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SOCIAL NETWORKING SYSTEMS SUCCESS MODEL: ASSESSMENT AND
VALIDATION OF THE IS SUCCESS MODEL IN SOCIAL CONTEXT

By

Aaron Michael French

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Business Information Systems
in the Department of Management and Information Systems

Mississippi State, Mississippi

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SOCIAL NETWORKING SYSTEMS SUCCESS MODEL: ASSESSMENT AND
VALIDATION OF THE IS SUCCESS MODEL IN SOCIAL CONTEXT

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Developments such as the ubiquity of electronic networks and the breadth of digital platforms beyond simple forums have lead to major economic and social transformations worldwide (Agarwal et al, 2008). This research will explore developments in the area of social networking using Internet technology in order to determine factors that lead to success.

Despite considerable growth among the number of online communities available, very few are successful at retaining members and continued usage by its members (Ma & Agarwal, 2007). The purpose of this dissertation is to determine factors leading to a successful social networking site (SNS). Through the unification of the IS success model and social capital theory, a new model is develop called the SNS success model. The result of this study support eight hypotheses with one hypothesis unsupported. It was shown that content quality, system quality, and trust positively affect social capital and user satisfaction. User satisfaction positively affects continued use intention. Social

capital was shown to support user satisfaction but the relationship with continued use intention was non-significant. Further investigation demonstrated that the relationship between social capital and continued use intention was fully mediated by user satisfaction.

This study contributes to knowledge by developing a model displaying success factors for SNS success. Further, it demonstrates the relationship between social capital and continued use intention through the mediation of user satisfaction. This study serves as a foundation of research in the emerging area of SNSs. It also has practical implications for practitioners to help SNS administrators understand factors that influence usage.

Recommendations for future research and practical implications for SNS administrators are also discussed.

Keywords: IS success, Social Network Sites, Social Capital, SNS Success Model

DEDICATION

I would like to dedicate this research to my parents, Carol and Charley French; my brother Charles Wayne French; my niece and nephews, Christopher, Samantha, and Dennis; my family including all my aunts, uncles, cousins, and grandparents; my closest friends, Jeremy Porter, Skates and Claudette Davis, Mike and Leslie Amann, Jay and Rachel Metzger, Jon Bruington, Dave Spencer, Jeff and Kate Zimmer, Hyunji Park, and Yoonhyung Choi; my professors, and all the people who have been close to me and supported me over the past four and a half years throughout this journey to obtain my Ph.D. It has been a long and difficult road but without the support and love from my friends and family, I would not have been able to make it where I am today. This may conclude my road as a doctoral student but it is only the beginning of many things to come.

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CHAPTER I

INTRODUCTION

Since the commercialization of the Internet, the World Wide Web has continued to evolve and increase in complexity. The Internet has been transformed from a technology used for eCommerce and the dissemination information to a socially constructed network encompassing virtual online communities. Developments such as the ubiquity of electronic networks and the breadth of digital platforms beyond simple forums have lead to major economic and social transformations worldwide (Agarwal et al, 2008). This research explores developments in the area of social networking using Internet technology in order to determine factors that lead to success. This chapter begins by discussing the problem area and the scope of the research being conducted. It is followed by a discussion of social networking sites and then outlines the research questions being studied. Concluding this chapter are the contributions produced by the current research and the organization of the study.

Research Statement And Scope

There has been a vast amount of research on Internet technology including eBusiness (Parker & Castleman, 2006), eCommerce (Parboteeah et al, 2009; Pavlou et al, 2007; Torkzadeh & Dhillon, 2002; Xiao & Benbasat, 2007), online auctions (Bapna et al,

2008; Chua et al, 2007; Gregg & Walczak, 2008; Mithas et al, 2008), trust (Ba & Pavlou, 2002; Pavlou & Dimoka, 2006; Gefen et al, 2003; Kim & Benbasat, 2006) and privacy (Dinev & Hart, 2006; Hui et al, 2007; Malhotra et al, 2004; Son & Kim, 2008). However, a new stream of research in the field of Management Information Systems (MIS) has recently started gaining attention in the area of social networking site (SNS) usage. Research on SNSs has been predominantly conducted in the field of sociology revolving around social behaviors within online networks. A vast majority of social networking research revolves around virtual communities focusing on social or group theories. However, very few studies have researched impacts on human behaviors regarding general purpose social networks involving public online interaction (Jones et al, 2004). This leaves the question as to why people participate in SNSs making these online communities successful.

Despite considerable growth in the number of online communities available, very few are successful at retaining members and continued usage by its members (Ma & Agarwal, 2007). A few of the online communities that have been able to garner high membership are among the top visited websites in the United States (U.S.) with 3 of the top 5 most visited websites falling in the social networking category (Facebook, MySpace, and YouTube; Alexa, 2009). With so many online communities failing and a few rising to the top, this poses the question as to what factors result in a successful SNS. SNSs fall under a broad categorization known as online communities. However, online communities may encompass many types of online technologies including bulletin boards, forums, chat rooms, message boards, blogs, wikis, and general purpose SNSs. SNSs themselves can provide a variety of communities types such as professional, hobby,

sports, entertainment, local groups, health related, shared beliefs, political, religious, and cultural (Preece et al, 2003). To conduct research in the area of online communities, it is important to define the scope of the research due to the breadth of the term ‘online community’ and the abstractions it encompasses.

Communities historically have been defined by geographical location involving intimate and stable relationships. With the advent of the Internet, communities are more commonly viewed in terms of social relationships without regard to space, time, or location (Hiltz & Wellman, 1997). This conceptualization of community, even when confined to online virtual communities, is too broad to be put into terms that can easily be researched. With the multitudinous varieties of online communities, it is imperative to define the scope of which the study is being performed.

Within the field of MIS, online communities have been researched in terms of knowledge sharing (McLure Wasko & Faraj, 2005; Miranda & Saunders, 2003), interaction among groups and teams (Kane & Alavi, 2008; Robert et al, 2008) and social effects of viral messaging (Bampo et al, 2008; Subramani & Rajagopalan, 2003). A new direction of research towards social networks has started to emerge in the field of MIS with the evaluation of factors leading to successful SNS from a business perspective (Lin, 2008; Lin & Lee, 2006).

The scope of the current study is limited to general purpose SNSs where usage is voluntary. These SNSs are designed for ubiquitous access among members from any social, economical, or cultural background. Members consist of various age groups and demographics. While membership of SNSs is increasing across international borders,

success factors may vary based on cultural differences. However, this study will evaluate success factors of SNS usage within the United State.

Information System Success Model

There has been a vast amount of research conducted in MIS evaluating factors that lead to successful information systems. Research in this area was highly dissipated until the development of the DeLone and McLean (D&M) model for information systems success (DeLone & McLean, 1992). Since the inception of the D&M model, many authors have sought to improve on this model by modifying the dimensions (Seddon & Kiew, 1994; Fraser & Salter, 1995; Seddon, 1997; DeLone & McLean, 2003) or applying the D&M model in new contexts, altering the dimensions as needed (Molla & Licker, 2001; Lin, 2008; Wang, 2008).

Motivated by the need for further development and validation of the D&M model, Seddon and Kiew's (1994) evaluation of the D&M model resulted in a respecified IS success model (Seddon, 1997). The D&M model and the Seddon model contain distinct differences and competed to be the leader in the area IS success. After further evaluation and validation was performed, it was determined that both models exhibited reasonable fit among the data they were tested against (Rai et al, 2002). However, DeLone and McLean (2003) argue that Seddon's (1997) model further complicated the IS success model and developed a parsimonious extension to their previous work. With the complexity of IS success and the various models that have been proposed, it is suggested that the application of IS success dimensions should be viewed and adapted based on the

context of the system being evaluated (DeLone & McLean, 1992; DeLone & McLean, 2003; Seddon, 1997).

Since the development of the original D&M model (DeLone & McLean, 1992), many authors have extended this work by applying it to a variety of contexts such as information systems business applications (Hwang et al, 2000; Wixom & Watson, 2001), eCommerce (DeLone & McLean, 2003; Molla & Licker, 2001; Wang, 2008), knowledge management systems (Jennex, 2008; Kulkarni et al, 2006; Lai, 2009), executive/expert systems (Sedera et al, 2003; Srivihok, 1999; Yoon et al, 1995), enterprise resource planning (Ifinedo & Nahar, 2006; Wu & Wang, 2007) and e-government (Teo et al, 2008; Wang & Liao, 2008), to name a few. The context of eCommerce has received the most attention due to heavy investments made by organizations in this area (DeLone & McLean, 2004). However, a new area of research is starting to gain significant attention in the area of online social networks.

Many advances have been made in the area of online social networks, also known as SNSs. With SNSs such as Facebook being reported a having a market value of 15 billion U.S. dollars (Arrington, 2008; MSNBC, 2007) and MySpace having a net worth up to 20 billion U.S. dollars (Arrington, 2008), it is important to measure the success of these types of systems as well. To date, only two researchers have attempted to study the success of information systems in regards to online social networks (Lin, 2008; Lin & Lee, 2006). However, that research viewed the social networking context in regards to business communication channels that connected online businesses with their consumers. This type of social networking community is very different than general purpose social networking sites that have gained tremendous popularity, causing sites like Facebook and

MySpace to be valued at billions of dollars. The current research evaluates these general purpose social networking sites and applies the IS success model in the context of SNSs bridging these two streams of research.

Social Networking Sites

SNSs are defined by the ability of users to create public or semi-public profiles, connect with other members, and view connections made by other members (Boyd & Ellison, 2008). These SNSs have revolutionized the way in which people communicate with continual growing numbers of people connecting with others through these online spaces engaging in self-expression (Kleinberg, 2008). There are a variety of SNS types ranging from special interest or niche communities (e.g. demographical, cultural, religious, or activities of interest) to general purpose SNSs used for basic means of communication. While the technical features of each SNS may differ, the nucleus of all SNSs consists of visible profiles with general information and the ability to display connections with other members (Boyd & Ellison, 2008).

Although SNS usage is relatively recent, the concept of people across the world being connected to each other through short chains of acquaintances, also known as the small world phenomenon, is nothing new (Killworth and Bernard, 1979; Lundberg, 1975; Milgram, 1967; Travers and Milgram, 1969). The small world phenomenon is often referred to as “six degrees of separation,” meaning that two people are connected to each other through an average of six nodes. This concept is magnified within the context of SNSs, with a degree of separation between two nodes being less than three (Howard,

2008). As these networks continue to grow, the separation between two members will continue to decrease.

It has been argued that networks that are too populated may become impersonal and undesirable, but a few sites have evolved in whimsical fashion (Howard, 2008) such as Facebook and MySpace. Despite conventional wisdom and predictions by experts, these SNSs have continued to grow by expanding from a niche phenomenon to mass adoption (Gross & Acquisti, 2005). There are many challenges that developers face in trying to make a SNS successful. The biggest challenge being that communication within a SNS differs from face-to-face communication in various ways, such as the lack of real-world physical cues, social order and control, purpose, and the ability of members to change their identity (Andrews et al, 2002). However, SNSs have been able to overcome these shortcomings and fulfill the needs of a community that consist of sociability, support, information, a sense of belonging, and social identify (Wellman, 2005) through the development of social capital.

Social capital is a concept that has been researched in sociology and is often attributed to a condition required for information exchange (Tsai & Ghoshal, 1998) or knowledge exchange (Kankanhalli et al, 2005). Social capital is embedded in the relationships among members within a community (Schultze & Orlikowski, 2004) being formed through social exchange (Bourdieu, 1985) relating to the intangible benefits gained through involvement within a community (Field, 2003). This concept has become important in the understanding of social exchange within online communities. With the multitude of SNSs that have been launched over the past ten years such as SixDegree.com, Cyworld, Friendster, Couchsurfing, LinkedIn, MySpace, Facebook, and

Flickr (Boyd & Ellison, 2008) to name a few, it is important to research factors that lead to a SNS being successful when so many are not. Social capital has become a significant factor to bridging this gap.

Research Questions

The purpose of the current study is to research general purpose SNSs and the factors that make them successful. The following research questions being investigated are derived from the goals of this dissertation:

1. What are the factors related to a successful SNS system?
2. What is the relationship between social capital and social networking success factors?

The first question reviews the literature on IS success to evaluate factors that lead to a successful information system. These factors are then applied to the context of SNSs to determine what the dependent variable is that results in a successful SNS system and the relationship between the constructs. While a SNS may contain many components that encompass traditional software packages, the motivations for using a SNS vary substantially. Sociologists have studied the effects of social capital considerably as a motivating factor for usage of a SNS. It was shown that many SNSs fail due to their inability to generate enough social capital to sustain continued use (Ludford et al, 2004).

The second research question evaluates the inclusion of social capital in the IS success model and how it relates to other factors leading to a successful IS system in the context of social networking. It is proposed that the perceived value of a SNS is viewed as social capital among its users, as derived deductively from previous research.

However, the relationship between other factors in IS success and social capital have yet to be explored.

While IS success factors can be researched on many levels such as individual, group, organizational, or societal impacts (DeLone & McLean, 2003), the research questions being evaluated in the current study will review net benefits as continued use intention based on an individual level of analysis and the individuals perception of the community overall. To begin researching IS success in the context of SNS, each factor will be discussed and defined in the context that it is being studied. Each factor will be carefully examined with its contribution for inclusion in the new SNS success model being evaluated. Based on this review, a SNS success model will be introduced with formulated hypotheses that will be formally tested.

Contributions

The current study makes two major contributions to the literature in the area of IS success. The first contribution made by the current study is the combination of two research streams: IS success factors and social capital theory. Social capital theory has been extensively researched in sociology to explain SNS usage. There is extensive stream of research in MIS literature on IS success that can be drawn upon. However, very little research in MIS or sociology to date has studied IS success factors in the context of SNSs. The current study will combine these two streams of research in order to explain factors leading to successful information systems in the context of SNSs.

The second contribution made by this study is the development of a SNS success model and validated scales. This model outlines the constructs and relationship between

these factors in evaluating the success of a SNS. This model can be used to evaluate existing SNSs such as Facebook, MySpace and other SNSs that may not be as well established to evaluate their success or measure continued success.

This research combined two well developed methodologies into a research methods composition in order to develop and validate constructs along with establishing relationships between construct in the model using structural equations modeling (SEM). This research could serve as a guide for future research that will be conducting studies that will require similar steps for developing and validating constructs and testing models using SEM.

Organization Of The Study

This study is organized into five chapters with appendices. Chapter I begins with an introduction followed by the problem area and scope of the research being conducted. Next, the term SNS is defined and discussed to outline the artifact being studied. Then the research questions along with the contributions of the study are outlined.

Chapter II presents the literature review, the research model, and states the hypotheses being researched. First, the background and literature review are discussed. Then, existing IS success models are evaluated to show what has been researched to date and evaluate how these models can be respecified within the context being studied. Next, the construct of social capital is introduced to show how it fits within the SNS success model. Then a conceptual model and hypotheses are developed and presented.

Chapter III describes the research methodology that is used to conduct the study. This research methodology encompasses two existing methodologies into a research

methods composition consisting of construct development and SEM. Following the research methods composition outline is the description of each stage performed in the current study. Then the sampling frame and data screening techniques are described for testing the hypotheses.

Chapter IV presents the analysis of the data collected along with the research results obtained from the methodology. This chapter also includes hypotheses results and a discussion of the research findings.

Chapter V presents the conclusion and research summary. Empirical findings are summarized along with limitations and contributions of the study followed by future research issues.

