of the relationship between innovation and productivity that knowledge was important in innovation with strong associations between innovation and productivity. Hogan and Coote (2014) found evidence supporting innovative behaviors and firm performance when examining the organizational culture of approximately 100 law firm principals. Organizational reinforcement of products and associated processes help prevent knowledge and innovation loss due to employee departures.

When key employees depart an organization, organizational processes are disrupted (Tzabbar & Kehoe, 2014). Changing the organizational processes opens the possibility of sharing ideas that lead to innovative practices and discovery (Bresman, 2013). Innovation has been positively associated with the reduction of employee turnover (Mohr, Young, & Burgess, 2012) and significant effective on organizational performance (Camison & Villar-Lopez, 2014). Enkel and Heil (2014) proposed that cross-industry innovation, internal to an organization and external with their teaming partners, suggests exploitive and exploratory innovation negates employee turnover (Mohr et al., 2012). Organizations that retain knowledge while encouraging growth of innovative practices through knowledge sharing decrease chances of employee departures.

Lopez-Nicolas and Merono-Cerdan (2011) studied the codification and personalization of how an organizational knowledge management strategy enhances innovation. The findings supported corporate knowledge strategies concluding that strategies of knowledge were vital for organizational efficiency, effectiveness, and innovativeness (Lopez-Nicholas & Merono-Cerdan, 2011). For an organization to attain or maintain successful performance, the use of dynamic capabilities ties to knowledge creation and the practices within the organization (Alegre, Sengupta, & Lapeidra, 2013). Successful performance requires understanding of the use of organizational knowledge management at both individual and team levels.

While knowledge creation is required for innovation, so are strong teams that understand the functionality of knowledge management to support innovation (Von Krogh et al., 2012). Innovation is a method to ensure a customer receives more value for

their contracts and exchanging tacit knowledge helps in the development of innovation (Arnett & Wittman, 2014). Sankowska (2013) determined that while trust facilitated knowledge transfer, knowledge creation facilitated organizational innovation. A strong, positive organizational culture may support lowering the risk of negative effects on firm performance through lessening the chances of employee turnover of strong employees who hold useful corporate knowledge. Van Beek, Taris, Schaufeli, and Brenninkmeijer (2014) found work engagement positively associated with job satisfaction and job performance negatively associated with turnover intentions. Adoption of innovative practices or processes requires employee buy-in to support the process (Argawal, Datta, Blake-Beard, & Bhargava, 2012). Employee turnover has risks of losing corporate knowledge and innovation performance so organizations must strengthen work engagement as part of the organizational culture.

### **Employee Turnover**

Organizations continue existing even as employees leave, but it is incumbent on the leadership to ensure the organization's performance maintains at a minimum through facilitation of knowledge transfer (Musa & Ismail, 2011). Organizations with cultures that accept a slow turnover may operate as if the workforce cannot make changes, reinforcing negative knowledge sharing (Durst & Wilhelm, 2011). Kwon and Rupp (2013) examined the relationship of high-performer turnover and predicting firm performance finding high-performer turnover predicting a negative relationship with firm performance. Repatriation of expatriate employees is also a consideration organizations need to make when conducting knowledge transfer since the organizational culture shifts

between transitions (Nery-Kjerfve & McLean, 2012). Employee turnover is more than just employee departures from the organization, but includes movement to different locations.

Organizational knowledge loss will continue as employee turnover occurs with failure in planning for knowledge capture and knowledge retention (Jennex, 2014). Specifically, human and social capital as forms of knowledge proficiency losses can occur with employee turnover (Hausknecht & Howweda, 2013). Daghfous, Belkodja, and Angell (2013) concluded in a study regarding knowledge loss as it applied to employee departures that organizations that targeted tacit knowledge retention as part of the organization's routines were effective in mitigating knowledge loss. Hancock, Allen, Bosco, McDaniel, and Pierce (2013) conducted a meta-analysis of employee turnover as a predictor of firm performance and found this was a negative relationship. Hancock et al. (2013) noticed a lack of turnover literature collected for this meta-analysis and a lack of material differentiating between function and dysfunctional turnovers. Organizational focus and application of knowledge loss risk and mitigation practices in advance of employee turnover are critical parts of organizational culture.

Mohr, Young, and Burgess (2012) found much of the literature regarding employee turnover focused on employee-initiated turnover and focused their research on the relationship between turnover of employees and firm performance. When key employees depart an organization, organizational routines are disrupted (Tzabbar & Kehoe, 2014). Changing the habits opens the possibility of sharing ideas that lead to innovative practices and discovery (Bresman, 2013). Organizations are at risk of

competitors gaining the knowledge of competitors' former employees (Shaw, Park, & Kim, 2013). Durst and Wilhelm (2012) conducted a study exploring how companies address knowledge loss based on long-term absences of employees. While examining how succession plan may support knowledge loss prevention, Durst and Wilhelm (2012) found there was a high dependency on members at the highest management level. The risk found during Durst and Wilhelm's (2012) study was that if one of the three management board members were to depart the organization no one could step in to address the organization's needs. A component of knowledge loss risk and mitigation plans must account for unplanned employee losses and possible transfer of knowledge to the competition.

Durst and Wilhelm (2011) found through a study of how executive turnover affects medium-sized organization when key staff departs an organization, the organization's entire workflow may be changed. Succession planning may be a viable option in mitigating the risk of loss of organizational productivity. Appelbaum et al. (2012) studied the effects of baby boomers retiring from a large, national, publicly traded company and made recommendations for improving retiree involvement in post-retirement activities to maximize knowledge transfer. The recommendations included: (a) focused training with a follow-on mentor program, (b) detailed procedures, (c) job rotation, and, (d) phased retirement to maintain organizational knowledge (Appelbaum et al., 2012). Succession planning allows organizations to recover quickly from employee turnover whether voluntary or involuntary.

**Voluntary employee turnover.** Organizations have varying aspects of voluntary employee turnover such as resignations (Park & Shaw, 2013). Campbell et al., (2012) determined that employee departures were more negative on firm performance when enacted for entrepreneurial reasons than for another opportunity at a different organization. Loss of intelligence or human capital occurs during voluntary turnover (Yang, Wan, & Fu, 2012). Yang, Wan, and Fu (2012) explored turnover of international tourist hotels in Taiwan. Yang et al. (2012) found the causes of voluntary employee turnover were (a) company factors, (b) compensation and promotion channels, (c) personal emotion, and (d) work content. Company factors were (a) management style, (b) company sub-culture, (c) working environment, (d) company decision-making, and (e) the owner's financial status (Yang et al., 2012). The management style included lack of independence of employees while and the company factor, working environment, showed a lack of teamwork and poor communication (Yang et al., 2012). These factors are important for management to consider since the effects of knowledge loss and organizational culture can be negative as they relate to firm performance.

Pollack (2012) examined the significance of the implementation of an Australian organization's knowledge management program as well as how the program functioned with an aging workforce. Pollack (2012) determined both tacit and explicit knowledge sharing need to occur before the retirement occurs. There should be enough time for employees to ask questions to gain knowledge from the retiring employee. Voluntary turnovers, however, are more likely to render more knowledge sharing and transfer than

involuntary turnovers since involuntary turnovers occur during undesirable circumstances such as downsizing or firing.

**Involuntary employee turnover.** Organizations have varying aspects of involuntary employee turnover that include downsizing and termination without notice (firing) categorized as reluctant leavers (Hom, Mitchell, Lee, & Griffeth, 2012). Reluctant leavers make up the largest group of involuntary employee turnovers (Hom et al., 2012). The organizational management team works downsizing as a method of ensuring retention of high social legitimacy while still terminating employees in a softer manner (Munoz-Bullon & Sanchez-Bueno, 2014). Involuntary turnover must be a mitigated risk within organizational strategic planning as a method of protecting organizational interests.

As downsizing applies to organizational innovation, both product and process-based innovation, Vincente-Lorente and Zuniga-Vicente (2012) examined how different types of organizational change affected employee downsizing practices. Vincente-Lorente and Zuniga-Vicente (2012) found a positive correlation concerning new process changes and counts of product innovations with downsizing. Vincente-Lorente and Zuniga-Vicente (2012) also found a negative correlation between new equipment process changes, the amount of product innovations, and new methods of process innovations by to downsizing. While these were the factors of the examination conducted, Vincente-Lorente and Zuniga-Vicente (2012) did not fully consider the firm size or margins for analysis of firm innovation. Downsizing is a softer approach to involuntary employee loss as opposed to employee loss due to firing.

