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Social Presence, Immediacy of Communication, Concurrency, and Use of Enterprise Social Networks

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Walden University
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Abstract

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MPhil, Walden University, 2019

MBA, Keller Graduate School of Management, 2005

BS, DeVry University, 2003

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Applied Management and Decision Sciences

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Abstract

Managers are faced with low continuous postadoption usage rates for enterprise social networks implemented at high costs. The problem is a potential loss of value-added benefits when organizations experience a lapse in continuous usage of enterprise social networks among corporate knowledge workers. The purpose of this quantitative study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. The key research question aimed to examine the relationship among social presence, immediacy of communication, concurrency, and the continuous usage of enterprise social networks. Multiple linear regression analysis was used to test the unified theory of acceptance and use of technology with 107 knowledge workers at information technology Fortune 500 companies in the United States. Key results of the study were that immediacy of communication and concurrency were significantly, positively related to continuous usage, while social presence was not significantly related to continuous usage. The overall regression model was statistically significant, $F(3, 103) = 62.64$, $p < .001$; Adjusted $R^2 = .64$, with at least one of the predictor variables a significant predictor of continuous usage, where the study model accounted for 64% of the variance in continuous usage. A recommendation for future researchers is to increase the sample size to increase internal validity. The findings may contribute to positive social change by providing Fortune 500 managers with useful strategic information to increase continuous usage of enterprise social networks which leads to increased innovation.

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Dedication

I dedicate this wonderful milestone to my parents, Frank (deceased) and Lucy. I am grateful to my immediate family for their love, patience, and support. To my husband, Tracey, thank you for carrying the load whenever I needed--I love you dearly. To my daughter, Olecia, and granddaughter Ny'Imah, I love you both, and thank you for always being my cheerleaders and inspiration. Special thanks to Dr. Theresa Pepe for being there, and being supportive of the journey I embarked upon.

Acknowledgments

"*A journey of a thousand miles begins with a single step*." ~Lao Tzu

All praises to God. Without Him, I am nothing, but with Him, I can do all things. The doctoral journey has been exciting and challenging with its ebbs and flows. Thank you to my committee members Dr. Craig Barton, Dr. John Nolley, and Dr. Raghu Korrapati for providing guidance to complete my dissertation. I am forever thankful to each and every person that had a part in this major milestone.

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Chapter 1: Introduction to the Study

Knowledge sharing via collaborative technologies characterizes the experience of work for many employees in the contemporary global workforce. A key reason is that knowledge sharing is linked to improved organizational performance (Nisar, Prabhakar, & Strakova, 2019; Sheng & Hartono, 2015; Singh & Power, 2014). Collaboration technology is crucial in support of an organization's mission, and when users explore the technology after implementation, it becomes a return on investment and a way to increase innovation (Maruping & Magni, 2015). Business leaders have implemented enterprise social networks to improve collaboration and knowledge sharing, allowing disbursed employees to socialize and quickly gain information while working on other tasks, yet continued usage of enterprise social networks remains a challenge postadoption (Wehner, Ritter, & Leist, 2017). Using a quantitative survey research design, I explored the factors that contribute to the continuous adoption of enterprise social networks.

I applied the unified theory of acceptance and use of technology to examine whether a relationship exists among social presence, immediacy of communication, concurrency (the ability to perform multiple activities concurrently), and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018. This chapter contains the background, problem statement, and purpose of the study. The research questions, theoretical foundation, and nature of the study precede the definitions, assumptions, scope and delimitations, limitations, the significance of the study, and a summary and transition to Chapter 2.

Background of the Study

The use of enterprise social networks in organizations is a key focus of business researchers. Wehner et al. (2017) conducted a systematic literature review and detailed topic analysis of enterprise social networks and the current state of research. Researchers showed less focus on the influence of enterprise social network in areas of collaboration, the culture of the organization, communication, and effective ways to increase use (Wehner et al., 2017). Van Osch, Steinfield, and Balogh (2015) provided background on challenges and opportunities using enterprise social media including social networking to communicate and collaborate throughout the organization. They found problems with adoption and use of enterprise social network indicating there was a need for effective strategies to increase utilization (Van Osch et al., 2015). The goal of Engler and Alpar (2017) was to build a model to determine intent to use enterprise social media and also to provide factors driving the adoption of enterprise social media. Engler and Alpar's results showed there is a difference with immediacy of communication, concurrency, and social presence dependent on the enterprise social media used.

Oostervink, Agterberg, and Huysman (2016) conducted a qualitative case study at an international information technology consultancy organization to investigate the use of enterprise social media for knowledge sharing. The findings showed the conflict for users was whether to share their knowledge with coworkers according to organizational standards or act as corporate members who share work knowledge to collaborate to increase organizational productivity (Oostervink et al., 2016). Similarly, the findings of a qualitative study of a global organization by Choudrie and Zamani (2016) indicated

hindrances with top-down and bottom-up pressures to effectively use the enterprise social network diminished the uptake of the platform. To provide more insight about these barriers, Stei and Rossmann (2017) conducted a qualitative study to find out what organizational leaders can do to influence the successful adoption and use of enterprise social networks due to low use after implementation. Findings indicated that the framing of enterprise social networks is a multilevel construct consisting of the individual, group, and organizational levels (Stei & Rossmann, 2017). Mäntymäki and Riemer (2016) collected data from five Australian companies using Yammer for day-to-day work activities, and the findings indicated that the users valued the ability to engage unsolicited with the system to share ideas and information. Chin, Evans, and Choo (2015) conducted an explorative case study research of two global professional service firms. The findings indicated low usage for sharing content and contributing to the enterprise social network based on the interviews of knowledge workers who had experience using enterprise social network (Chin et al., 2015).

Problem Statement

Organizational leaders are adopting enterprise social networks to increase collaboration and innovation among geographically disbursed employees using online platforms for finding, connecting, messaging, and interacting with colleagues (Berger, Klier, Klier, & Probst, 2014; Riemer, Stieglitz, & Meske, 2015). Survey data collected on 1,500 companies using enterprise social networks by McKinsey and Company from 2007 to 2015 showed companies who used this technology loyally derived an incremental 5% in value added in 2010 and 6.5% in 2014 (Bughin, 2015). Bughin (2015) indicated the

data from the survey showed 66% of companies were using enterprise social networks, but only one out of five employees was an active user, which could have decreased companies' revenue benefits from enterprise social network usage. The general problem is that organizational managers are challenged by low continuous postadoption usage rates for enterprise social networks implemented at high costs (Bala, Massey, & Hsieh, 2016; Cai, Huang, Liu, & Wang, 2018). The specific management problem is a potential loss of value-added benefits when organizations experience a lapse in continuous usage of enterprise social networks among corporate knowledge workers (Aboelmaged, 2018; Archer-Brown & Kietzmann, 2018; Bughin, 2015; Cetto, Klier, Richter, & Zolitschka, 2018). Based on the literature reviewed, there is a seeming lack of empirical studies that address the relationship among employees' social presence, the immediacy of communication, concurrency, and the continuous use of enterprise social networks.

Purpose of the Study

The purpose of this quantitative survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. The independent variable social presence was defined as the score on the Social Presence scale of the Constructs and Measures survey (Brown, Dennis, & Venkatesh, 2010). The second independent variable of immediacy of communication was defined as the score on the Immediacy scale of the Constructs and Measures survey. The third independent variable of concurrency was defined as the score on the Concurrency scale of the Constructs and

Measures survey. The dependent variable of continuous usage was defined as the score on the Use scale of the Constructs and Measures survey.

Research Question and Hypotheses

The overarching research question for the study was as follows:

What is the relationship among social presence, immediacy of communication, concurrency, and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018?

I tested the following hypotheses:

$H_0$1: There is no significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A1: There is a significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

$H_0$2: There is no significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A2: There is a significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

$H_0$3: There is no significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A3: There is a significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

Theoretical Foundation

The theoretical framework for this study was the unified theory of acceptance and use of technology developed by Venkatesh, Morris, Davis, and Davis (2003). Researchers such as Brown et al. (2010) and Engler and Alpar (2017) conducted quantitative studies that incorporated the theoretical framework of unified theory of acceptance and use of technology to determine whether users will adopt and use collaborative tools including enterprise social networks. In line with Brown et al. and Engler and Alpar, incorporating collaborative theories with unified theory of acceptance and use of technology was helpful in answering the research question posed in this study.

According to Brown et al. (2010), technology adoption is at an established stage in the information systems field, including in research where many frameworks are applicable and can be used to extend research. Brown et al. indicated that the technology adoption model is the most widely used theoretical model to predict the adoption of technology. The technology acceptance model originated more than 25 years ago in the field of psychology utilizing the theory of reasoned action and theory of planned behavior (Marangunić & Granić, 2015). The technology acceptance model continues to be a top

model used to predict human behavior in accepting or rejecting technology (Marangunić & Granić, 2015). In developing the unified theory of acceptance and use of technology, Venkatesh et al. (2003) included eight of the elements from the technology acceptance model and extended them with social and facilitating conditions.

As robust as the unified theory of acceptance and use of technology is, it is limited in predicting design criteria that influence the adoption of technology. Based on their study results, Brown et al. (2010) recommended that future researchers study the unified theory of acceptance and use of technology integrated with collaboration research theories such as social presence theory, immediacy of communication, and concurrency. The factors in these theories could influence the adoption and use of collaboration technology such as enterprise social networks, the focus of this study. Researchers have used the unified theory of acceptance and use of technology for nearly two decades to forecast behavioral intention to use technology and the actual usage of that technology mainly in organizations (Venkatesh, Thong, & Xu, 2016). With the unified theory of acceptance and use of technology in its maturity, Venkatesh et al. (2016) posited that it described 77% of the difference in behavioral intention to use a particular technology and 52% of the variation in technology use. Figure 1 illustrates the relationship between the dependent variable in this study, continuous usage, and the three independent variables of social presence, immediacy of communication, and concurrency.

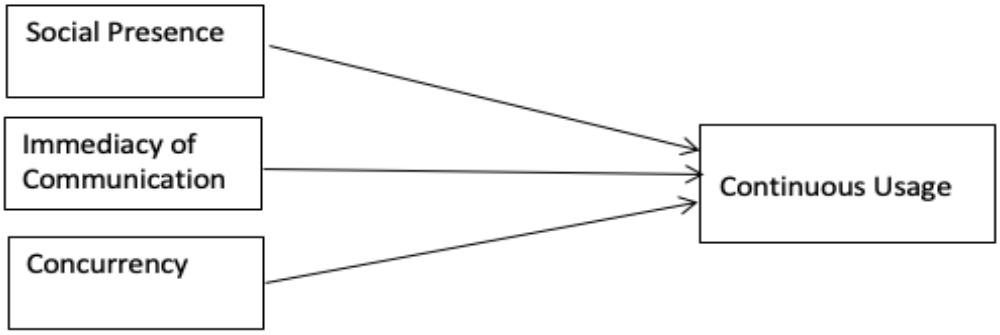

Figure 1. Variables and their relationships.

Nature of the Study

The nature of this study was a quantitative correlational study using regression analysis based on the methodology as demonstrated in Brown et al. (2010). The population was corporate knowledge workers who used enterprise social networks at information technology Fortune 500 companies in the United States. I estimated the sample size to be 107 based on Green's 1991 guideline for calculating regression sample size (as cited in VanVoorhis & Morgan, 2007). Green indicated the way to test individual predictors is to start with a sample size of 104 and add the number of independent variables, which in this research was three for a total of 107.

In this study, I sought to explore the independent variables of social presence, immediacy of communication, concurrency, and the dependent variable of use of enterprise social networks using the inferential statistic linear regression analysis, following Brown et al.'s (2010) approach. I obtained permission to adapt and use the

Constructs and Measures survey to measure the independent variables and the dependent variable.

Definitions

The following terms and definitions provide readers with a common understanding of the terminology used in this study:

Concurrency: Collaboration technology facilitating users' ability to multitask and do other tasks while using the system (Brown et al., 2010).

Enterprise social networks: Technology systems used in organizations for employees to collaborate, locate, and share knowledge with features similar to consumer-oriented social media such as Facebook, Twitter, and LinkedIn (Drahoova & Balco, 2016).

Immediacy of communication: The degree to which a collaboration via technology enables an individual to quickly correspond with other users (Brown et al., 2010).

Information technology: Collaboration and communication technologies that connect virtual team members who are geographically disbursed nationally or internationally to social media technologies used for knowledge sharing internally and externally to the organization (De Vreede, Antunes, Vassileva, Gerosa, & Wu, 2016).

Knowledge worker: Generates or uses knowledge to develop knowledge in a way that produces new products or services, in job roles such as engineers, scientists, software developers, programmers, and executive level positions (Shujahat et al., 2019). Drucker (1999, p. 83) identified six main factors of productive knowledge workers:

1. Knowledge-worker productivity seeks and answers the question of what is the task.
2. Knowledge workers must manage their individual tasks and require independence.
3. Using knowledge for innovations in the organization is the focus and job of knowledge workers.
4. Knowledge workers must obtain continuous learning as well as impart knowledge to others.
5. Knowledge-worker productivity is based, firstly, on the quality of the output, not the quantity.
6. Knowledge-worker productivity is valued as an asset and not as a cost by the organization where the knowledge worker would prefer to be employed at that organization versus any other prospects.

Social presence theory: A theory that maintains collaboration technology is differentiated by the technology's ability to express psychological impression of the user physically being present (Brown et al., 2010).

Assumptions

Several assumptions were considered for this quantitative survey research. Assumptions are what the researcher believes to be true but not proven accurate (Marshall & Rossman, 2014). One assumption was this topic was important because knowledge workers' output is content-based knowledge where organizations are shifting from individualized content-based knowledge management towards collaboration-based

knowledge management with the use of enterprise social networks (O'Leary, 2016a; O'Leary, 2016b). Finding out why individuals continue or stop using an information system helps increase users' acceptance of information systems such as enterprise social networks (Bonsón, Escobar, & Ratkai, 2014). The methodological assumption was each respondent would possess a functional understanding of enterprise social networks and understood the questions on the survey instrument. It was assumed that the instrument would measure what it set out to study. Theoretical assumption was that the unified theory of acceptance and use of technology integrated with collaboration-related constructs of technology characteristics would help to explain the results of the study.

Scope and Delimitations

An online survey was administered through SurveyMonkey.com to collect responses from knowledge workers at information technology Fortune 500 companies in the United States who adopted collaboration technology such as enterprise social networks. Delimitations to define the scope of the study were to exclude roles that were not identified as knowledge workers at information technology Fortune 500 companies as well as exclude knowledge workers who were not employed at information technology Fortune 500 companies.

Limitations

Limitations are described as potential shortcomings usually not controlled by the researcher (Marshall & Rossman, 2014). For this descriptive correlation study, I used nonprobability snowball sampling where no attempt was made to randomize the sample, which posed a limitation to generalize the findings to the population. A limitation was

using snowball sampling towards those who are more amenable to research. I expected there could have been errors in self-reported data due to the participants' perception and their willingness in reporting perceptions accurately.

Significance of the Study

The potential significance of the study was to provide information that could aid business managers in making decisions about the allocation of funding for acquisition, training, and adoption of enterprise social networks. The information regarding the influence of employees' social presence, the immediacy of communication, and concurrency on continuous usage of enterprise social networks could add value to the business through corporate collaboration and knowledge sharing among geographically-disbursed employees. Examining how enterprise social networks' usage related to the user's perception of virtual collaboration will help decision-makers effectively build buy-in of enterprise social networks and lead to increased efficiency with dynamic and transparent knowledge sharing among employees.

Significance to Theory and Practice

The potential contribution of the study is that findings correspond to the model developed and tested by Brown et al. (2010) and expand the original study using a participant pool in the United States comprised of corporate knowledge workers on virtual teams. The study could have the potential of promoting innovation and collaboration in the virtual workplace using enterprise social networks of publicly held Fortune 500 companies in the United States. Management has increased spending on collaboration technology (Colbert, Yee, & George, 2016; Maruping & Magni, 2015), and

the research implications from this study could lead to designing enterprise social networks that heighten collaboration among corporate knowledge workers.

Significance to Social Change

Van Osch et al. (2015) asserted that enterprise social networks impact corporate knowledge workers in different areas of organizations including sharing knowledge and managing innovations. The growth of enterprise social networks has resulted in its implementation where four out of five companies are at different stages of maturity (Van Osch et al., 2015). The potential positive social change of this study is introducing creative information technology initiatives that use enterprise social networks to leverage collaboration across global boundaries. The information from this study is insightful to help managers make decisions about the allocation of funding for acquisition, training, and adoption of enterprise social networks.

Summary and Transition

Knowledge sharing is confirmed as a link to improvement in organizational performance (Nisar et al., 2019; Sheng & Hartono, 2015; Singh & Power, 2014), and collaboration technology is a return on investment when it is continuously used to increase innovation (Maruping & Magni, 2015). This study was grounded in the unified theory of acceptance and use of technology integrated with collaboration-related constructs and technology characteristics. I examined social presence, immediacy of communication, concurrency, and use of enterprise social networks by knowledge workers within information technology Fortune 500 companies.

Chapter 1 introduced the research by establishing the problem statement, research questions, purpose of the study, theoretical basis, assumptions, limitations, delimitations, definitions, and significance. In Chapter 2, the current literature is reviewed that is relevant to using enterprise social networks to collaborate among information technology knowledge workers at Fortune 500 companies in the United States. The literature review also includes explanations of the literature search strategy, a discussion of the theoretical foundation, and information about the key variables and concepts of the study.

Chapter 2: Literature Review

The general problem is that organizational managers are challenged by low continuous postadoption usage rates for enterprise social networks implemented at high costs (Bala et al., 2016; Cai et al., 2018). The specific management problem is a potential loss of value-added benefits when organizations experience a lapse in continuous usage of enterprise social networks among corporate knowledge workers (Aboelmaged, 2018; Archer-Brown & Kietzmann, 2018; Bughin, 2015; Cetto et al., 2018). The purpose of this quantitative survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. Findings from survey data collected on 1,500 companies using enterprise social networks by McKinsey and Company from 2007 to 2015 showed companies who used this technology loyally derived an incremental 5% in added value in 2010 and 6.5% in 2014 (Bughin, 2015). Bughin (2015) indicated that the data from the survey show 66% of companies were using enterprise social networks, but only one out of five employees were active users, which can decrease companies' revenue benefit from enterprise social network usage.

In this chapter, I will review the literature on the study topic. Sections include "Literature Search Strategy," "Theoretical Framework," and "Literature Review Related to Key Variables." Last, the "Summary and Conclusions" section will include a summary of the key points in this chapter.

Literature Search Strategy

Walden University's databases were the primary source of scholarly literature for the literature review. I obtained pertinent peer-reviewed articles from the online databases EBSCOhost, Google Scholar, Information Systems Management, ProQuest Central, ScienceDirect, Dissertations & Theses @ Walden University, and ProQuest Dissertations & Theses Global. I also used Walden's Thoreau Multi-Database Search. I used a combination search terms and key words, which included *collaboration information systems*, *collaboration technology*, *concurrency*, *continued usage intention*, *ESN*, *enterprise social media*, *enterprise social networks*, *expectations-confirmation theory*, *immediacy of communication*, *information technology*, *IS continuance*, *knowledge management*, *knowledge workers*, *post-adoption intention*, *social media*, *social networks*, *social presence theory*, *technology acceptance*, *technology acceptance model*, *technology adoption*, *UTAUT*, and *unified theory of acceptance and use of technology*.