CHAPTER II

LITERATURE REVIEW, MODEL, AND HYPOTHESES

Numerous researchers have evaluated core dimensions of IS success research (DeLone & McLean, 1992; Seddon, 1997; DeLone & McLean, 2003), tested and validated these dimensions (Rai et al, 2002; Seddon & Kiew, 1994), or sought to apply IS success models to a specific context such as eCommerce (DeLone & McLean, 2004; Molla & Licker, 2001; Wang, 2008). However, little research has been conducted to evaluate the success of information systems in the context of online communities. This chapter starts by conducting a background literature review followed by the theoretical development and hypotheses formulation. With strong evidence in sociology showing the importance of social capital to SNS usage, a review of the literature on IS success, social capital, and social networks is conducted to evaluate how these theories can be merged to advance research in this area. Succeeding the literature review is construct development, where key factors towards IS success are developed in the context of social networking websites. Finally, the SNS success model is developed along with hypotheses for testing the model.

Background & Literature Review

Since the commercialization of the Internet in the early 1990's, the World Wide Web has gone through many transformations. The Internet's origins were confined to academic, scientific, and military communities by the National Science Foundation until these restrictions were lifted allowing for commercial use (Greenstein, 1998). Removing these restrictions resulted in a bustle of entrepreneurs looking to exploit a new market with no centralized control (Press, 1994). This resulted in new and creative ways to generate revenues using Internet technology. However, not all Internet locations were designed solely for the purpose of generating revenues. Many websites existed solely for the purpose of disseminating information. While the most studied concepts involving the Internet consist of electronic commerce (eCommerce), the initial platform used by all websites included a push approach where information travels in one direction from the website to the user. With the emergence of concepts such as Web 2.0 and social networking services, the Internet has been transformed from a place of commerce and information into a community where information is disseminated by the users. This has changed the Internet from a unidimensional platform to a multidimensional platform where information is created, maintained, and disseminated from multiple sources.

In order to study a phenomenon, we must first review the environment in which that phenomenon occurs (Ajzen & Fishbein, 1980). To gain a better understanding of the behaviors surrounding the social phenomena of Web 2.0, we must evaluate the context in which these behaviors occur. Social networking sites exist within a classification of software described at Web 2.0. Web 2.0 is the name given to a new wave of social services provided on the Internet. The next section will describe the Web 2.0

environment to gain a better understanding of the context in which social networking sites exist.

Web 2.0

The term Web 2.0 was first conceived by Tim O'Reilly in 2005 as a revolution in Web technology (O'Reilly, 2005). However, the name Web 2.0 does not imply a discrete updated version of Internet software but rather vision of how the Web has evolved over time (Millard & Ross, 2006). It is more of a conceptual evolution of the Web and how it is being exploited rather than an upgrade of Web technology. The term Web 1.0 refers to the dissemination of information (Mortimer, 2007) where communication is one way (Fine, 2008) and in read-only format (Reid, 2008). Web users could visit websites to acquire information, interact with Web content, or make a purchase but were unable to modify information. With the emergence of Web 2.0, users have been given the ability to create and modify content through social networking applications (Dietrich et al, 2008). This has empowered users by giving them the power to publish information through files, photos, videos, and content to socially constructed websites such as Wikis and Blogs (Mortimer, 2007). These social websites create a two way communication channel between the website and the user allowing visitors to not only search for and read content but also modify the website to add their own information. It creates a sense of community on the Web where users facilitate the development of online content and online interaction.

This new generation of Web applications has created a sense of community that is unbounded by systems (Walker, 2005). These social websites allow the user to create the

content on the website instead of pushing information to the user (Fine, 2008). However, there is still much debate concerning exactly what Web 2.0 is. Many critics and supporters alike can come to an agreement on general outlines of what Web 2.0 entails (Alexander, 2006), but these broad generalizations leave the concept of Web 2.0 too vague for solid classification (Millard & Ross, 2006). Despite the lack of consensus on how to classify Web 2.0, there is little argument that social software emphasizing interaction, community, and openness has surfaced as a major component of this movement (Alexander, 2006; Millard & Ross, 2006). If we view social software as a guideline for defining a pure Web 2.0 website and classifying websites where information is pushed to the users as Web 1.0, then anything between these two extremes would be considered a hybrid website combining both concepts. Figure 1 gives an outline of visual representation of how the Web 1.0 and Web 2.0 are interrelated and have evolved over time. As demonstrated in this figure, Web 1.0 and Web 2.0 have some overlap. As time has gone by, the web has had a shifted from exclusively being Web 1.0 type of applications to more of the social applications such as Wikis, Forums and SNSs classified as Web 2.0.

O'Reilly (2005) gives an outline comparing the differences between Web 1.0 and Web 2.0 technologies, however, many websites that incorporate characteristics defined as Web 2.0 also demonstrate Web 1.0 characteristics. This indicates that there is an overlap between Web 1.0 and Web 2.0 technologies on many websites which adds to the confusion of trying to define exactly what Web 2.0 is. It is proposed here that a pure Web 2.0 website is one where content on the website is completely constructed and modified by the users.

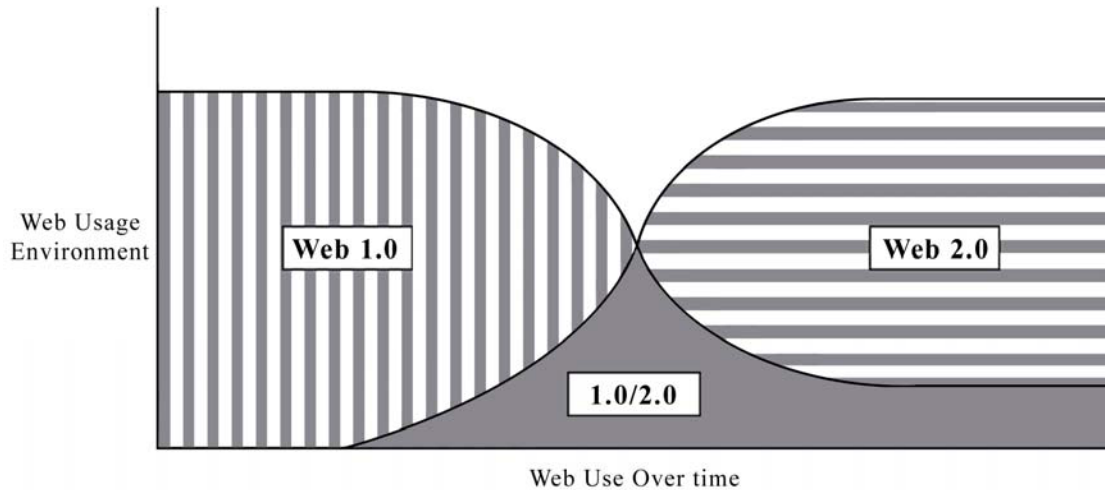


Figure 1

Evolution from Web 1.0 to Web 2.0

The current research evaluates a specific category of Web 2.0 applications known as SNSs. With SNSs such as Facebook and MySpace becoming some of the most visited websites on the Internet, it is important to study factors that have led to their success. The following section will review information system success as discussed in the literature. Based on a review of this literature, the current research develops and tests theories concerning online social networks success.

Information System Success Model

In the area of information systems, a key variable that has been researched by many authors is the success of information systems themselves. The breadth of literature in this area was quite extensive with little unification until DeLone and McLean (1992) created a taxonomy for Information System (IS) success that resulted in the creation of the DeLone & McLean model (D&M) for IS success. Since the development of the

D&M model (1992), many authors have applied this model to various contexts and respecified the various dimensions of the model in attempts to make it more comprehensive and applicable to various contexts being studied. Table 1 displays a list of system categories and authors of essential research that has been conducted in the stream of IS success literature. As shown here, the D&M model has been heavily researched and applied to a variety of contexts such as information systems business applications, eCommerce, knowledge management systems, executive/expert systems, enterprise resource planning, e-government, etc.

An emerging area of interest in IS literature revolves around the study of information systems in the context of SNSs. Two studies to date have been conducted to evaluate the success of information systems in regards to online/virtual communities (Lin, 2008; Lin & Lee, 2006). However, the research conducted viewed online communities from the perspective of business communication channels connecting online businesses with their consumers. To date, no research has evaluated the success of general purpose SNSs such as Facebook and MySpace to determine the factors resulting in a successful SNS system. The following sections will review seminal articles in the development of IS success models that have been applied to various contexts. The three most significant studies in this area include the original IS success model developed by DeLone & McLean (1992), a model that was further developed by Seddon (1997) and a respecification of the original D&M model (DeLone & McLean, 2003). These studies are the foundation in IS success literature that will be used to develop an IS success model that is appropriate for the context of SNSs.

Table 1

Categories and Essential Research Conducted on IS Success

<p>Development & Validation Ballantine et al, 1996 DeLone & McLean, 1992 Hwang et al, 2000 Hwang & Xu, 2008 Iivari, 2005 Landrum et al, 2008 McGill et al, 2003 Petter et al, 2008 Rai et al, 2002 Sabherwal et al, 2006 Seddon, 1997 Seddon & Kiew, 1994 Wixom & Watson, 2001</p> <p>Knowledge Management Systems (KMS) Halawi et al, 2007/2008 Jennex, 2008 Jennex & Olfman, 2007 Kulkarni et al, 2006 Lai, 2009 Wu & Wang, 2006</p> <p>Executive/Enterprise Systems (EIS/ES) Bajwa et al, 1998 Gable et al, 2003 Rainer & Watson, 1995 Sedera et al, 2003 Sedera & Gable, 2004 Srivihok, 1999 Yoon et al, 1995</p>	<p>eCommerce Brown & Jayakody, 2008 DeLone & McLean, 2003 DeLone & McLean, 2004 Garrity et al, 2005 Kuan et al, 2008 Molla & Licker, 2001 Pather et al, 2006 Quaddus & Achjari, 2005 Torkzadeh & Dhillon, 2002 Wang, 2008</p> <p>Enterprise Resource Planning (ERP) Bernroider, 2008 Chien & Tsaur, 2007 Häkkinen & Hilmola, 2008 Ifinedo & Nahar, 2006 Ifinedo & Nahar, 2007 Wu & Wang, 2007 Zhang et al, 2005</p> <p>e-Government Hussein et al, 2007 Prybutok et al, 2008 Teo et al, 2008 Wang & Liao, 2008</p> <p>IT Planning Bradley et al, 2006 Sabherwal, 1999</p>
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DeLone & McLean (1992) Model

The D&M model (1992) describes six IS success dimensions including information quality, system quality, use, user satisfaction, individual impact, and organizational impact along with their interrelationships. Figure 2 displays the dimensions and the relationships between each dimension as outlined in the D&M model.

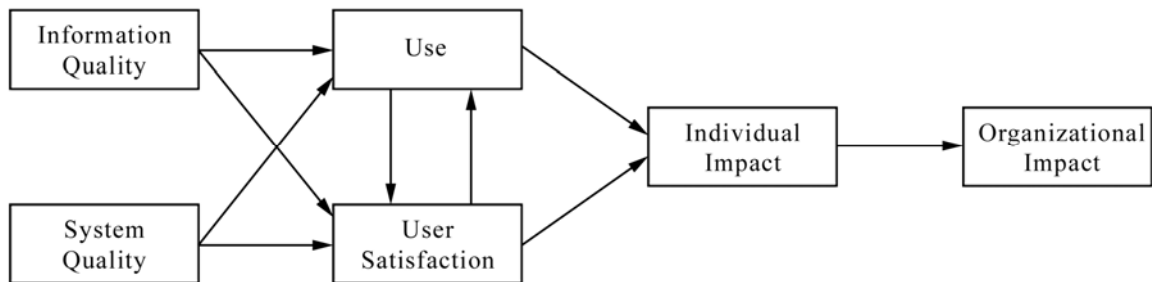


Figure 2

DeLone & McLean Model (1992)

The D&M model is based on Shannon and Weaver's (1949) communication theory, consisting of three levels of communication: technical level, semantic level, and effectiveness level. System quality falls under the technical level and is concerned with the accuracy of information being transmitted by the information system. Information quality is categorized at the semantic level, which is concerned with transmitted data conveying the desired meaning. The effectiveness level contains the four remaining dimensions of the D&M model such as use, user satisfaction, individual impact, and organizational impact, and is concerned with the information being transmitted affecting conduct in a desirable way. DeLone and McLean (1992) contend that their taxonomy and model of IS success factors encompasses all the work done prior to their study,

however, the model needs further development prior to becoming a basis for culling appropriate IS measures.

Since the development of the D&M model, many other studies have sought to improve on the IS success factors by adding dimensions, changing the dimensions (Seddon & Kiew, 1994; Fraser & Salter, 1995; Seddon, 1997; DeLone & McLean, 2003), or by applying the D&M model in various contexts modifying the dimensions as needed (Molla & Licker, 2001; Lin, 2008; Wang, 2008).

Seddon (1997) Model

Seddon and Kiew (1994) updated the IS success model replacing the *use* dimension with *usefulness*. Upon successful testing of the new model using the dimension of *usefulness*, the authors set out to respecify and extend the model again. It is argued that the attempt by DeLone and McLean to combine both process and causal explanations leads to potentially confusing meanings when trying to interpret the D&M model (Seddon, 1997). In the respecified model developed by Seddon (1997), *use* was replaced by *usefulness* arguing that *use* does not cause benefits, however, *use* must precede benefits according to the process model. Seddon also groups individual, organization, and society impact into one measure labeled *net benefits*. The respecified model by Seddon (1997) is shown in Figure 3.

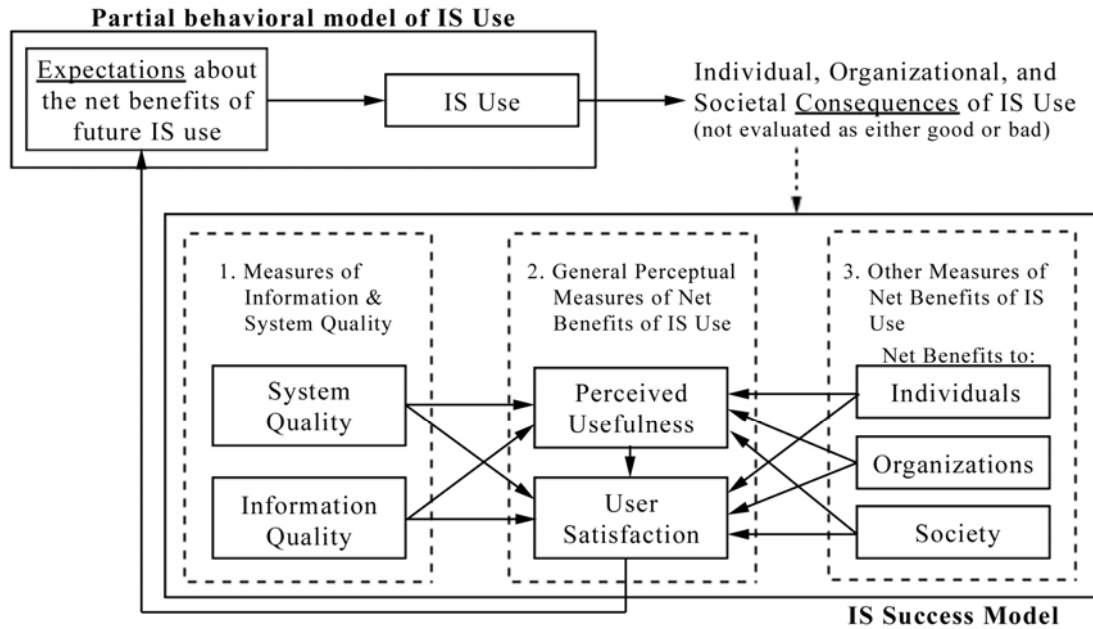


Figure 3

Seddon's Model of IS Success

It is argued that *use* does not determine the success of a system but rather the *perceived usefulness* of the system by the users will determine IS success. Users who perceive the system as being useful, improving their job performance, will be more satisfied and use the system more resulting in increased net benefits. DeLone and McLean (2003) disagree with Seddon's (1997) argument that *use* does not cause *net benefits* stating that declined usage is a good indicator that net benefits are not being realized. Based on this argument and other concerns, they revisited their original model and developed the updated D&M model.