Whereas downsizing has a phased approach for employee loss, employee firings bring an immediate loss of knowledge for the organization (Hom et al., 2012). There may also be a loss of funding due to severance payouts, based on the causes for the immediate termination of an employee (Martin & Scarpetta, 2012). Some regulations may even require severance payouts to those terminated employees, which may affect organizational profits (Martin & Scarpetta, 2012). Strategic planning must account for the possibility of involuntary employee turnover when considering how knowledge and innovation losses affect firm performance.

### **Firm Performance**

Firm performance is an organization's ability to (a) increase market share, (b) operate efficiently, and (c) improve services, products, or sales, innovative practices, and overall profit shares (Chang & Chuang, 2011; Wang & Wang, 2012; Damanpour & Aravind, 2012). Tacit knowledge held by employees is the firm's human capital of knowledge management (Cohen & Olsen, 2015). In contrast, Song and Kolb (2012) found that learning organizations and knowledge creation on firm performance, specifically, the financial aspects were not statistically significant. Nold (2012) compared two organizations to find aspects of organizational culture that influenced firm performance. Nold's (2012) findings indicated organizational trust and knowledge management initiatives supported superior firm performance. In the lens of human capital, knowledge and innovation are prime components of firm performance.

Wang and Wang (2012) conducted a study regarding knowledge sharing, innovation, and firm performance. Conclusions gained were statistically significant

relationships between tacit knowledge sharing, innovation quality, and both financial and operational performance (Wang & Wang, 2012). There was also a significant relationship between explicit knowledge and financial performance yet not with operational performance (Wang & Wang, 2012). Wang and Wang (2012) proposed that these relationships might be able to guide the organizational leadership to attain higher organizational performance through knowledge sharing and innovation practices. Management's use of innovative practices, combined with knowledge management practices, can support organizational growth.

Innovation is a useful tool for organizational growth (Hung & Chou, 2013). In a study regarding open innovation on firm performance of 791 tech firms, Hung and Chou (2013) found open innovation principles and activities were applicable in multiple industries. During an examination of intellectual capital and knowledge management, Hsu and Sabherwal (2012) found that organizational innovation and an active learning culture positively affected firm performance. Chang and Chuang (2011) believed that when corporations adopt knowledge management practices, utilization and sharing of the knowledge and competitive advantage increased. With a competitive advantage, organizations have influence on how other organizations function, which may allow access to their knowledge.

Jayasingam, Ansari, Ramayah, and Jantan (2013) conducted a study to determine how knowledge management practices of acquisition and dissemination influence firm performance of smaller organizations. It especially important when employees depart smaller organizations since this can negatively affect knowledge transfer, which may be

the bulk of the knowledge within the organization (Campbell et al., 2012). However, in a review of the meta-analysis of previous research regarding employee turnover as a predictor of organizational performance, Hancock et al. (2013) concluded that the employee turnover was not a predictor of organization performance. While employee turnover is not a predictor of firm performance, researchers have proven in most cases that knowledge management and innovation are predictors of firm performance.

### **Transition and Summary**

This section of the study included information on the foundation of the study, assumptions, limitations, delimitations, and the proposed significance of this study as well as the background for the research to follow. In discussing the purpose and problem statement for this study, I ensured the independent variables of knowledge management and innovation were discussed as well as the dependent variable of firm performance. In addition to the discussion of the variables, I also conducted a literature review that included a discussion of the different aspects of learning organizations and the theoretical framework of the dynamic theory of organizational knowledge creation (Nonaka, 1994).

I will share the research method and design, participant population and sampling, and the data collection instrument of the project in Section 2. This section will also contain the data collection and technique to include the testing of the assumptions used in support of conducting multiple linear regression. I will discuss the validity of the study last in this section.

In Section 3, I will discuss the application for professional practice and implications for social change. Specifically, I will present and discuss the findings,

provide recommendations for action, and recommendations for future research. I will close this study with a brief summary of the study, discussion of the conclusions, and sharing my reflections of the study process.

## Section 2: The Project

This section starts with a restatement of this study's purpose. Primary areas of this section include the role as researcher, research method, and research design for this quantitative study. It includes the population of the ship repair industry surveyed during data collection, methods used to recruit participants, and ethical considerations taken during the creation of the study because of my employment in the ship repair industry and my membership in VSRA. The section also includes the instruments to measure the data and the chosen collection method. The techniques used for the data collection, data organization, and data analysis are shared.

### **Purpose Statement**

The purpose of this quantitative correlation study was to examine the relationship between knowledge management, innovation, and firm performance in the U.S. ship repair industry. The independent variables were knowledge management and innovation and the dependent variable was firm performance. The targeted population consisted of members from 253 organizations of the Virginia Ship Repair Association (VSRA) in the mid-Atlantic, Tidewater region. This population was especially appropriate for studying this topic because Virginia had the largest percent of U.S. private employment in the shipbuilding and ship repair industry at 24.9%, which was significantly more than the closest competing state (12.9%) (Maritime Administration, 2013). This study promoted positive social change by improving organizational knowledge management and innovative practices to counter employee turnover while continuing to execute an organization's strategic plans.

### **Role of the Researcher**

In this quantitative study, one of my roles as the researcher in the data collection process was to identify a representative sample from a population (Bryman & Bell, 2011). Another role was to acquire survey participation from the proposed population with informed consent, as shown in the consent form (Appendix B) (Couper & Singer, 2013). I collected the resultant data through a SurveyMonkey<sup>®</sup> survey, processed and analyzed the data via Statistical Package for the Social Sciences (SPSS 21) software (Tabachnick & Fidell, 2013), and securely stored the raw data to end in a timeframe of 5 years from the collection start date (Appendix B).

While some of the participants may have known me in my professional capacity through my organization or participation at the VSRA monthly member luncheons, I did not have a personal relationship with any of the population. My current position as a knowledge manager in my organization and professional background as a retired Surface Warfare Officer demonstrated credibility in my research. My professional and educational background was available through my public LinkedIn profile should any of the participants have wanted to learn more about me before responding to the survey.

No intent existed to initiate contact with the requested participants outside of the survey unless through my professional duties. Following the Belmont Report guidance, I ensured sufficient information was provided prior to the participants' involvement in the study via informed consent (U.S. Department of Health and Human Services, 1974). I advised participants regarding their ability to withdraw consent at any time (Appendix B).

## **Participants**

I selected participants via purposive sampling since I desired a particular set of respondents from the VSRA population to take the survey since it is a method of selecting participants strategically in support of the research question (Bryman & Bell, 2011). Although Barratt (2014) suggested that although purposive sampling was primarily in qualitative studies, purposive sampling is now accessible in quantitative research. Internet surveys are an available method of reaching large samples of participants that may be difficult to reach otherwise (Barratt, 2014).

Eligibility criteria for the research participants were if that their organizations were members of VSRA and if they are CEO/Presidents, Human Resource personnel, or members in leadership positions within their organizations. The participants were aged 18 or older. I gained access to the participants through the President of VSRA, who serves the mid-Atlantic region, and the associated authorized email permissions granted by VSRA members. The selected participants were required to identify their ages as related to age 18 on the second page of the survey and have the option not to participate via the third page of the survey, which is where they will either consent or not consent to participate. If the participant is under age 18 or did not consent to participate in the survey, I thanked them for their consideration and electronically routed them to end of the study to end their participation.

The President of VSRA signed the Letter of Cooperation (Appendix A) in support of this effort. I had a working relationship with some of the participants through my participation in monthly VSRA luncheons and my roles and responsibilities as a defense

contractor. Measures integrated into this study ensured that the ethical protection of participants per the Belmont Report guidance (U.S. Department of Health & Human Services, 1974).

I sent unique links for the survey generated by SurveyMonkey<sup>®</sup> to all selected participants with a survey end date of 2 weeks from transmission of unique links. The Informed Consent form made up the third and fourth pages of the survey before the survey questions, but after the confirmation of age of over 18 on the second page of the survey. After 2 weeks from sending the survey to the unique links, there were only 19 completed surveys. I continued to send reminders every 2 weeks receiving 69 completed survey responses and closed the survey.

### **Research Method and Design**

This research supported examination of a statistical relationship between knowledge management and innovation on firm performance. To conduct this study I used a quantitative research method and correlation design. This section provides justification for the chosen research method and research design.

#### **Research Method**

I chose the quantitative research method based on the capability to calculate statistical significance or statistical nonsignificance. The quantitative method was justifiable because I used the survey to ask for opinions and feelings regarding knowledge management, innovation, and firm performance of the respondents' organizations, collecting responses via a seven-point Likert scale (Boone & Boone, 2012;

Wakita, Ueshima, & Noguchi, 2012). This method provided a neutral anchor in the center of an even-numbered span of options (Wakita et al., 2012).