I sought peer-reviewed journal articles from the databases indicated. The qualifiers used for the search included peer-reviewed, full-text, and scholarly journals with a range of publication from December 2014 until October 2019. Articles related to this study were grouped by subject and date and categorized by topic (collaboration technology, enterprise social networks, information technology, technology acceptance model, and virtual teams).

Theoretical Foundation

The theoretical framework for this study was the unified theory of acceptance and use of technology integrated with collaboration-related constructs, technological characteristics of social presence, immediacy of communications, and concurrency.

Four Core Constructs of Unified Theory of Acceptance and Use of Technology

The unified theory of acceptance and use of technology has four core constructs that include: (a) performance expectancy; (b) effort expectancy; (c) social influence; and (d) facilitating conditions that are directly related to usage intention and behavior (Venkatesh et al., 2003). The four core constructs were derived from eight distinct models of information technology system adoption that are integrated in theory. Venkatesh et al. (2003, p. 428) described these models as: (a) the theory of reasoned action; (b) the technology acceptance model; (c) the motivational model; (d) the theory of planned behavior; (e) a model combining the technology acceptance model and the theory of planned behavior; (f) the model of PC utilization; (g) the innovation of diffusion theory; and lastly, (h) social cognitive theory.

The theory of reasoned action developed by Fishbein and Ajzen (1975) has its roots in psychology, defining relationships between beliefs, attitudes, norms, intentions, and behavior. The technology acceptance model, which has the theory of reasoned action as part of its foundation, originated to predict whether an individual will adopt to using new technology (Davis, 1985). A few years later, Davis and Warshaw (1992) developed the motivational model to explain why an individual chooses one technology versus another. The theory of planned behavior, an extension of the theory of reasoned action,

was created by Ajzen (1985). Attitude, subjective norms, and perceived control shape an individual's behavioral intention to use technology and use behavior (Ajzen, 1991). Behavioral intention and use behavior are the two dependent variables of the unified theory of acceptance of use of technology. In the early 2000s, Venkatesh et al. (2003) developed a hybrid model that combines technology acceptance model's perceived usefulness construct with constructs from the theory of planned behavior.

The model of PC utilization (Thompson, Higgins, & Howell, 1991) was adapted from a psychology theory to predict personal computer use in an information systems context. The innovation of diffusion theory is a social science framework initially developed by Rogers in the 1960s to understand technology acceptance since the 1960s (Venkatesh et al., 2003). Rogers (2003) posited that individuals adopt innovations using a specific sequence or rate of adoption. Social cognitive theory evolved from social learning theory (Bandura, 1986) and asserts that learning transpires in a social context with lively and shared interaction among the individual, the actions of others, and environmental factors.

Venkatesh et al. (2003) reviewed the 32 constructs from the eight models and selected four main constructs after empirical examination indicated they would play a substantial part in testing for acceptance and adoption of information technology. The four core constructs of the unified theory of acceptance and use of technology are defined by Venkatesh et al. as follows:

1. Performance expectancy (p. 448) is the degree to which individuals believe that using the system will help them better attain significant rewards. This

construct's foundation is perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations. Perceived usefulness is an independent variable from the technology acceptance model and the theory of planned behavior. Extrinsic motivation is from the motivational model, job-fit is from the model of PC utilization, relative advantage is from the innovation of diffusion theory, and lastly, outcome expectations is from social cognitive theory (p. 440).

2. Effort expectancy (p. 450) is the degree of ease associated with using the system. This construct is based on perceived ease of use and complexity, and ease of use. Perceived ease of use is an independent variable from the technology acceptance model, complexity is from the model of PC utilization, and ease of use is from the innovation of diffusion theory (p. 440).
3. Social influence (p. 451) is the degree to which individuals perceive that important others believe they should use the new system. This construct contains subjective norm, social factors, and image. Subjective norm is an independent variable from the theory of reasoned action, the technology acceptance model, the theory of planned behavior, and from combining the technology acceptance model and theory of planned behavior; social factors are from the model of PC utilization. Image is from the innovation of diffusion theory (p. 440).
4. Facilitating conditions (p. 453) are the degree to which individuals believe that an organizational and technical infrastructure exists to help them use the

> system. This construct contains perceived behavioral control, facilitating conditions, and compatibility. Perceived behavioral control is an independent variable from the theory of planned behavior, and from combining the technology acceptance model and theory of planned behavior; facilitating conditions are from the model of PC utilization. Compatibility is from the innovation of diffusion theory (p. 440).

Research on the four core constructs of the unified theory of acceptance and use of technology treats each construct as a separate and independent variable that is used to predict continuous usage of technology (Queiroz & Fosso Wamba, 2019; Williams, Rana, & Dwivedi, 2015; Wong, Tan, Loke, & Ooi, 2015). Queiroz and Fosso Wamba (2019) conducted their study on blockchain adoption and modified the unified theory of acceptance and use of technology to exclude performance expectancy. In 2019, Deloitte conducted a survey gathering perceptions on attitudes and investments in blockchain technology polling 1,386 senior executives in 12 countries with annual revenue of $100 million dollars or more, including executives at 31 groups who considered blockchain emerging disruptors with revenue less than $50 million dollars , and 53% indicated blockchain technology was a critical priority in their companies, a 10-point increase from 2018 (Pawczuk, Massey, & Holdowsky, 2019). Queiroz and Fosso Wamba (2019) were concerned there was minimal research of blockchain adoption behavior occurring at the individual level leading the authors to build a model by altering the unified theory of acceptance and use of technology. Core constructs used by Queiroz and Fosso Wamba

(2019) were social influence, facilitating conditions, and performance expectancy, while excluding effort expectancy and instead incorporating behavioral intention.

Wong et al.'s (2015) study on adoption of mobile social network sites for learning and factors that influence behavioral intentions, specifically exploring association of mobility, reachability and convenience, used two of the four core constructs of the unified theory of acceptance and use of technology that included performance expectancy and effort. Mobile social networking sites are a combination of social networking services like Facebook and LinkedIn combined with mobile technology for real-time interactions via communities using devices like mobile and smart phones, tablets, and personal digital assistants (Wong et al., 2015). The authors use of performance expectancy and effort expectancy were based on their belief that both would have a significant impact on individuals' behavioral intentions to use mobile social networking services (Wong et al., 2015). Williams et al. (2015) conducted a literature review of the unified theory of acceptance and use of technology, and out of the 451 articles analyzed, 407 of those articles cited the start of the theory, 16 articles consisted of applying the theory for non-quantitative methods, while 12 articles used some of the constructs of the theory. There were 16 research articles that used and tested all the core constructs of the unified theory of acceptance and use of technology (Williams et al., 2015).

Collaboration-Related Constructs: Technology Characteristics

Social presence theory. Social presence theory originated by Short, Williams, and Christie (1976) refers to the ability of technology to convey the psychological impression of the physical presence of users. Short et al. (1976) operationalized social

presence as the degree the communication mediated is sociable, warm, sensitive, where the users of the mediated communication perceive the medium the same as if not mediated. Social presence is also comparable to media richness theory (Daft & Lengel, 1986) concerning how information can be understood differently over some time. Social presence theory has been used in studies related to sports channel loyalty (Lim, Hwang, Kim, & Biocca, 2015), online students learning experience and satisfaction (Richardson, Maeda, Lv, & Caskurlu, 2017), online social brand engagement (Osei-Frimpong & McLean, 2018), and recently to study the enhancement of customer trust in peer-to-peer accommodation such as Airbnb (Ye, Ying, Zhou, & Wang, 2019).

Social television is a combination of television and social media where individuals share their combined experience of watching television and using social media like Facebook and Twitter at the same time (Lim et al., 2015). A randomly drawn sample of 500 users in a study conducted by Lim et al. (2015) assessed user communication on social television and whether they were impacted positively on sports channel loyalty. The authors (Lim et al., 2015) found there were three dimensions of social media engagement which include functional, emotional, and communal. Using structural equation model testing, it was found that social presence was positively impacted by communal and functional engagement (Lim et al., 2015). With a peer-to-peer study conducted to find out more about consumer interaction, social presence theory was measured and found to affect trust through functional and emotional engagement (Ye et al., 2019).

A study examining social branding was done by Osei-Frimpong and McLean (2018) using an eight-item scale adapted from Nowak (2013) to measure social presence. Nowak's (2013) original social presence scale consisted of: (a) giving others a good idea of who I am; (b) helping others better understand my message; (c) providing a sense of realism; (d) helping others better understand me; (e) making me seem more real, makes it seem more like my communication partner and I are in the same room; (f) making it seem more like we are having a face-to-face conversation; and (g) allowing others to know me well even if I only met them online. Social presence is described as elusive to capture in one measure and has a multidimensional nature (Richardson et al., 2017). Osei-Frimpong and McLean's (2018) adaptation added an eighth scale: I feel out of touch when I do not log into a social media platform, and the results of the study were social brand engagement was significantly impacted by social presence theory, strongest when used with firm generated content.

Immediacy of communication. Brown et al. (2010) posited that social presence and immediacy are social constructs with a connected past to perceptions of performance and user satisfaction. Researchers have noted the similarities of the social presence and immediacy of communication constructs indicating that immediacy was also a construct of social presence theory (Anumudu, Yasin, Akmar, & Latif, 2018; Short et al., 1976). Tseng, Cheng, Yu, Huang, and Teng (2019) conducted on mobile instant messaging by collecting 247 responses from an online survey, using structural equation modeling and hypothesis testing. Richness in information as well as immediacy in feedback are significant factors of media richness, positively related to social presence, relatedness

need satisfaction and user loyalty (Tseng et al., 2019). Tseng et al. (2019) posited that immediate feedback and personal focus can effectively encourage user loyalty.

Immediacy of communication, originated by Wiener and Mehrabian (1968), refers to how quickly technology collaboration enables the user to communicate with others. Wiener and Mehrabian (1968) created the construct to psychologically quantify the distance between the speaker and communicating with other people. A review of immediacy, a construct of social presence theory with the ability to instill communication satisfaction via asynchronous computer mediated communications, has been suggested to study the third most used corporate communication style, email, to determine communication satisfaction (Anumudu et al., 2018). Lodhia and Stone (2017) also indicated immediacy is a media richness framework feature tied to strategic focus and future orientation as well as reliability and completeness, identifying immediacy as a construct with technological ability.

Concurrency. Brown et al. (2010) described concurrency as a construct enabling a person to multitask while using the technology such as being in several chat sessions while emailing and engaging in a phone conversation. The ability to fully multitask many tasks at the same time is perhaps difficult as some tasks will overlap, although it is likely there are situations where a user can move a few seconds between tasks to switch attention allowing for management of multiple activity streams (Brown et al., 2010). Lodhia and Stone (2017) described concurrency as part of the media richness framework which encapsulates collaboration within web-based technologies and enables companies to interact directly, not only for relaying information and linked to stakeholder

relationships and materiality. Lodhia and Stone (2017) pointed out that with constructs such as immediacy and concurrency having both social and technological features that are provisioned for multitasking and using the system concurrently also needed is user training with the motivation to use the technology simultaneously. Media richness framework uses media richness theory with features that include immediacy, language variety, multiple cues, personal source, multiple addressability, computer processable memory, externally recordable and concurrency (Lodhia, 2018).

Soulier and Tamine (2017) showed a synthesis of five main collaboration-based fields in information retrieval which were identified as: (a) interactive information retrieval; (b) dynamic information retrieval; (c) collaborative filtering; (d) social information retrieval; and (e) collaborative information retrieval. Collaboration information retrieval is defined as the backdrop for explicit collaboration among a group of individuals working jointly to solve a shared information need, and it is also important in knowledge management and sharing (Cha, Kim, Park, & Lee, 2015; González-Ibáñez, Shah, & White, 2015; Soulier & Tamine, 2017). Collaborative filtering is the practice of collaborating among different agents, viewpoints, and data sources often used in knowledge management (Cha et al., 2015). Concurrency construct was shown capable in asynchronous and synchronous environments for both dynamic information retrieval and collaborative information retrieval; and in synchronous environments for interactive information retrieval and asynchronous environments for collaborative filtering and social information retrieval (Soulier & Tamine, 2017).

Integrating Unified Theory of Acceptance and Use of Technology and Collaboration-Related Constructs: Technology Characteristics

Information technology is a non-specific field, which allows researchers a multitude of different theories for testing adoption and continuous use of technology (Jia, Guo, & Barnes, 2017; Mouakket, 2015; Sun, 2013). In the adoption and use of technology, the unified theory of acceptance and use of technology has about two decades of testing acceptance and use of technology in many fields (Venkatesh et al., 2016). The unified theory of acceptance and use of technology's four core constructs of performance expectancy, effort expectancy, social influence, and facilitating conditions are directly related to predicting usage intention as well as able to explain about 70% of the variance in behavioral intention to continual use (Wu, Huang, & Hsu, 2014) while social presence, immediacy of communication, and concurrency are factors that affect the adoption and use of collaboration technology (Brown et al., 2010). Concurrency is a novel construct where it had not been given much consideration previously in which the findings of Brown et al.'s (2010) study were that concurrency increased performance expectancy in decision-making versus idea-generation tasks.

Silic and Back (2016) conducted a quantitative survey study to find out what factors influenced the adoption of unified communications and collaboration technology in companies where the unified communications and collaboration technology used by the employees was Microsoft Lync. Silic and Back (2016) also combined the unified theory of acceptance and use of technology with collaboration theories based on the model by Brown et al. (2010). The findings of Silic and Back's (2016) single case study

of a multi-national organization in the financial industry found that seven of the 19 hypotheses were statistically significant at 5% level. The study's finding showed that the construct of social presence should be a priority and that employees tied this construct to adopting and using unified communications and collaboration technology. Silic and Back's (2016) study findings agreed with Brown et al. (2010) where social presence and collaboration technologies create an environment for communication among users.

Literature Review Related to Key Variables

The literature review section will describe ways researchers approached the problem including strengths and weaknesses. This section will include the synthesis of related studies along with literature showing a summary of major themes to use to produce a description of what is known and what is left to be studied. Lastly, the literature review will describe potentially how this study can extend knowledge in the discipline.

Social Presence Theory

Han, Min, and Lee (2016) pointed out the central principle of social presence is its integration into the medium used for communicating using computer-mediated interactions. Ogara, Koh, and Prybutok (2014) indicated that social presence is increased by the richness of the communication medium with visual cues being one of the features of richness. Social presence has been used in many studies involving virtual and ubiquitous environments such as online or distance learning (Lowenthal & Dennen, 2017; Poquet et al., 2018) and mobile instant messaging (Choi, Kim, & Qu, 2015; Ogara et al., 2014).

Ogara et al. (2014) concluded in their study that there is a relationship between social presence and user enjoyment when using mobile instant messaging. Choi et al. (2015) showed that the higher the level of social presence in ubiquitous connectivity, the greater the enjoyment of users of virtual environments. A study conducted by Mirkovski, Jia, Liu, and Chen (2018) used social network theory and social presence theory to create a framework to detail the microblogging habits of Twitter and Sina Weibo users and their continued usage of these microblogging sites. The study found satisfaction and habit were major influencers in a user's continuance intention and that patterns of microblogging are founded in satisfaction and frequency of past behavior (Mirkovski et al., 2018). While habits were further established by social presence and social network centrality (Mirkovski et al., 2018), the use of Twitter and Sina Weibo microblogging sites allowed for greater external validity in the study.

Immediacy of Communication

Gunawardena and Zittle (1997) indicated that an individual can exhibit immediacy nonverbally and verbally, and nonverbal immediacy can be affected by the distance between communicators, a person's appearance, or their facial appearance, for example. The immediacy construct enriches social presence (Gunawardena & Zittle, 1997). Immediacy of communication construct can be attributed to the works of Straub and Karahanna (1998). The immediacy construct has often been used in studies related to asynchronous mediated communications (Anumudu et al., 2018). Anumudu et al. (2018) found that immediacy is influential in users communicating in asynchronous channels. Additionally, studies that previously used the immediacy construct are confined mainly to

qualitative and mixed methods because quantitative studies lacked generalizability (Anumudu et al., 2018).

Concurrency

Valacich, Paranka, George, and Nunamaker (1993) experimented with two groups by using verbal face-to-face or computer-mediated communication compared to the group who communicated using a computer and were geographically disbursed. Valacich et al. (1993) found the group that was geographically disbursed and used computer-mediation to communicate outpaced the face-to-face group in performance which indicated that distance had no impact on performance. Value and emphasis on modern communication technology is the capability to integrate concurrency which increases interaction (Valacich et al., 1993). Brown et al. (2010) posited that the social patterns and setting of the user must also be amenable for concurrency or users of the technology will need to become innovative and create ways to use the system concurrently for multitasking.

Lodhia and Stone (2017) argued concurrency is the same as social presence and would show positive expectancy of performance and effort since integrating concurrency into tasks can provide greater effectiveness, efficiency, satisfaction, and improved cognition in performance and effort expectancy. Engler and Alpar (2017) stated engaging in multiple blogs while simultaneously working on other job tasks is likely harder than multitasking on a social network or wiki. The negative path coefficient of concurrency on intention to use blogs indicates blogging inhibits multitasking and prevents performing concurrent duties, possibly due to the task of creating a long, opinionated, and edited blog not amenable to multitasking (Engler & Alpar, 2017). Silic and Back (2016) were

astonished that concurrency did not have an impact on performance and effort expectancy asserting they were not critical elements needed for performance, effort expectancy, and ultimately for adoption and use of technology. The results of Silic and Back (2016) study are in contrast to Brown et al. (2010) where concurrency was found to influence performance and effort expectancy.

Use of Collaboration Technology

A few of the models and theories in the literature used for current solutions to continued use of collaboration technology post-adoption are herd behavior (Sun, 2013). Dağhan and Akkoyunlu (2016) along with Mouakket (2015) utilized expectations-confirmation theory. The information systems continuance model was employed by Jia et al. (2017). Technology-organization-environment framework was used by Awa, Ojiabo, and Orokor (2017) and Jia et al. (2017). Other models and theories used by researchers include the unified theory of acceptance and use of technology (Wu et al., 2014); technology acceptance model (Huang, 2017); and, the theory of interpersonal behavior (Huang, 2017). Substantial effect of herd behavior in the context of adopting technology was found, where the literature proposes people usually disregard their own views in favor of imitating others in technology adoption decisions, and the resulting adoption decisions are insubstantial and are easily undone during post-adoptive stage where individuals go back to their own needs and local use environment at post-adoptive stage (Sun, 2013).

Jia et al. (2017) used information systems continuance model with the technology-organization-environmental framework and found perceived usefulness and satisfaction

were not the strongest predictors of continuance usage when applied to enterprise systems. Awa et al. (2017) integrated technology-organization-environment framework with individual and task characteristics to examine issues associated with task complexity, task interdependence, and characteristics of individual user adoption to get an inclusive and insightful look into explaining and predicting enterprise context technology adoption. The study used the unified theory of adoption and use of technology 2 and technology-organization-environment theories to evaluate issues related to individual characteristics and task- technology -fit model for examining issues related to task contexts (Awa et al., 2017). A 12-factor-framework from five drivers that included technology, organization, environment, individual, and task was proposed by Awa et al. (2017), where 11 out of 12 hypothesized relationships were significant at $p < 0.01$ or 0.05 with each factor differing in its statistical coefficient, although a few were negative significant coefficients. Technology adoption behaviors supported were comprised of perceived simplicity, compatibility, perceived values, top management support, size of the enterprise, scope of business operations, normative pressure, mimetic pressure, subjective norms, task complexity, and task interdependence (Awa et al., 2017). The one hypothesized relationship that was not supported in technology adoption behaviors was hedonistic drives (Awa et al., 2017). On the other hand, Behringer and Sassenberg (2015) posited that in their study, it supported the relationship concerning the importance and deficits regarding knowledge exchange, and experience with the use of social media jointly affects the intention to use social media following its implementation. The organization and environment such as subjective norms and competitive pressure were

influential factors in the plan to renew the enterprise's social media service as well as influenced their technology perceptions (Jia et al., 2017).