Updated DeLone & McLean (2003) Model

DeLone and McLean (2003) argue that Seddon's (1997) model further complicates things, so they set out to develop a revised and parsimonious extension to their previous work. The updated D&M model is presented in Figure 4.

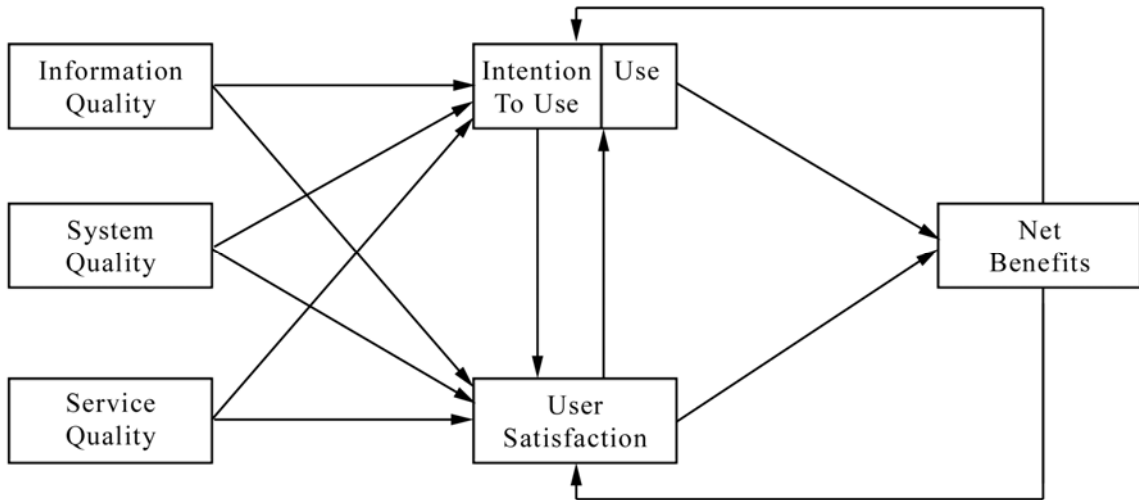


Figure 4

Updated DeLone & McLean Model (2003)

Based on previously updated versions of the D&M model by a variety of authors, a third dimension of *service quality* was added to the model positively influencing *use/intention to use* and *user satisfaction*. DeLone and McLean (2003) also point out that the impact of the IS system is based on the context in which it is being used or studied. Therefore, *net benefits* were used in the place of *individual impact* from the original model. The net benefit gained by the system should be determined based on the context of the information system. In certain contexts, when individual impact is appropriate, perceived usefulness would be highly related to individual perception of the net benefits

gained by the system (Rai et al, 2002), therefore usefulness in the updated D&M model is viewed as the benefit gained as apposed to the cause of net benefits according to the Seddon (1997) model.

IS Success Model Evaluation

The updated D&M model (2003) and the Seddon (1997) model have many commonalities as well as many differences. The updated D&M model proposes that *service quality* is an important factor that causes the intention to use and user satisfaction, whereas the Seddon model argues that *service quality* is contained within the IS department and not the IS system itself. Both models have come to agreement on the inclusions of *information quality* and *system quality* along with *user satisfaction* and *net benefits*. The most significant difference between the two models is the placement of the *use dimension* and *user satisfaction*. In the Seddon (1997) model, user satisfaction is proposed to cause net benefits with use being taken out of the causal model. DeLone and McLean (2003) argue that use is a determinant of net benefits and net benefits could include individual and organizational impact, where individual impact is argued to be related to user satisfaction (Rai et al, 2002). When these two models were both tested and compared against each other, it was found that they both exhibit reasonable fit among the data they were tested against (Rai et al, 2002).

This could potentially create some confusion as to which model should be implemented when evaluating IS success. Therefore, it is suggested that application of the IS success dimensions should be viewed in the context of the system being evaluated (DeLone & McLean, 1992; DeLone & McLean, 2003; Seddon, 1997). The next section

will evaluate updates to the IS success model in different contexts such as eCommerce and SNS.

Context Based IS Success Models

With the advances in information technology such as the Internet, many researchers have turned their attention towards redefining, testing, and applying the D&M model to various contexts such as online social networking (Lin & Lee, 2006; Lin, 2008). When applying the D&M model, the context in which it is being studied must be defined so that the net benefit being measured can be identified (DeLone & McLean, 2004). Many advances have been made in the realm of online social networking causing significant investments to be made towards these high valued communities. With SNSs such as Facebook being reported as having a market value of 15 billion U.S. dollars (Arrington, 2008; MSNBC, 2007) and MySpace having a net worth up to 20 billion U.S. dollars (Arrington, 2008), it is important to measure the success of these types of systems as well.

There is a limited amount of research concerning the success of information systems in the context of SNSs. Lin (2008) attempted to develop a model in order to explain success factors for virtual communities by applying the D&M model to SNS. The authors identified member loyalty as the net benefit being evaluated in the model, where loyalty represents the continued usage of the SNS. This model made significant changes to the D&M model from which it was adapted that led to several significant findings. However, the usefulness construct was found to be insignificant in this model and a key construct such as social capital that has been extensively studied in this context

was omitted. While incomplete, this work has contributed greatly to opening the door to researching IS success in the context of SNS.

Social Capital

The concept of connecting people around the world through the Internet is nothing new. People have been able to communicate through email and chat rooms since the Internet was first established. After commercialization, the Internet was geared towards the dissemination of information and commerce with the intention being towards increasing physical capital. The emergence of social software in the Web 2.0 paradigm has changed the Internet from being a source of information and commerce to a sense of community and user involvement. Users now have the capability of updating web content and interacting with others through these online communities. This has created a paradigm shift from the primary focus of physical capital to include social benefits in the form of social capital.

Coleman (1990) describes three forms of capital that are important to us as human beings: physical capital, human capital, and social capital. Physical capital refers to tangible benefits that can be gained with monetary value such as factories, machines, land, and other material resources. Human capital and social capital are more concerned with intangible gains that are mentally acquired. Human capital focuses specifically on the acquisition of skills and knowledge whereas social capital focuses more on investments made in social relations. Social capital has been referred to as the intangible benefits gained through involvement in a community (Field, 2003) resulting in a connection between two participating parties or emotional support (Williams, 2006) gained through

information exchange (Adler, 2001). With Web 2.0 emerging as a socially constructed community using Internet technology, it is important to understand how social capital affects the use of this new phenomenon.

Capital in any form can be viewed as the expected return or benefit resulting from an investment of some type of tangible or intangible resource (Lin, 2001). As with other forms of capital, social capital results from the investments provided by the user leading to expected future benefits (Adler & Kwon, 2000) and is often conceptualized as resources gained through social connections (Bourdieu, 1985; Coleman, 1988; Coleman, 1990; Woolcock, 1998; Lin, 2001). Social capital consists of the combined parts of networks, norms, and the reciprocity of trust that facilitates the resources provided along with the benefits expected (Putnam, 1993; Putnam, 2000). Every online social network has its own set of norms that are established by the community of users that participate in that social network. The one defining commonality that all social networks share is the ability to communicate and share information with other members, which is viewed as the core element supposition of social capital (Putnam, 2000; Woolcock, 1998). In order to gain an understanding of how social capital influences the overall success of SNSs, we must first understand the various dimensions of social capital and then see how they apply in the context of SNSs. Hazleton and Kennan (2000) identify three dimensions of social capital (i.e. structural, content, and relational), which are shown in Figure 5. Each of these will be described next and then applied to the context of online communities and SNSs.

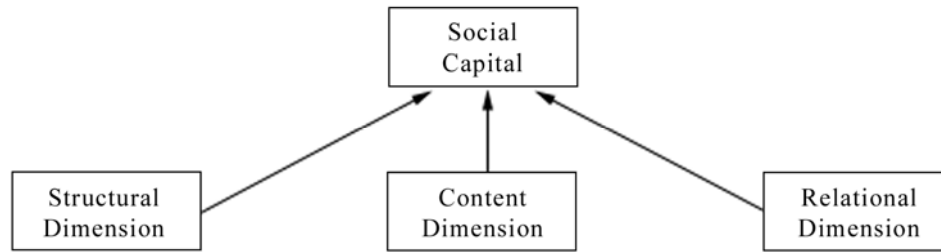


Figure 5

Social Capital Dimensions

Structural Dimension

The structural dimension of social capital is concerned with access to other actors within a network (Widén-Wulff & Ginman, 2004). It contains the network ties and configurations associated with the community (Nahapiet & Ghoshal, 1998). Within online communities, these network ties and configurations are encompassed within the SNS system itself. Network ties within the structural dimension of social capital provide access to resources (Nahapiet & Ghoshal, 1998). A valuable resource in the context of social capital is information and social relations (Coleman, 1988) that in turn creates a connection between two actors (Hazleton and Kennan, 2000). SNSs facilitate connections between actors by giving members access to information about other members. Members can establish connections and exchange messages with one another as well as participate in various group related activities. While the structural dimension is concerned with the system and granting access to member information, the depth of information that each member has access to is dependent upon the amount of information posted by each member. The actual information itself that is provided through the SNS is contained within the content dimension of social capital.

Content Dimension

The content dimension is concerned with the information that is shared within the community (Hazleton & Keenan, 2000), or in the context of virtual communities, the SNS. Nahapiet and Ghoshal (1998) refer to this dimension as the cognitive dimension that contains shared codes, language, and shared narratives. Language has a direct influence on social exchange and is required to form relationships. It is the means of communication used to establish relationships that form social capital (Widén-Wulff & Ginman, 2004). In any community, communication and information exchange is provided by the actors within the community. The type of community determines the method in which dialog occurs. In the context of SNSs, information is provided by the users in the form of written text rather than verbal communication. Members of the SNS typically provide at least a minimal amount of information on their profile to identify who they are in order for further information exchange to take place. Within this dimension, the quality of information is important in the building of social capital. Members of a SNS are concerned with the accuracy and currency of information that is provided.

Relational Dimension

The relational dimension is concerned with expectations and obligations (Hazleton & Kennan, 2000; Widén-Wulff & Ginman, 2004) and includes factors such as trust, norms, obligations, and identification (Nahapiet & Ghoshal, 1998). Trust is the most studied concept of social capital (Portes, 1998) and is also the primary relational feature of Coleman's (1988) social capital model. In IS success research, trust has been

included within the service quality dimension (Wang, 2008) and in some cases has even replaced service quality in the model (Molla & Licker, 2001; Lin, 2008). The components of the relational dimension such as norms, obligations, and identification are concerned with the community as a whole; therefore, trust should be evaluated at the community level and refers to the assets rooted in these relationships (Tsai and Ghoshal, 1998). In SNS, there many communities that encompass the entire system just as many communities make up a city. Therefore, while trust should be viewed at the community level, it should be bounded to the community that the member is a part of. Norms represent a degree of consensus among actors in the social system (Coleman, 1990). These norms guide the formation of trust in the community that in turn builds the perception of costs and benefits in the form of social capital.

Trust is a very broad term that is difficult for researchers to operationalize or even reach a consensus on basic definitions (Husted, 1998). Despite many difficulties in the operationalization of trust, many disciplines have developed their own understanding of trust and its dimensions within the contexts being studied. In the field of IS, trust has been conceptualized as the belief that other people will behave in a socially responsible manner based on personal expectations (Gefen, 2000; Mistzal, 1996; Pavlou, 2003). Within the context of SNSs trust can be viewed as an overall trust in the community as a whole resulting from norms and beliefs that members of the community will meet personal expectations. Therefore, to evaluate the trust dimension of IS success in regards to online communities, trust would need to be measured in regards to the community itself rather than individual actors within the community.

Social Capital within Social Networking Sites

Social capital is created through the relationships that are formed through social exchange (Bourdieu, 1985). Through a dialectical process, social exchange is created and facilitated via continued usage of the SNS (Nahapiet & Ghoshal, 1998). The quality of the system, quality of information, and trust within the online community are positively related to social capital. Once trust is established, people can then move forward with the development of relationships and the formation of communities (Putnam, 2000). There are many different communities that users may choose to be a part of from general purpose communities to more specific communities of interest. Many people are part of multiple online communities, which is argued to lead to a higher level of social capital (Wellman, 2001). However, the interest of this research is in measuring the success of a SNS rather than measuring social capital. Since participation in various online communities may vary depending upon the level of social capital each SNS results in, we propose that within each SNS, social capital leads to continued usage rather than the non-recursive relationship of use increasing social capital.

Social Networking Site Success Model

Within the context of online social networks, the primary system users (or customers) are the suppliers of information rather than internal users. The original IS success model evaluated internal users where use and satisfaction lead to individual and organizational impact (DeLone & McLean, 1992). When studying IS success where the users are external to the organization and use is voluntary such as with eCommerce and SNSs, perceived value and user satisfaction are the key constructs that lead to intention to

reuse causing the information system to be successful (Wang, 2008). In eCommerce, a single use or multiple uses can lead to a successful system due to customers purchasing items resulting in the generation of revenues for the company. However, in the context of SNSs, a system is only successful if continued use takes place. Therefore, use alone is not enough to constitute a net benefit, but the intention to continue using the SNS is required. Benefit is only gained if the users continue to use the site and interact with each other. With eCommerce, the users receive tangible benefits by purchasing products, whereas in the context of SNSs, the benefits gained by the user are intangible in the form of social capital. Previous research has used *trust* in the place of the *service quality* construct (Molla & Licker, 2001). In the context of SNSs, with trust being a significant component of social capital, it makes sense to use trust in this context as well. Defining and identifying each of these constructs in the context of a SNS is the next step in developing a SNS success model.

To respecify the IS success model in the context of SNSs, it is important to understand the original theory used to develop the dimensions in the D&M (1992) model. The D&M model was based on the theory of communication (Shannon & Weaver, 1949) that viewed communication in a very broad sense including for any form of communications such as speech, art, theatre, or any form of human behavior. The form of communication being studied in the current research comes via online social communities. Following the work of the original D&M model, the proposed model will be viewed in the context of SNSs by fitting each construct within the three levels of communications that are identified as the technical level, the semantic level, and the

effectiveness level (Shannon & Weaver, 1949). Table 2 outlines these three levels as described by Shannon & Weaver (1949).

Table 2
Levels of Communication & SNS Success Categories

Communication	Definition	SNS Success Constructs
Technical Level	How accurately can the symbols of communication be transmitted?	System Quality
Semantic Level	How precisely do the transmitted symbols convey the desired meaning?	Content Quality, Trust
Effectiveness Level	How effectively does the received meaning affect conduct in the desired way?	Social Capital, User Satisfaction, Continued Use

Source: Shannon, C. & Weaver, W. 1949. **The Mathematical Theory of Communication**. Urbana, IL: University of Illinois Press.