The qualitative method was not appropriate because the intent of this research was to examine the relationship, or correlation, between the variables (Bryman & Bell, 2011; Punch, 2014). Qualitative was more appropriate to determine causation where the research would support finding a causal relationship between variables (Punch, 2014). The mixed method approach was not appropriate because this types of research is directed at ensuring strengths of the qualitative and quantitative research are complementary with weakness not overlapping which could potentially skew the analysis (Punch, 2014).

### **Research Design**

The chosen research design for this study was a correlation design in which participants would complete an online survey for data collection. The correlation design is best for a nonexperimental study since participants are not randomized nor part of a control group or multiple measures (Bryman & Bell, 2011). I used correlation design due to its ability to show the relationship between the independent variables of knowledge management and innovation and the dependent variable of firm performance (Punch, 2014).

The correlation design was justifiable because showed the relationship between the two independent variables of knowledge management and innovation and the dependent variable of firm performance (Punch, 2014). A causal-comparative study is best when comparing two or more groups and one independent variable (Turner, Balmer,

& Coverdale, 2013). Since this study examined the relationship between two independent variables and one dependent variable, a causal-comparative design was not appropriate (Turner et al., 2013). The correlation research design derived logically from the applied business problem statement since a positive firm performance is the naturally desired outcome of an organization's work effort.

### **Population and Sampling**

The sample was from the population of VSRA's CEO/Presidents, Human Resource personnel, or members in leadership positions within their organizations. The population aligned with the overarching research question because this sample provided personal insight into their organization's knowledge management practices and was in the position to address innovative ideas. CEOs and management generally develop strategy and direction for an organization (Andries & Czarnitzki, 2014). The population had personal insight as to how their organizations performed or are performing. This supported gaining their view of their organizations' performance compared to their ship repair competitors. Organizational size was not a consideration in this study.

The sampling method of nonprobabilistic purposive sampling supported the representation of employees within each organization with specific attributes such as insight of their organization's performance history (Bryman & Bell, 2011). This method helps management understand how knowledge management and innovation can affect the performance of their organizations. The selected participants had personal knowledge of organizational knowledge management and innovative practices with some familiarity with the performance of their organizations. A weakness of purposive sampling was that

a researcher may not capture all of the characteristics that support the examination of the research question or questions and would leave a quality sample out of the selection.

The sample size was appropriate based on an a priori power analysis validation using G\*Power 3.1.9.2. I used Tabachnick and Fidell's (2013) method for sample size determination of a calculation of  $n = \text{sample size}$ , where  $n = 50 + 8(m)$ . For this calculation,  $m = \text{number of independent variables}$  (Tabachnick & Fidell, 2013). With  $m = 2$ , this calculated as  $n = 50 + 8(2)$  or  $n = 66$ . Utilizing G\*Power 3.1.9.2, I conducted an a priori power analysis to validate a minimum sample size of 66 as calculated by the method proposed by Tabachnick and Fidell (2013). Using a medium effect size ( $f = .15$ ) and a  $\alpha = .05$  resulted in a minimum sample size of 68 which invalidated my original sample size of 66. Increasing the sample size to 146 increased the power to .99. The use of a medium effect size ( $f = .15$ ) was appropriate as calculated for proposed study as displayed in Figure 1.

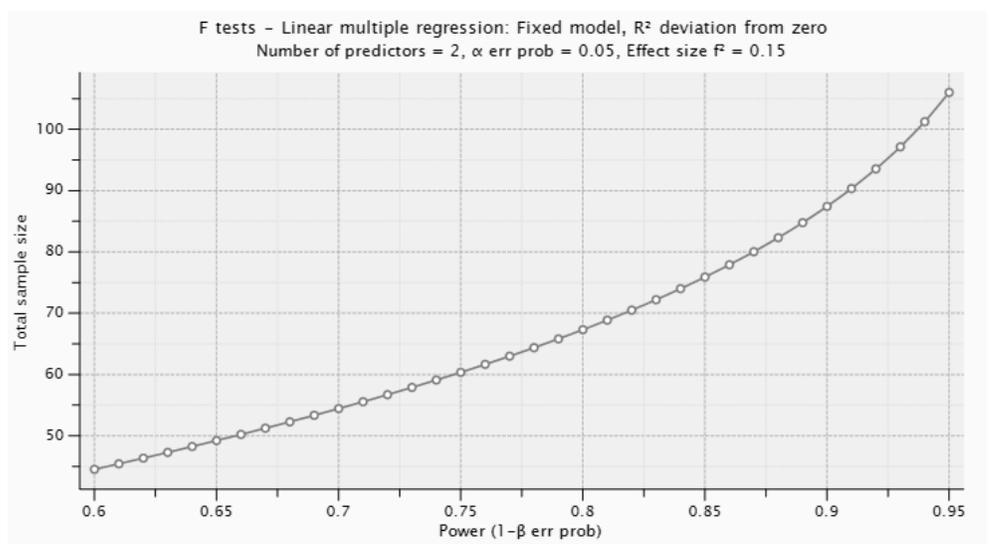


Figure 1. Power as a function of sample size.

### **Ethical Research**

The consent form (Appendix B) was the third page of the SurveyMonkey® survey that the participants accessed via their unique SurveyMonkey® link. Answer options to the consent form will be “I consent” or “I do not consent”. If the participant chose “I consent” they were taken to the survey questions. If the member selected “I do not consent”, they were taken to the “Thank you” page through SurveyMonkey®’s page logic tool and did not have the opportunity to answer the survey. I included Walden’s IRB approval number, 11-13-15-0418195, and the expiration date of 11/12/2016 in the consent form. After survey completion, participants could still withdraw from this study via email to me requesting to have their responses withdrawn.

There were no incentives used in this study. There were no conflicts of interest since I was not asking for any information that would put any of the participants’ organizations at risk with my organization or any of the other participants’ organizations. None of the participants worked for me. I also did not work with contracts between my organization and any of the participating organizations. I maintained the data collected and analyzed in a personal safe to protect rights of participants for no fewer than 5 years nor used names of organizations or persons in this study. No others have accessibility to my SurveyMonkey® account. No other individuals have seen the raw survey data. The agreement documents are in the text of this study, appendices, and the Table of Contents as well as my National Institutes of Health Certificate of Completion certifying my training in *Protecting Human Research Participants* (Appendix C).

### **Data Collection Instrument**

The data collection for this study included the use of an online survey tool, SurveyMonkey<sup>®</sup>, for capturing survey participant responses as well as gaining their consent via an online consent form prior to starting the survey. Data collected came from survey responses based on questions concerning strategic knowledge management, innovation, and performance questionnaire (Lopez-Nicolas & Merono-Cerdan, 2011). After receiving 69 completed surveys, I exported the raw result data from SurveyMonkey<sup>®</sup> to SPSS 21 as a .sav file, conducted data cleaning to remove the incomplete surveys, tested the assumptions of the data, and conducted multiple linear regression analysis on the remaining surveys. The findings are recorded in Section 3 of this study.

### **Strategic Knowledge Management, Innovation, and Performance Questionnaire**

The use of the Strategic Knowledge Management, Innovation, and Performance Questionnaire by Lopez-Nicolas and Merono-Cerdan (2011) was appropriate for use in this study. Lopez-Nicolas and Merono-Cerdan (2011) created this survey to conduct empirical testing of a sample of 310 Spanish firms of varying industries for determining the effects of strategies of knowledge management on innovation and organizational performance. Furthermore, Lopez-Nicolas and Merono-Cerdan (2011) divided knowledge management strategy into two types, codification and personalization, for determining if there were further differences within knowledge management strategies.

This questionnaire was comprised of three underlying domains with five subscales. The three underlying domains were strategic knowledge management,

innovation, and performance. The two subscales for strategic knowledge management were codification and personalization (Lopez-Nicolas & Merono-Cerdan, 2011). There were no subscales identified for innovation. The three subscales for firm performance were financial performance, process performance, and internal performance (Lopez-Nicolas & Merono-Cerdan, 2011). The scales of measurement for each variable were scaled values. Lopez-Nicholas & Merono-Cerdan (2011) conducted a confirmatory factor analysis of the five subscales of knowledge management and firm performance as well as the innovation domain. The team found the scales had high reliability and validity as indicated by Cronbach's alpha results (Lopez-Nicholas & Merono-Cerdan, 2011). The lowest score was .677 while the highest score was .819 of the subscales and innovation domain (Lopez-Nicholas & Merono-Cerdan, 2011). The domains within this questionnaire support measurement of this study's two independent variables of strategic knowledge management and innovation and the dependent variable of firm performance.

I administered this survey online via SurveyMonkey<sup>®</sup>. This survey took approximately 10 minutes to complete. This survey required the use of a computer with internet access. Brandt et al. (2014) defined close replication of a study having the following qualities: (a) defines proposed replicated effects and methods, (b) follows previous study methods, (c) has high statistical power, (d) provides complete details regarding the replication, and (e) evaluates the replication results. The findings of this study are replicable due to the ease of ability to use this survey and apply it to other organizational industries outside of ship repair.