A combination of the unified theory of acceptance and use of technology along with a model for training geographically disbursed teams applied by Godin and Leader (2013) where 108 members of the team completed a survey after their training. The study concluded that only one of the four constructs of the unified theory of acceptance and use of technology constructs did not play a crucial role in the prediction of collaborative technology continued use (Godin & Leader, 2013). Technology acceptance model theorizes on an individual level wherein it is a group level process to use technology throughout an organization, but the model does not delve into investigating the social and organizational factors that are a part of information technology systems that would essentially decide whether technology is effectively adopted (Korpelainen & Kira, 2013). Huang (2017) used the theory of interpersonal behavior and technology acceptance model to test the prediction of continued use of information systems, and the outcome from the study showed the theory of interpersonal behavior is better at predicting continued use than technology acceptance model. On the other hand, the technology acceptance model is better at predicting the intention to continue using than does the theory of interpersonal behavior. Huang's (2017) study also concluded the integration of the technology acceptance model and theory of interpersonal behavior appropriately justifies the continued use of information systems though they had two drastically different outcomes when analyzed between light experience users and heavy experience users. The two

models should be combined which would accurately predict continued usage of information systems (Huang, 2017).

Wu et al. (2014) studied the continued use of online social network users with the unified theory of acceptance and use model and extending it to include satisfaction, credibility trust, and benevolent trust. The results from the regression analysis conducted by Wu et al. (2014) showed that all four core constructs of the unified theory of acceptance and use of technology along with satisfaction, credibility trust, and benevolence trust were able to predict continued use of online social networks. Mouakket (2015) conducted a study focused on Facebook's continuous usage intention with college student participants in the United Arab Emirates. The expectation- confirmation theory was extended to examine the influence of enjoyment and subjective norms crucial to predict continuous usage intention and habits used as the mediator for satisfaction and continuance intention (Mouakket, 2015). The results of the study indicated perceived usefulness, satisfaction, habit, enjoyment, and subjective norms described 54.8% of the variance in continuation intention (Mouakket, 2015).

Wang, Zhao, Sun, Zheng, and Qu (2016) combined habit and perceived critical mass constructs into the expectancy-confirmation model to create a model of Sina Weibo users' continuance intentions and to investigate the moderating effect of gender. Sina Weibo is a popular social network site in China that is similar to Twitter for microblogging with weibo meaning microblog in Chinese (Wang et al., 2016). There were 498 Sina Weibo users in the study and the results showed that perceived usefulness, satisfaction, and habit are significant determinants of a users' intent to continue to use the

social network site. The results of the study conducted by Wang et al. (2016) showed a significant difference in gender when it comes to habit and user's continuance intentions to use the Sina Weibo platform, and the habit was more significant to females than males regarding continuance intention. Due to a downward trend in microblog users in China over a two-year period from three billion people in 2013 to 2.04 billion people in 2015, a conceptual model was proposed by Zhang, Min, Liu, and Liu (2016) that integrated Wixom and Todd's theoretical framework, the uses and gratifications theory, and the DeLone and McLean information systems success model to explore factors that affect users' continuous microblog usage intention.

Zhang et al. (2016) found that gratification of microblogging could be regarded as behavioral attitudes and shows a substantial impact on users' continuance intention. System characteristics that conveyed satisfaction to users were autonomy, ease of use, broadcasting, and interoperability while users were satisfied with information characteristics such as perceived usefulness, reliability, timeliness, conciseness, and subscription (Zhang et al., 2016). Wang et al. (2016) also noted perceived usefulness had a robust influence on satisfaction when confirmation linked to perceived usefulness and satisfaction, and it was found that satisfaction and perceived critical mass are both main qualifiers to habit formation.

Use of collaboration technology was found to increase the quality of knowledge sharing and social relationships where virtual team members created and exchanged information that was relevant, usable, and key knowledge for the team (Olaisen & Revang, 2017). Employees sharing knowledge can reduce redundancy in efforts to learn

companywide information and increase innovative performance (Soto-Acosta, Popa, & Palacios-Marqués, 2017). Social media encompasses online social network, enterprise social network, and microblogging (Wehner et al., 2017) consisting of various enterprise social media types. Social media is the umbrella for which enterprise social media falls under as depicted in Figure 2 (See Appendix A).

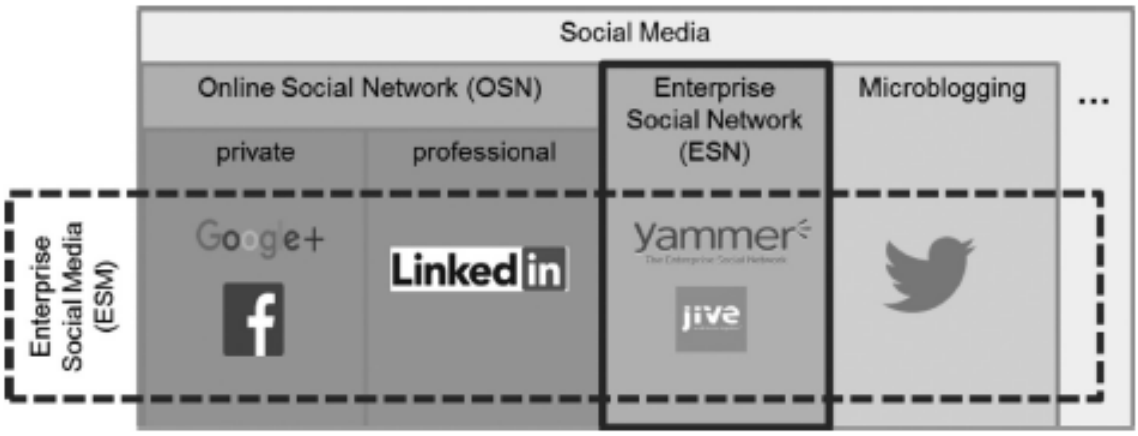

Figure 2. ESNs in the context of enterprise social media. From "Enterprise social networks: A literature review and research agenda," by B. Wehner, C. Ritter, and S. Leist, 2017, *Computer Networks, 114*, p. 127.

Online social networks are private or professional, and commonly known online social networks are Facebook, Google+ and LinkedIn. As Berger et al. (2014) noted, online social networks are influential in the way people live their lives. Pew Research Center's Social Media Use in 2018 survey, showed the majority of social media users use Facebook daily, a total of 68% of social media users (Smith & Anderson, 2018). In September 2018, Facebook had on average 1.49 billion daily active users and 2.27 billion

monthly active users (Facebook, 2018). Companies also use online social networks to aid with innovation (Berraies, 2019; Palacios-Marqués, Merigó, & Soto-Acosta, 2015). The results of a study conducted by Palacios-Marqués et al. (2015) showed a statistically significant positive relationship between online social networks and innovation capacity and the connection with online social network and a firm's performance facilitated by innovation capacity.

Berraies (2019) examined the effect of enterprise social networks use on two kinds of innovations: exploitative and exploratory, which are categories of innovation. When successful companies use both, it is referred to as ambidextrous innovation, where there is equilibrium between exploiting existing knowledge and skills and exploring new ones which enables these companies to meet their short- and long-term profits (Berraies, 2019). Berraies (2019) posited that intellectual capital, related to innovation, incorporates sub-dimensions of human capital, social capital, and organizational capital, where enterprise social networks promote knowledge, human, social, and organizational benefit. Hypotheses supported in Berraies (2019) study were that enterprise social networks use influences exploitative innovation both directly and indirectly through human capital, and exploratory innovation was affected indirectly through human and social capital. Social media software commonly used for enterprise social networks are Microsoft Yammer, Salesforce's Chatter, Jive, and Facebook's Workplace (Haugsbakken, 2018; Leonardi, Huysman, & Steinfield, 2013).

Ellison, Gibbs, and Weber (2015) posited enterprise social networks are vital to sharing professional and personal goals across the organization. Enterprise social

networks are used internally in an organization for employees to share information and work together in differing time zones and physical locations using asynchronous technology. Enterprise social networking is a system of enterprise social media that uses various types of social media for collaborating (Aboelmaged, 2018; Scott, Sorokti, & Merrell, 2016). Hacker, Bodendorf, and Lorenz (2017) indicated typical features offered in enterprise social networking that include: (a) profile pages that enable users to share information about themselves; (b) following other users to see their status and updates; (c) activity streams displaying updates from users and to follow topics within an integrated newsfeed; (d) searching for content stored on enterprise social network; (e) group capabilities that allow interactions within public or restricted groups; (f) discussion threads where users can start conversations via status updates, share files, and participate in conversations by replying to, liking, rating, and sharing the messages of others; (g) tagging other users or topics in messages; (h) bookmarks that allow for saving, organizing, and sharing content; (i) blog and wiki capabilities that enable the collaborative creation of content and storing of information; and (j) social analytics that provide users with contact recommendations. Microblogging features are content-based, which is one of the significant differences between online social networks being more user-oriented (Berger et al., 2014).

Corporations are increasingly incorporating social media into their business intending to help with knowledge creation. Social media technology can capture knowledge within the corporation for reuse and has characteristics similar to previous collaborative technologies including group decision support systems and knowledge

management systems (Garcia-Morales, Martín-Rojas, & Lardón-López, 2018). Cleveland (2016) reported organizations incorporate collaboration technology to reduce errors among employees that can be costly and interruptive. Also, continuous usage of social media use in the enterprise can capture the wealth of knowledge of over 3.5 million baby boomers forecasted to leave the workplace by the year 2020 (Cleveland, 2016).

Users have difficulty with understanding the habit of knowledge sharing using enterprise social media. Ogara et al. (2014) argued that the design of the information technology environment was critical to limit how quickly a user becomes familiar with the system. Dulipovici and Vieru (2015) case study examined how a newly-implemented collaboration technology in a United States' organization used by three groups focusing on the relationship between users' perceptions of not only the technology but knowledge shared, and the material properties of the collaboration technology. The findings from the study conducted by Dulipovici and Vieru (2015) indicated that individuals of the technology twist or alter the meaning of reality of the material properties of the technology to support using the collaboration technology. Aboelmaged (2018) conducted one of the first studies to understand the adoption and use of enterprise social network use in a developing economy and providing strong evidence of the positive influence that enterprise social networks have on knowledge sharing and productivity. Aboelmaged (2018) found that enjoyment is critical for employees to continue using enterprise social networks. Employee rewards for sharing on an enterprise social network platform, which is set up for sharing knowledge and information, can cause an adverse effect of continuing its use since users would compete for a restricted amount of rewards, leading a

user to have a perception of loss when another person gets the incentive (Aboelmaged, 2018).

Haugsbakken (2018) study was conducted to question what sharing meant to employees at a Norwegian public organization. The findings indicated there were challenges to understand what sharing meant, and sharing was defined and performed, based on Haugsbakken's (2018) study, as a task which enlightens practice but can also lead to too much information causing users to not engage with the technology. Knowledge workers provide content-based information that can lead to innovations within an organization. O'Leary (2016a) pointed out that knowledge management was moving from content-based alone to include social media for collaboration. Hacker et al.'s (2017) study focused on the behavior of knowledge workers using an enterprise social network to enable opportunities to collaborate and share information and innovate how knowledge work gets conducted with enterprise social media. Knowledge workers output is content-based knowledge which means organizations are shifting from individualized content-based knowledge management towards collaboration-based knowledge management with the use of enterprise social networks (O'Leary, 2016b).

Wang, Jung, Kang, and Chung (2014) indicated their study was one of the first empirical studies to identify an individual's motivation to use Enterprise 2.0, also referred to as enterprise social media. Wang et al. (2014) tested the adoption intentions of Enterprise 2.0 using the unified theory of acceptance and use of technology to recommend a research model to include context-specific variables to improve prediction of individual's adoption of Enterprise 2.0. The findings from Wang et al.'s (2014) study

showed most individuals held opinions that the use of enterprise social networks would allow faster access to information, blogs would increase knowledge sharing, and enterprise social networks improved problem-solving. Two-thirds of the study respondents pointed towards the use of wikis to increase collaboration with others, while 64% agreed that a collaborative and cooperative culture could come to fruition (Wang et al., 2014). Another important aspect from Wang et al. (2014) study was that 67% of respondents thought using enterprise social networks would lessen the cost of doing business and increase revenues, and 51% responded Enterprise 2.0 applications would garner growth in innovation in products and services. Chin et al. (2015) found there were 19 factors in the technological, organizational, social, and individual areas that affect employee adoption of an enterprise social network. Engler and Alpar (2017) concluded that employees' intent to use enterprise social networks increases when employees can concurrently work on other tasks even while using the social network. Chin et al. (2015) and Engler and Alpar (2017) agreed that enterprise social networks would continue to be a necessary tool to create and share knowledge across organizations, where employees are motivated to maintain usage in the post-adoption phase.

The Chin et al. (2015) case study, based on two professional firms that used enterprise social media where they found that leaders should be involved in instituting facilitating conditions that encourage enterprise social media adoption and continued use, and a culture of collaboration. Employees are seeking to work for organizations whose leaders are focused on incorporating digital technologies such as enterprise social media, mobile, analytics and cloud, for example, indicating digital maturity towards the

transformation of business processes (Kane, Palmer, Phillips, Kiron, & Buckley, 2015). Kane (2017) looked at the conceptual aspect of using enterprise social networks for organizational knowledge management based on previous studies and integrating emerging technologies such as artificial intelligence, augmented reality, and virtual reality. Kuegler, Smolnik, and Kane (2015) conducted a study with a sample size of 529 employees aimed at finding out the effects of enterprise social media on employee performance, which indicated employee performance increased with access to organizational knowledge.

An examination of 234 surveys from employees in various organizations found key findings of tertius lungens orientation, the introduction of disconnected and dissimilar individuals, does affect knowledge sharing activities in enterprise social media environments (Kwahk & Park, 2016). Findings from a case study conducted by Oostervink et al. (2016) examined the use of enterprise social media for knowledge sharing showed employee knowledge sharing is based both on logic from the profession and information technology consultancy organization. Pillet and Carillo (2016) surveyed 66 employees at a large international information technology services company using a quantitative case study methodology by exploring habits to explain knowledge sharing without the use of email in organizations implementing enterprise social media where findings indicated social media collaboration had an advantage in this context.

Razmerita, Kirchner, and Nielsen (2016) conducted a study surveying 114 employees in seven organizations in Denmark to understand what factors motivate employees to partake in enterprise social media for organizational knowledge sharing and

communication and what factors hampered employee participation. The findings were significant for factors influencing use which included enjoying helping others, monetary rewards, management support, management encourages and motivates knowledge sharing behavior and knowledge sharing is recognized, and significant factors barring use were a change of behavior, lack of trust and lack of time (Razmerita et al., 2016). Sun and Shang (2014) surveyed 281 employees of intra-organization microblog systems in China, dividing social- and work-related use to explore the effects of social-related use on work-related use where the findings indicated social-related usage of social media impacts work-related enterprise social media.

Treem, Dailey, Pierce, and Leonardi (2015) conducted a case study and interviewed 58 employees in a large financial service organization in the United States that implemented an enterprise social media platform to compare employee views of the technology against existing organizational communication technologies and public online social media. Treem et al. (2015) findings were that employees' frames concerning expectations and assumptions of social media are developed from activities outside of the work setting that influence employees' views about the usefulness of enterprise social media. The shift from consumer social technologies being incorporated into organizations as enterprise social media networks are motivated by the benefits of connecting and networking (Lal, 2016). However, as indicated by Lal (2016), after implementation of enterprise social networks, organizations are tasked with motivating employees to continue participating and interacting among peers post-adoption of the enterprise social network (Lal, 2016). Knowledge workers provide content-based information that can lead

to innovations within an organization. Hacker et al.'s (2017) study focused on the behavior of knowledge workers using an enterprise social network to enable opportunities to collaborate and share information and innovate how knowledge work gets conducted with enterprise social media. Knowledge workers' output is content-based knowledge which means organizations are shifting from individualized content-based knowledge management towards collaboration-based knowledge management with the use of enterprise social networks (O'Leary, 2016b).

As described by Singh, Chandwani, and Kumar (2017), knowledge work encompasses the creation, distribution and/ or application of knowledge thus knowledge workers usually possess a high degree of expertise, education and/ or experience. In January 2014, the American Productivity and Quality Center, an organization that creates and communicates knowledge management information to its members laid out five best practices for knowledge management (O'Leary, 2016b).

1. Management and specialists should decide what is critical knowledge supported by reasoning for the decision;
2. At the time of decisions are made to gather and share knowledge, attention is warranted for proportion of tacit to explicit knowledge, the stakeholders, and speed of which information changes;
3. Organize methodical ways to transmit scheduled knowledge with transparent goals, purpose, markers and results;
4. Unless knowledge needs to be restricted, it should be freely disclosed;

5. Self-help options to sort, traverse, and tailor knowledge flow should be offered first with live support as a final option.

The factors defined by the American Productivity and Quality Center have evolved from best practices previously defined by Drucker (1999), who first coined the term knowledge worker, in that it is considers information technology as a means of managing content by capturing, storing, and reusing knowledge when needed, akin to a repository of knowledge. Drucker described productive knowledge workers as:

1. Knowledge-worker productivity seeks and answers the question of what is the task;
2. Knowledge workers must manage their individual tasks and require independence;
3. Using knowledge for innovations in the organization is the focus and job of knowledge workers;
4. Knowledge workers must obtain continuous learning as well as impart knowledge to others;
5. Knowledge-worker productivity is based, firstly, on the quality of the output, not the quantity;
6. Knowledge-worker productivity is valued as an asset and not as a cost by the organization where the knowledge worker would prefer to be employed at that organization versus any other prospects.

Surawski (2019) pointed out knowledge work makes up a wide range of industries; the phrase, knowledge workers, has become vague with few recent attempts to

define clearly it in the literature. Knowledge work is an effort of brainpower and cognitive work creating new knowledge and innovations (Shujahat et al., 2019). Knowledge workers have been researched in a variety of industries such as high-tech information and communications technology, high-tech manufacturing, pharmacy and biotechnology to lawyers to winemaking (Surawski, 2019). Anthony (2018) noted that knowledge workers are individuals who think for a living such as engineers, software developers, financial analysts, and scientists, acknowledging the long and central role that epistemic technologies play in knowledge creation. Knowledge workers are central to product development and those in areas such as operations, engineering, and quality management are influential in this domain (Kach, Azadegan, & Wagner, 2015). Epistemic technologies are central in terms of tools used by knowledge workers to aid in researching and cultivating knowledge used on an ongoing basis across various areas of knowledge work (Anthony, 2018).