At the technical level, the system is concerned with how accurately the symbols of communication can be transmitted. It is concerned with the quality of the system in delivering the information accurately in the form that it was sent in. System quality is proposed as an antecedent to social capital and user satisfaction within the context of SNSs. Information quality and trust both compose the semantic level, which is concerned with the symbols conveying the desired meaning. In a SNS, the users provide the content that is displayed on the website and communicated throughout the community. Content quality is directly concerned with the accuracy of content that is being provided while trust is directly concerned with the users themselves who provide the information. It is proposed that if the content is accurate and there is a high level of trust that the person is who they say they are, then satisfaction in the SNS and social capital will increase through interaction. Social capital, user satisfaction, and continued use intention

encompass the effectiveness level that determines the overall success of a SNS. If users are satisfied and gain high levels of social capital from the SNS, then they will continue to use it. Also, it is proposed that increased social capital will lead to increased satisfaction among the users. Figure 6 shows the SNS success model that is proposed.

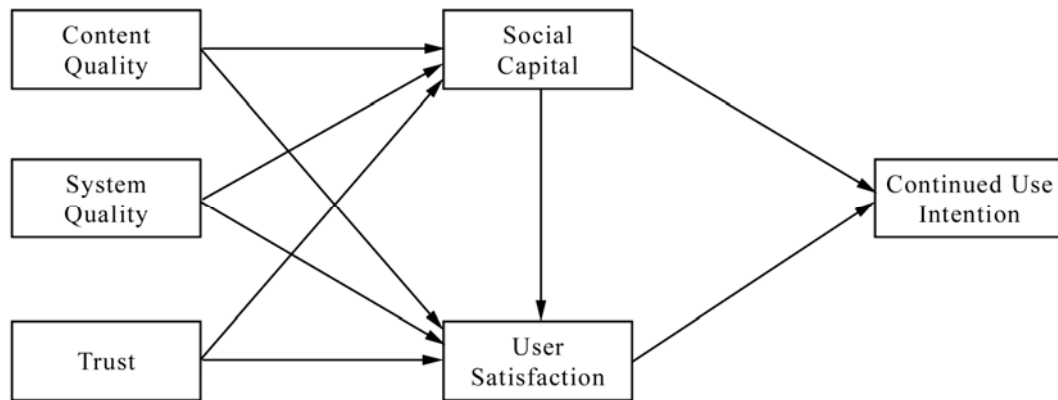


Figure 6

Social Networking Site (SNS) Success Model

This model uses social capital as the perceived value in the context of SNSs to determine continued use intention as the net benefit. Service quality has also been replaced with trust in the context of SNSs. The following section will elaborate in more detail on each construct and give the hypotheses that are derived from the model.

Hypotheses

The primary reason for conducting this research is to develop a model that can be used to determine IS success in the context of online social networks. The theories that have been used to developed the SNS success model include IS success (DeLone &

McLean, 1992; Seddon, 1997; DeLone & McLean, 2003; Molla & Licker, 2001; Wang, 2008; Lin & Lee, 2006; Lin, 2008) and social capital theory (Bourdieu, 1985; Coleman, 1988; Coleman, 1990; Lin, 2001; Putnam, 1993; Putnam, 2000; Woolcook, 1998). Based on the unification of these two research streams, a model for determining the success of information systems in the context of SNSs has been developed. This section will review the constructs that make up the model and form hypotheses based on the proposed relationships.

Continued Use Intention

The focus of this research is to determine factors that lead to a successful IS system in the context of SNSs. In order to conduct meaningful research we must first establish a well-defined dependent variable (DeLone & McLean, 1992). The original IS success model measured individual impact and organizational impact within organizational information systems (DeLone & McLean, 1992). An updated D&M model was created using *net benefits* as the dependent variable in order to apply the IS success model to various contexts (DeLone & McLean, 2003). The net benefit being studied and the benefactor of the net benefit vary depending on the context being studied. It has been argued that the net benefit of a system should be measured by system use (Seddon, 1997). In a context such as eCommerce and SNSs, use is strictly voluntary (Molla & Licker, 2001), requiring *use* to take on new importance in success measurement essential to desired outcomes (Liu & Arnett, 2000; Palmer, 2002).

Systems used by individuals outside of the organization do not have a direct impact on the organization apart from using the system itself. Therefore it is argued that

the only net benefit obtained from an IS system in the context of SNSs would evolve around the *use* construct. However, use can be measure is many different ways such as initial use, reuse, and continued use. It has been shown that initial use and future use are affected by different factors (Agarwal & Prasad, 1997). Further more, potential adopters and continuing users are also affected by different factors showing that early use and continued use are significantly different (Karahanna et al, 1999). In the context of eCommerce, the construct of *reuse* has been adopted as the dependent variable in the dimension of net benefits (Wang, 2008). Using *reuse* as the net benefit in the context of eCommerce is practicable because an effective eCommerce system is dependent upon customer returning to make a repeat purchase. Within the context of SNSs, the net benefits are similar by being concerned with use, but the measurement of use is quite different. Many online communities fail as a result of their inability to sustain continued participation (Ludford et al, 2004). Therefore, we propose that the net benefit for information systems in the context of a SNS should be measured as continued use intention. This research will define continue use intention as follows:

Continued use intention is defined as frequent future use of the SNS by the members of the community.

Content Quality

Content quality is a construct used in most IS success models as information quality and has been shown to be a significant predictor of IS success. In the original D&M model (Delone & McLean, 1992), information quality is shown to have an indirect effect on IS success through mediating variables such as use and user satisfaction. This

relationship has been reiterated through many different adaptations of IS success models over its 17 year history. It has been argued that information quality on the Internet, and more specifically in the context of eCommerce, should be referred to as content quality (Molla & Licker, 2001). In the context of SNSs, it is argued that the terminology of content quality should be used because the users provide the content that is shared online within the community. Therefore accuracy, timeliness, and complete information are important aspects of content among members in the SNS. Content quality as used in this research is defined as follows:

Content quality is defined as the accuracy and completeness of information provided to the SNS by the users within the community.

Content quality has a direct relationship with social capital in the context of SNSs and has been shown to be one of three dimensions that make up social capital (Hazleton & Keenan, 2000). Communication through a SNS is conducted through the content provided by the users. This content is used to establish relationships that form social capital (Widén-Wulff & Ginman, 2004). Therefore, we conclude in our model that higher levels of information quality will result in higher levels of social capital.

H_{1a}: Content quality is positively related to social capital in the context of SNSs.

Content quality, viewed as information quality in traditional IS success models, has been directly linked to user satisfaction (DeLone & McLean, 1992; Seddon, 1997; Molla & Licker, 2001). This relationship was later tested empirically and validated showing that content quality has a major influence on user satisfaction (Rai et al, 2002). We propose that this relationship will have similar effects in the context of SNSs.

H_{1b}: Content quality is positively related to user satisfaction in the context of SNSs.

System Quality

System quality has been shown to be a significant indicator of IS success through mediating variables of perceived value (Wang, 2008), use (DeLone & McLean, 1992), usefulness (Seddon, 1997), intention to use (DeLone & McLean, 2003) and user satisfaction (DeLone & McLean, 1992; Seddon, 1997; DeLone & McLean, 2003; Wang, 2008). The use of an information system might be quite different in various contexts such as eCommerce systems and SNSs, but the principles of system quality remain the same. Therefore we define system quality in the context of SNSs as follows:

System quality is defined as the consistency of the system interface, availability, ease of use, and quality of features provided.

Many models debate whether use, user satisfaction, or some other variable should be used in the IS success model as a mediating variable for the determinant of net benefits; however, there is little argument over the inclusion of user satisfaction and its relationship with system quality. Petter et al (2008) created a summary of empirical studies that reviewed individual levels of analysis between relationships hypothesized in IS success models. Their research showed that all 21 empirical studies displayed a positive relationship from system quality to user satisfaction. Keeping in line with the stream of research conducted over the past two decades, we will hypothesize that systems demonstrating a higher level of quality will result in increased user satisfaction.

H_{2a}: System quality is positively related to user satisfaction in the context of SNSs.

It is also proposed that system quality has a direct relationship with social capital in the context of SNSs. If users are unable to access the system or the system is difficult to use, then this will impede the user's ability to increase their social capital and ultimately will not use the SNS. This relationship is shown by the structural dimension of social capital, which relates to network configurations associated with the community (Nahapiet & Ghoshal, 1998). This dimension is concerned with the users within the network having access to communicate with each other (Widén-Wulff & Ginman, 2004). In the context of SNSs, the system is used to establish connections between users as a means of communication, therefore the structural dimension within social capital is equivalent to the system quality construct of IS success. Therefore we conclude that increased system quality will lead to an increase in social capital.

H_{2b}: System quality is positively related to social capital in the context of SNSs.

Trust

Trust research can be categorized into two levels consisting of a comprehensive view of trust at the society level or individual level of trust between two parties such as in customer-supplier relationships (Sargeant & Lee, 2004). Trust can also be viewed among different dimensions such as trusting behaviors and trusting beliefs (Gefen et al, 2003). Trusting behaviors is concerned with the actions based on trust whereas trusting beliefs includes a person's evaluation of cognitive beliefs that the other party is trustworthy (Rempel et al. 1985). Trusting belief is highly related to emotional trust, which is concerned with ones level of comfortability in relying on the trustee (Komiak and Benbasat 2004). With trust being a multilevel-multidimensional construct, it is important

to understand the level of abstraction of trust in the context of the research being conducted (Ajzen & Fishbein, 1980; DeLone & McLean, 1992).

Very few studies have evaluated the specific role of trust within the IS success framework. Molla & Licker (2001) evaluated the role of trust in IS success within the context of eCommerce, showing that trust has a significant affect warranting its inclusion. However, service quality is a construct that has been included in the updated D&M model and is theorized as being a significant indicator of use, intention to use, and user satisfaction (DeLone & McLean, 2003). While trust has been previously included in the construct of service quality in IS success (Wang, 2008), not all of the components that make up service quality are directly relevant in the context of online virtual communities. It has also been argued that service quality does not conceptually fit within the IS success model (Seddon, 1997). Within the context of eCommerce, service quality has shown to be positively related to perceived value and user satisfaction (Wang, 2008). However, only half of the empirical studies examining the relationship between service quality and user satisfaction have shown a significant relationship while no empirical studies have shown a significant relationship between service quality and use (Petter et al, 2008). Within SNSs, users often volunteer as administrators to help answer questions and solve problems for other users. Therefore, service is not always being conducted by the website itself but by other members of the community. Trust then becomes the predominant factor in service quality within the context of SNSs.

The basic view of trust in the literature results from the belief that the trusting party conceives that the trustee has high integrity, is honest, and reliable (Morgan & Hunt, 1994). The result of trust between the two parties has been shown to lead to information

exchange within online retailing (Mukherjee & Nath, 2007) and eBanking (Vatanasombut et al, 2008). Within the context of SNSs, users do not form relationships with the website directly but rather other members within the online community. Hence, the decision to use the particular SNS results in the indirect affect of trust based on their overall trust of the members within community. Within SNSs, users connect with many other members forming their own communities within the overall system. Therefore, trust should be measured at the community level bounded by the users network of friends that they are a part of. Based on this view of trust, we define trust as follows:

Trust is concerned with degree to which the trusting party feels that members of the online community have high integrity, are honest, and reliable.

Trust has been shown to be a factor that contributes to relationship exchange through the mediating variable of relationship commitment (Morgan & Hunt, 1994). This model showing the relationships between trust and relationship exchange has become known as the Key Mediating Variable (KMV) model. The KMV model shows that trust positively influences relationship commitment, which in turn positively influences relationship exchange. Within the context of SNSs, relationship exchange occurs through continued use as a result of the mediating affect on trust. However, relationship commitment is viewed quite differently in the context of SNSs since users form relationship with other users rather than the website itself. In the context of marketing, the perceived value gained through an IS system could be viewed as relationship commitment, where the user develops a relationship with the website resulting in relationship exchange, or continued use. In the context of SNSs, it is

proposed that the mediating variable between trust and continued use exists in the form of social capital.

Trust has been widely cited as a significant variable and is the most studied concept in social capital theory (Portes, 1998). Trust has been studied as a factor within the relational dimension of social capital (Nahapiet & Ghoshal, 1998) and in some models is viewed as the primary relational feature of social capital (Coleman, 1988). The relational dimension of social capital under which trust is categorized is concerned with expectations and obligations of members within the community (Hazleton & Kennan, 2000; Widén-Wulff & Ginman, 2004). Members of the community have a certain expectation in regards to trust and social capital will increase by other members in the community meeting or exceeding this expectation. Based on the KMV model and social capital theory, we conclude that a higher level of trust leads to a higher level of social capital.

H_{3a}: Trust is positively related to social capital in the context of SNSs.

Trust also plays an important role in the level of satisfaction with the online community by the user. Due to trust being fully captured by the service quality dimension (Wang, 2008) it can be hypothesized that trust will contain the same relationship with user satisfaction as service quality. Research has shown that there is a positive relationship between service quality and user satisfaction (Chakrabarty et al, 2007/2008) with even more evidence showing this relationship within the IS success model (DeLone & McLean, 2003). Molla and Licker (2001) also explore the relationship between trust and user satisfaction and propose that there is a direct positive relationship between these two constructs. Therefore, we propose that the perception of integrity,

honesty, and reliability among other members within the SNS will lead to higher levels of user satisfaction.

H_{3b}: Trust is positively related to user satisfaction in the context of SNSs.

Social Capital

Traditional IS success models have used *Use* (DeLone & McLean, 1992; DeLone & McLean 2003) and *Usefulness* (Seddon, 1997) as a direct determinant of net benefits and an indirect determinant of net benefits through user satisfaction. In the context of eCommerce, *use* and *usefulness* were replaced by perceived value as a determinant of user satisfaction and net benefits (Wang, 2008). The net benefit measured in eCommerce was the intention to reuse the eCommerce site. However, in the context of SNS, we propose that the net benefit should be viewed as continued use and is determined by the combination of social capital and user satisfaction.

Social capital in itself is a very broad theory consisting of multiple dimensions (Adler & Kwon, 2002). Within the organization view, social capital has been construed as a condition required for knowledge exchange to occur (Kankanhalli et al, 2005). Other authors have illustrated the concept of social capital in comparison to other types of capital such as physical and human capital (Coleman, 1990; Putnam, 1995). Social capital has been referred to as the intangible benefits gained through involvement within a community (Field, 2003) and is embedded in the relationships among its members (Schultze & Orlikowski, 2004). Social capital has also been defined by the benefits accrued through information exchange (Adler, 2001; Coleman, 1988), resources embedded in social networks (Lin, 2001; McLure Wasko & Faraj, 2005), or the

combined parts of networks, norms and the reciprocation of trust facilitating recourses provided and expected benefits (Putnam, 1993; Putnam, 2000). Social capital has also been broken down by type, such as bridging and bonding categories of social capital (Putnam, 2000; Williams, 2006). Bridging social capital is concerned with connecting individuals from different backgrounds between different social networks. Bonding social capital refers to providing emotional and substantive support among individuals within a social network. It is proposed that the dimensions of social capital relating to the intangible benefits encompassed in bonding social capital are significant in the context of general purpose SNS usage. Based on this assumption, this research defines social capital as follows:

Social capital is concerned with the intangible emotional benefits gained through relationships within the online community.

In the IS success model adapted to the context of eCommerce, it was shown that perceived value has a positive affect on user satisfaction (Wang, 2008). In the context of SNSs, perceived value is postulated to occur in the form of social capital, but also has positive effect on user satisfaction. Few studies have evaluated the relationship between social capital and satisfaction in general without any studies to date showing a direct relationship between social capital and user satisfaction in the context of SNSs. However, this relationship has been established in other areas such as job satisfaction (Requena, 2003) and life satisfaction (Helliwell, 2001; Bjørnskov, 2003). In applying the relationship shown between social capital and other forms of satisfaction along with perceived value and user satisfaction, we propose that increased social capital will positively affect the user's level of satisfaction with the online community.