I derived the scores for this study from the questionnaire responses. Responses to the 20 items ranged from 1 (*strongly disagree*) and 7 (*strongly agree*) on 7-point Likert scales. The scale was: 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *neither agree nor disagree*, 5 = *somewhat agree*, 6 = *agree*, and 7 = *strongly agree*. A higher score indicated a greater opportunity for higher firm performance when knowledge management and innovation practices occur within an organization. There were no reverse-coded items in this survey.

Lopez-Nicolas and Merono-Cerdan (2011) developed this instrument (Appendix D) by using question sets from various studies. Lopez-Nicolas and Merono-Cerdan (2011) adopted the knowledge management strategy questions from Choi and Lee's (2002) studies regarding knowledge management and knowledge creation. Lopez-Nicolas and Merono-Cerdan (2011) adopted the innovation questions from Lee and Choi's (2003) study regarding knowledge management enablers. Finally, Lopez-Nicolas and Merono-Cerdan (2011) adopted the firm performance questions from organizational performance studies (Choi & Lee, 2002; Hoque & James, 2000). I did not find this instrument used in any of the studies reviewed.

While publisher permission was not required for use of this instrument to the survey participants, I sent an email (Appendix E) to the authors of the instrument telling them of my intentions to use the instrument and to solicit opinions on their view of their instrument in this study (Appendix F), but received no response. I did request and receive a limited license from the publisher to reproduce this instrument in this study (Appendix G). Minor changes to the wording of two questions corrected grammatical errors. I

revised one question from the knowledge management section, originally written as “It is easy to get face-to-face advises from experts in your company” to read “It is easy to get face-to-face advice from experts in your company”. Additionally, I revised one question from the firm performance section, originally written as “Compared with key competitors, your company delivers orders quicklier” to read “Compared with key competitors, your company delivers orders more quickly”. Given that these changes only correct the grammar and not the intent of the questions, I assumed the psychometrics properties were preserved.

### **Data Collection Technique**

The technique used to collect data was an electronic, online survey using SurveyMonkey<sup>®</sup>, an authorized data collection and survey tool. I used the option to send the study survey via the prospective participants’ email addresses registered with VSRA rather than an open web link to allow for tracking of the surveys. This option restricted anyone from outside of the desired sample selection criterion from taking the survey. Kays, Gathercoal, and Buhrow (2012) conducted a study as to whether or not participants responded differently to online surveys as opposed to paper-pencil, phone, or interviews. Kays et al. (2012) found there were advantages to Internet-based surveys due to the ability to reach a large audience with fewer costs and time as well as the capacity to cover a wider aspect of subject areas. A disadvantage of this collection technique was that those less familiar with the technology might not respond to Internet-based surveys (Kays, Gatherol, & Buhrow, 2012).

## Data Analysis

As stated in Section 1, the research question for this study was what is the relationship between knowledge management, innovation practices, and firm performance? The associated hypotheses were:

$H_0$ : There is no relationship between knowledge management, innovation, and firm performance.

$H_a$ : There is a statistically significant relationship between knowledge management, innovation, and firm performance.

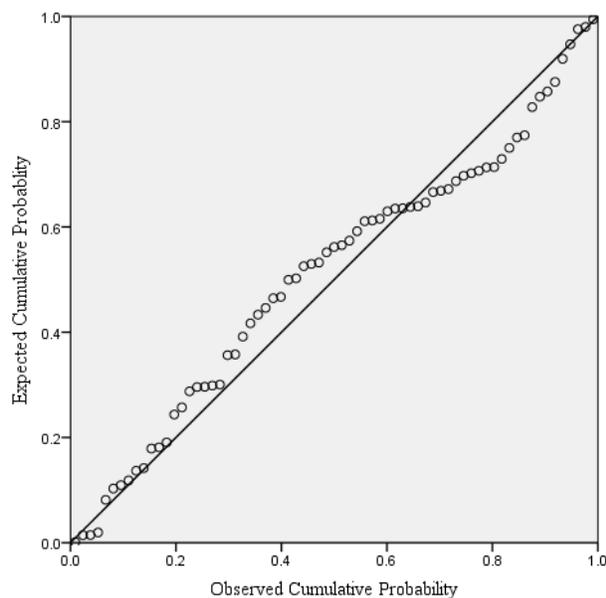
I analyzed the data collected from my survey via SPSS 21 using multiple linear regression analysis (Nathans, Oswald, & Nimom, 2012). Multiple linear regression analysis was appropriate in this study because it supported a statistical assessment of relationships or correlations between variables (Nathans et al., 2012). I selected an instrument with appropriate survey questions for participants to answer using Likert scale responses (Boone & Boone, 2012). Following data collection, I downloaded the responses from SurveyMonkey<sup>®</sup>, performed data cleaning, and transferred the data into SPSS 21 for analysis.

The process of data cleaning ensure researcher detect errors and remove these errors for quality improvement purposes (Cai & Zhu, 2015). As part of the data cleaning process, I examined the data to address missing data and deleted the incomplete surveys before conducting the multiple linear regression analysis in SPSS 21. The data cleaning resulted in 69 completed surveys.

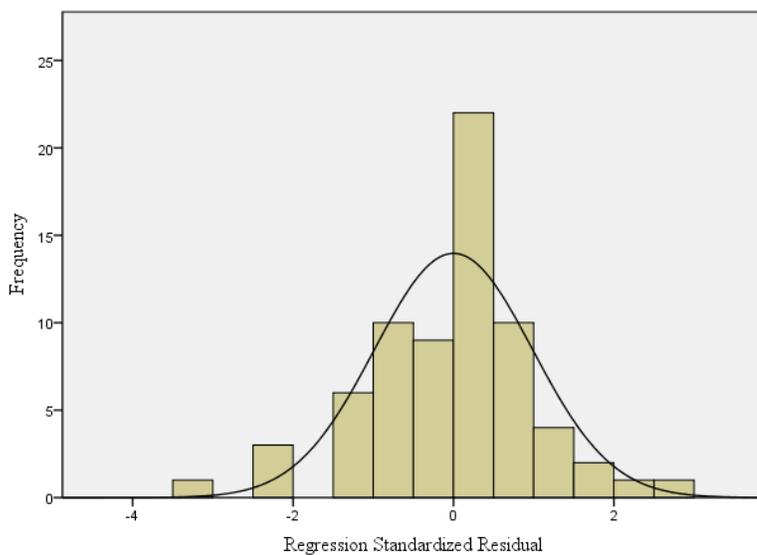
## Testing of Assumptions

Using multiple regression analysis required testing and assessing of the following assumptions: (a) outliers, (b) normality, (c) linearity, (d) multicollinearity, and (e) homoscedasticity (Tabachnick & Fidell, 2013). Testing of assumptions provides support for the statistical analysis of correlation relationships (Tabachnick & Fidell, 2013). I tested each assumption through SPSS 21.

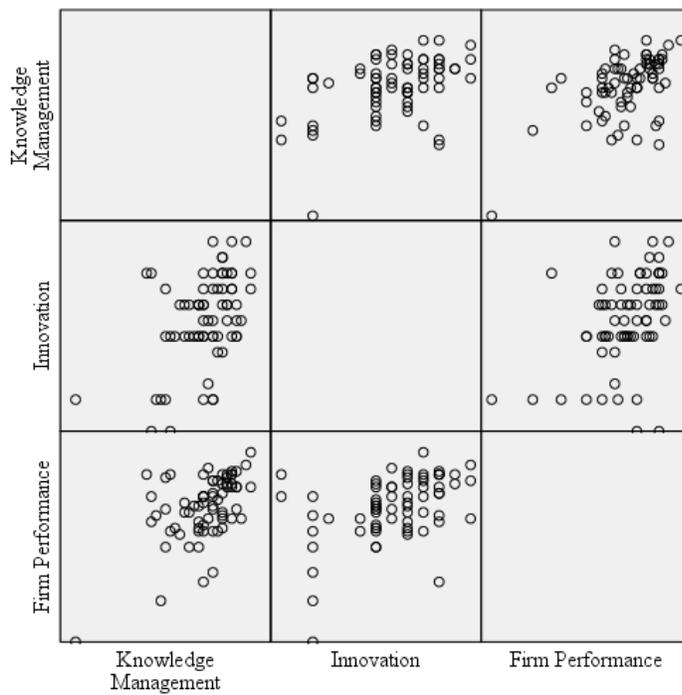
Use of the normal probability plot determined the normal distribution of the data around the dependent variable for normality (Tabachnick & Fidell, 2013). I created a probability plot (Figure 2) and histogram (Figure 3) to depict acceptable normality assumptions. Figure 4 depicts linear relationships between the IVs and each of the IVs with the DV.