With different types of knowledge workers, Kach et al. (2015) conducted a study about knowledge workers and their impact on innovation in new product development and improved product development. Kach et al. (2015) posited there was limited attention to this topic, although there is substantial interest regarding knowledge workers. The high cost of hiring, training, and paying knowledge workers a high percentage is a cost that manufacturers bear (Kach et al., 2015). Understanding the difference when hiring is important to gain increased performance in product development as opposed to focusing on high-level knowledge workers for new products and low-level knowledge workers focus for improved product development (Kach et al., 2015). Gao, Wang, and Wang

(2019) utilized an empirical study to collect data from 103 knowledge workers in a high-tech company, and the findings were that job performance is positively influenced by online communication network properties and negatively influenced by offline communication network properties. Front line managers also influence the performance outcome of knowledge workers, motivating through value, trust and respect, and providing support, recognition and appreciation are all factors that enhance knowledge workers performance (Edgar, Geare, & O'Kane, 2015). Differentiations are made between high- and low-level knowledge workers such as their training, responsibilities, and environment they work in with other valued knowledge workers who are in support staff roles, but less likely involved in innovations of new products or processes (Kach et al., 2015).

In previous studies, perceived enjoyment of helping others and knowledge self-efficacy were instrumental in predicting employees' knowledge sharing behavior and intention to continue use of enterprise social media (Lal, 2016; Singh et al., 2017). Singh et al.'s (2017) conducted study involved the use of a cross-sectional survey design that examined the role of factors related to knowledge sharing and knowledge seeking as it affects the adoption of Web 2.0 (such as blogs, wikis, social networking sites, information sharing sites, syndication, and mashups) among knowledge workers. The results of the study confirmed the intention to adopt Web 2.0 was dependent on the knowledge workers' attitude relevant to knowledge sharing and knowledge seeking, and of these two factors, knowledge-sharing factors were more important (Singh et al., 2017). Although Singh et al.'s (2017) study was generalizable to all knowledge workers since health care

professionals represent typical knowledge workers, the authors posited that sampling knowledge workers from other contexts and their use of Web 2.0 applications would increase the strength of the findings. Corcoran and Duane (2017) conducted a study to examine how enterprise social networks can facilitate employee knowledge sharing in the context of communities of practice. Corcoran and Duane (2017) described virtual communities of practice as a knowledge management technique with groups of individuals linked by their passion for sharing and developing their knowledge, usually done in an informal environment. Corcoran and Duane (2017) indicated a complete knowledge-sharing environment would be virtual communities of practice as the primary knowledge management technique supported by enterprise social networks for company strategies towards improving staff collaboration and knowledge sharing to push organization efficiencies.

Practitioners and researchers are aware of improved organizational performance with using social media in the enterprise, and Qi and Chau (2018) study findings showed that using enterprise social networking systems directly and indirectly influenced organizational learning with knowledge management processes such as creating and sharing knowledge as the mediator between the two. Qi and Chau (2018) posited their study was among the first to bind three independent concepts of social media, knowledge sharing, and organizational learning together. Professional enterprise social networking systems is a novel phenomenon scarcely researched (Choudrie & Zamani, 2016; Rode, 2016) and some of those enterprise social networking systems are Jive, Yammer, IBM, Connections, Socialcast, and Chatter. Enterprise social networks are implemented within

the bounds of the organization where employees can gain access (Aboelmaged, 2018; O'Leary, 2016a; Qi & Chau, 2018). When there are optimal communication channels available for knowledge workers to network, Gao et al. (2019) posited knowledge workers will have high job performance. Gao et al. (2019) explored the importance of understanding online and offline communication among knowledge workers who are increasingly using online interaction. An empirical study by Gao et al. (2019) collected data from 103 knowledge workers in a high-tech company, and the findings were that job performance is positively influenced by online communication network properties and negatively influenced by offline communication network properties.

Social media is beneficial for knowledge sharing providing leaky pipes for communication, irrespective of directionality and content since the message is visible to participants not involved (Kane, 2017; Leonardi, 2017). Leonardi (2017) conducted a study to explore barriers affecting new employees from contributing knowledge or seeking out knowledge shared by others using enterprise social media and to develop propositions for strategically utilizing enterprise social media for effectively overcoming those barriers. Barriers disclosed by employees to knowledge contribution were: (a) lack of incentive; (b) ease of free riding; (c) and belief that one's own knowledge is not useful whereas obstacles for knowledge retrieval were revealed to be lack of awareness of what knowledge is out there, and preference for knowledge from people who are known personally (Leonardi, 2017). The propositions outlined are in line with the nature of using enterprise social media as an overhaul to organizational knowledge sharing and knowledge seeking (Ellison et al., 2015; Leonardi, 2017). Existing theories from

corporate knowledge management and current writings on social media affordances are part of developing the following propositions suggested by Leonardi (2017) as a result of interviewing employees from a financial services firm about barriers to knowledge sharing and knowledge seeking.

Proposition 1 - Lack of incentive. For individuals who need intrinsic incentives to contribute knowledge to social media, public affirmations on the individual's knowledge contributions by managers and/ or coworkers such as commenting on or liking a post to encourage continued knowledge sharing.

Proposition 2a - Ease of free riding. Social media can demonstrate the personal value of knowledge contributions made by others with algorithms that push notifications of related people and content such as documents and videos, for example, to individuals.

Proposition 2b - Belief that one's own knowledge is not useful. Social media features that easily show active conversations that they are not participating in will entice them to contribute their own knowledge.

Proposition 3a - Belief that one's own knowledge is not useful for coworkers. The more that individuals receive passive feedback that other social media users are interacting with their knowledge products by commenting or public recommendations, for example, the likelihood the individual will share additional knowledge in the future.

Proposition 3b - Belief that one's own knowledge is not useful to others seeking advice. Positive and encouraging public comments by managers through social media on employees' requests for help or admissions that they do not know what is necessary to

complete particular work tasks will encourage more people to post such queries, allowing others who have the requested knowledge to realize that their knowledge is indeed useful.

Proposition 4a - Lack of awareness of what knowledge exists in the organization. Algorithms that push content at users or recommend people for users to get to know based on similarity in tasks, projects, or other work-related attributes versus simple similarities of social connections would help users see the value of social media for retrieving knowledge.

Proposition 4b - Belief that one has organization information overload. Spreading the use of emerging tags or folksonomies across the organization will not only help people find relevant knowledge faster but also help them to stumble across relevant content that they might not have known existed.

Proposition 5 - Preference for knowledge from people who are known personally. Social media users who are exposed to personal information such as narratives and photos by coworkers who are otherwise unknown to them will be more likely to retrieve work-related knowledge from those coworkers.

Cetto et al. (2018) identified different characteristics of givers, takers, and matchers roles in enterprise social networks. Matchers want to help others with reciprocity that they benefit by receiving something back and are the ones who keep the enterprise's social network energetic with a high level of interconnectedness and activity while givers and takers participate less with few activities and are not well connected (Cetto et al., 2018). A characteristic identified by Cetto et al. (2018) was the commonality across all user roles to use the enterprise social network mainly for professional reasons.

Huang, Singh, and Ghose (2015) developed and estimated a framework for analyzing social media content creation and consumption behavior using dataset comprised of full details of blog posting and reading the behavior of 2,396 employees over 15 months at a Fortune 1000 IT services and consulting firm. Findings from the Huang et al. (2015) study were that blogging over the long term is where the benefits of blogging transpire and outweigh the costs with employees competing amongst each other for the readership of their posts. Although Huang et al. (2015) found that leisure posts do not have much value, employees post a significant amount of leisure posts which have a significant spillover effect on work-related posts by creating leisure posts.

Enterprise social media is a source that aids knowledge seekers in collaborating with experts and gathering information as needed (Ding, Liu, Huang, & Gu, 2019; Kane, 2017; Kuegler et al., 2015; Kwahk & Park, 2016; Oostervink et al., 2016; Pee, 2018; Pillet & Carillo, 2016). Ding et al. (2019) examined how the relationship between perceived work stressors of employees such as challenge and hindrance stressors and employee creativity are moderated by team task- and relationship-oriented enterprise social network usage. The results of the study were that team task- and relationship-oriented enterprise social network usage varies in moderating the relationship concerning work stressors and employee creativity in that task-oriented enterprise social network use positively moderates the effects of challenges and hindrance stressors on employee creativity, but relationship-oriented enterprise social network use negatively moderates the relationship between hindrance stressors and employee creativity (Ding et al., 2019).

Cai et al. (2018) conducted a study to examine how enterprise social media use is related to employees' agility performances using three mediators from Kahn's (1990) theoretical framework of employees' psychological conditions including meaningfulness, safety, and availability. Meaningfulness is a feeling that one is getting a return on investment of one's self in role performances; safety is a sense of being able to show and employ self without fear of negative consequences of self-image, status, or career; and, availability is a sense of possessing the physical, emotional, and psychological resources necessary for investing self in role performances (Kahn, 1990). The dependent variable of agility performance was three-dimensional and encompassed proactivity, adaptability, and resilience (Cai et al., 2018). Proactivity is the initiation of activities that have a positive effect on changed environment; adaptability references changing or modifying oneself or behavior to better fit a new environment; and resilience is efficiently functioning under stress, even when environmental changes are encountered, or when applied strategies and solutions have failed (Alavi, Wahab, Muhamad, & Shirani, 2014). The resultant data do support most of Cai et al. (2018) hypotheses indicating psychological conditions are influential in the transmission of the value of enterprise social media usage to agility performance, advising managers focus on employees' psychological conditions to leverage this benefit.

Rode (2016) posited that management at knowledge-intensive companies promote the sharing of knowledge with the expectation of reduction in current technological, organizational, and knowledge workers barriers to knowledge-sharing, and to ease individuals' reluctance to share knowledge by implementing enterprise social media

containing social networking, searching for, linking, tagging, and authoring information in one corporate platform. Rode (2016) conducted an empirical quantitative study, and 492 participants were surveyed from a large knowledge-intensive firm to address the gap of factors that determine active use of enterprise social media platforms. The outcome of the study specifically revealed extrinsic motivation such as anticipating gains in reputation and mutual benefits as drivers to sharing knowledge in enterprise social media platforms (Cetto et al., 2018; Rode, 2016). Although knowledge sharing self-efficacy was found to facilitate participation, enjoyment in helping others was not a participation driver in Rode's (2016) study compared to studies where perceived enjoyment was a driving factor in the continued use of enterprise social media (Lal, 2016; Singh et al., 2017).

As noted by previous researchers (Cai et al., 2018; Trimi & Galanxhi, 2014), numerous organizations have started using enterprise social media but were not successful in its implementation where effective use involves both managers and employees obtaining benefit from its use and equivalency in management-employee perceived benefits. Trimi and Galanxhi (2014) conducted a study to find out: (a) what were the perceived/ expected benefits of Enterprise 2.0 for the employees and managers; (b) what was the degree of congruence of perceived/ expected Enterprise 2.0 benefits between the employees and managers; (c) how did the level of individual-organizational benefits congruence affect the adoption of Enterprise 2.0; and (d) what were the main success factors of Enterprise 2.0 adoption. Two factors used were perceived usefulness for employees and perceived organizational value to represent managers' perceived

benefits, along with if and whether they were congruent, to determine the successful adoption of Enterprise 2.0 (Trimi & Galanxhi, 2014).

The benefits of adopting Enterprise 2.0 were measured in terms of improved communication, collaboration, community building, employee engagement, knowledge management, where Trimi and Galanxhi (2014) found Enterprise 2.0 to have a positive impact on each, and eventually, the organizational activities and outcomes. Enterprise social media studies show using this medium can create social ties between employees and manifest the relationship among employees and information allowing for support of social connections and access to relevant information (Cai et al., 2018; Kuegler et al., 2015; Kwahk & Park, 2016; Razmerita, Kirchner, & Nabeth, 2014). Razmerita et al. (2014) found that social media helps both personal and collective dimensions of knowledge, while incorporating a social collaboration dimension. Azaizah, Reychav, Raban, Simon, and McHaney's (2018) research examined an enterprise social network implementation using Yammer's platform along with its effect on communication and interaction levels among employees of varying units in a company. Information elicited from the extracted data of this large, multinational software company was that employees found novice ways to communicate using Yammer and post-implementation continued to use a significantly higher level integrating inter- and -intra-organizational communication. Managers can support improvement in continuous use of enterprise social networks by finding out challenges among employees, instilling how enterprise social networks assist with collaboration, ultimately, reducing boundaries and promoting innovation (Berraies, 2019).

Summary and Conclusions

Themes observed in the literature review are related to the underutilization of enterprise social networks (Lal, 2016; Li, 2015). The research shows knowledge sharing can help corporations increase innovation (Nisar et al., 2019; Sheng & Hartono, 2015; Singh & Power, 2014) where adoption of enterprise social networks were implemented to improve collaboration, and ultimately, innovation within a corporation (Maruping & Magni, 2015). The literature is that organizations are increasingly adopting enterprise social networks for knowledge sharing among their knowledge workers (Berger et al., 2014; Riemer et al., 2015). Sharing knowledge is the practice of generating new ideas and opportunities in business using learning and social processes among knowledge workers (Soto-Acosta et al., 2017). My study addressed the gap in the literature where there are minimal empirical studies that have researched the continued use of enterprise social networks after implementation using the unified theory of acceptance and use of technology and collaboration-related constructs such as social presence, immediacy of communication, and concurrency. Chapter 3 will detail the research methodology.

Chapter 3: Research Method

The purpose of this quantitative survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs (Brown et al., 2010) to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. According to Hair, Black, Babin, and Anderson (2014), researchers review the structural relationships between constructs to verify whether they make sense and if they are consistent with the theory, positive, or negative. In this research, I leveraged the unified theory of acceptance and use of technology and collaborative constructs integrated to test hypotheses with a goal of furthering understanding of the adoption and continued use of enterprise social networks by knowledge workers.

Chapter 3 contains three sections. In the "Research Design and Rationale" section, I will explain the variables, describe the research design, define the target population and sampling and sampling procedures, describe the data collection procedures, and present the instrumentation and operationalization of the constructs. The "Threats to Validity" section will contain a description of threats to the internal and external validity of the study, threats to the construct or statistical conclusion validity, the ethical procedures related to data collection, and the treatment of the data. The "Summary" section will be a synthesis of the design and methodology in this chapter.

Research Design and Rationale

I analyzed the relationships between the independent variables of social presence, immediacy of communication, concurrency, and the dependent variable of continuous

usage of enterprise social networks for corporate knowledge workers. To do so, I used a quantitative correlational research design. In planning for this study, two main methodologies were considered, namely qualitative and quantitative research methods, in selecting the appropriate research design. The backbone of qualitative research is the collection of data from interviews using open-ended questions, field notes, or participant observation (Johnson & Christensen, 2004). Quantitative researchers use a scientific method involving prediction, generalization of a sample to a larger group of subjects, and analysis of numbers to prove or disprove a hypothesis (Leedy & Ormrod, 2015). Quantitative research is considered to be objective in its approach.

My examination of the relationship between three independent variables and a dependent variable was appropriate for a quantitative research paradigm versus a qualitative paradigm. The form of data is from numerical rating scales. A quantitative design has two branches of research consisting of experimental and nonexperimental research. With nonexperimental studies, no treatments or interventions are applied. Although researchers conducting experimental studies may seek to conclude whether there is a cause and effect relationship among the variables based on the treatments and interventions, those conducting nonexperimental research do not seek to find or confirm with certainty that there is a cause and effect relationship between variables (Leedy & Ormrod, 2015). Nonexperimental research designs, namely, observational studies, correlational research, developmental designs, and survey research, have resultant quantitative data that the researcher statistically analyzes.

Quantitative observation studies are vastly different. When a person is the unit of analysis in a quantitative observation study, a specific behavior or narrowed predetermined focus is under observation (Leedy & Ormrod, 2015). Further, quantitative observation studies can be used to observe plants, nonliving objects, or dynamic physical phenomena (Leedy & Ormrod, 2015).

Survey researchers obtain data from one or more groups of people by asking questions and quantifying the answer. Leedy and Ormrod (2015) indicated that the purpose of using survey research is to capture data from a sample of a population to understand the larger population, which is also referred to as a descriptive survey or normative survey. The results from survey research allow the researcher to draw inferences about the specific population based on the sampled responses (Leedy & Ormrod, 2015). Surveys can be conducted in person, by telephone interview, or by written questionnaire.

Correlational research allows the researcher to examine the relationship between two or more variables and the degree, if any, to which they are different. Fink (2009) posited that a correlational design is often used when the researcher wants to gather data to pilot future studies. There is no evidence to support that a correlational study can show causation, although information about causality can be obtained from conducting the study using a nonexperimental design (Campbell & Stanley, 1963). For instance, if there is no correlation evidenced in the study, credibility is less for the hypothesis, but the inverse is true when a high degree of correlation is established (Campbell & Stanley, 1963). There is evidence of a correlation when a variable increases while a different

variable is affected positively or negatively allowing the researcher to predict the value of another variable with some degree of certainty (Leedy & Ormrod, 2015). However, it is important for researchers not to draw faulty conclusions when interpreting correlational results. A positive correlational study of one variable seeming to affect or influence another variable can lead to the identification of faulty cause-and-effect relationships, although in some cases a cause-and-effect relationship does exist. In analyzing the various quantitative research designs, I concluded that a correlational research design was appropriate as I sought to examine the relationship between two or more variables.

Methodology

In conducting this study, I wanted to fill the existing gap in empirical studies that address the relationship among employees' social presence, the immediacy of communication, concurrency, and the continuous use of enterprise social networks. Data were collected from a survey that was given to participants who were information technology knowledge workers in Fortune 500 companies in the United States. In this case, I considered a quantitative study best to analyze the relationships of the dependent and independent variables.

Population

The target population for this study was information technology corporate knowledge workers at organizations who had knowledge of enterprise social networks and its relationship with collaboration technology characteristics. The target population was identified on the following criteria: (a) the participant had to be an employee of an information technology Fortune 500 company that relies on enterprise social networks to

collaborate; (b) the participant had to be employed at the organization for at least 2 years; (c) participants had to be corporate knowledge workers who directly engaged with collaboration technology; and (d) the organizations had to be located in the United States. A population is the entire number of elements that can be included in a study (Gray, 2009). It is important to note that the size of the true population of corporate knowledge workers at Fortune 500 information technology companies is unknown due to the definition and nature of what a knowledge worker is.

Sampling and Sampling Procedures

The sampling strategy consisted of targeted snowball sampling to select from the population of corporate knowledge workers who work for information technology Fortune 500 companies in the United States. LinkedIn boasted being the most-used social media platform by Fortune 500 companies (LinkedIn, 2016). LinkedIn is different than Facebook and other typical social media due to the platform's ability to reach professionals in different fields and thought to increase the chance of gathering data from a suitable social network (Dusek, Yurova, & Ruppel, 2015). A targeted snowball sampling approach was used on social media including Facebook to target hard-to-reach Fortune 500 corporate knowledge workers, which can be done within a reasonable time and cost.