H_{4a}: Social capital is positively related to user satisfaction in the context of SNSs.

In the context of eCommerce, it has also been shown that perceived value positively affects net benefits in the IS success model (Wang, 2008). With the perceived value being social capital and the net benefit being measured as continued use intention, we propose that social capital positively affects intention to continue using the SNS. One reported reason for failure of many online communities is the failure to generate enough social capital to sustain continued participation (Ludford et al, 2004). It has also been shown that social capital was significantly related to information exchange (Tsai & Ghoshal, 1998). It has been postulated that social capital would be more sustainable in environments where frequent and routine interactions take place, such as online communities (Schultze & Orlikowski, 2004). Therefore we conclude that social capital is fitting as the perceived value in the context of SNSs and positively influences continued use intention.

H_{4b}: Social capital is positively related to continued use intention in the context of SNSs.

User Satisfaction

The most commonly used dimension found in IS success literature is user satisfaction. Since the development of the original D&M model was established (DeLone & McLean, 1992), many other studies have been conducting respecifying IS success measures (Seddon, 1997; DeLone & McLean, 2003), validating its measures (Rai et al, 2002; Petter et al, 2008) and creating new IS success models specific to various contexts such as eCommerce (Molla & Licker, 2001; DeLone & McLean, 2004; Wang,

2008) and virtual communities (Lin & Lee, 2006; Lin, 2008). While each of these studies adapt the D&M model to the context their studying through the inclusion or exclusion of different constructs, one construct that is consistent among all of these studies as a direct determinant of IS success is user satisfaction. While there might be a strong consensus of the inclusion of a user satisfaction construct, there has not been a clear consensus on how to measure user satisfaction. In the context of eCommerce, no specific instrument has been developed for measuring user satisfaction (DeLone & McLean, 2004). DeLone & McLean (2004) recommend adapting user satisfaction measures and adding new measures based on the specific research being conducted due to these limitations. In the context of IS success, no studies to date have developed a specific measure for SNS user satisfaction.

The difficulty in using ‘user satisfaction’ in IS success lies in the definition of user satisfaction in the context of the system being studied. User satisfaction is a very broad concept describing the affective attitude of the user towards a variety of factors in a given situation (Bailey & Pearson, 1983). Terms that have been used to describe user satisfaction include “felt need,” “system acceptance,” “perceived usefulness,” “MIS appreciation,” and “feelings about the information system.” (Ives, Olson & Baroudi, 1983). User satisfaction has been used to measure attitudes towards an information system (Baroudi, Olson & Ives, 1986) as well as end user computing satisfaction towards a specific computer application (Doll & Torkzadeh, 1988). The one commonality that all views of user satisfaction have in common is the attitude towards the object being measured results is the sum of one’s feelings. Within the IS success model of social networking websites, user satisfaction is predicted to result from the sum of information

quality, system quality, trust, and social capital. Therefore it is important to choose a measure of user satisfaction that encompasses the overall satisfaction of the system resulting in the sum of the other dimensions. Therefore we define user satisfaction as follows:

User satisfaction is concerned with one's overall feelings of the virtual community and interaction with other members.

The model of attitudes and behaviors suggests that attitudes towards an object (such as a SNS) will influence intentions ultimately influencing behavior (Fishbein & Ajzen, 1975). The attitude being measured in this study is user satisfaction. If the system does not meet the user's requirements they will become dissatisfied and discontinue usage of the system (Ives, Olson & Baroudi, 1983). Some of the first work proving that user satisfaction leads to system usage was conducted by Baroudi, Olson and Ives (1986). Since then, user satisfaction has become a significant construct in IS success models as a predictor of net benefits and system usage. Through 2008, there were 14 empirical studies all supporting a positive relationship between user satisfaction and net benefits (Petter et al, 2008). There have been 21 empirical studies specifically testing the relationship between user satisfaction and use with 17 of them showing a positive relationship leading from user satisfaction to use.

User satisfaction has also been related to information system continuance, a post adoption behavior (Bhattacharjee, 2001). The 'use' construct refers to systems acceptance describing initial adoption of a system and is more influence by usefulness and preconceived notions pertaining to the system. Post acceptance behavior relating to the continued use of a system is heavily affected by the user's satisfaction after already

using the system. Based on these findings and results from previous studies relating user satisfaction to net benefits, and more specifically ‘use’, we conclude that overall user satisfaction in the virtual community will positively influence continued use intention.

H₅: User satisfaction is positively related to continued use intention in the context of SNSs.

Summary

This chapter provided the theoretical foundation for two distinct streams of research depicted as IS success and social capital theory. These two theories were merged in order to study the success of information systems in the context of SNSs. A conceptual model was developed based on the proposed theories in order to predict the success of information systems within the SNS context.

In order to conduct research in this area, the study’s context was established and the importance of research in this area was shown. The Web 2.0 environment was described entailing the components that helped shaped the foundation of SNSs.

Next, a comprehensive review of IS success models was conducted to set the theoretical foundation of the current research. Based on the original IS success model and social capital theory as it relates to SNSs, a theoretical model was developed to predict the success of IS systems in the context of SNSs. Table 3 lists the definition of each construct as it will be used this line of research.

Table 3

Definitions of IS Success Constructs

Construct	Definition
Continued Use Intention	Continued use intention is concerned with frequent future use of the SNS by the members of the community.
Content Quality	Content quality is concerned with the accuracy and completeness of information provided to the SNS by the users within the community.
System Quality	System quality is concerned with the consistency of the system interface, availability, ease of use, quality of features provided.
Trust	Trust is concerned with degree to which the trusting party feels that members of the online community have high integrity, are honest, and reliable.
Social Capital	Social capital concerned with the intangible emotional benefits gained through relationships within the online community.
User Satisfaction	User satisfaction is concerned with one's overall feelings of the virtual community and interaction with other members.

Consequent to defining each construct, a review of the literature was conducted to show the proposed relationships between the various constructs as hypothesized by this research. Table 4 gives an outline of all hypotheses and their structural relationships.

Table 4

Hypotheses and Structural Relationships

Hypotheses	Structural Relationship
H _{1a}	Content quality is positively related to social capital in the context of SNSs
H _{1b}	Content quality is positively related to user satisfaction in the context of SNSs
H _{2a}	System quality is positively related to user satisfaction in the context of SNSs
H _{2b}	System quality is positively related to social capital in the context of SNSs
H _{3a}	Trust is positively related to social capital in the context of SNSs
H _{3b}	Trust is positively related to user satisfaction in the context of SNSs
H _{4a}	Social capital is positively related to user satisfaction in the context of SNS
H _{4b}	Social capital is positively related to continued use intention in the context of SNSs
H ₅	User satisfaction is positively related to continued use intention in the context of SNSs

The hypotheses proposed in this research are the combination of existing IS success research amalgamated with social capital theory to develop a context specific IS success model related to SNSs. Figure 7 displays the final model with hypotheses being testing in this research.

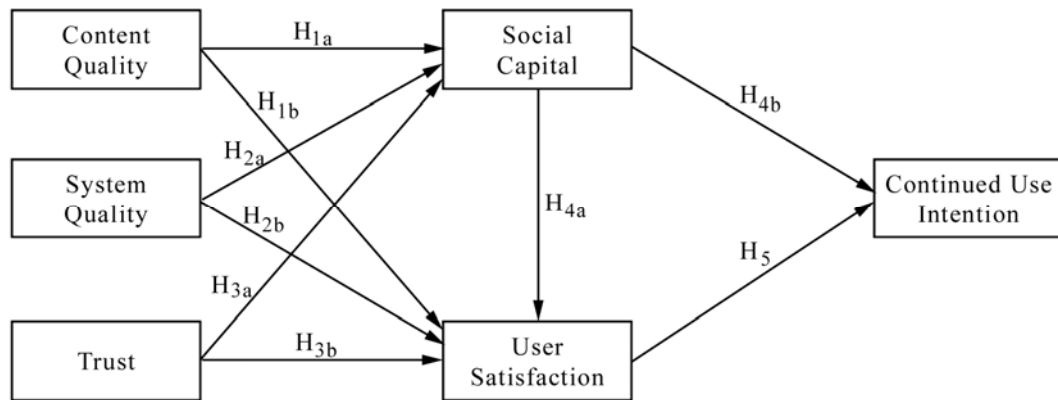


Figure 7

Social Networking Site (SNS) Success Model and Hypotheses

CHAPTER III

RESEARCH METHODOLOGY

Chapter III concerns the methodology and methods used in the research. The proposed research will combine two established methodologies into a research methods composition consisting of three stages: definitional domain, instrument development and measurement properties. The measurement properties stage will be divided into two parts comprising of a pilot study and the main study. This chapter begins with an overview of the research methods composition including a description outlining each of the three stages and the thirteen procedures that comprises the research methods composition. Then, the population and sample being used for the current study will be discussed describing how data was collected. This chapter will conclude by discussing data screening techniques used to ensure valid and reliable data.

Research Methods Composition

The research methods composition is adapted from a construct development methodology (Lewis et al, 2005) and the structural equation process methodology (Chin et al, 2008). The research method used consists of three stages: definitional domain, instrument development and measurement properties. The measurement properties stage will be divided into two parts. Stage III-A conducted the pilot study to perform construct

validity, measurement model evaluation and estimation in order to test the instrument and make any respecifications needed. Stage III-B conducted the main study data collection to assess construct validity, reliability, and conduct structural model estimation and structural model evaluation. The three stages and thirteen procedures of the research methods composition are outlined in table 5. This methodology addresses the guidelines set forth by Straub (1989) for instrument validation in order to bring rigor to the forefront of academic research in MIS. While there is still much work to be done to improve validations practices in MIS research (Boudreau et al, 2001), the current study helps by providing a model for similar studies to follow to achieve rigor in MIS research.

The research methods composition is used to establish the relationships between constructs that are grounded in theory. The current research used previously validated instruments to test the hypotheses in question. The model used in the current research uses latent constructs, which means they are not directly observable (Bagozzi, 1979). Therefore, the constructs had to be properly identified in the context they were being investigated in with unambiguous terms that discernibly distinguishes them from each other (MacKenzie, 2003). The validation of constructs is a multifaceted process that encompasses content validity, construct validity, and nomological validity (O’Leary-Kelly & Vokurka, 1998). Content validity refers to the ability of the instrument to reflect the construct that it embodies (Cronbach, 1971; Lawshe, 1975). Content validity is commonly measured via literature reviews and expert judges (Boudreau et al, 2001).

Table 5

Research Methodology Composition

	Procedure	Description
Stage I (Definitional domain)	Content Analysis	Establish the domain of the study.
	Conceptual Definition	Specify the purpose of the construct and the conceptual definition.
	Model Specification	Specify the structural equation model with relationships between constructs.
Stage II (Instrument development)	Model Identification	Identify measures that will reflect the construct being studied.
	Content Validity	Perform content validity using an expert review panel to evaluate items.
	Final Measurement Instrument	Finalize the instrument based on content validity findings.
Stage III-A: Measurement Properties (Pilot Study)	Confirmatory Assessment (Construct Validity)	Perform pilot study testing construct validity of measurement items.
	Measurement Model Evaluation	Evaluate the model fit of the pilot study data.
	Measurement Model Estimation	Estimate the model parameters
	Model Respecification	Evaluate the nomological network and underlying theory to respecify the model as needed.
Stage III-B: Measurement Properties (Main Study)	Reliability Assessment	Test the model for reliability
	Confirmatory Assessment (Construct Validity)	Perform main study and test construct validity of respecified measurement items.
	Model Evaluation	Assess the model overall fit.
	Model Estimation	Estimate model parameters showing empirical findings and hypotheses results.

Derived from Lewis et al, 2005 and Chin et al, 2008.

The research methods composition established content validity in Stage II through model identification based on the literature review along with additional content validity via expert review panel. After establishing content validity, focus is turned to conducting construct validity. Construct validity is concerned with the extent to which the indicators measure the construct being investigated (Campbell & Fiske, 1959; Cook & Campbell, 1979; Bagozzi & Edwards, 1998). Construct validity was performed in Stage III-A and

Stage III-B of the research methods composition using confirmatory factor analysis.

Nomological validity refers to the extent to which the constructs are related as anticipated (O’Leary-Kelly & Vokurka, 1998). This refers to the reliability of the model and the model evaluation that was performed in stage III of the research methods composition by using SEM. Below is a more detailed outline of the methods that were used in the current research.

Stage I: Definitional Domain

The definitional domain established the scope of the study being performed (Lewis et al, 2005). This included the content analysis used to identify the domain of the study and identifying the premise, conceptual definition, and dimensions of the constructs used. This stage of the research methods composition was performed through the literature review conducted in Chapter II. The context of the study was established resulting in the development of a model and its constructs. Based on an extensive literature review, conceptual definitions were developed for each construct in the context of the research being performed. The structural model with theoretically established relationships between the constructs was established in Chapter 2 of the current research. A summary of construct definitions capturing the contextual dimensions of the current research can be found in Table 3 on page 47 of this dissertation.

Stage II: Instrument Development

The second stage is an iterative process where the instrument was developed and validated to measure the constructs being researched (Lewis et al, 2005). Each construct was reviewed to determine if previously validated scales could be used based on recommendations to increase rigor in MIS research (Straub, 1989). Consequently, this study used previously validated scales from a pool of research to develop the current survey instrument (Lin & Lee, 2006; Lin, 2008; Wang, 2008; Williams, 2006; Pavlou & Gefen, 2004). Since the items selected are applied in a context that has not been heavily researched, content validity was established to ensure they represent the domain in which they are being studied. Instrument measurements should be validated prior to conducting other core empirical validities (Cook & Campbell, 1979). Therefore, an expert panel review was used to establish content validity to confirm the items reflect the definitional domain being studied. This resulted in a final measurement model used to test the hypotheses based on the research questions of this study. Each procedure of model identification will now be described in more detail.

Model Identification

Model identification determines the measurements that will be employed for model estimation (Chin et al, 2008). The instrument should use previously validated measures whenever possible (Leidner & Jarvenpaa, 1995 ; Straub, 1989) with no fewer than three items per construct (Chin et al, 2008; Dillon et al, 1997). Each construct was researched to determine if a previously validated scale was able to be adapted to the context of this study. Content validity was established deductively by defining the

context of the study being performed and selecting or creating items that are adapted to the domain (Cronbach & Meehl, 1955).

The constructs of information quality, defined as content quality in the current research, and system quality have been used throughout the literature as key constructs in IS success (DeLone & McLean, 1992; Seddon, 1997). The underlying dimensions of information quality are similar across many domains from client server information to content provided by the users through SNS. Within the context of SNS, the construct of information quality is viewed as content quality since users provide content on the website (Molla & Licker, 2001) rather than useful information as it is viewed within the organizational context. For the purposes of the proposed research, content quality is defined as the accuracy and completeness of information provided to the SNS by the users within the community. This construct is well established in the literature and has been adapted to many domains such as client server systems (Doll & Torkzadeh, 1988), eCommerce systems (Wang, 2008), and online communities (Lin & Lee, 2006). The scales used in this study are adapted from previously validated scales by Lin & Lee (2006) having factor loadings ranging from 0.78 to 0.91 and a composite reliability of 0.87.