*Figure 2.* Normal P-P plot of regression standardized residual: Dependent variable: Firm performance.



*Figure 3.* Histogram of regression standardized residual: Dependent variable: Firm performance.



*Figure 4.* Test for linearity.

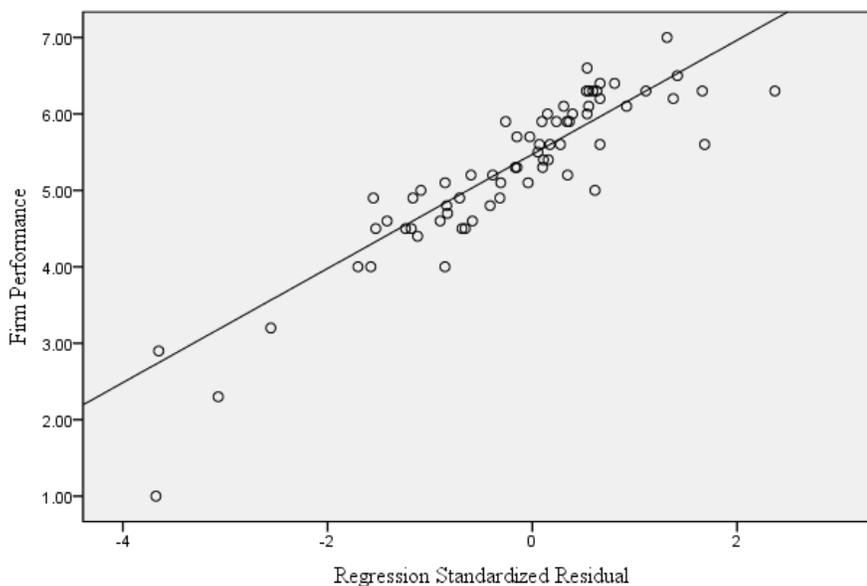
I conducted a test in SPSS 21 regarding severity of multicollinearity using knowledge management as the DV and innovation as the IV. I tested the assumption of multicollinearity to determine if the linear relationships of the IVs depicted in Figure 4 were too close to be useful for data analysis. This test was essential since there are two predictor variables in this study where tolerance and variance inflation factor (VIF) would need to be calculated (McGowan et al., 2012). Per Table 2, the VIF was less than 10, with a tolerance of more than .1 at 1.0, therefore, there were no conflicts between IVs for this study (McGowan et al., 2012; York, 2012).

Table 2

*Multicollinearity of Knowledge Management and Innovation*

Model		Collinearity Statistics	
		Tolerance	VIF
1	Innovation	1.000	1.000

I tested for homoscedasticity to determine that knowledge management had the same impact on firm performance as innovation had on firm performance. Figure 5 depicts the results of the distribution around the fit line. The result does not violate the assumptions since it appears that the plots are scattered somewhat evenly along the fit line without curving around or fanning away from the fit line.



*Figure 5.* Test results for homoscedasticity: Dependent variable: Firm Performance.

Inferential results are the differences in the populations based on the measures calculated from the participants' responses (Tabachnick & Fidell, 2013). I conducted the data analysis logically and sequentially via SPSS 21 to address the research questions and the hypotheses, clearly reporting the outcomes of hypothesis-testing procedures. I ensured the data analysis, for presentation, interpretation, explanation, was consistent with the research question, hypotheses, and underlying theoretical/conceptual framework of the study.

### **Study Validity**

There were several types of validity to address in support of this study such as content validity, criterion-related validity, and construct validity (Punch, 2014). Validity is how study scores are used as opposed to how an instrument is used (Fan, 2013).

Content validity is based on all parts of the defined measure being adequately represented (Punch, 2014). Criterion-related validity is an indicator, when compared to another measure, holds the same characteristics (Punch, 2014). Construct validity, also called measurement validity, addresses whether or not the instrument used will reflect the concept to be measured (Bryman & Bell, 2011). Threats to external validity, internal validity, and statistical conclusion validity were also concerns to address for this study.

Threats to external validity were related to generalizability, in particular to this study is that this study may not apply to other organizations outside of ship repair (Punch, 2014). I addressed this threat by ensuring the instrument was valid for organizations outside of the ship repair association. These questions regarding knowledge management, innovation, and firm performance were applicable to multiple markets and industries. These variables applied to organizations outside of ship repair.

Two other threats to external validity, as specified for quantitative studies, are people generalization and ecological validity. People generalization is based on probability sampling (Punch, 2014), but since this study's sample was based on purposive sampling, a non-probability sample, this threat was not applicable. Ecological validity is a concept of non-social findings being relevant to people (Bryman & Bell, 2011). Since this a social science study and the findings were resultant from participant opinions, this threat was also not applicable.

Threats to internal validity are almost exclusively specific to causal relationships of the variables within a qualitative study (Bryman & Bell, 2011). Specifically, internal validity is in regards to logic and consistency of the research (Punch, 2014). Other than

selecting incorrectly, or the population information being out of date, there was not a threat to the internal validity of the study based on VSRA information. I addressed this threat by requesting the selected participants confirm the fit in the selected group prior to taking the survey.

Statistical conclusion validity is when adequate data analysis supports a logical conclusion for a study (Garcia-Perez, 2012). A threat to statistical conclusion validity particular to this study was my ability to correctly process the statistical data. Another threat was my ability to attain the correct conclusion from the processed data by rejecting the null hypothesis, or Type I error, when it should have been accepted (Tabachnick & Fidell, 2013). I conducted a G\*Power 3.1.9.2 analysis to ensure the minimum sample size was correct. To address the remaining threat, I used all statistical reference material to support a proper interpretation of the resultant data.

Upon conclusion of this study, the research findings were generalizable to larger populations and applied to different settings. The population was within the ship repair industry, but knowledge management, innovation, and firm performance are concerns of most organizations. The proposed study instrument as written is non-specific to any industry or market (Lopez-Nicolas & Merono-Cerdan, 2011).

### **Transition and Summary**

In this section, I restated the purpose statement, research question, and hypotheses of this study, stated my role as a researcher, reviewed the research design, and proposed the population to be studied. I discussed my survey instrument to be used in this study and included all required aspects of data collection, organization, and analysis. Finally, I

discussed the threats and mitigations for internal, external, and statistical conclusion validity specific to this quantitative study.

In Section 3, I will present the findings, application to professional practice, implications for social change. I will provide a discussion of the recommendations for action and further research to include biases I was unaware of until conducting this research. I will summarize the study and discuss the conclusions to include the statistical significance of the research.

### Section 3: Application to Professional Practice and Implications for Change

#### **Introduction**

The purpose of this quantitative correlation study was to examine the relationship between knowledge management, innovation, and firm performance in the U.S. ship repair industry. After sending 637 surveys via SurveyMonkey® to Virginia Ship Repair Association members comprising 253 small and large organizations, of the 84 survey responses, I rejected 15 incomplete surveys and used the remaining 69 completed surveys in this study. One organization of 10 participants was not able to access SurveyMonkey® due to security firewalls at their organization. There was an overall response rate of 13.19% and with a completion rate of 10.83%. In this section, the presentation of the findings, applications to professional practice, and social change provide the basis for the recommendations for future research. Based on the data from this study, I rejected the null hypothesis since the analysis showed that knowledge management and innovation did have a significant positive relationship on firm performance. Tables 3, 4, and 5 represent the means of each survey response.

Table 3

*Means of Knowledge Management Survey Responses (n = 69)*

Knowledge Management	<i>M</i>
Knowledge (know-how, technical skill, or problem solving methods) is well codified in your company.	5.435
Knowledge can be acquired easily through formal documents and manuals in your company.	5.333
Results of projects and meetings should be documented in your company.	6.275
Knowledge is shared through codified forms like manuals or documents in your company.	5.507
Your knowledge can be easily acquired from experts and co-workers in your company.	5.304
It is easy to get face-to-face advice from experts in your company.	5.667
Informal dialogues and meetings are used for knowledge sharing in your company.	5.768
Knowledge is acquired by one-to-one mentoring in your company.	5.087

Table 4

*Means of Innovation Survey Responses (n = 69)*

Innovation	<i>M</i>
The number of new or improved products and services launched to the market is superior to the average in your industry.	4.503
The number of new or improved processes is superior to the average in your industry.	4.609

Table 5

*Means of Firm Performance Survey Responses (n = 69)*

Firm Performance	<i>M</i>
Compared with key competitors, your company is growing faster.	4.899
Compared with key competitors, your company is more profitable.	4.594
Compared with key competitors, your company achieves higher customer satisfaction.	5.551
Compared with key competitors, your company provides higher quality products.	5.812
Compared with key competitors, your company is more efficient in using resources.	4.957
Compared with key competitors, your company has internal processes oriented to quality.	5.870
Compared with key competitors, your company delivers orders more quickly.	5.058
Compared with key competitors, your company has more satisfied employees.	5.333
Compared with key competitors, your company has more qualified employees.	5.420
Compared with key competitors, your company has more creative and innovative employees.	5.217

### **Presentation of the Findings**

Multiple regression analysis was the logical choice to use in the study's evaluation since it supports a statistical assessment of correlations (Nathans, Oswald, & Nimon, 2012). I used standard multiple linear regression,  $\alpha = .05$  (two-tailed) to examine the effectiveness of the IVs in predicting the DV, specifically to ascertain the relationship between knowledge management, innovation, and firm performance. The IVs were knowledge management and innovation. The DV was firm performance. There were no violations of the assumptions as discussed in Section 2.