A comparison was made between G*Power and Green's rule of thumb (as cited in VanVoorhis & Morgan, 2007) to determine a sufficient sample size. A power analysis for multiple regression with three predictors in G*Power using an alpha of 0.05, a power of 0.80, and a medium effect size (f2 = .15) indicated a sample size of 77. The sample size

was estimated at 107 based on Green's 1991 rule of thumb on the regression sample size. Green indicated the way to test individual predictors is to start with a sample size of 104 and add the number of independent variables, which in this research would be 3 for a total of 107. The decision was made to use Green's rule of thumb to allow for ample participants needed for this study. Inclusion criteria for this study were to select men and women corporate knowledge workers who were 18 years of age or older who: (a) agreed to participate in the survey; (b) resided in the United States; and (c) were currently employed by Fortune 500 information technology companies. Exclusion criteria were corporate knowledge workers who were men and women under 18 years of age who: (a) did not agree to participate in the survey; (b) did not live in the United States; and (c) were not employed by Fortune 500 information technology company. Sample frame characteristics consisted of gathering demographics and job information. Demographic data collected were geographic location, gender, and age. Job data included collecting job function and type of company.

Procedures for Recruitment, Participation, and Data Collection

Recruiting procedures consisted of contacting participants from LinkedIn groups. Later during data collection, approval was obtained from Walden's Institutional Review Board to use social media professional groups found on Facebook for obtaining additional surveys from the targeted sample population. The social media post contained a link to the study survey, which was hosted on SurveyMonkey's online platform. The LinkedIn and social media postings encouraged participants from the specific population of information technology corporate knowledge workers at Fortune 500 companies in the

United States to complete the survey by clicking on the posted link. The expected timeframe for the survey to be hosted for data collection was one month or until 107 surveys were completed from the sample population.

Before completing the survey, participants did electronically sign the informed consent provided through SurveyMonkey. Participants were informed of the objective of the research to gather information on the continuous usage of enterprise social networks. To minimize the social desirability response set, participants were not aware of the specific focus of the study to validate an instrument to predict continuous usage of enterprise social networks. The informed consent discussed the participant's right to refuse to participate without any negative consequences.

The responses for the survey were gathered electronically and stored on SurveyMonkey's database with access to the data retrievable only by the researcher. Participants were able to exit the study at any point during the survey and also once they submitted the survey and closed SurveyMonkey. No incentives for completing the survey were offered.

Instrumentation and Operationalization of Constructs

The Constructs and Measures instrument was developed and published by Brown et al. (2010). The questionnaire was developed using previously validated items from the unified theory of acceptance and use of technology and the social presence theory. Immediacy and concurrency are new scales where the developers found them reliable and valid, with Cronbach's alpha exceeding .80. The remaining scales also were highly reliable with similar findings of Cronbach's alpha scores. The instrument was appropriate

to the current study using a nonexperimental quantitative correlational research design employing the Constructs and Measures instrument to identify continuous usage of enterprise social networks by corporate knowledge workers at information technology Fortune 500 companies.

Brown et al.'s (2010) study revealed that the unified theory and acceptance and use of technology integrated with technology characteristics are factors that influence the adoption and use of collaboration technology. Permission was granted from the developer to use the instrument (See Appendix C). The instrument was used previously with two separate groups of study participants. The population from the first study consisted of students at a major university in Finland, and the second study population included participants who were corporate knowledge workers at a Fortune 500 technology company in Finland. From the literature review, recent research with Brown et al.'s (2010) instrument was for research in supply chain blockchain adoption challenges (Queiroz & Fosso Wamba, 2019), to examine how trust is formed and its impact on collaboration in virtual teams and how trust impacts collaboration (Choi & Cho, 2019), to validate a comprehensive model for the adoption and use of academic social networking sites (Salahshour Rad, Nilashi, Mohamed Dahlan, & Ibrahim, 2017), and to examine how social factors affect the use of corporate wikis to share knowledge in organizations using Web 2.0 tools (Iglesias-Pradas, Hernández-García, & Fernández-Cardador, 2015).

The independent variable, social presence, was defined as the score on the Social Presence scale of the Constructs and Measures survey. The second independent variable of immediacy of communication was defined as the score on the Immediacy scale of the

Constructs and Measures survey. The third independent variable of concurrency was defined as the score on the Concurrency scale of the Constructs and Measures survey. The Social Presence, Immediacy, and Concurrency scales was measured by a 7-point Likert scale that ranged from 1 (strongly disagree) to 7 (strongly agree). The dependent variable of continuous usage was defined as the score on the Use scale of the Constructs and Measures survey. The first question on the Use scale was measured by a 7-point Likert scale that ranged from 1 (very light) to 7 (very heavy). The second Use scale question was measured by a 7-point Likert scale that ranged from 1 (never) to 7 (very frequently). The remaining two questions of the Use scale is listed below as examples:

- On an average week, how much time (in hours) do you use collaboration tool?
- Of the opportunities you have to use collaboration tools, including a telephone, what percentage of time do you choose a collaboration tool?

In Table 1, summarized variables and associated composite scores are presented.

Table 1

A Summary of Variable Data Collection

Variable	Data Source Instruments	Type	Scale - [items, range]	Scoring, range	Research question
Continuous usage	Constructs & Measures Survey/ Use scale	Criterion (dependent)	Interval (Two items using 7-point ratings): 1. I rate my intensity of use of enterprise social networking collaboration tool to be: Very light (1) to Neutral (4) to Very heavy (7) 2. How frequently do you use enterprise social networking collaboration tool: Never (1) to Neutral (4) to Very frequently (7)	Composite score for 2 sub-questions, Range 2 to 14.	RQ1
Social presence	Constructs & Measures Survey	Predictor (independent)	Interval (Three items using 7-point ratings) Strongly disagree (1) to Neutral (4) to Strongly agree (7): 3. Using enterprise social networking collaboration tool to interact with others creates a warm environment for communication. 4. Using enterprise social networking collaboration tool to interact with others creates a sociable environment for communication. 5. Using enterprise social networking collaboration tool to interact with others creates a person environment for communication.	Composite score for 3 sub- questions, Range 3 to 21.	RQ1

Table continues

Variable	Data Source Instruments	Type	Scale - [items, range]	Scoring, range	Research question
Immediacy of communication	Constructs & Measures Survey	Predictor (independent)	Interval (Three items using 7-point ratings) Strongly disagree (1) to Neutral (4) to Strongly agree (7): 6. Enterprise social networking collaboration tool enables me to quickly reach communication partners. 7. When I communication with someone using enterprise social networking collaboration tool, they usually respond quickly. 8. When someone communicates with me using enterprising social networking collaboration tool, I try to respond immediately.	Composite score for 3 sub- questions, Range 3 to 21.	RQ1
Concurrency	Constructs & Measures Survey	Predictor (independent)	Interval (Three items using 7-point ratings) Strongly disagree (1) to Neutral (4) to Strongly agree (7):	Composite score for 3 sub- questions, Range 3 to 21.	RQ1

9. I can easily use enterprise social networking collaboration tool while participating in other activities.
10. I can easily communicate using enterprise social networking collaboration tool while I am doing other things.
11. I can use enterprise social networking collaboration tool while performing another task.

Data Analysis Plan

Statistical tests, as Rugg (2007) explained, help to rule out if something is happening randomly by chance. For this quantitative correlational study, I used linear regression analysis for statistical testing of the hypotheses. Multiple regression analysis supported this study since relationships among several variables are under examination. I conducted entry method for multiple linear regression for the last analysis of the study, and I have interpreted inferential statistics produced by regression analysis.

The overall research question and hypotheses that guided this research are described below:

Research Question 1: What is the relationship among social presence, immediacy of communication, concurrency, and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018?

H_{01}: There is no significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_{A1}: There is a significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_{02}: There is no significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_{A2}: There is a significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_{03}: There is no significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_{A3}: There is a significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

Data Analysis Steps:

1. I transferred data from Survey Monkey to a Microsoft Excel spreadsheet.
2. Data cleansing and screening procedures consisted of (a) identifying and removing surveys where participants did not match the target audience criteria; (b) identifying surveys where speed of survey completion was quicker than the average participants; (c) participants who chose the same answer for all questions; (d) providing unlikely answers; (e) contradicting answers inconsistent with responses given to questions asked previously; and (f) responses that were senseless on open-ended questions.
3. I uploaded data into Statistical Package for the Social Sciences software, which was used for multiple linear regression analysis. The software is known to be effective and used to streamline gathering and managing data,

and I used the program to organize, store, and conduct statistical tests on the quantitative data.

4. I followed the regression procedure using social presence + immediacy of communication + concurrency = continuous usage.

Threats to Validity

The survey constructs were from the unified theory of acceptance and use of technology and collaboration-related constructs in the area of technology characteristics such as social presence, immediacy of communication, and concurrency. These constructs have been examined expansively with publications in peer-reviewed academic journals, articles, research manuals, and books (Brown et al., 2010; Mandal, 2012; Oliveira, Faria, Thomas, & Popovič, 2014).

External Validity

External validity means that there is the ability to generalize the results of a study to other populations. Threats to external validity were addressed by obtaining data from the sample of the target population. My research sought to determine possible relationships between the independent variables and continuous usage, where my goal was to make qualified conclusions based on the study results and extant literature. Also, the larger the sample size, the more the study results are reliable, and the likelihood of the results being generalized to future researchers (Onwuegbuzie, 2000). For this descriptive correlation study, I used a nonprobability snowball sampling where no attempt was made to randomize the sample, which posed a limitation to generalize the findings to the population.

Internal Validity

Internal validity can be threatened when credible conflicting explanations cannot be ruled out (Onwuegbuzie, 2000). Threats to internal validity such as history and mortality threats were addressed to alleviate any impacts. History threat was addressed by having a short, two-week window for participants to complete the survey. Mortality threats were addressed by carefully monitoring dropout rates using the monitoring tool on SurveyMonkey, allowing for additional participants to be added to meet sampling size.

Construct Validity

Construct validity is described by evaluating how constructs are measured and threats determined including incorrect definitions of constructs, mono-operation bias, and mono-method bias (Downing & Clark, 1997). The instrument used in this study was pre-existing and confirmed by previous researchers as valid and reliable, which reduced the threat to construct validity. Testing of the hypothesized relationships also helped to address the threat to construct validity. Concurrency and immediacy were new scales created by Brown et al. (2010), and I found the scales to be reliable exceeding .80 Cronbach's alpha. Similarly, Brown et al. (2010) found social presence scale was highly reliable with comparable Cronbach's alpha scores. The unified theory of acceptance and use of technology constructs are highly reliable, tested for validity multiple times in various scenarios, and found to have comparable Cronbach's alpha scores surpassing .80 (Brown et al., 2010).

Ethical Procedures

Walden has ethical guidelines that are enforced by the Institutional Review Board, where approval number 09-26-19-0110969 was provided to collect data. I have also completed training and received certification by the National Institute of Health (NIH) Office of Extramural Research (Number 2588593) titled Protecting Human Research Participants. This study was conducted by collecting data from participants using an electronic survey hosted on the SurveyMonkey.com platform. All information gathered during this study was confidential and sensitive requiring the appropriate storage and security. I secured and stored data on the SurveyMonkey.com platform where data is only accessible to the researcher. All data were carefully secured in a locked file cabinet only accessible by the researcher regardless of what medium or technology was used to work on the information. Pseudonyms assigned to participants ensured no one can identify any organizations or participants. Physical articles, documents, and media files obtained during the study were stored and secured with a password known only to me.

Only approved individuals, such as university reviewers and my dissertation committee will have access to the data collected for this study with all participant information redacted to comply with the assurance of confidentiality. All research data collected will be secured for the required maximum of five years from the conclusion of this study. Five years after the study, documents will be shredded or destroyed through proper means.

Summary

Chapter 3 included a review of the research design and the rationale for completing the study. It also delineated the methodology for conducting the study, sample and how the sample size was determined as well as validity concerns. Chapter 3 detailed the instrumentation, data collection procedure, data analysis and ethical considerations for conducting this study. The expectation was the data collected would help answer the research question and fill the gap in the literature. In Chapter 4, the results are reported, including the process of collecting and analyzing the data, the emergent themes, and detailing how the information relates to the research questions.

Chapter 4: Results

The purpose of this quantitative, correlational survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. The potential significance of the study was to provide information that could aid business managers in making decisions about the allocation of funding for acquisition, training, and adoption of enterprise social networks. The potential contribution of the study is that findings corresponded to the model developed and tested by Brown et al. (2010) and expanded the original study using a participant pool in the United States comprised of corporate knowledge workers on virtual teams. The instrument utilized in the study consisted of the Constructs and Measures Survey published by Brown et al. (2010). I collected data from a survey that I administered to participants who were information technology knowledge workers in Fortune 500 companies in the United States.

The overarching research question for the study was: What is the relationship among social presence, immediacy of communication, concurrency, and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018? The associated hypotheses were as follows:

$H_0$1: There is no significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A1: There is a significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_02: There is no significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A2: There is a significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_03: There is no significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

H_A3: There is a significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.

Chapter 4 includes two main sections: "Data Collection" and "Study Results." In the results section, I will discuss the data collection, sample demographics, reliability analyses, descriptive statistics, data screening, and research question/hypothesis testing and present a summary of the results. Data were analyzed with SPSS 23 for Windows. I begin the chapter with a discussion of the data collection for the study.

Data Collection

Regarding the time frame for data collection for the research study, I planned for four weeks or until the minimum amount of surveys were completed. The minimal amount of surveys as stated in Chapter 3 was based on Green's 1991 guideline for regression sample size (as cited in VanVoorhis & Morgan, 2007). According to Green, the way to test individual predictors is to start with a sample size of 104 and add the number of independent variables, which in this research was three for a total of 107.

SurveyMonkey.com was the host for the Constructs and Measures instrument. I posted the invitation to participate in the study on LinkedIn and Facebook groups with knowledge workers from information technology Fortune 500 companies in the United States. I also shared the survey using snowball sampling. One week after the initial posting, I posted a reminder announcement on the LinkedIn group accounts. A final reminder was posted on LinkedIn and Facebook group accounts during the last week of the survey being available. The survey was closed after nine weeks, and an announcement posted to the LinkedIn and Facebook groups that more information would be provided regarding the study results.

Study Results

Sample Demographics

The sample consisted of 107 participants; 57% (n = 61) were men and 43% (n = 46) were women. The largest age group of participants consisted of respondents who were 31 to 40 years of age (35.5%, n = 38), followed by 41-50 (25.2%, n = 27), and 18-30 (18.7%, n = 20). Age groups are presented in Table 2.

Table 2

Age Group

Age	*n*	*%*	*Cumulative %*
18 to 30	20	18.7	18.7
31 to 40	38	35.5	54.2
41 to 50	27	25.2	79.4
51 to 60	19	17.8	97.2
61 to 70	3	2.8	100.0
Total	107	100.0	

Regarding job roles, the largest group of respondents were managers (34.6%, n = 37), which included directors, administrators, and executives. The next largest group consisted of analysts (15%, n = 16), which included budget analysts, data analysts, system analysts, and so forth. Developers (11.2%, n = 12) and support technicians (11.2%, n = 12) were equally distributed. Job roles are presented in Table 3.

Table 3

Job Roles

Job role	*n*	%
Accountant	5	4.7
Analyst	16	15.0
Banker	2	1.9
Commercial lender	1	0.9
Developer	12	11.2
Independent associate	1	0.9
Information technology recruit	1	0.9
Manager	37	34.6
Media researcher	1	0.9
Media tech	1	0.9
Payroll clerk	1	0.9
QA specialist	1	0.9
Quality engineer	1	0.9
Scrum master	1	0.9
Senior advisor	1	0.9
Software programmer	1	0.9
Solutions architect	3	2.8
Specialist	5	4.7
Support technician	12	11.2
Teacher	1	0.9
Technical writer	2	1.9
Test engineer	1	0.9
Total	107	100.0

One of the survey questions was, "On an average week, how much time (in hours) do you use enterprise social networking collaboration tool?" On an average week, participants reported using enterprise social networking collaboration tools 17.63 hours (*SD* = 13.26) with a median of 15 hours. Participants were also asked, "Of the opportunities you have to use collaboration tools, including a telephone, what percentage of time do you choose enterprise social networking collaboration tool?" Participants chose enterprise social networking tool 57.12% (*SD* = 32.73) of the time with a median of 70%.

Instrument Reliability

The reliability for the sample was tested with Cronbach's alpha. The internal consistency for the variables of interest ranged from acceptable (α = .783) for immediacy of communication to excellent (α = .960) for concurrency and continuous usage (α = .932). The interpretation of the coefficients is based on generally accepted criteria (DeVellis, 2012). Reliability coefficients are presented in Table 4.

Table 4

Reliability Coefficients

Variable	*N* of Items	Cronbach's alpha	Interpretation
Continuous Usage	2	.932	Excellent
Social Presence	3	.817	Good
Immediacy of Communication	3	.783	Acceptable
Concurrency	3	.960	Excellent

Descriptive Statistics

The scores for each variable of interest were computed by summing the values for each item. Each item was measured on a 7-point Likert scale. Thus, for continuous usage, it was possible for scores to range from two to 14. Scores ranged from three to 14 (M = 9.52, SD = 3.74) for the sample. For social presence, it was possible for scores to range from three to 21. Scores actually ranged from seven to 21 (*M* = 14.16, *SD* = 3.04). For immediacy of communication, scores ranged from three to 21 (*M* = 15.81, *SD* = 3.92). For concurrency, scores ranged from three to 21 (*M* = 16.13, *SD* = 4.01). Descriptive statistics are presented in Table 5.

Table 5

Descriptive Statistics

Variable	*Minimum*	*Maximum*	*M*	*SD*
Continuous Usage	3	14	9.52	3.74
Social Presence	7	21	14.16	3.04
Immediacy of Communication	3	21	15.81	3.92
Concurrency	3	21	16.13	4.01

Data Screening

Preliminary data screening consisted of skewness and kurtosis statistics, the Shapiro-Wilk Test of Normality, and histograms. In SPSS, distributions are normal if the absolute values of their skewness and kurtosis coefficients are less than two times their standard errors (George & Mallery, 2010). According to these guidelines, three out of four of the distributions were not normal and one distribution was normal. Skewness and kurtosis coefficients are presented in Table 6.

Table 6

Skewness and Kurtosis Coefficients

	Skewness		Kurtosis	
Variable	Statistic	Std. Error	Statistic	Std. Error
Continuous Usage	-.475	.234	-1.15	.463
Social Presence	-.134	.234	-.061	.463
Immediacy of Communication	-.758	.234	.080	.463
Concurrency	-.919	.234	.871	.463

The Shapiro-Wilk Test of Normality is another method of screening the data for normality. Distributions are not normal when the *p*-value is less than .05. According to the Shapiro-Wilk Test of Normality, all the distributions were not normal. See Table 7.

Table 7

Shapiro-Wilk Test of Normality

	Shapiro-Wilk		
Variable	Statistic	*df*	*p*
Continuous Usage	.887	107	.000
Social Presence	.973	107	.026
Immediacy of Communication	.934	107	.000
Concurrency	.909	107	.000

For continuous usage, the distribution was not normal, $p < .001$. The skewness was 2.03 times the standard error. The kurtosis was 2.48 times the standard error. The histogram of continuous usage is presented in Figure 3.