System quality is a multidimensional construct (Wang, 2008) that is most commonly measured as perceived ease of use based on research relating to the technology acceptance model (Petter et al, 2008). System quality refers to the system itself and is concerned with the consistency of the system interface, availability, ease of use, and quality of features provided. Many different dimensions have been suggested for measuring system quality depending on the domain of the research (Liu & Arnett,

2000; Molla & Licker, 2001; Rai et al, 2002; DeLone & McLean, 2003). Due to the context of the current study and the vast amount of validation that has been conducted on system quality scales, the current research chose to use items that were already validated in the context of the present study. The items used for this study were adapted from previously validated scales by Lin & Lee (2006) and Lin (2008) having factor loadings ranging from 0.74 to 0.84 and a composite reliability of 0.88.

The construct of trust has been previously applied to IS success (Molla & Licker, 2001) although most IS success research uses service quality which has also been used to capture the dimensions of trust (Wang, 2008). In the context of SNS, the current research has shown that trust is applicable within the domain being studied. However, trust is a broad term consisting of multiple levels (Sargeant & Lee, 2004) and dimensions (Gefen et al, 2003). Trust can be evaluated at the individual level or societal level containing dimensions of trusting behaviors and trusting beliefs. In the context of SNS, trust is viewed as the degree to which the trusting party feels that members of the online community have high integrity, are honest, and reliable. The items used for this study were adapted from Morgan and Hunt (1994) to measure trust in a community. The items had a Cronbach's alpha reliability of 0.94 and have been cited over 1,200 times to date.

Similar to trust, social capital is also multidimensional construct with little consensus as to what constitutes social capital (Adler & Kwon, 2002). Two of the more popular categorizations of social capital are bridging and bonding social capital (Putnam, 2000; Williams, 2006). In the domain of this study, social capital is concerned with the perceived intangible emotional benefits gained through relationships within the online community. Previously developed scales for bonding social capital used to measure

emotional support were adapted from Williams (2006). Of the items used for this study, the factor loadings ranged from 0.755 to 0.765. Further validation was conducted in order to apply the social capital construct to IS success in the context of SNS.

User satisfaction is another commonly used construct in IS success literature describing the attitude of the user towards a variety of factors in a given situation (Bailey & Pearson, 1983). Within the domain of the current research, user satisfaction is viewed as one's overall cognitive appraisal of members within the online community. It is recommended to reuse measures, adding or dropping items as needed based on the specific research being conducted (DeLone & McLean, 2004). The items being used in the current research are adapted from Lin (2008) to fit within the definition domain of this study. The factor loading for these items ranged from 0.71 to 0.87 with a composite reliability of 0.84.

The dependent variable in the SNS success model is net benefit, with the net benefit being viewed as continued use intention. While the construct of *use* has been previously used as the net benefit in IS success (DeLone & McLean, 1992; DeLone & McLean, 2003), more current research has adapted this construct to be measured as reuse (Wang, 2008). For any online service provider, the essential element for survival lies in their ability to sustain usage from its customers (Kim & Son, 2009). The success of SNS is no different, depending highly upon continued usage of its members (Ludford et al, 2004). Continuance refers to the recurring usage of an IS system after initial acceptance has occurred (Bhattacharjee, 2001) referring to the continued future use of the system in the long run (Bhattacharjee et al, 2008). The challenge lies is determining the time frame for which continuance will occur. A user might intend to continue using the SNS system

over the next six months, then discontinue prior to one year. To compensate for this, the current study modified previously validated scales from Vatanasombut et al (2008) that tests continued usage based on time spans of 3 months, 9 months, and 12 months. The items for IS continuance intention used in the Vatanasombut et al (2008) measurement instrument had factor loadings ranging from -0.81 to -0.88 with a composite reliability of 0.92.

Each construct contains a minimum of three items based on minimal recommendations for construct operationalization (Dillon et al, 1997) and identification. Seven point Likert-type scales were used anchored at "strongly disagree" (1), "strongly agree" (7), and "neutral" (4). Since these scales were modified based on the definitional domain used in this study, further validation will need to be performed. Table 6 displays the measurement items for each construct.

Table 6
Measurement Items

Constructs	Measures		Sources
Continued Use Intention	CUI1	I will continue to use the SNS for the next 3 months	Vatanasombut et al, 2008
	CUI2	I will continue to use the SNS for the next 6 months	
	CUI3	I will continue to use the SNS for the next 12 months	
Content Quality	CQ1	The Facebook community provides timely content	Lin & Lee, 2006
	CQ2	The Facebook community provides accurate content	
	CQ3	The Facebook community provides complete content	
	CQ4	The Facebook community provides useful content	
System Quality	SQ1	The SNS system is reliable	Lin & Lee, 2006
	SQ2	The SNS system is convenient to access	
	SQ3	The SNS system is easy to use	
	SQ4	The SNS system is flexible	
Trust (Network Ties)	TNT1	The people on my friends list are those who I can rely on	Morgan & Hunt, 1994
	TNT2	The people on my friends list have high integrity	
	TNT3	The people on my friends list can be trusted	
	TNT4	The people on my friends list are those who I have great confidence in	
	TNT5	The people on my friends list can be counted on to do what is right	
Social Capital	SC1	Within the online community there is someone I can turn to for advice about making very important decisions	Williams, 2006
	SC2	Within the online community there are several people I can talk to when I feel lonely	
	SC3	Within the online community there are several people that I feel comfortable discussing intimate personal problems with	
User Satisfaction	SAT1	I am pleased with my interactions within the virtual community	Lin & Lee, 2006
	SAT2	The virtual community has met my expectations	
	SAT3	Overall, I am satisfied with the online community	

Content Validity

Content validity is the theoretical identification of empirical indicators expected to measure a construct (O’Leary-Kelly & Vokurka, 1998). There are three criteria that encompass content validity: domain definition, domain representation, and domain relevance (Sireci, 1998). Domain definition is the first step to ensuring content validity and is established through the literature review in order to define the context in which the variables are being studied. Domain representation is used to ensure the items that the items selected reflect the construct that it embodies (Cronbach, 1971; Lawshe, 1975; Nunnally, 1978). Domain relevance is concerned with the relevance of the items within the domain being studied.

When developing a set of measures to represent a construct, it is important to ensure that all the items used fully reflect all key elements of the conceptual definition and nothing outside of this domain (MacKenzie, 2003). The items used in the current study were validated to eliminate misleading or confusing questions. Content validity is first assessed theoretically when developing the items (Malhotra & Grover, 1998). Further content validity can be established by using an expert review panel to verify that the items do in fact reflect the conceptual domain they are intended to measure (Boudreau et al, 2001; Cronbach, 1971; Malhotra & Grover, 1998; Straub, 1989).

The proposed study first established content validity through an extensive review of the literature to define the conceptual domain for each construct included in the model. Further content validity was conducted through a panel of professors at Mississippi State University to ensure that each item reflects the construct that it is intended to measure. Upon the expert panel review, the final measurement model was developed.

Final Measurement Model

The final measurement model consists of 22 items measuring 6 constructs. Each set of items was adopted from previously validated scales and then validated again using content validity to ensure they reflect the definitional domain as described in the current research. A series of demographic variables were captured to describe the sample and ensure that a true representation of the population is being observed. Each reflective item is being measured using a seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree.

Stage III: Measurement Properties

Stage III contains the measurement properties consisting of construct validity, reliability, model estimation and model evaluation. There are two phases in this stage: stage III-A (pilot study) and stage III-B (main study). Stage III-A consisted of a pilot study used to assess construct validity of the items in the instrument. Initial model estimation and model evaluation was also performed on the measurement model. Based on the results of the pilot study, the measurement model was re-evaluated to ensure the items reflected the constructs they were intended to measure. Upon completion of Stage III-A, sample data from the population was collected to conduct the main study used to test the hypotheses. Construct validity and reliability were assessed to ensure that the results held up to what was discovered in the pilot test.

The procedures used for Stage III-A and Stage III-B contain similar steps for collecting data and validating the measurement model. The data collection methods will be discussed at the end of this chapter. Stage III used a confirmatory assessment of the

factors in the study to test for construct validity. Reliability was conducted in Stage III-B to ensure that the results were consistent with the first round of data collection. LISREL 8 was used to perform model estimation using structural equation modeling in Stage III-B of this study. Upon estimating the model parameters, the model was evaluated and conclusions were made based on the hypotheses being researched in this study. Each of these procedures will be further explained below.

Confirmatory Assessment

Confirmatory assessment was used to test for construct validity. Construct validity should be tested whenever items are to be interpreted as a measure that cannot be operationally defined (Cronbach & Meehl, 1955). Construct validity is used when the instrument items are supposed to reflect a particular construct (Cronbach & Meehl, 1955) to ensure that the scale fully captures the underlying construct of interest (Campbell & Fiske, 1959; Cook & Campbell, 1979; Schwab, 1980). This measures the degree to which the items used measure the construct (Schwab, 1980) and only that construct. (O'Leary-Kelly & Vokurka, 1998).

It is empirically and logically necessary that constructs are unidimensional (Bagozzi, 1980). Unidimensionality refers to a set empirical indicators that are used to measure a single trait or construct (Gerbing & Anderson, 1988). Two methods commonly used for assessing unidimensionality include exploratory (EFA) and confirmatory (CFA) factor analysis (Long, 1983; Nunnally, 1978; Pedhazur and Schmelkin, 1991). When using structural equation modeling, it is important to develop

the model first and use CFA to validate the constructs and analyze the data (O'Leary-Kelly & Vokurka, 1998).

The proposed research developed the model based on the theoretical foundation obtained from a thorough literature review. CFA was used to test for unidimensionality of the constructs in the study and obtain inferential statistics for hypothesis testing (Gerbing & Anderson, 1988). The resulting factors indicated the items with high correlations that functioned together to reflect the construct being tested (Campbell & Fiske, 1959; Cronbach & Meehl, 1955).

Reliability Assessment

Reliability was used to evaluate the accuracy of the measurement instrument used to ensure consistent results that are free from error (Churchill, 1979; Hair et al, 2005; Straub, 1989). Reliability is concerned with the degree to which the observed variables are able to measure the true value yielding the same results on repeated trials. There are five general methods that can be used to assess reliability (Boudreau et al, 2001; Rogers, 1995):

1. Internal Consistency
2. Split halves
3. Test-retest
4. Alternative forms
5. Inter-rater reliability

Internal consistency tests the degree to which procedures estimate the same characteristic. The most commonly used measure for testing the reliability of multiple indicators for a construct is coefficient alpha, also known as Cronbach's alpha (Hair et al, 2006; Pedhazur and Schmelkin, 1991). Cronbach's alpha is the primary method used for

internal consistency reliability testing of a set of items (Churchill, 1979; Churchill et al, 1974). Another reliability coefficient commonly used in conjunction with SEM is called construct reliability (Hair et al, 2005, p. 777). The equation for construct reliability is as follows:

$$CR = \frac{\left(\sum_{i=1}^n \lambda_i\right)^2}{\left(\sum_{i=1}^n \lambda_i\right)^2 + \left(\sum_{i=1}^n \delta_i\right)^2} \quad (\text{Eq 1})$$

The squared sum of factor loading for each construct is computed using λ_i and δ_i to compute the error variance for the construct. The coefficient alpha, Cronbach's alpha and construct reliability, both measure how well items are positively correlated with one another (Churchill, 1979; Churchill et al, 1974; Sekaran, 2003). This is also an indicator of convergent validity having reliability estimates ranging from 0 to 1 with 0.7 deemed as the lower limit of acceptability (Hair et al, 2005).

The advantage of using reliability coefficients over other reliability tests is that they only require a single sample to perform reliability tests (Bollen, 1989). However, Cronbach's alpha can be problematic for research containing homogeneous measures. It has been reported to underestimate reliability leading to false conclusions about measures reliability (Bollen, 1989). Cronbach's alpha also has a limitation of estimating errors caused by factors external to the instrument due to its focus on internal reliability (Churchill, 1979).

Another form of reliability that was conducted in the current research was test-retest reliability. Test-retest reliability tests for reliability in the instrument among multiple data collections to account for different testing situations and other types of external error (Churchill, 1979). Jacoby (1978) argues that test-retest is a reliability method often ignored by many researchers that should be incorporate more in research. Test-retest is typically performed by giving respondents the same question at two different times, generally two weeks apart (Peter, 1979). One limitation to this approach is response memory, where respondents tend to remember how they answered before and answer the same for consistency. This research takes this limitation into account and administered the survey to different groups to test reliability among different population samples. This still tests for reliability among the items but does not fall victim to response memory.

Other forms of reliability were not suited for the current research being conducted. Inter-rater reliability is concerned with reliability among several judges making observations (Rust & Cooil, 1994). Split-halves reliability uses one data collection and splits the data in half based on a sampling technique used by the research. Alternative form reliability conducts two data collections at two different times, similar to test-retest reliability, but this method using two different scales with similarly worded items to account for memory response (Peter, 1979).

Model Evaluation

Model evaluation was used to assess the model fit and show empirical findings and hypotheses results. This step was used to evaluate the estimates returned from the previous procedure in the current methodology. First, the measurement model was

evaluated to test determine the relationship between the observed variables and the constructs on which they form (Anderson & Gerbing, 1988). The notation used for testing independent latent variables is as follows:

$$\mathbf{X} = \Lambda_x \xi + \delta \quad (\text{Eq 2})$$

where X is a vector of the observed measures, Λ_x is the regression parameters related to x_i , ξ refers to the construct being measured and δ represents the residuals (Anderson & Gerbing, 1988; Bagozzi & Yi, 1988). For the dependent latent variables, the following notation was used:

$$\mathbf{Y} = \Lambda_y \eta + \varepsilon \quad (\text{Eq 3})$$

where Y is a vector of the observed measure, Λ_y is the regression parameters related to y_i , η refers to the dependent latent variable and ε represents the uncorrelated error (Bagozzi & Yi, 1988).

Upon successful testing of the measurement model, the relationships between the constructs and the hypotheses being researched were evaluated. The structural model is used to test causal relationships of the constructs being tested (Anderson & Gerbing, 1988). The equation for testing this relationship is as follows:

$$\eta = \mathbf{B}_\eta + \Gamma_\varepsilon + \zeta \quad (\text{Eq 4})$$

where η refers to a dependent latent variable, \mathbf{B}_η refers to the path representing the causal relationship, Γ_ε represents the entire set of γ relationships and ζ captures the between constructs error (Hair et al, 2005). Structural parameters and p-values were calculated for each construct to test the hypotheses being studied. Overall fit statistics were also evaluated to test the fit of the model as a whole.

Model Estimation

The analysis and model estimation was carried out by LISREL 8 for Windows. In this step, the data was entered and the model parameters were retrieved from the LISREL output. The structural equation model was estimated and with all correlations being reported. Appendix B displays the structural equation model that was estimated in this procedure of the methodology. The results from the structural equation model were be used to conduct the model evaluation.

Model Respecification

Based on the model estimation and model evaluation, model respecification may be required. Any respecifications made to the measurement model went through the steps for ensuring content validity as outlined in Stage II of the research methods composition. All suggested changes to the structural model were evaluated theoretically through additional review of the underlying literature. Any changes made to the measure model or structural model were theoretically grounded with validity assessments to ensure rigor in the research being conducted.

Sampling Frame

The proposed research conducted two separate data collections for two stages of research. Sample data was collected for Stage III-A to conduct a pilot test used for validation and initial model estimation. The sample for this stage of the study consisted of a group of students in the College of Business at Mississippi State University who were currently members of the SNS called Facebook. Facebook was used for the

sampling frame because it contains all the elements described in the context of the study being performed to make assumptions about general purpose SNS. Students were recruited from business classes during the summer session at Mississippi State University and asked to voluntarily participate in the study being performed. This data was used to validate the measurement model and modify the survey instrument as needed.