The null hypothesis was that the IVs did not have a significant relationship with the DV. The alternative hypothesis was that the IVs had a significant relationship with the DV. The model as a whole was able to significantly predict the DV,  $F(2, 66) = 17.33$ ,  $p = .000$ ,  $R^2 = .344$ , therefore, the null hypothesis was rejected. The  $R^2$  (.344) value indicated that approximately 34% of variation in firm performance is accounted for by the linear combination of the predictor variables of knowledge management and innovation as shown in Tables 6 and 7. In Table 8, the model was predictive of firm performance with knowledge management and innovation shown as statistically significant with knowledge management (beta = .442,  $p = .000$ ) accounting for a higher contribution to the model than innovation (beta = .231,  $p = .044$ ).

Table 6

*Descriptive Statistics (n = 69)*

		Bootstrap				
		Statistic	Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
Firm Performance	<i>M</i>	5.27101	.0000	.1227	5.0130	5.49855
	<i>SD</i>	1.036553	-.01483	.14244	.74808	1.29987
Knowledge Management	<i>M</i>	5.5471	-.0007	.0954	5.3496	5.7283
	<i>SD</i>	.79147	-.01190	.10883	.58922	.99558
Innovation	<i>M</i>	4.5580	.0078	.1768	4.2029	4.8986
	<i>SD</i>	1.42596	-.01501	.12460	1.15958	1.65447

Table 7

*Model Summary with Dependent Variable of Firm Performance*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.587	.344	.324	8.51933	1.335

Table 8

*Analysis of Variance*

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	25.160	2	12.580	17.333	.000
Residual	47.902	66	.726		
Total	73.062	68			

In Table 9, the significance of knowledge management and innovation were both less than .05 which indicated both IVs were predictors of the DV, firm performance.

Table 9

*Coefficients of Knowledge Management and Innovation*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.291	.731		1.765	.082
Knowledge Management	.579	.147	.442	3.930	.000
Innovation	.168	.082	.231	2.053	.044

I ran 2,000 bootstrapping samples to adjust for any violations of the assumptions. The results differ in Table 10 from those in Table 9 since the significance of innovation is more than .05 with  $p = .144$ . This indicates that with 2,000 samples in this bootstrapping analysis, innovation is not a predictor of firm performance leaving knowledge management as the single predictor of firm performance. This result does not change the rejection of the null hypothesis since the result is indicative of innovation not providing a significant contribution to firm performance.

Table 10

*Bootstraps for Coefficients of Knowledge Management and Innovation*

Model	B	Bias	Bootstrap			
			Std. Error	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
1 (Constant)	1.291	.092	1.150	.286	-.554	3.796
Knowledge Management	.579	-.020	.214	.007	.136	.965
Innovation	.168	.004	.114	.144	-.058	.393

**Discussion of the Findings**

This study confirmed findings of several studies. While the study results by Arnett and Wittman (2014) are not a direct relationship of knowledge management since the researchers addressed tacit knowledge exchange specifically, there was a positive relationship between the tacit knowledge and firm performance through sales and marketing, which this study does support. Alegre et al. (2013) also conducted a study resulting in showing positive relationships between knowledge management practices and knowledge management dynamic capabilities and knowledge management dynamic capabilities and firm innovative performance. My study does confirm the findings between knowledge management and firm performance, but does not replicate the exact construct of Alegre et al. (2013) variables.

Wang and Wang's (2012) study regarding knowledge sharing, innovation, and firm performance included a seven-point Likert scale similar to the one developed by Lopez-Nicolas and Merono-Cerdan (2011). Wang and Wang (2012) further divided the variables into tacit and explicit knowledge sharing, innovation speed and quality, and

operational and financial firm performance. The results indicated a divide between the variables and their impacts in of tacit and explicit knowledge sharing.

This study extended the findings of Lopez-Nicolas and Merono-Cerdan (2011). Using the same survey instrument created by Lopez-Nicolas and Merono-Cerdan (2011), I examined the views of the employees within the ship repair organizations with both knowledge management and innovation on firm performance. Lopez-Nicolas and Merono-Cerdan (2011) examined if innovation capacity would indirectly affect corporate performance and found it did while my study did not support a significant relationship between innovation and firm performance. This may have been a result of the limited number of questions regarding innovation.

The theoretical framework model I used to support this study was the unified model of dynamic knowledge creation (Nonaka, 1994; Nonaka et al., 2000). This study extended the knowledge of the theoretical framework since there was no evidence examining the ship repair industry in this lens of theoretical framework prior to this study. The only published examination of U.S. ship repair was through a government review of the economic importance of U.S. shipbuilding and ship repair, specifically through operational and capital investments impact (Maritime Administration, 2013).

### **Applications to Professional Practice**

I collected survey data from individuals in positions of management in the ship repair industry to fill gaps in the understanding of how knowledge management and innovation support positive firm performance. Respondents provided their opinions as responses to questions regarding knowledge management, innovation, and firm

performance within their organizations and as compared to their competitors. The participants provided their responses independently, based on their opinions, without using financial documentation or other historical documents from their organizations.

When organizations recognize employees for strong performance, organizations are more likely to have solid firm performance through opportunities for new skill development or autonomy (Tregaskis, Daniels, Glover, Butler, & Meyer, 2013). Managers can influence firm performance through mentorship by investing not only into knowledge management and innovation framework, but also by empowering their employees to better support the organization through knowledge of the organization's processes and practices. As with Wang and Wang's (2012) proposal in using the relationships of knowledge management, innovation, and firm performance to guide the organizational leadership to attain higher organizational performance, this study supports the same underlying goals for organizational firm performance growth through knowledge and innovation.

This study's value to business starts with the responses based on the knowledge and perceptions of the organization concerning knowledge management, innovation, and firm performance internally and as compared to their competitors. The results of this study support the need to continue support of organizational knowledge management and to improve innovation within the organizations. Improvements in these key areas may lead to increased contribution of employee ideas as well as increased mentorship and leadership throughout the workforce. In turn, this would support better products and services to customers.

### **Implications for Social Change**

An organization's support to social change through personal and professional growth of their workforce organization-wide and provides better support to their customers as their internal processes improve. Increasing knowledge sharing and innovation practices provides the organizations' personnel new or additional skills that are immediately usable outside of the organization. These personnel have opportunities to use these new skills while supporting their churches, neighborhoods, family, and friends. Through this, personnel teach these knowledge and innovation practices while transferring them for others to use beginning a continual cycle of positive social change.

The social change led from the organization's leaders and managers avoids ethics violations while encouraging employee empowerment for organizational improvements (Weisenfeld, 2012). As part of organizational learning and organization growth, employees must receive the forceful backup of the leaders and managers to improve the culture of the organization through knowledge sharing and innovative improvement. This organizational culture improvement may lead to positive external culture improvement with the customers increasing firm performance.

Positive social change includes encouraging knowledge management and innovation practices outside of standard meetings to include communities of practice or online forums (Von Krogh, 2012). This would allow those without the voice of management to share their knowledge and grow as a part of the organization through an online presence without violating perceptions of protocol for sharing information. Specifically within communities of practice, this knowledge sharing builds credibility for

the employee as well as the organization. The recommendations for action support the implications for social change.

### **Recommendations for Action**

Actionable recommendations for organizations would start with being aware of the current organizational knowledge management and innovation processes and procedures. Once knowledge of the processes and procedures are known, the management can support putting in place mentorship programs and cross training that allows tacit knowledge to be passed to other workers throughout an organization purposefully to become explicit knowledge. This explicit knowledge would become part of the organizations standard operating procedures, instructions, and other guidance. This will build the explicit knowledge, improve processes and procedures, and open communication throughout an organization while building innovation reflective of the SECI process of dynamic knowledge creation (Nonaka, 1994; Nonaka et al., 2000).