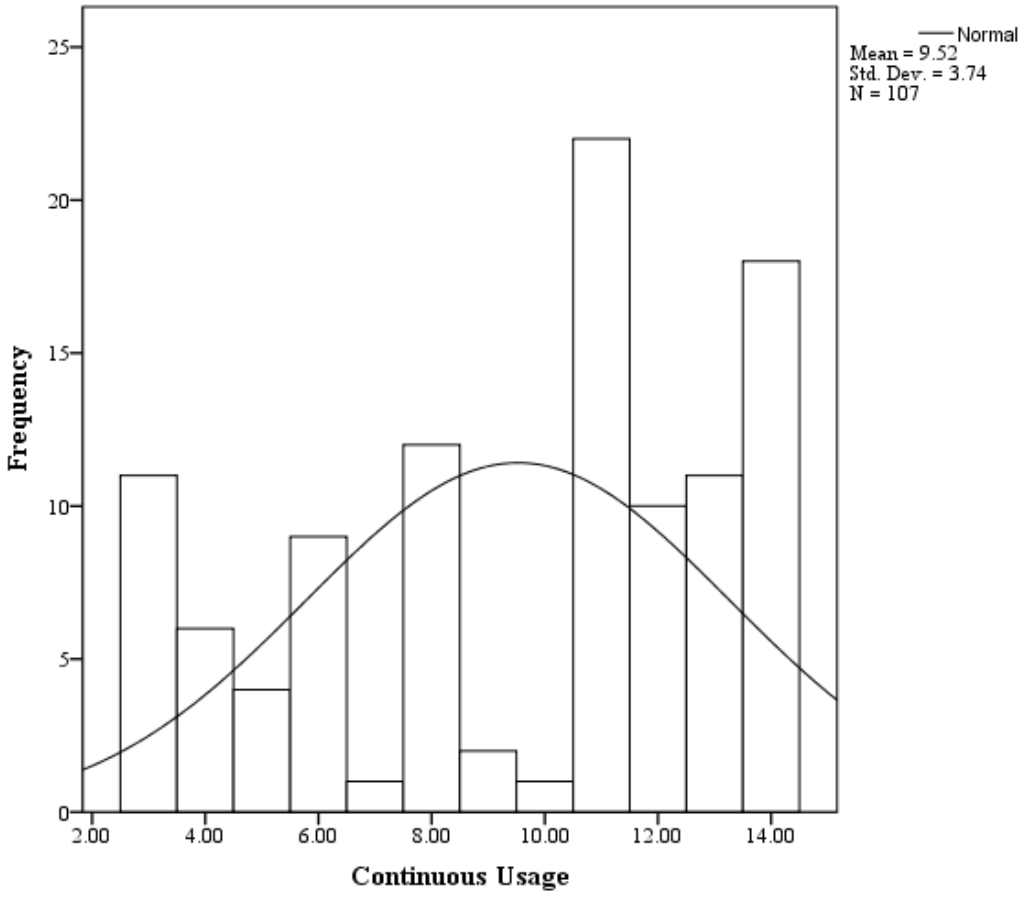

Figure 3. Histogram of Continuous Usage

Data were also screened for statistical outliers with stem and leaf plots and with box and whisker plots. A statistical outlier is indicated when it falls above or below the whiskers in the box and whisker plot. It is determined mathematically when it falls above or below 1.5 X the interquartile range (IQR). The interquartile range is computed by subtracting the range of the first quartile from the range of the third quartile. For continuous usage, there were no statistical outliers. The median was 11. The IQR = 7. The box and whisker plot for continuous usage is presented in Figure 4.

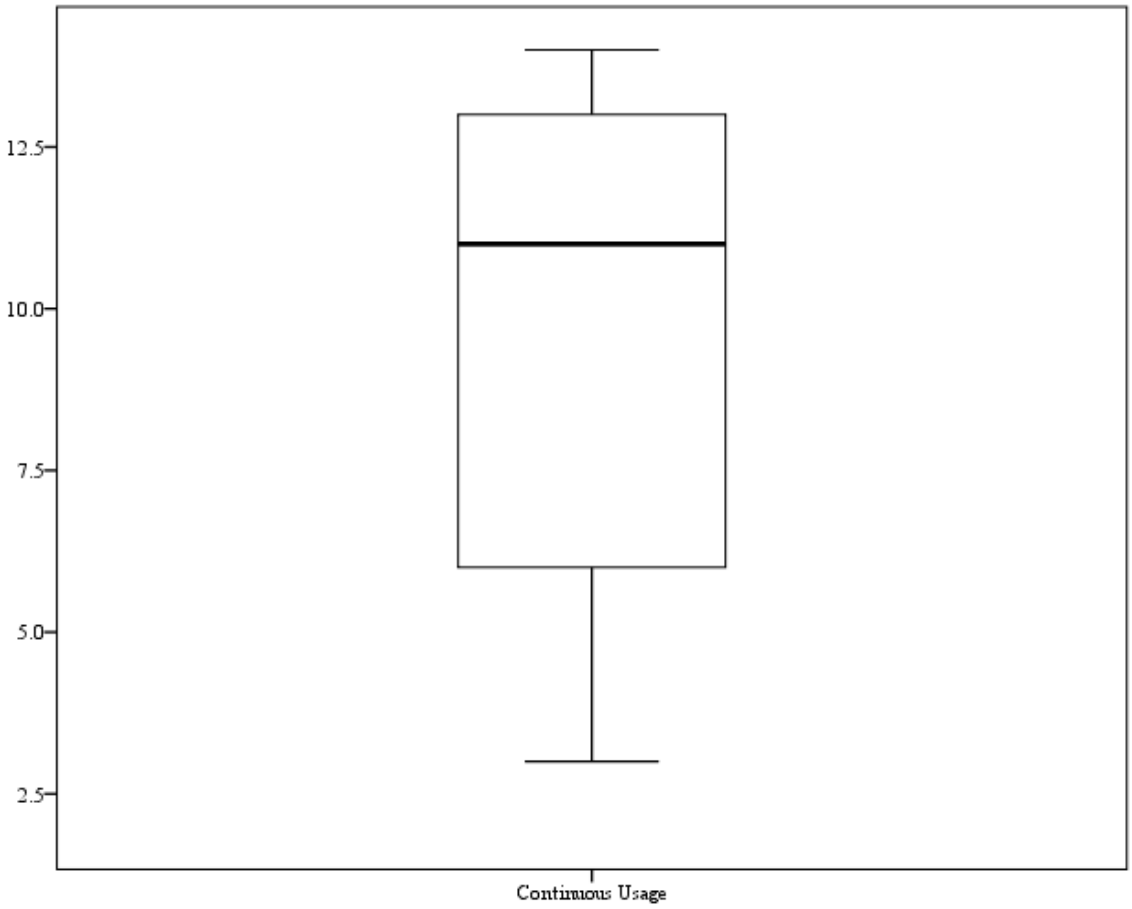

Figure 4. Box and Whisker Plot for Continuous Usage

For social presence, the distribution was not normal, $p = .026$. The skewness was 0.57 times the standard error. The kurtosis was 0.13 times the standard error. The histogram of social presence is presented in Figure 5.

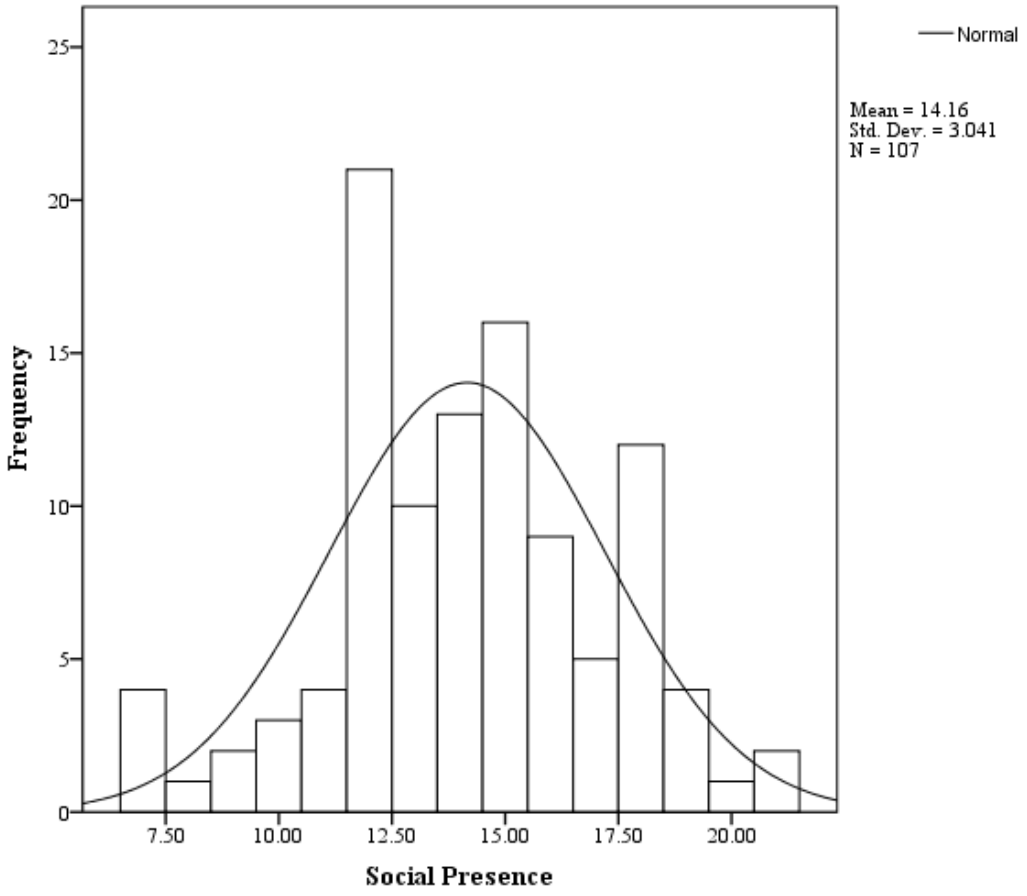

Figure 5. Histogram of Social Presence

For social presence, there were no statistical outliers. The median was 14. The IQR = 4. The box and whisker plot for social presence is presented in Figure 6.

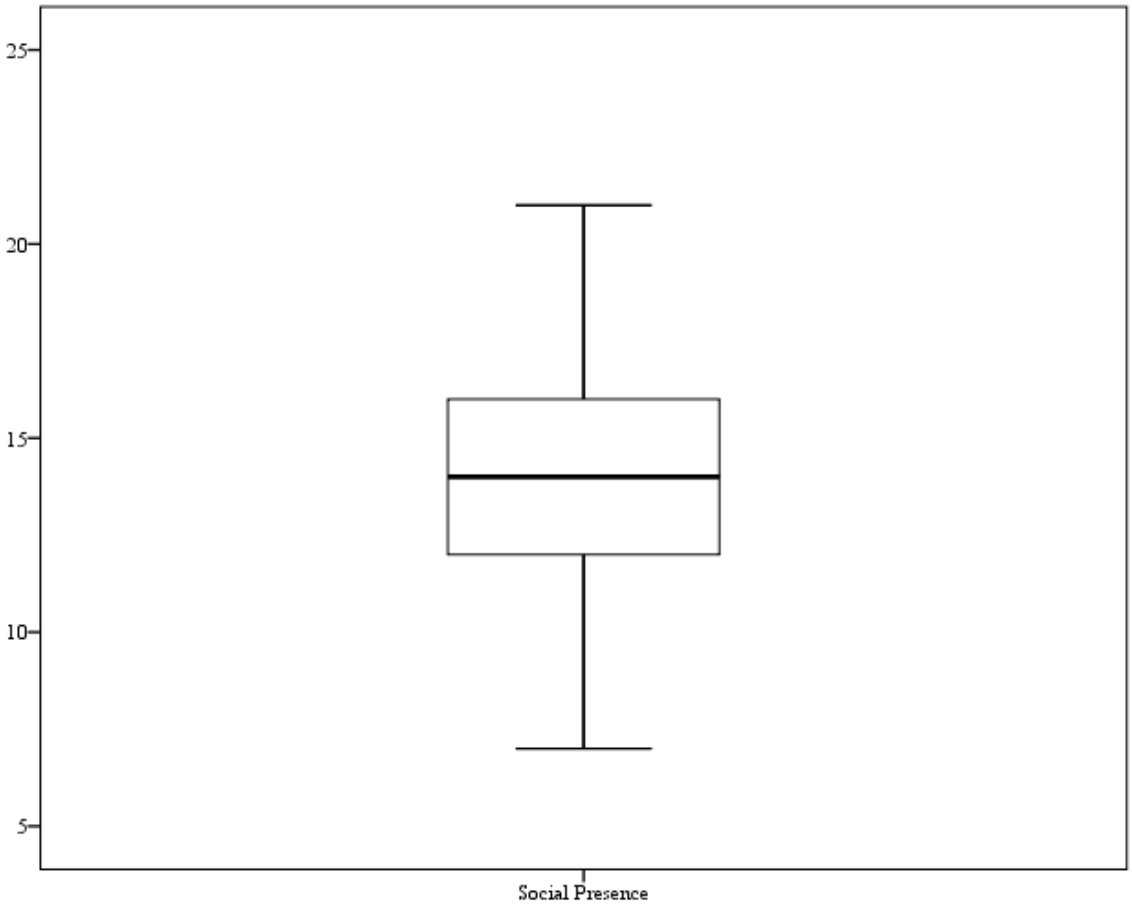

Figure 6. Box and Whisker Plot for Social Presence

For immediacy of communication, the distribution was not normal, $p < .001$. The skewness was 3.24 times the standard error. The kurtosis was 0.17 times the standard error. The histogram of immediacy of communication is presented in Figure 7.

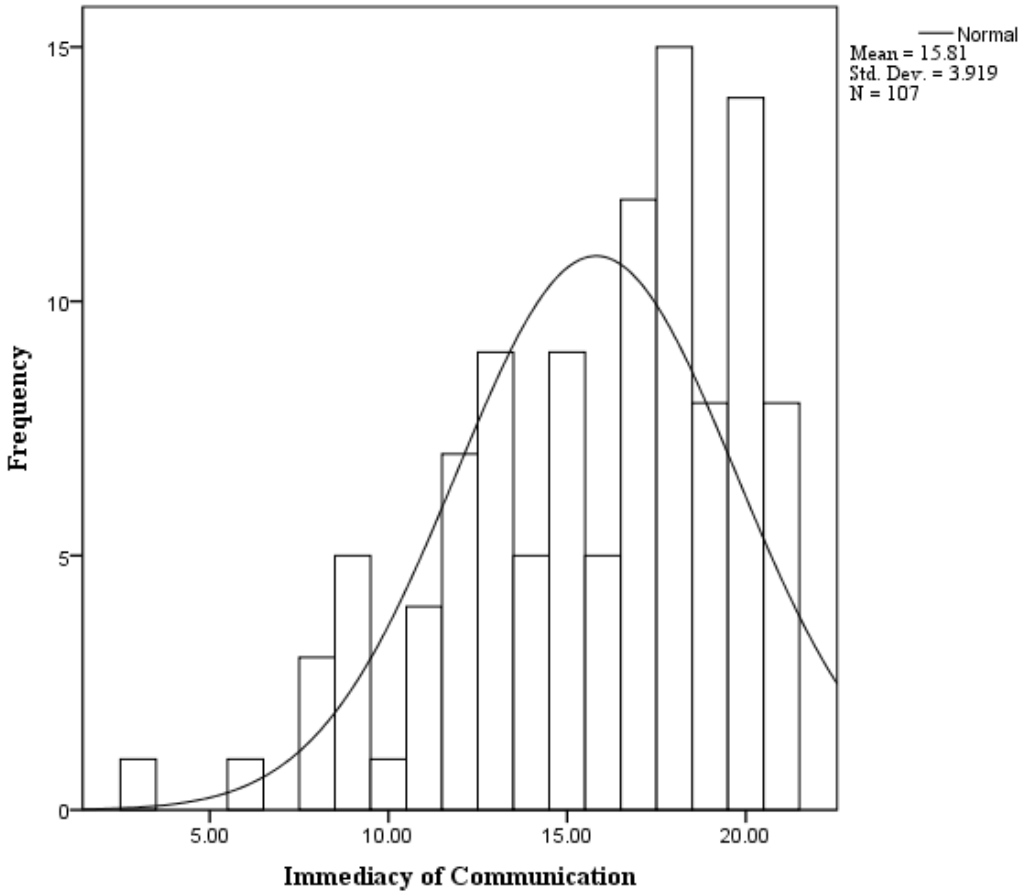

Figure 7. Histogram of Immediacy of Communication

For immediacy of communication, there was one statistical outlier (≤ 3). The median was 17. The IQR = 6. The box and whisker plot for immediacy of communication is presented in Figure 8.

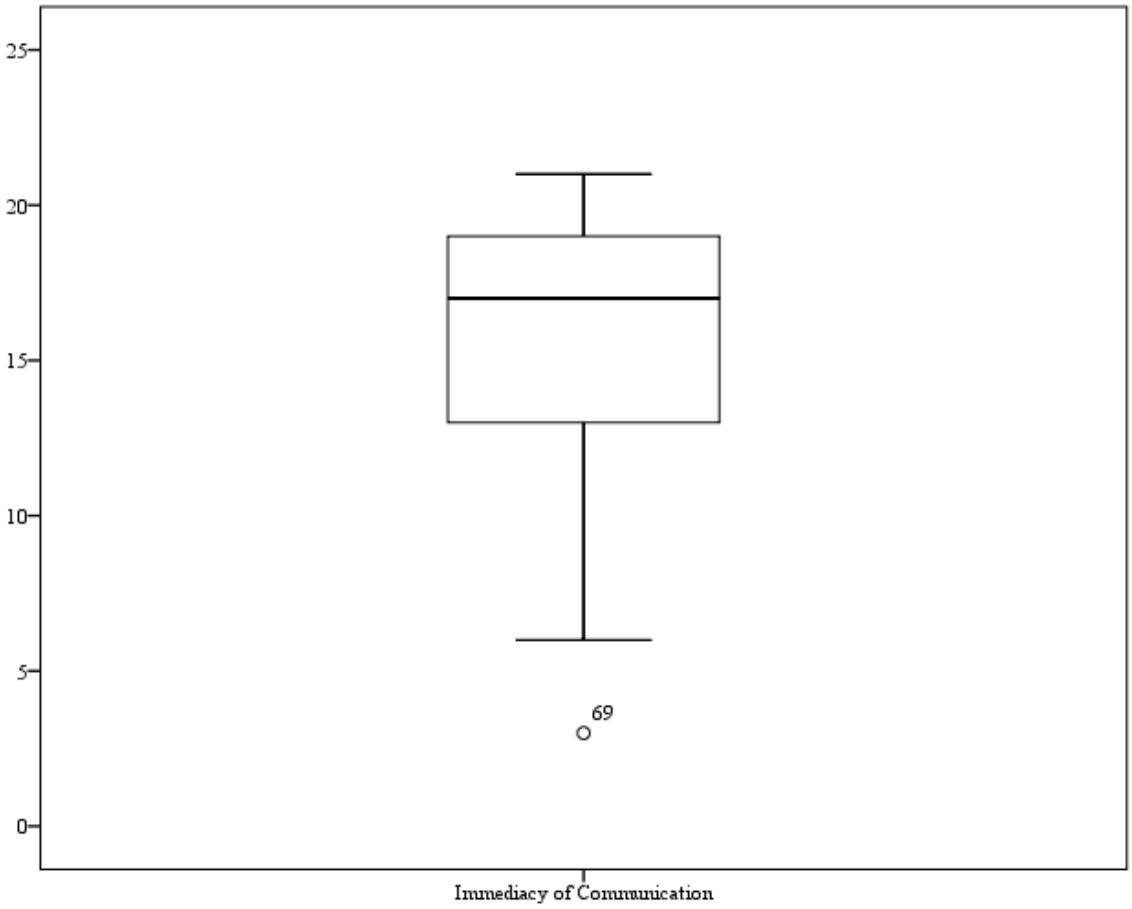

Figure 8. Box and Whisker Plot for Immediacy of Communication

For concurrency, the distribution was not normal, $p < .001$. The skewness was 3.93 times the standard error. The kurtosis was 1.88 times the standard error. The histogram of immediacy of concurrency is presented in Figure 9.