A second data collection was conducted for stage III-B in this study. This data collection was used for testing validity and reliability of the instrument and performing model estimation and evaluation to test the hypotheses being studied. Data was collected from the population of students at Mississippi State University in various classes across campus. The goal was to get students from various departments that would be representative of the Mississippi State University network on Facebook. Students were approached in class and asked to voluntarily participate in the study being conducted.

Data Screening

Systematic error, which has often been reported (Couch & Keniston, 1960; Cronbach, 1946, 1950; Hamilton, 1968) can contaminate response results and affect conclusions about relationships between scale items and constructs (Bagozzi, 1994). The proposed research used methods to remove survey responses that displayed obvious response bias in order to strengthen the results of the study.

Response bias occurs when respondents taking the survey respond systematically to items on the questionnaire (Paulhus, 1991). Extreme response style (Baumgartner & Steenkamp, 1984; Chen, et al, 1995; Hui & Triandis, 1985; Stening & Everett, 1984) and midpoint responding (Chen, et al, 1995; Stening & Everett, 1984) are two types of bias of

particular concern with the current research. This bias refers to respondents who either respond the most extreme values or respond in the middle of the scale category regardless of the content. This causes respondent to appear to be in agreement or disagreement more than they actually are when filling out the survey (Greenleaf, 1992) ultimately reducing the validity of the research results (Broughton & Wasel, 1990).

To check for response bias an additional question was added inquiring about the honesty when filling out the survey instrument. A single item asking the user if they were honest when filling out the survey ranging from “1 – Strongly disagree” to “7 – Strongly agree” was added to make sure they are reading the questions. Any responses that do not contain the predicted result for this question was assumed to contain response bias and removed from the population sample.

Other reasons for conducting data screening and pre-data analysis include missing data and ensuring accuracy of the data collected (Levy, 2006). Survey responses that were not filled out completely were removed from the population sample. Complete survey responses are required in order to conduct accurate statistical analysis on the data.

CHAPTER IV

RESEARCH RESULTS

Chapter IV provides a succinct delineation of the results from the research being performed. Included in this chapter is the data collection and analysis of the pilot study and main study that was conducted. Reliability analysis, confirmatory assessment, model estimation and evaluation are explicated with a discussion of the research questions and hypotheses results using SEM. SEM is a multivariate technique that simultaneously applies multiple regression analysis and confirmatory factor analysis to evaluate a series of interrelated dependence relationship within a theoretically developed model (Hair et al, 2005).

Data Collection And Analysis

The survey questionnaire for this study was derived from several previously validated scales used to measure each construct included in the model. The initial survey instrument consisted of 22 items that are grouped according to the construct they reflect. Two samples of data were collected for analysis, the pilot study and the main study. The pilot study consisted of 220 students from the College of Business at Mississippi State University who are members of the SNS called Facebook. Students were invited to voluntarily participate in the research being conducted. After initial testing and

validation of the pilot study data, the main study data collection was conducted. The survey questionnaire was administered to the population of members on the Mississippi State University network of Facebook. Students were approached in several classrooms across Mississippi State University's campus and asked to voluntarily participate in the studying being performed.

Data analysis was conducted on both the pilot study and the main study. The data collected from the pilot study were used to test the measurement model through reliability analysis and confirmatory assessment. Cronbach's alpha, composite reliability, and average variance extracted (AVE) for each construct were measured for reliability, convergent and construct validity were assessed, and the goodness of fit for the measurement model was established. The analysis of the measurement model using the pilot study data was used to refine the instrument. The revised instrument was administered to the main study population.

The data collected from the main study was used to evaluate the measurement model and the structural model in order to perform hypotheses testing. It is important to test the measurement again to ensure reliability of the measures and generalizability. While there are limitations in every research method limiting its ability to address all aspects of desirable features of research such as generalizability, precision, and realism (McGrath et al, 1982), this research attempts to maximize realism and generalizability in the research design. Conducting the research on the population of actors within an existing SNS increases the realism of the study being conducted. Surveys by nature lead to an increase in generalizability. The data analysis for both the measurement model and the structural model of each study was conducted using LISREL 8.

Pilot Study

The pilot study was conducted to refine the instrument and validate the measurement model used in the current study. Previously validated scales were used and modified to fit the context of the study. A group of professors at Mississippi State University who are knowledgeable on the constructs used in the study were selected to evaluate the content validity of the instrument prior to administering the survey to the subjects. Based on feedback from the group of professors, the survey instrument was modified and administered to the pilot study. The results of the pilot study are discussed below, beginning with an analysis of the demographics followed by reliability analysis and confirmatory assessment. Based on the results, the model was re-evaluated to improve the research instrument prior to conducting the main study data collection.

Demographic Analysis

The following descriptive statistics depict the sample population used for the pilot study. As mentioned earlier, the pilot study consisted of 220 users of the popular SNS called Facebook. The largest demographic group consisted of White Americans between the ages of 20 and 24 with some college experience. The pilot study consisted of 131 male students (59.5%) and 89 female students (40.5%). The largest demographic of users on Facebook are reported to be Females between the ages of 18 and 25 (Smith, 2009). Demographics on race and education are not captured on Facebook. The sample of users surveyed in the pilot study is similar to the Facebook population in age with slight differences in the male to female ratio. An outline of all demographic data is presented in Table 7.

Table 7

Demographic Frequency and Percentages (n=220)

Variable	Frequency	Percentage
Age		
< 20	7	3.2%
20 – 24	187	85%
25 – 29	21	9.5%
30 – 34	3	1.4%
35 – 39	1	0.5%
40 – 44	1	0.5%
Gender		
Male	131	59.5%
Female	89	40.5%
Ethnicity		
White	171	77.7%
African American	43	19.5%
Asian	5	2.3%
Other	1	0.5%
Education		
Some College	170	77.3%
College Graduate	24	10.9%
Masters	25	11.3%
Ph.D	1	0.5%

In addition to general demographic data detailing the sample population of the pilot study, participants were also asked to report information about their usage of Facebook. This gives more insight into the intensity of usage of the population sample showing the relevance of the study being conducted. Participants in the pilot study reported that they use Facebook approximately 44 minutes per day and five days a week on average. On average, participants had been a member of the Facebook community for longer than three years (36 months) with an average of 250-299 friends on their contact list. Table 8 outlines the reported usage statistics of the pilot study sample.

Table 8

Reported Usage Statistics (n=220)

Variable	Average
Avg. Days Per Week	5.19
Minutes Per Day	44.43
Months Using	36.97
Average Friends	250-299
Total Friends:	
<50	4
50-99	8
100-149	20
150-199	18
200-249	17
250-299	14
300-349	20
350-399	16
> 400	103

This data gives great insight to extent of use by the sample of users selected for the pilot study to represent the population of Facebook users in order to further validate the measurement model. In addition, it also shows the intensity of use and the commitment users have shown to belonging to a SNS.

Reliability Analysis

Reliability analysis is used to test the reliability of the items to the construct they are intended to measure. It is concerned with the consistency of the items use to reflect the latent construct and evaluate the quality of the instrument (Churchill, 1979). The most commonly used measure for assessing reliability is the Cronbach’s alpha, also known as the coefficient alpha. Table 9 lists the coefficient alpha, composite reliability, and AVE for each construct used in the study.

Table 9

Reliability and Variance Analysis

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Content Quality	0.813	0.8136	0.5250
System Quality	0.810	0.8192	0.5425
Trust	0.945	0.9446	0.7740
Social Capital	0.840	0.8469	0.6500
User Satisfaction	0.913	0.9013	0.7533
Continued Use Intention	0.940	0.9383	0.8367

A minimal coefficient alpha of 0.50 to 0.60 is recommended for early stages of research (Nunnally, 1978), with more developed research requiring a minimal coefficient alpha of 0.70 (Hair et al, 2005). All six constructs in the current study have a coefficient alpha greater than 0.80 with three constructs having strong coefficient alphas exceeding 0.90. Reviewing the composite reliability obtained from the confirmatory factor analysis gives similar results. A composite reliability of 0.70 is desirable to suggest good reliability among the items on the construct (Hair et al, 2005). All items meet this minimal requirement with composite reliabilities greater than 0.80. AVE is an indicator of convergence with a minimal level of 0.50 indicating that the items show adequate convergence on the construct (Hair et al, 2005). All constructs display an AVE of higher than the required 0.50 level.

Confirmatory Assessment

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to determine and confirm the structure of the measurement model. EFA was evaluated first to establish the measurement model, validating the items that load on each

factor. EFA was conducted using principal components analysis with a varimax rotation looking for a minimal factor loading of 0.70 to indicate a strong fit for each item on the component it is predicted to load on (Hair et al, 2005). The results of the factor analysis are displayed in Table 10.

Table 10

Exploratory Factor Analysis for Pilot Study

	Rotated Components Matrix						Communalities	
	1	2	3	4	5	6	Initial	Extraction
CQ1	.061	.260	.456	.400	.401	.160	1.000	.626
CQ2	.087	.195	.804	.001	.213	.108	1.000	.749
CQ3	.100	.051	.854	.177	.078	.191	1.000	.816
CQ4	.243	.052	.700	.160	.008	.159	1.000	.603
SQ1	.116	.147	.549	.188	.325	.047	1.000	.480
SQ2	.080	.440	.220	.664	.227	.104	1.000	.752
SQ3	.157	.264	.115	.826	.210	.046	1.000	.836
SQ4	.168	.133	.222	.789	.185	.153	1.000	.775
TNT1	.837	.137	.109	.138	.220	.069	1.000	.803
TNT2	.835	.071	.124	.115	.216	.170	1.000	.806
TNT3	.891	.092	.129	.085	.069	.132	1.000	.848
TNT4	.881	.146	.108	.135	.135	.091	1.000	.854
TNT5	.896	.053	.120	.013	.023	.137	1.000	.839
SC1	.188	.049	.138	.170	.117	.847	1.000	.817
SC2	.133	.177	.226	.267	.192	.759	1.000	.785
SC3	.182	.174	.154	-.101	.175	.798	1.000	.766
SAT1	.282	.179	.237	.207	.763	.278	1.000	.870
SAT2	.205	.227	.200	.220	.799	.157	1.000	.845
SAT3	.237	.309	.181	.314	.691	.223	1.000	.809
CUI1	.131	.789	.115	.405	.232	.120	1.000	.885
CUI2	.167	.898	.129	.216	.194	.144	1.000	.955
CUI3	.139	.879	.188	.135	.163	.146	1.000	.893
% of Variance	19/3	13.2	12.9	11.7	11.2	10.7		
Cumulative %	19.3	32.6	45.5	57.2	68.4	79.1		

*Principal components analysis using Varimax rotation

Items CQ1 and SQ1 appear to be most problematic with factor loadings below 0.5 and 0.6 respectively. Item SQ1 displays even more evidence of a lack of fit with a communality less than the 0.5 minimal requirement, indicating that this item does not demonstrate sufficient explanatory power in the model (Hair et al, 2005). Further analysis should be conducted on these two items for possible removal. Items SQ2 and SAT3 have factor loadings that fall just below the 0.70 requirements for well-defined structures, but exceed the 0.50 level for practical significance (Hair et al, 2005). Items SQ2 and SAT3 have communalities of 0.752 and 0.809 respectively indicating that they have sufficient explanatory power in the model. With moderately low factor loadings for these items, further evidence would need to be presented before making a decision that these items do not belong in the model. The six factors extracted account for 79.1% of the variance in the measurement model.

Next, CFA was conducted on the proposed measurement model to confirm the findings in the EFA and evaluate the overall fit of the data collected for the pilot study. The initial measurement model consists of 6 latent constructs containing between 3 and 5 items each. Figure 8 displays the initial measurement model used for the pilot study. Factors loadings for each item to the construct they are proposed to reflect are displayed along with correlations between constructs.

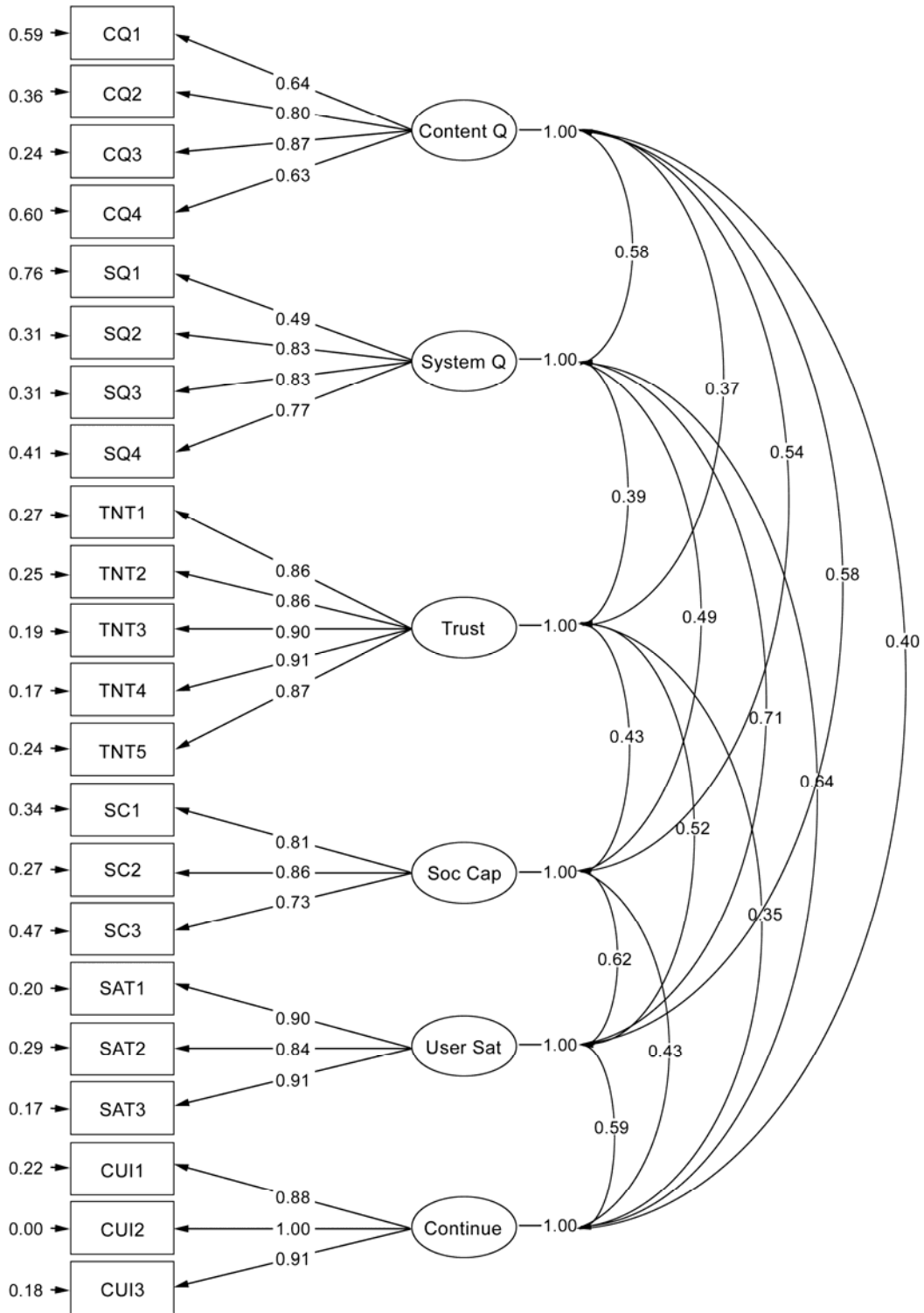


Figure 8
Initial Measurement Model

The measurement model shown outlines the relationships between the items and the latent constructs used in the study. Table 11 displays the factor loadings for each item on the construct it was designed to reflect along with the t-values and SMCs.