All personnel within an organization should be aware of their organizational knowledge management and innovation practices and policies. There should also be an awareness as to what benefits knowing about these can bring about to the workforce, management, and overall financial bottom line of the organization. Organizational training at the departmental level would be valuable since each department could train on what is important to the organization's success from their perspective. Knowledge sharing during onboarding of employees would allow management to set a tract of positive knowledge management and innovation mindset.

Sharing these study results with the Virginia Ship Repair Association (VSRA) is logical since I drew the participants from this association. To complete this, I would present the findings to the VSRA president independently or to the membership-at-large during a monthly membership luncheon. Ultimately, VSRA will have access to the study, but the method of disseminating the information is still to be determined.

Another avenue to share these results may be at an American Productivity and Quality Center (APQC) or Knowledge Management World (KM World) conference on knowledge management or a Project Management Institute (PMI) conference to discuss how knowledge can be better shared through an organization's PMO. APQC and PMI are forums with member that provides opportunities for interaction with other professionals that would have interest in this study. Finally, I have an option to share these results through my organization's newsletter.

### **Recommendations for Further Research**

For future studies, it is recommended to add employee turnover as a factor to explore via a qualitative case study since knowledge loss can occur without leadership involvement when employees leave an organization (Musa & Ismail, 2011). Conducting a case study would not only support the timeliness of responses, but would add personal interaction to provide personal perceptions and allow for follow-up questions to this survey (Houghton, Casey, Shaw, & Murphy, 2013). The addition of firm size, as in Wang and Wang's (2012) study, would also benefit future research since it adds challenges of exploring information sharing as well as a knowledge management structure overall.

Another option would be to conduct a qualitative longitudinal study. Based on my available timeframe to complete this study, I did not have the time to conduct a longitudinal study that would have added much needed depth to the data collected. Conducting a qualitative longitudinal study with the addition of historical data, such as financial or training records, would add richness to the subject providing background or baseline data.

If the desire is to stay with a quantitative study, surveying knowledge managers and innovation leaders would provide more accuracy for responses since the participants would be more specific to the topic in question. Some participants may not have been aware of their organizational knowledge management procedures and policies, possibly assuming there was little knowledge management or innovation activity so this could support providing unknown false answers. This would be a good opportunity to add in data based on employee turnover as well since it may factor into the effect of tacit knowledge or personal experience loss on firm performance.

Since this study only examined the perspective of the ship repair community within the mid-Atlantic region of Virginia, it would be good to gather samples from additional ship repair associations from other states. Data could then be compared to this study and reveal more avenues for exploration. The examination of other ship repair associations may reveal an increase in statistically significant relationships between knowledge management, innovation, and firm performance. This type of finding would potentially support improvement the relationships within the VSRA.

## **Reflections**

This DBA Doctoral Study process was definitely a challenge balancing work, home, and school. I had to develop plans to write and research, but those plans did not always work out due to travel events for work and ensuring I kept up with my home and family. Since U.S. ship repair literature is sparse outside of government sources, it was more difficult than expected to find literature addressing that industry; however, this made the topic that much more interesting and challenging to research.

I had biases going in that knowledge sharing and transference were regular occurrences. As a retired Naval officer, my experience was that knowledge sharing and transference occurred as daily standard operating procedure to complete tasking since personnel and their tacit knowledge and experience could be gone without notice. A bias of mine was that within the military, we are required to continually share knowledge and lessons learned while being innovative with our processes and procedures since assets were not always available at sea. Another possible bias is that since I retired from the military, a perception is that knowledge is not always shared due to the fear of scarcity of employment. As I am a member of the ship repair industry through my contracted knowledge management responsibilities, I am hopeful that this study can bring about interest in the knowledge management and innovation processes throughout an organization vice relying exclusively on management for each process or procedure.

## **Summary and Study Conclusions**

The need to continue examining the relationship of knowledge sharing and innovation of firm performance is critical with the continual shrinking labor forces

throughout the United States (Bureau of Labor Statistics, 2014, para. 3). Through this quantitative correlation study, I examined the relationship between knowledge management and innovation on firm performance of the U.S. ship repair industry through members of the VSRA. I conducted an online survey through SurveyMonkey<sup>®</sup> to obtain a minimum of 68 completed surveys to process through multilinear regression analysis using the resultant data from SurveyMonkey<sup>®</sup> exported directly to SPSS. I used the Strategic Knowledge Management, Innovation, and Performance Questionnaire by Lopez-Nicolas and Merono-Cerdan (2011) (Appendix D) for this study.

Study results were statistically significant for a positive correlation between knowledge management, innovation, and firm performance. Knowledge management was a more influential variable than innovation in this study. I rejected the null hypothesis based on the resultant positive correlation.

I recommend continued examination and exploration through the addition of employee turnover and firm size in future studies as well as conducting research of knowledge management, innovation, and firm performance as longitudinal case studies to add depth to this research. This study is the only examination of U.S. ship repair regarding knowledge management, innovation, and firm performance that I was able to find and believe it to be the only one. With reduction in forces to work on these government contracts, it is imperative that knowledge management and innovation continue to expand and improve to ensure ship repair organizations continue to flourish in this economy and dwindling labor forces.

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## Appendix A: Letter of Cooperation

## VIRGINIA SHIP REPAIR ASSOCIATION



150 Boush Street, Suite 802 Norfolk, VA 23510

Voice : 757.233.7034 Fax : 757.233.7035

October 30, 2015

Cynthia J. Young, PMP, LSS MBB  
Walden University, College of Management and Technology  
[REDACTED]

RE: Letter of Cooperation

Dear Cynthia,

Based on the review of your research proposal, the Virginia Ship Repair Association (VSRA) will support the project entitled *Knowledge Management and Innovation on Firm Performance of United States Ship Repair*. As part of this study, VSRA will assist you in soliciting members to provide opinions of their organization's knowledge management processes, policies, and programmatics, organizational innovation, and firm performance via a confidential survey conducted via the Internet. Individual member participation will be completely voluntary and at their own discretion. Your selection of member companies desired to participate will be based upon previously established member consent to allow VSRA and VSRA members to use their email addresses.

[REDACTED] will assist you in your access to the member database for members that identify their positions within their organizations and their authorized email addresses of members meeting your inclusion criteria. Although this information is entirely accessible to you via your VSRA membership login, we understand that this will help you simplify your identification process for members as participants.

VSRA reserves the right to withdraw from the study at any time.

[REDACTED] I am authorized to approve research in this setting and that this request complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from VSRA and the Walden University IRB. Although the raw data will not be shared with VSRA, we will meet following the completion of your doctoral study to allow you to provide me [REDACTED] the summary of the results of your study for possible dissemination.

Sincerely,  
[REDACTED]

## Appendix B: Consent Form

You are invited to take part in a research study to help determine how knowledge management and innovation within organizations of Virginia Ship Repair Association affect the performance of those organizations. The researcher is inviting you to be in the study since you have identified yourself on your VSRA membership as a CEO/President, Human Resource person, or a member in a leadership position within your organization.. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Cynthia J. Young, a doctoral student at Walden University. You may already know the researcher as Cindy Young, a knowledge manager with McKean Defense. This study is separate from that role.

### **Background Information:**

The purpose of this study is to examine if knowledge management and innovation within an organization has an effect on the organization’s performance.

This study will not require you to use any of your personal notes, your organization’s papers, or your organization’s financial data.

Data will only be collected once and is expected to take approximately 10 minutes to complete.

### **Procedures:**

If you agree to be in this study, you will be asked to:

- Provide your opinions by responding to survey questions on a scale of 1 to 7 where 1 = strongly disagree and 7 = strongly agree.

### **Here are some sample statements you will be asked to respond to:**

- Knowledge (know-how, technical skill, or problem solving methods) is well codified in your company.
- The number of new or improved products and services launched to the market is superior to the average in your industry.
- Firm performance (as compared with key competitors, your company...) is growing faster.

**Voluntary Nature of the Study:** This study is voluntary.

Everyone will respect your decision of whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

**Risks and Benefits of Being in the Study:** Being in this study would not pose risk to your safety or well-being.

The study's potential benefits are to collect data that may show organizations within the Virginia Ship Repair Association how knowledge management and innovation affect performance of the organization.

**Payment:** No payments are associated with this survey.

**Privacy:** Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. I will not include your name or anything else that could identify you in the study reports. I will maintain the data collected and analyzed in a safe to protect rights of participants and will not use names of individual organizations or individuals in this study. The researcher will be the single owner and user of the password to access my SurveyMonkey® account. The only individuals of the researcher to see the survey data in its raw form will be my required representatives at Walden University for the purposes of my doctoral study review and acceptance processes. Data will be kept for a period of at least 5 years, as required by the university.