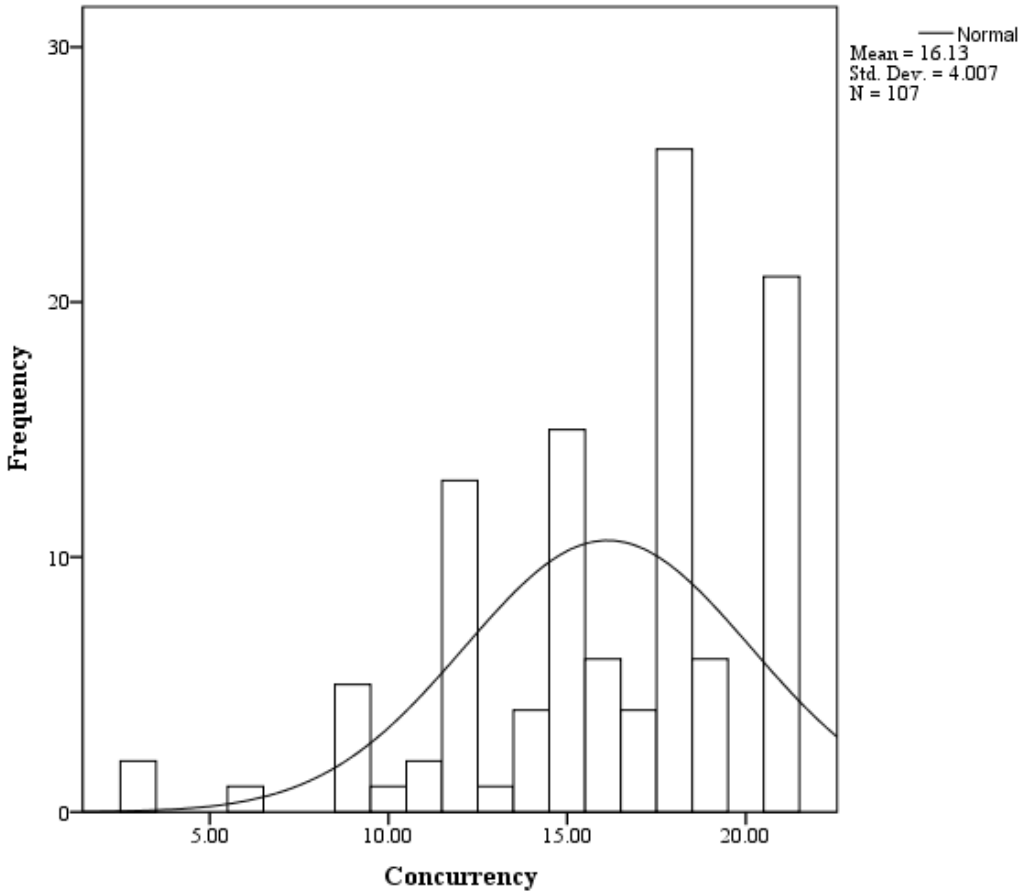

Figure 9. Histogram of Concurrency

For concurrency, there were two statistical outliers (≤ 6). The median was 17. The IQR = 5. The box and whisker plot for concurrency is presented in Figure 10.

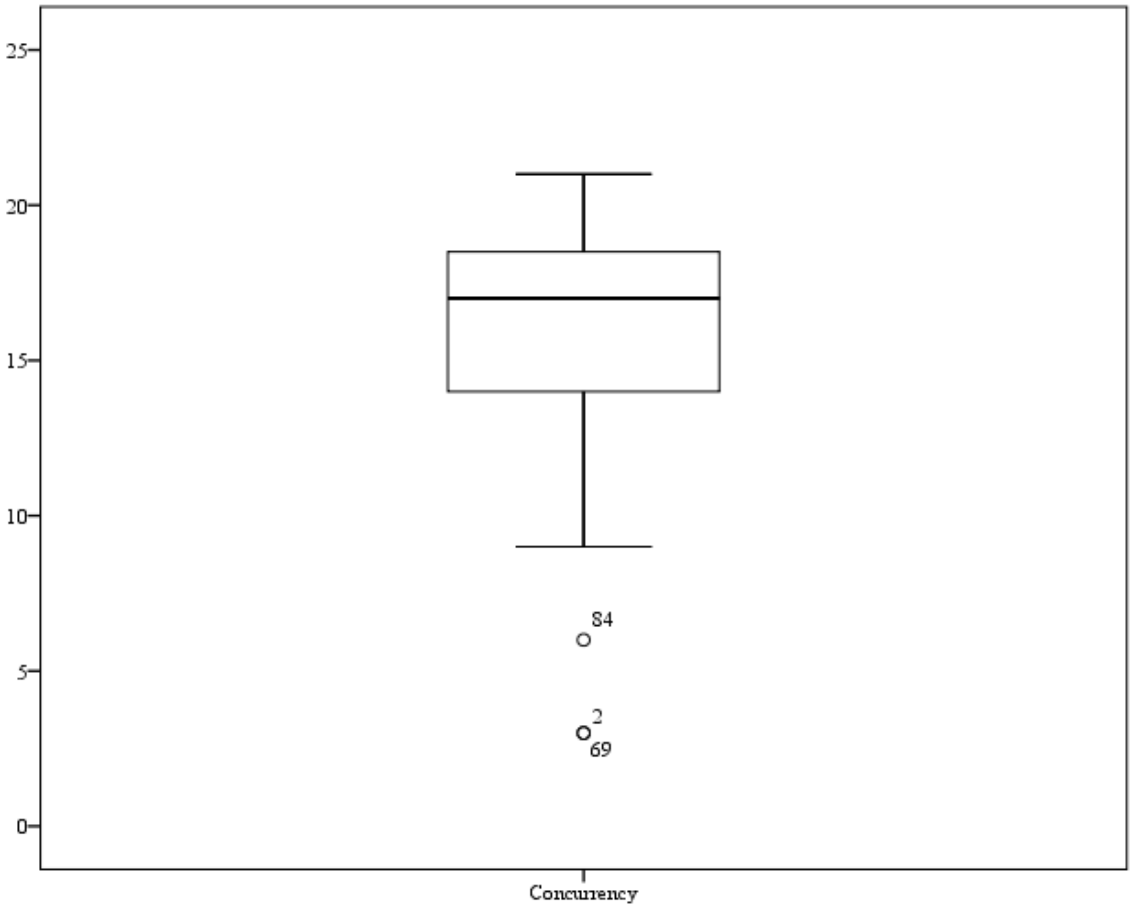

Figure 10. Box and Whisker Plot for Concurrency

To summarize the preliminary data screening results, one (social presence) out of four distributions was normal according to the skewness and kurtosis coefficients but not according to the Shapiro-Wilk Test of Normality. According to the Shapiro-Wilk Test of Normality, all four of the distributions were not normal. Two distributions had no statistical outliers present (continuous usage and social presence). Two distributions had statistical outliers present (immediacy of communication and concurrency). Preliminary data screening results are summarized in Table 8.

Table 8

Preliminary Data Screening Results Summary

Variable	Skewness/Kurtosis Normality	Shapiro-Wilk Normality	Statistical Outliers
Continuous Usage	No	No	No
Social Presence	Yes	No	No
Immediacy of Communication	No	No	Yes
Concurrency	No	No	Yes

Testing of the Research Hypotheses

I tested the three research hypotheses using multiple linear regression. One regression model was used to test all three hypotheses simultaneously. Prior to the analysis, the assumptions of multiple regression were tested. The assumptions of multiple linear regression included linearity of relationships, normality of residuals, homoscedasticity, and no multicollinearity.

Assumption 1: Linearity of relationships. Linearity of relationships was tested by generating a scatterplot matrix of the variables of interest and including a line of best fit. The line of best fit was computer-generated by SPSS. Linear relationships among the variables of interest are illustrated by the slopes in the line of best fit as illustrated in Figure 11.

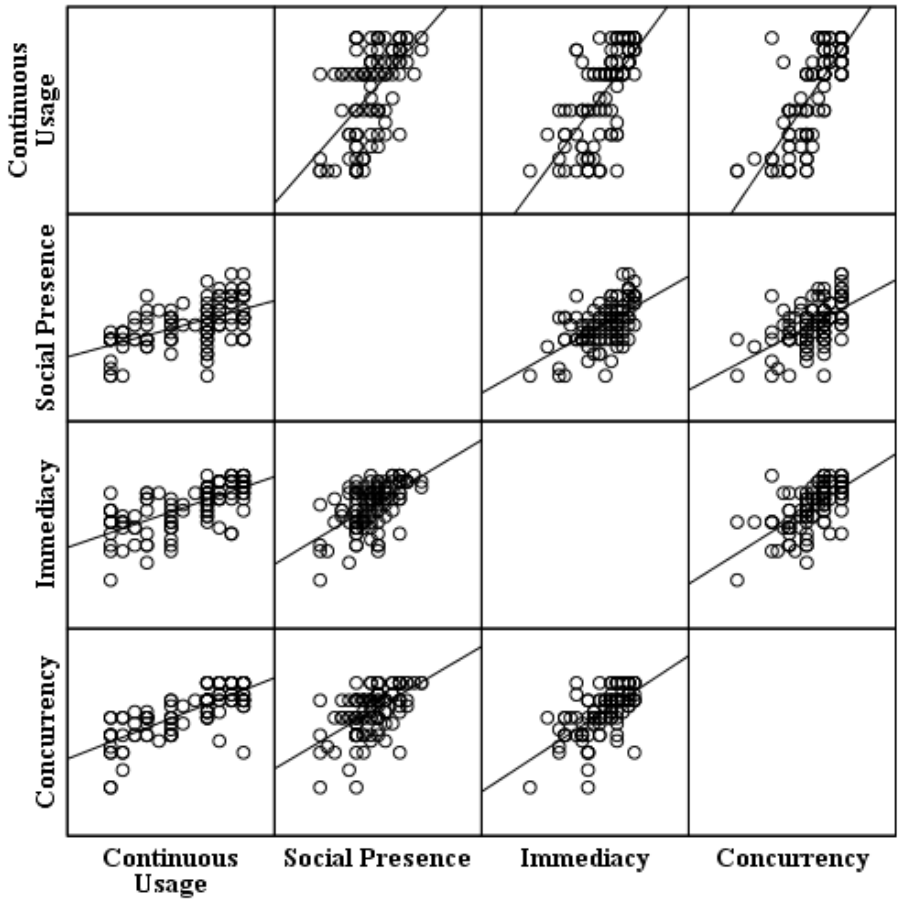

Figure 11. Scatterplot Matrix for Variables of Interest

Assumption 2: Normality of residuals. The normality of residuals was examined statistically. Standardized residuals that exceeded ±3 were candidates for exclusion. Standardized residuals ranged from -2.43 to 2.68 and were therefore within normal limits. A normal P-P Plot of standardized residuals is presented in Figure 12. Normality of residuals is indicated to the extent that the plotted values fall closely along the 45-degree line.

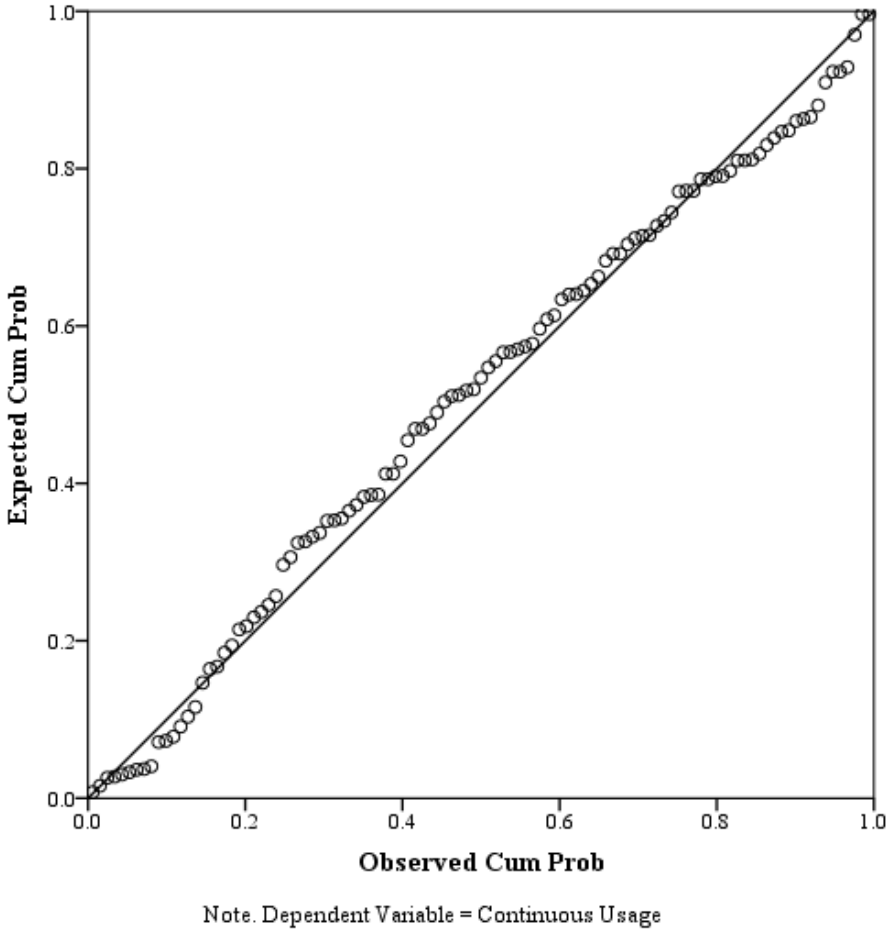

Figure 12. Normal P-P Plot of Regression Standardized Residuals

Assumption 3: Homoscedasticity. Homoscedasticity means that the variance of the errors is the same across all levels of the independent variables. This assumption was tested by examining a scatterplot of regression standardized residuals by the regression standardized predicted value. This assumption was met when the residuals are randomly scattered around zero, the horizontal line as illustrated in Figure 13.

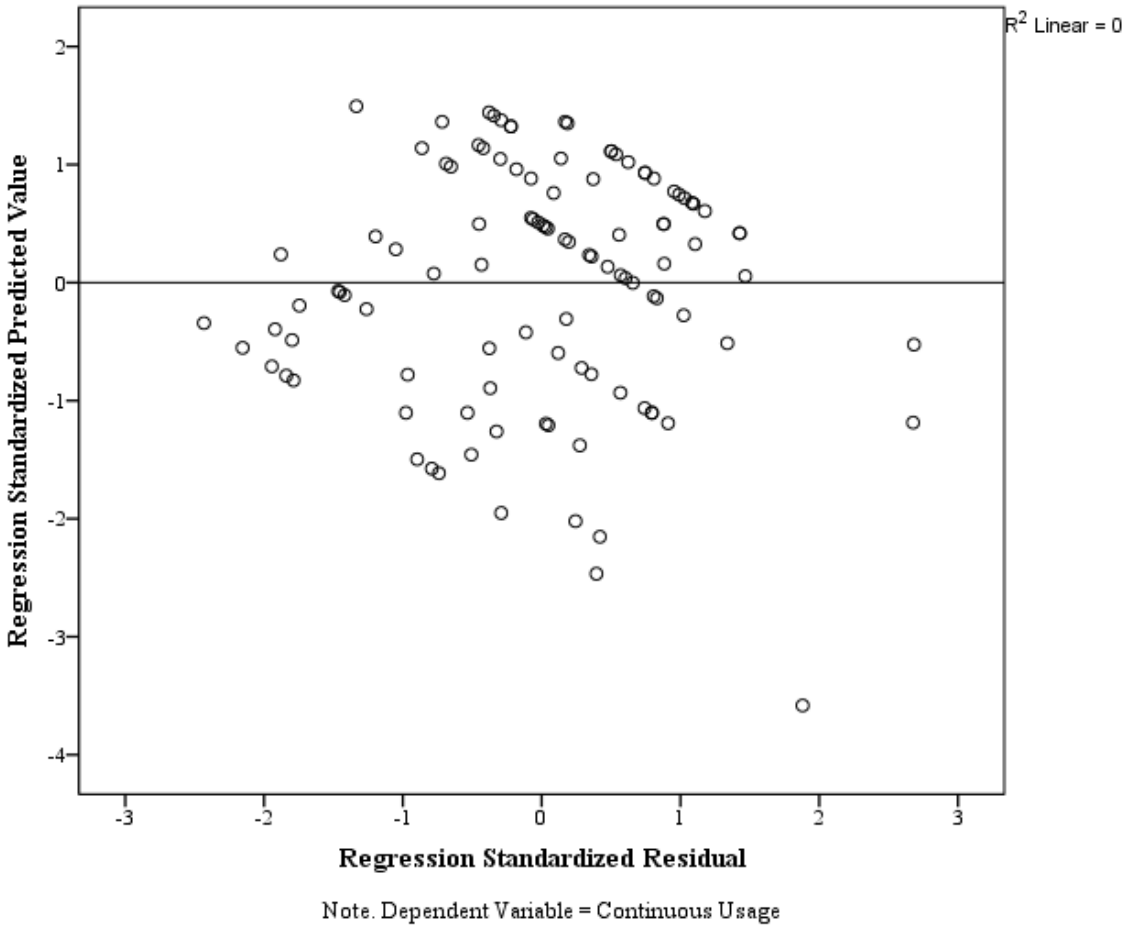

Figure 13. Regression Standardized Residuals by Standardized Predicted Values

Assumption 4: No multicollinearity. Multicollinearity was assessed with the variance inflation factor (VIF). VIF values greater than 10 indicate high collinearity. VIF values ranged from 1.66 to 1.94. Therefore, multicollinearity was not problematic. VIF values are presented in Table 9.

Table 9

Variance Inflation Factors

Variable	VIF
Social Presence	1.66
Immediacy of Communication	1.94
Concurrency	1.87

The overall regression model was statistically significant, $F(3, 103) = 62.64$, $p < .001$; Adjusted $R^2 = .64$. This means that at least one of the predictor variables was a significant predictor of continuous usage. It also means that the regression model accounted for 64% of the variance in continuous usage. An examination of the univariate statistics revealed that social presence was not a significant predictor of continuous usage ($\beta = .10$, $t = 1.28$, $p = .205$). However, immediacy of communication was a significant, positive predictor of continuous usage ($\beta = .29$, $t = 3.55$, $p = .001$). As immediacy of communication increased by one standard deviation, continuous usage increased by .29 standard deviations. Concurrency was also a significant, positive predictor of continuous usage ($\beta = .52$, $t = 6.50$, $p < .001$). As concurrency increased by one standard deviation, continuous usage increased by .52 standard deviations. Regression coefficients are presented in Table 10.

Table 10

Regression Coefficients

Variable	*B*	SE *B*	β	*t*	*p*
(Constant)	-4.36	1.13		-3.86	.000
Social Presence	0.12	0.09	.10	1.28	.205
Immediacy of Communication	0.28	0.08	.29	3.55	.001**
Concurrency	0.49	0.08	.52	6.50	.000***

Note. Dependent Variable = Continuous Usage. **p< .01, ***p< .001; N = 107; F = 62.64; R = .80, R^2 = .65, Adjusted R^2 = .64.