**Contacts and Questions:** For questions now or later, you may contact the researcher via email at [cynthia.young3@waldenu.edu](mailto:cynthia.young3@waldenu.edu). If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1 21. Walden University's approval number for this study is IRB 11-13-15-0418195 and it expires on 11/12/2016.

**Please print or save this consent form for your records.**

**Statement of Consent:** I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By selecting, "I consent". I understand that I am agreeing to the terms described above.

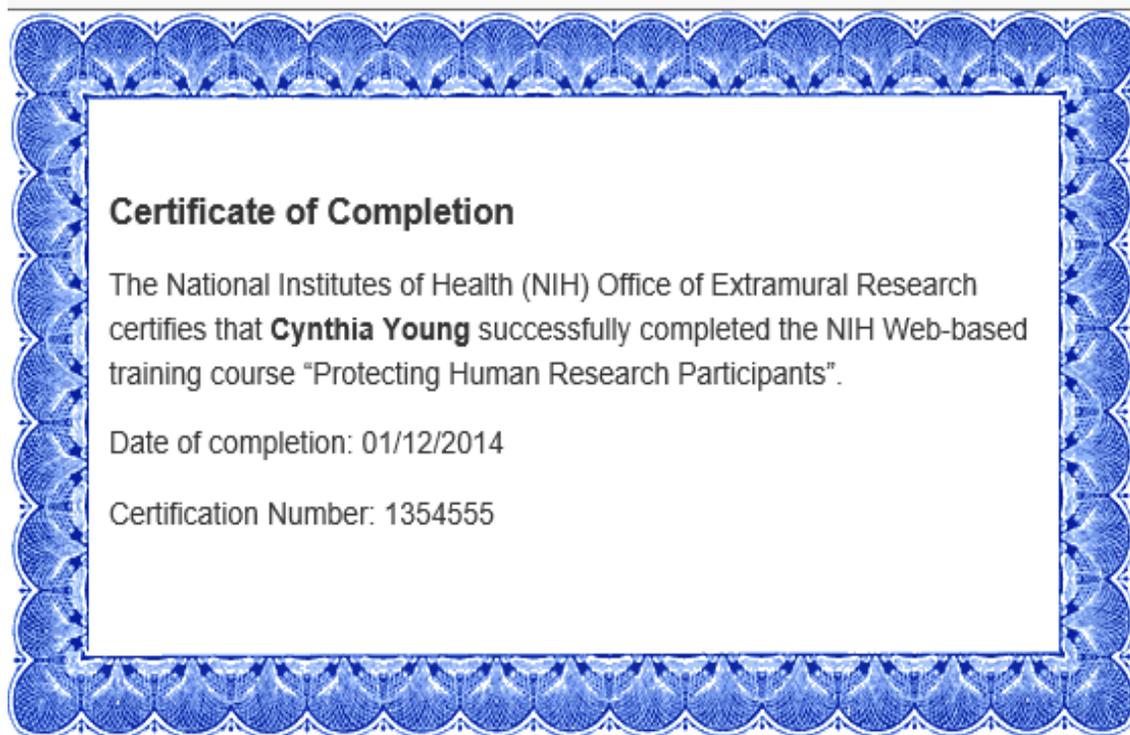
-----  
Answer options on survey:

I consent

I do not consent.

If the participant selects "I consent." they will be taken to the survey questions.  
If the participant selects "I do not consent." they will be taken to the "Thank you" page through the page logic tool and will not have the opportunity to answer the survey.

## Appendix C: National Institutes of Health Certificate of Completion



## Appendix D: Sample of Instrument

Measurement (7-point scales where 1 = *strongly disagree* and 7 = *strongly agree*)

### *Section 1: Knowledge Management Strategy (KMS)*

KMS1 - Knowledge (know-how, technical skill, or problem solving methods) is well codified in your company.

KMS2 - Knowledge can be acquired easily through formal documents and manuals in your company.

KMS3 - Results of projects and meetings should be documented in your company.

KMS4 - Knowledge is shared through codified forms like manuals or documents in your company.

KMS5 - My knowledge can be easily acquired from experts and co-workers in your company.

KMS6 - It is easy to get face-to-face advice from experts in your company.

KMS7 - Informal dialogues and meetings are used for knowledge sharing in your company.

KMS8 - Knowledge is acquired by one-to-one mentoring in your company.

### *Section 2: Innovation (INN)*

INN1 - The number of new or improved products and services launched to the market is superior to the average in your industry.

INN2 - The number of new or improved processes is superior to the average in your industry.

*Section 3: Firm Performance (Compared with key competitors, your company . . .)*

FP1 - is growing faster

FP2 - is more profitable

FP3 - achieves higher customer satisfaction.

FP4 - provides higher quality products.

FP5 - is more efficient in using resources.

FP6 - has internal processes oriented to quality.

FP7 - delivers orders quicker.

FP8 - has more satisfied employees.

FP9 - has more qualified employees.

FP10 - has more creative and innovative employees.

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## Appendix E: PsycTESTS Documentation

**Strategic Knowledge Management, Innovation and Performance Questionnaire**

Note: Test name created by PsycTESTS

**PsycTESTS Citation:**

Lopez-Nicolás, C., & Meroño-Cerdán, Á. (2012). Strategic Knowledge Management, Innovation and Performance Questionnaire [Database record]. Retrieved from PsycTESTS. doi: 10.1037/t34065-000

Test Shown: Full

**Test Format:**

Responses for the 20 items ranged from 1 (strongly disagree) and 7 (strongly agree) on 7-point scales.

**Source:**

López-Nicolás, Carolina, & Meroño-Cerdán, Ángel L. (2011). Strategic knowledge management, innovation and performance. *International Journal of Information Management*, Vol 31(6), 502-509. doi: 10.1016/j.ijinfomgt.2011.02.003, © 2011 by Elsevier. Reproduced by Permission of Elsevier.

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## Appendix F: Email to Questionnaire Authors



Cynthia Young &lt;cynthia.young3@waldenu.edu&gt;

---

**Your Strategic Knowledge Management, Innovation, and Performance Questionnaire**


---

Cynthia Young <cynthia.young3@waldenu.edu>  
 To: carlopez@um.es, angelmer@um.es

Sun, Mar 8, 2015 at 9:09 PM

Good evening,

My name is Cynthia Young and I am a doctoral candidate with Walden University. I believe your questionnaire regarding strategic knowledge management, innovation, and performance may support my doctoral research via a quantitative correlation study. I read in your 2011 article, Strategic Knowledge Management, Innovation, and Performance in the journal, International Journal of Information Management, that you conducted your questionnaire via interviews.

I realize that you have given permission to use your instrument for research and testing per the psychTESTS database, but I would greatly appreciate your permission on the use of your instrument in my doctoral study nonetheless. I intend to conduct an online research survey to gather information about knowledge management and innovation to determine their relationship to firm performance and believe your questionnaire best fits my intended doctoral research instrument. Did you consider sending this questionnaire to your participants via online methods?

Copied are my current versions of my problem and purpose statements from my draft doctoral study:

**Problem Statement**

The largest concentration of the United States' labor force, those age 25 to 54 years, comprised 71.4% of the labor force in 1992 has since decreased to 65.3% in 2012 (Bureau of Labor Statistics, 2014). Based on projections, by 2022 the 25 to 54 age group should decline almost another 2% comprising 63.1% of the total labor force (Bureau of Labor Statistics, 2014). The general business problem is ensuring solid knowledge management practices are resident throughout an organization to support the growing employee turnover of the largest section of the labor force. The specific business problem is organizations may lack strategies to manage knowledge and innovation practices to ensure positive firm performance as employee turnover occurs.

**Purpose Statement**

The purpose of this quantitative correlation study is to examine the relationship between knowledge management, innovation, and firm performance. The independent variables are knowledge management and innovation. The dependent variable is firm performance. The targeted population is membership from the Virginia Ship Repair Association (VSRA) in the mid-Atlantic, Tidewater region. I intend to survey the CEO/Presidents as well as Human Resource and Operations leadership from the over 230 organizations that are part of VSRA. Raosoft (2004) calculations set a sample size of 145 based on a 5% margin of error, 95% confidence, a population of 230, and a 50% response distribution while Tabachnick and Fidell's (2013) calculations set a sample size of greater than or equal to 66. This population is justified because Virginia has the largest percent of United States private employment in the United States shipbuilding and repair industry at 24.9%, which is 12% more than the closest competing state (Maritime Administration, 2013). The implication for positive social change includes supporting organizational knowledge management even with employee turnover while continuing to execute an organization's strategic plans.

Thank you in advance for your help and the consideration for granting use of your survey instrument and for your time. I feel your instrument is the best one to support my doctoral study.

Regards,

Cynthia Young, PMP, LSSMBB

Doctoral Candidate, Doctor of Business Administration

Walden University

## Appendix G: License Agreement

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