Hypothesis 1. $H_0$1 stated that there is no significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018. An examination of the univariate statistics revealed that social presence was not a significant predictor of continuous usage (β = .10, t = 1.28, p = .205). Therefore, the null hypothesis was not rejected.

Hypothesis 2. $H_0$2 stated that there is no significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018. Immediacy of communication was a significant, positive predictor of continuous usage (β = .29, t = 3.55, p = .001). Therefore, the null hypothesis was rejected.

Hypothesis 3. $H_0$3 stated that there is no significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018. Concurrency was a significant, positive predictor of continuous usage (β = .52, t = 6.50, p < .001). Therefore, the null hypothesis was rejected. The hypotheses and outcomes are summarized in Table 11.

Table 11

Hypothesis Summary and Outcomes

Hypothesis	Significance	Outcome
$H_0$1: There is no significant relationship between social presence and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.	$p = .205$	Null Not Rejected
$H_0$2: There is no significant relationship between immediacy of communication and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.	$p = .001$	Null Rejected
$H_0$3: There is no significant relationship between concurrency and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018.	$p < .001$	Null Rejected

Summary of Results

One overarching research question was formulated for investigation, which generated three associated hypotheses. The research question was: "What is the relationship among social presence, immediacy of communication, concurrency, and the continuous usage of enterprise social networks at publicly held Fortune 500 companies in the United States in 2018?" It was determined that social presence was not significantly related to continuous usage when controlling for immediacy of communication and concurrency. Both immediacy of communication and concurrency were significantly and positively related to continuous usage. The regression model accounted for 64% of the variance in continuous usage. Implications and recommendations will be discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative, correlational survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. The nature of this study was a quantitative correlational study using regression analysis based on the methodology demonstrated in the study conducted by Brown et al. (2010). I conducted the study in response to the specific management problem of a potential loss of value-added benefits when organizations experience a lapse in continuous usage of enterprise social networks among corporate knowledge workers. Key findings from this study of 107 participants were that immediacy of communication and concurrency were significantly and positively related to continuous usage while social presence was not significantly related to continuous usage when controlling for immediacy of communication and concurrency. Chapter 5 consists of a discussion of the findings of the study organized in five sections: "Interpretation of Findings," "Limitations of the study," "Recommendations," "Implications," and "Conclusions."

Interpretation of Findings

To test the relationship between the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks, I undertook a multiple regression strategy to measure not only the strength of a relationship but to measure the predictions of three independent variables' relationships to the dependent variable, controlling for and taking into account

the variance in each predictor variable. Venkatesh et al. (2016) posited that the unified theory of acceptance and use of technology described 77% of the difference in behavioral intention to use a particular technology and 52% of the variation in technology use. In this study, 107 participants from various information technology Fortune 500 companies chose an enterprise social networking tool 57.12% (SD = 32.73) of the time with a median of 70%. The model used in this study accounted for 64% of the variance in continuous usage.

Immediacy of communication and concurrency were significantly and positively related to continuous usage of enterprise social networks by knowledge workers at information technology Fortune 500 companies in the United States. Immediacy of communication was a significant, positive predictor of continuous usage (β = .29, t = 3.55, p = .001). As immediacy of communication increased by one standard deviation, continuous usage increased by .29 standard deviations. Concurrency was also a significant, positive predictor of continuous usage (β = .52, t = 6.50, p < .001). As concurrency increased by one standard deviation, continuous usage increased by .52 standard deviations.

In reviewing the literature, I found only a few studies whose authors tested the unified theory of acceptance and use of technology constructs with collaboration-related technology constructs. The two major streams of knowledge are technology adoption and use and collaboration technology. Brown et al. (2010) and Silic and Back (2016) performed studies similar to mine with these streams. Brown et al. first surveyed 349 student users of a short message service technology at a leading Finnish university, and in

the secondary study conducted at a Fortune 500 technology company in Finland, the researchers surveyed 447 employees' use of a new collaboration technology developed in-house. The findings of my study indicated that immediacy of communication and concurrency constructs were significantly and positively related to continuous usage and were similar to the findings of Brown et al.

Like Brown et al. (2010), Silic and Back (2016) found that the immediacy of communication and concurrency constructs had an impact on performance and effort expectancy. Silic and Back surveyed 296 employees from 50 different countries to discover factors that push adoption and use of unified communication and collaboration technology. The authors asserted that concurrency did not have critical elements needed for performance and effort expectancy (Silic & Back, 2016), a finding which was different from mine. Furthermore, Silic and Back found that social presence did not influence effort expectancy in the unified theory of acceptance and use of technology. Similarly, the findings from my research show that social presence was not significantly related to continuous usage when controlling for immediacy and concurrency.

Limitations of the Study

There were three noted limitations of this study. The plan was to post the social media flyer to LinkedIn groups geared toward the targeted sample. Due to the small number of surveys (nine) obtained in three weeks, I sent a request to change the social media posting to Walden's Institutional Review Board. The request was to create a post that encompassed a broader array of job roles and types of companies to meet the targeted sample for knowledge workers at information technology Fortune 500

companies. The second limitation was the initial use of LinkedIn as the only social media platform which limited the reach to professionals who were eligible to participate in this study. At three weeks in, there were only nine usable surveys. I also made a request to Walden's Institutional Review Board to add Facebook as an additional social media platform to help reach participants after the fourth week with nine completed surveys. The change in the social media flyer was helpful in obtaining, over weeks, the 107 participants needed from different information technology Fortune 500 companies. A third limitation was the recruitment strategy. It might have been more efficient in terms of recruitment and generalizability to have targeted specific companies and jobs instead of social media. For this descriptive correlation study, a nonprobability snowball sampling was used, and no attempt was made to randomize the sample, which posed a limitation to generalizing the findings to the population.

Recommendations

Analysis of study findings yielded five recommendations. A first recommendation for future research is testing the immediacy of communication and concurrency constructs with employees who are knowledge workers in various kinds of companies including nonprofit, retail, and financial institutions, not solely information technology Fortune 500 companies in the United States. Previous researchers who have used the immediacy construct have mainly conducted qualitative and mixed-methods studies; very few quantitative studies have been performed (Anumudu et al., 2018). The findings showed that 36% of the variance for continuous usage was not accounted for in this study. A second recommendation for future studies would be to control for age or

specific knowledge worker job roles such as programmers only. A third recommendation is to obtain a larger sample size, which would increase internal validity in future studies.

Social presence was not significantly related to continuous usage of enterprise social networks by knowledge workers at information technology Fortune 500 companies in the United States, when controlling for immediacy of communication and concurrency. A fourth recommendation for future research is to conduct mixed-methods or qualitative research, which could give more information on the social presence construct involved in enterprise social network usage by knowledge workers at information technology Fortune 500 companies in the United States. Mixed-methods research may give a broad-based view by combining the unified theory of acceptance and use of technology with collaboration-related constructs. Due to the limited research in continuous usage postadoption of enterprise social networks, a fifth recommendation would be to conduct a study comparing factors of a successful postadoption usage of an enterprise social network to those of a poor postadoption use of the technology.

Implications

The potential significance of the study was to provide information that could aid business managers in making decisions about the allocation of funding for acquisition, training, and adoption of enterprise social networks. The potential contribution of the study was that findings corresponded to the model developed and tested by Brown et al. (2010) and expanded the original study using a participant pool in the United States comprised of corporate knowledge workers on virtual teams. The internal consistency for the study's variables ranged from acceptable to excellent, testing reliability using

Cronbach's alpha. Continuous usage was excellent at .932, social presence good at .817, immediacy of communication acceptable at .783, and concurrency excellent at .960, comparable to Brown et al. (2010) model where scales were highly reliable surpassing .80 Cronbach's alpha for these same constructs. The results of this study shows the importance for creators of enterprise social networks to incorporate immediacy of communication and concurrency into the software to help with continued usage of the technology.

The potential of this study is a positive impact towards social change of continuous usage of enterprise social networks, where the study finds that concurrency can increase performance expectancy in decision-making tasks. There are a few studies including this study that have tested the theoretical framework by Brown et al. (2010) by combining technology adoption and collaboration technology streams to predict collaboration technology use with my study testing's continuous usage of enterprise social network. Practitioners and researchers are aware of improved organizational performance with using social media in the enterprise, and Qi and Chau's (2018) study findings showed that using enterprise social networking systems directly and indirectly influenced organizational learning, which knowledge management processes such as creating and sharing knowledge are the mediator between the two.

This study adds to the literature using a model combining technology adoption and collaboration technology research, two major streams of technology knowledge. Companies can also use the model from this study as a way to measure the helpfulness of use of an enterprise social network and whether there is increased innovation using a

specific kind of enterprise social network. The model from this study can be used by companies to evaluate the usefulness of increased training and software design taking into consideration immediacy of communication and concurrency built into the enterprise social network and as a factor in continued usage post-adoption of the technology.

Conclusion

The purpose of this quantitative survey research study was to test the unified theory of acceptance and use of technology that relates collaboration technology constructs to continuous usage of enterprise social networks for knowledge workers at information technology Fortune 500 companies in the United States. Knowledge sharing is confirmed as linked to improvement in organizational performance and collaboration technology is a return on investment when it is continuously used to increase innovation. Enterprise social networks can increase innovation, and the 107 knowledge workers surveyed during this study indicated they use this technology 70% of the time. This study closes with filling in some of the gap in the literature with insightful information as to the merging of the unified theory of acceptance and use of technology with collaboration related constructs.

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Appendix B: Confidentiality Agreement

Name of Signer: Veleta Gordon

During the course of collecting data for this research: "Social Presence, Immediacy of Communication, Concurrency, and Use of Enterprise Social Networks," I will have access to information which is confidential and not for disclosure. I acknowledge that the information must remain confidential and that improper disclosure of confidential information can be damaging to participants.

By signing this Confidentiality Agreement, I acknowledge and agree that:

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6. I understand that a violation of this agreement will have legal implications.

Signing this document, I acknowledge that I have read the agreement, and I agree to comply with all terms and conditions stated above.

Signature: <Insert Signature> Date: xx/xx/2019

Appendix C: Permission to Use Survey Instrument

To obtain permission for the survey to be used in this study, I first requested permission from Dr. Venkatesh's website at http://www.vvenkatesh.com/paper/ to use the paper "Predicting Collaboration Technology Use: Integrating Technology Adoption and Collaboration Research" published in 2010. I have also included a screenshot of the request procedure in Figure 14.

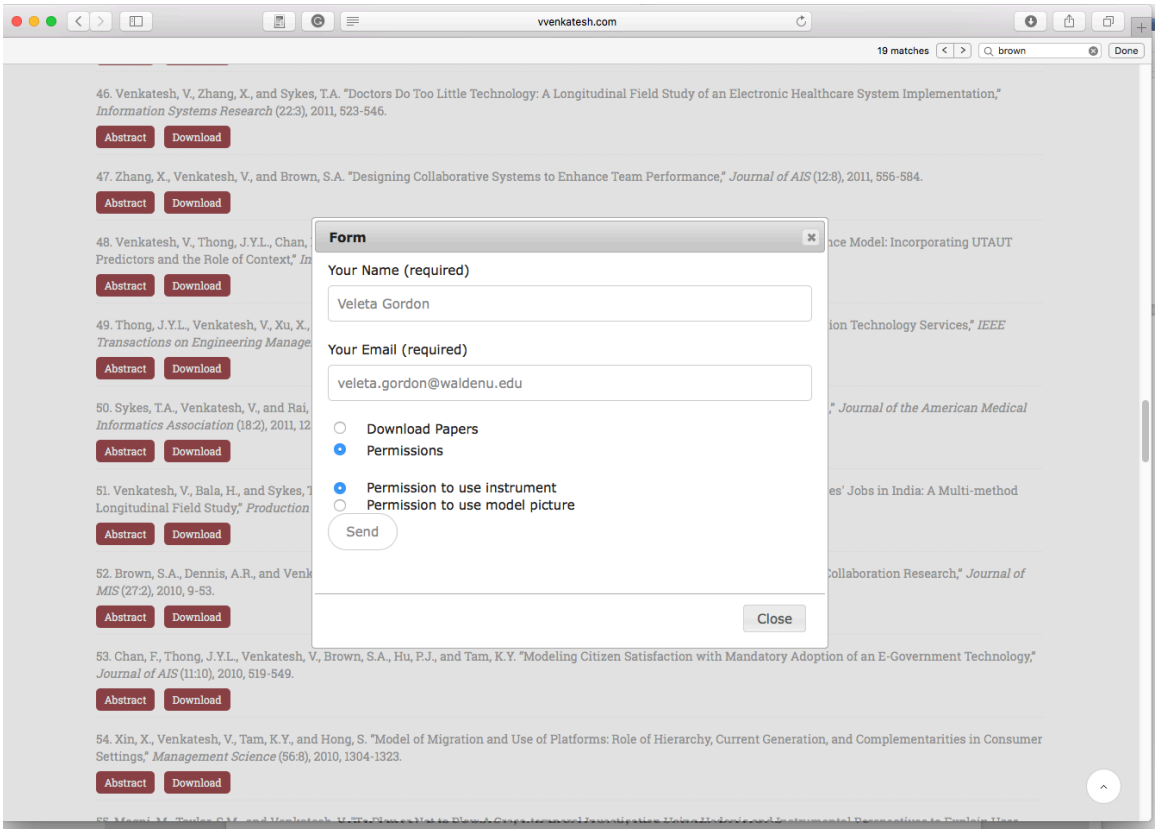
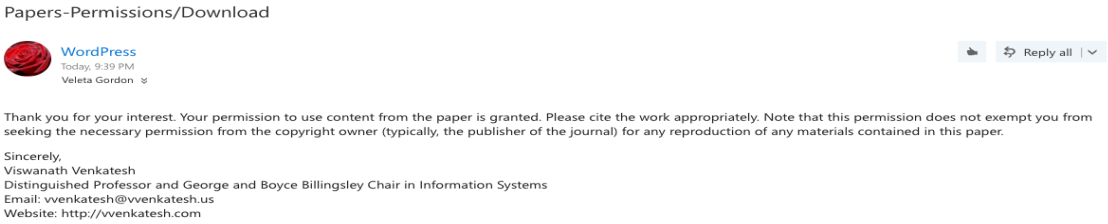


Figure C14. Request to use the survey instrument.

Immediately after requesting permission to use the survey instrument, an email was sent granting permission for the researcher to use the survey instrument. The permission email is shown below in Figure 15.



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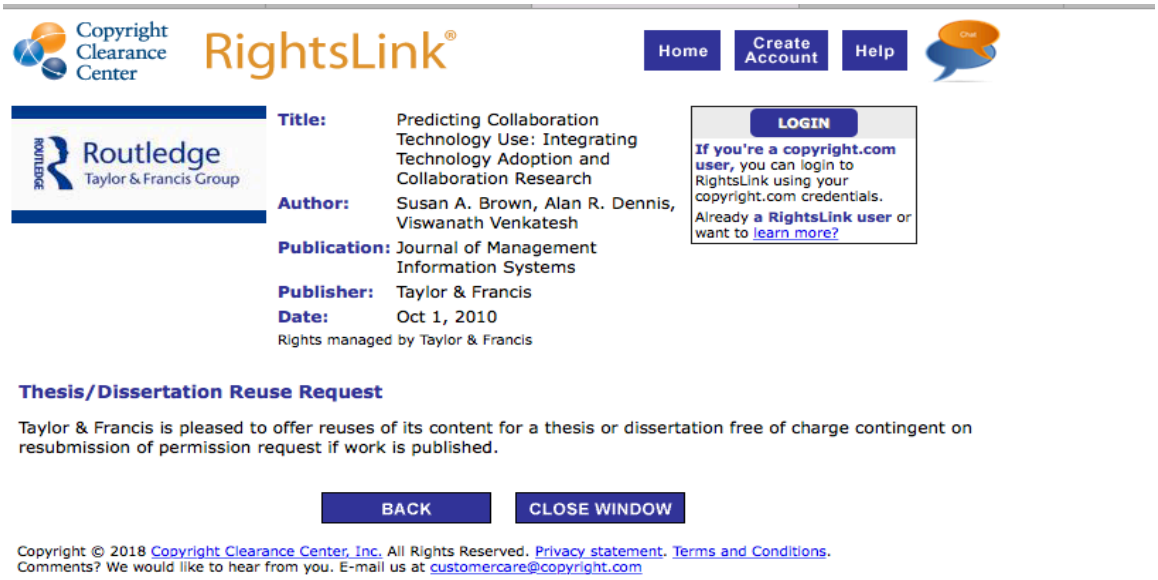
Distinguished Professor and George and Boyce Billingsley Chair in Information Systems
Email: vvenkatesh@vvenkatesh.us
Website: http://vvenkatesh.com

Figure C15. E-mail indicating permission to use the survey instrument.

Furthermore, I have permission from the publishing journal to use material from Brown et al. (2010), as indicated below in Figure 16.



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Publication: Journal of Management Information Systems

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Figure C16. Permission from the publisher to use material from Brown et al. (2010).

Appendix D: Data Collection Instrument

Demographics

1. What is your age?

- 18 to 30
- 31 to 40
- 41 to 50
- 51 to 60
- 61 to 70

2. What is your gender?

- Female
- Male

3. What is your job role?

_____

Collaboration Technology Survey

4. I rate my intensity of <enterprise social networking collaboration tool> to be:

- Very Light
- Light
- Somewhat Light
- Neutral
- Somewhat Heavy
- Heavy
- Very Heavy

5. How frequently do you use <enterprise social networking collaboration tool>:

- Never
- Very Rarely
- Rarely
- Neutral
- Occasionally
- Frequently
- Very Frequently

6. On an average week, how much time (in hours) do you use <enterprise social networking collaboration tool>?

_____ Hours

7. Of the opportunities you have to use collaboration tools, including a telephone, what percentage of time do you choose <enterprise social networking collaboration tool>?

_____ Percentage of Time

8. Using <enterprise social networking collaboration tool> to interact with others creates a warm environment for communication.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

9. Using <enterprise social networking collaboration tool> to interact with others creates a sociable environment for communication.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

10. Using <enterprise social networking collaboration tool> to interact with others creates a personal environment for communication.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

11. <Enterprise social networking collaboration tool> enables me to quickly reach communication partners.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

12. When I communicate with someone using <enterprise social networking collaboration tool>, they usually respond quickly.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

13. When someone communicates with me using <enterprise social networking collaboration tool>, I try to respond immediately.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

14. I can easily use <enterprise social networking collaboration tool> while participating in other activities.

- o Strongly Disagree
- o Moderately Disagree
- o Slightly Disagree
- o Neutral
- o Slightly Agree
- o Moderately Agree
- o Strongly Agree

15. I can easily communicate using <enterprise social networking collaboration tool> while I am doing other things.

- Strongly Disagree
- Moderately Disagree
- Slightly Disagree
- Neutral
- Slightly Agree
- Moderately Agree
- Strongly Agree

16. I can use <enterprise social networking collaboration tool> while performing another task.

- Strongly Disagree
- Moderately Disagree
- Slightly Disagree
- Neutral
- Slightly Agree
- Moderately Agree
- Strongly Agree

Debriefing

Thank you for participating in this survey. Your responses have been documented and will be kept safe and anonymous.

Please note that due to the anonymity of this survey, your response cannot be removed from the system since it will be impossible to identify the survey taker.

Thank you for your participation in this study.

Veleta Gordon