Table 11
Factor Loadings for Pilot Study Measurement Model

	Content Quality	System Quality	Trust	Social Capital	User Satisfaction	Continued Use Intent	t value	SMC
CQ1	0.64						10.07	0.41
CQ2	0.80						13.41	0.64
CQ3	0.87						15.14	0.76
CQ4	0.63						9.79	0.40
SQ1		0.49					7.35	0.24
SQ2		0.83					14.47	0.69
SQ3		0.83					14.45	0.69
SQ4		0.77					12.87	0.59
TNT1			0.76				15.69	0.73
TNT2			0.84				15.92	0.75
TNT3			0.81				17.13	0.81
TNT4			0.78				17.37	0.83
TNT5			0.75				16.08	0.76
SC1				0.82			13.68	0.66
SC2				0.85			14.64	0.73
SC3				0.73			11.74	0.53
SAT1					0.89		16.72	0.80
SAT2					0.84		15.08	0.71
SAT2					0.91		17.10	0.83
CUI1						0.88	16.53	0.78
CUI2						1.00	20.66	1.00
CUI3						0.91	17.34	0.82

*All t-values significant at the p=0.01 level.

Convergent validity was tested by evaluating the factor loadings of each item on the factor they are predicted to reflect. Statistical factor loadings of 0.70 or higher should be used to determine if items converge on the construct in question (Garver & Mentzer, 1999). There are three items that fall below the minimal level to load on their factor.

Item SQ1 has a factor loading of 0.49, which falls well below the minimal requirement. Items CQ1 and CQ4 have factor loadings of 0.64 and 0.63 respectively falling just under the minimal level. Before determining how to handle these potentially problematic items, further analysis should be conducted.

To assess the reliability of each item, the squared multiple correlation (SMC) value were evaluated. The SMCs show the amount of variance accounted for by each item for the factor (Bagozzi & Edwards, 1998). There are three items that have a SMC value less than 0.50, meaning the latent construct explains less than 50 percent of the variance in that item. As shown in table 9, items SQ1, CQ1, and CQ4 have SMCs of 0.24, 0.41, and 0.40 respectively indicating that these items are not as reliable as they should be. Based on these results, further attention should be given to these items for possible respecification.

Next discriminate validity was assessed at both the construct level and the item level. Discriminant validity at the construct level evaluates the correlation between each construct, with highly correlated constructs being viewed as measuring the same thing (Campbell & Fiske, 1959). Table 12 displays the correlation coefficients between constructs and modification indices for each item. Three construct stand out with moderately high correlations with other constructs. Content quality has correlation coefficients greater than 0.50 with system quality and user satisfaction. System quality has correlation coefficients greater than 0.60 on user satisfaction and continued use intention. User Satisfaction had moderately high correlations with all 5 constructs. This indicated that the scales might be measuring the same constructs rather than different

constructs. Discriminant validity on the item level is evaluated to determine the items that are causing problems with discriminant validity at the construct level.

Table 12
Construct and Item Level Discriminant Evaluation

	Content Quality	System Quality	Trust	Social Capital	User Satisfaction	Continued Use Intent
CQ	0.53					
SQ	0.58	0.54				
Trust	0.37	0.39	0.77			
SC	0.54	0.49	0.43	0.65		
US	0.58	0.71	0.52	0.62	0.75	
CUI	0.40	0.64	0.35	0.43	0.59	0.84
Item Level Evaluation (Modification Indices)						
CQ1	--	57.25	1.84	11.14	42.10	23.13
CQ2	--	4.80	0.45	1.61	0.05	0.46
CQ3	--	12.01	3.55	3.21	22.89	15.66
CQ4	--	0.21	6.57	1.19	0.56	0.11
SQ1	27.97	--	2.79	5.28	8.87	0.02
SQ2	0.04	--	2.26	0.05	0.34	15.14
SQ3	11.39	--	0.03	6.66	3.31	2.73
SQ4	0.56	--	1.04	2.05	0.99	6.61
TNT1	0.70	6.38	--	0.01	6.36	2.48
TNT2	1.67	1.89	--	5.21	5.64	0.00
TNT3	0.21	1.97	--	0.20	4.28	0.65
TNT4	0.01	1.26	--	0.42	0.84	2.31
TNT5	2.77	12.07	--	1.14	11.92	5.33
SC1	2.95	3.23	0.08	--	3.45	5.71
SC2	5.36	16.33	0.69	--	5.81	5.48
SC3	0.62	7.69	0.47	--	0.47	0.00
SAT1	0.79	5.98	2.44	3.95	--	6.63
SAT2	0.03	0.09	0.56	1.65	--	0.01
SAT2	0.52	4.60	0.80	0.72	--	6.03
CUI1	6.31	54.03	0.75	3.05	13.90	--
CUI2	8.61	23.58	0.15	3.29	8.49	--
CUI3	2.59	0.21	0.06	0.67	0.14	--

To evaluate discriminant validity at the item level, the modification indices are evaluated to look for items greater than 5 (Kelloway, 1998). The first problem to evaluate is item CQ1, displaying high modification indices on the constructs of system quality, social capital, user satisfaction and continued use intention. Item CQ3 also displays high modification indices on the constructs of system quality, user satisfaction and continued use intention. Item SQ1 displays high modification indices on content quality and marginal modification indices on social capital and user satisfaction. Item CUI1 and CUI2 have high modification indices on system quality with marginal modification indices on user satisfaction. There are many items that display high modification indices on the construct of system quality. It appears from the evaluation of discriminant validity, that the construct of content quality and system quality are most problematic and further evaluation of the items should be considered for respecification.

Model Respecification

Based on the factor loadings and SMCs from the previous two sections, there are three items that need to be further evaluated for model respecification. Item SQ1 has shown to be the most problematic of the three items in question. Item SQ1 did not sufficiently load on any factor during the EFA analysis and had a communality less than the required 0.50 minimal requirement. Item SQ1 also has a CFA factor loading of 0.49 with a SMC of 0.24. Item SQ1 also shows a lack of discriminant validity with modification indices of 27.97 and 8.87 on content quality and user satisfaction respectively. However, the decision to respecify the model by removing this item should not be based solely on statistical conclusions alone (Anderson & Gerbing, 1988). Theory

and content reflection should accompany statistical conclusions prior to removing or modifying the instrument. Item SQ1 measures reliability while the other three items of the system quality construct consist of convenient to access, easy to use, and flexibility. After further review, it was determined that reliability did not reflect the system quality construct and did not fit with the other three items. Statistical analysis also showed that the coefficient alpha increased from 0.810 to 0.850 with SQ1 dropped from the model. Table 13 displays the new factor loadings, coefficient alphas and SMCs for the respecified model after dropping item SQ1.

Item CQ1 displayed problems during EFA by failing to load on any factor at the minimal required component of 0.50. Items CQ1 and CQ4 also had issues with CFA factor loadings and low SMCs that caused concern, requiring further analysis. With CQ1 and CQ4 having factor loadings of 0.64 and 0.63 along with SMCs of 0.41 and 0.40 respectively, it was determined that further analysis was required to understand the problems with these items. The modification indices were evaluated next to assess discriminant validity of each item on the other constructs. Item CQ1 had high modification indices with 57.25 on system quality, 11.14 on social capital, 42.10 on user satisfaction and 23.65 on continued use intention meaning that this item loaded on these other constructs.

The problems with CQ1 and CQ4 are also predicted to have caused problems with the overall fit of the model. The Chi-square measure is used to determine if the model fits the data with the null hypothesis being that the data fits the model perfectly (Hair et al, 2005). In this situation, we want to accept the null hypothesis and conclude that there is a good fit between the data and the model. The chi-square statistic for the measurement

model has a p-value of 0.00, meaning we would reject the null hypothesis implying we do not have a good fit for our data. However, due to mathematical properties of chi-square being a function of sample size, it can sometimes be problematic as a stand-alone measure of GOF (Hair et al, 2005).

Table 13

Respecified Factor Loadings and Coefficient Alpha

Variable	Factor Loading	alpha	SMC
Content Quality		0.813	
CQ1	0.64		0.41
CQ2	0.80		0.64
CQ3	0.87		0.76
CQ4	0.63		0.40
System Quality		0.850	
SQ2	0.83		0.68
SQ3	0.86		0.74
SQ4	0.77		0.59
Trust		0.945	
TNT1	0.86		0.73
TNT2	0.86		0.75
TNT3	0.90		0.81
TNT4	0.91		0.83
TNT5	0.87		0.76
Social Capital		0.840	
SC1	0.81		0.66
SC2	0.86		0.73
SC3	0.73		0.53
User Satisfaction		0.913	
SAT1	0.90		0.80
SAT2	0.84		0.71
SAT3	0.91		0.83
Continued Use Intention		0.940	
CUI1	0.88		0.77
CUI2	1.00		1.00
CUI3	0.91		0.82
Goodness of Fit (GOF)			
$\chi^2 = 488.84$; $df = 174$; Chi sq/df ratio = 2.81			
GFI = 0.82; AGFI = 0.76; CFI = 0.91			
RMR = 0.078; RMSEA = 0.092			

The Goodness-of-Fit index (GFI) and Adjusted GFI (AGFI) are additional measures to assess GOF with a suggested value of 0.9 or higher (Bagozzi & Yi, 1988). Based on these statistics, the model in the current study has a problem with poor fit having an GFI and AGFI of 0.82 and 0.76 respectively. The chi-square to degrees of freedom ratio requires a value of less than 5 to show a good fit of the data (Kelloway, 1998). The model displays a chi-square/df ratio of 2.81 showing adequate fit of the data.

Another measure used to test GOF is the comparative fit index (CFI) that is less sensitive to model complexity and looks for values of 0.90 or higher (Bentler & Bonett, 1980). Based on the CFI measure, the model shows good fit having a CFI value of 0.91. Two other measures used to assess model fit are root mean squared residuals (RMR) used to inspect residual (Bagozzi & Yi, 1988) and root mean square error of approximation (RMSEA) used to represent how well a model fits the population (Hair et al, 2005). Each of these measures look for a value of 0.10 or less to represent a good fit. Based on these measures, the current model has reasonable fit with RMR and RMSEA values of 0.078 and 0.092 respectively. The respecified measurement model, as shown in figure 9, shows a poor fit by the Chi-square, GFI and AGFI measures while displaying good fit among the CFI, RMR and RMSEA measures. Items CQ1 and CQ4 have displayed several problems that are believed to be the reason for inadequate fit in the measurement model. Looking at these items in more depth revealed some of the problems as to why they want to load on other constructs.

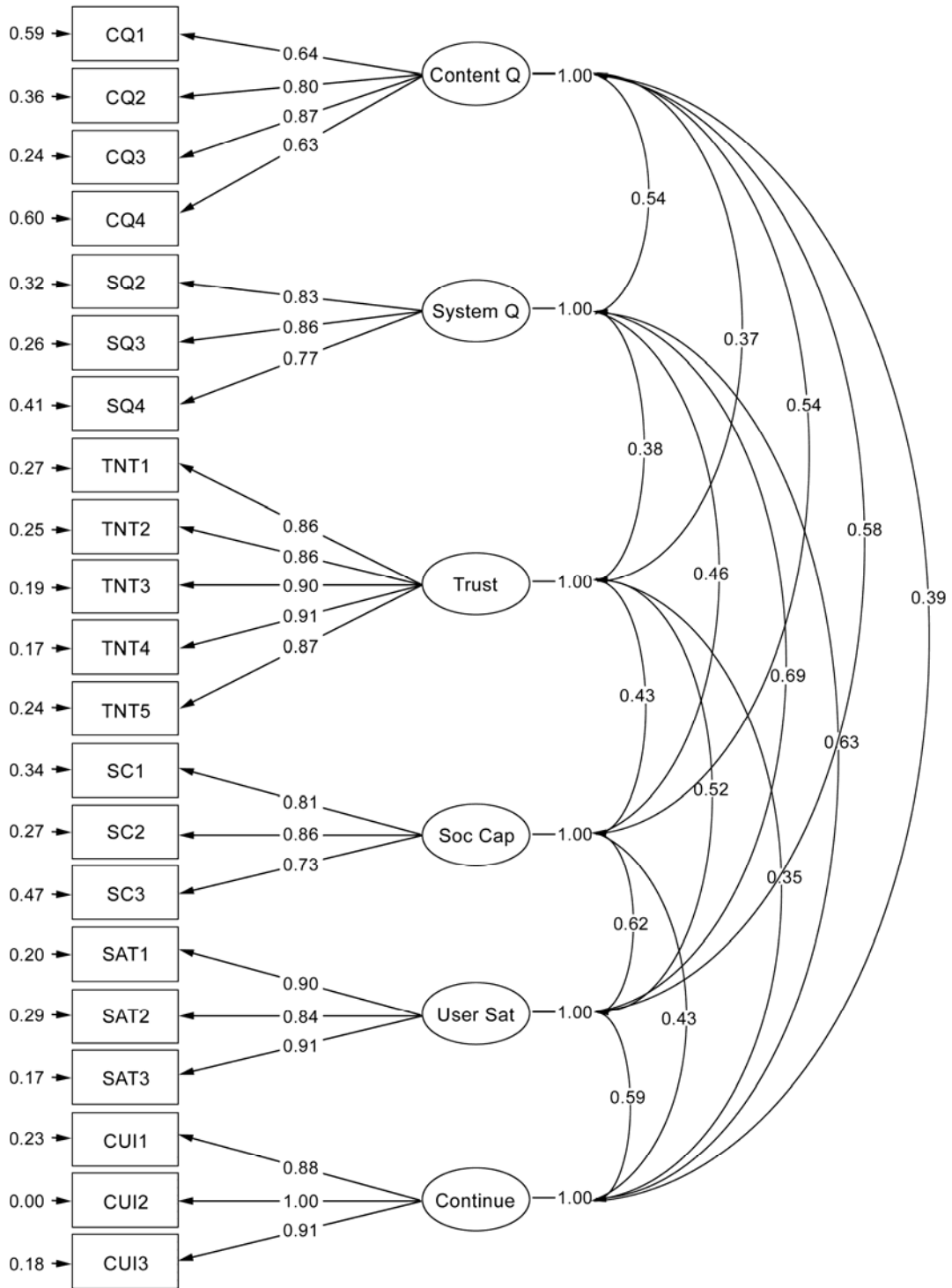


Figure 9
Updated Measurement Model

Item CQ1 is measuring *timely content* and appears to load on many other constructs. One synonym of the word timely is convenient, which is being measured by the system quality construct. This measure has qualities that are being reflected in other constructs, thus warranting its removal. Item CQ4 is not a strong measure of content quality and should be replaced by an item that more accurately reflects the construct. In review of the definition of content quality, items CQ1 and CQ4 were removed and two new items were added that are predicted to better reflect the construct. The new items added in the content quality construct include *factual content* and *thorough content*. It is predicted that these changes in the content quality should dramatically improve the overall fit of the measurement model and increase statistical validity. Validity, reliability, and goodness of fit will be measured again in the main study prior to testing the structural model.

Main Study

The main study was conducted to test the hypotheses using the refined instrument from the pilot study. The measurement instrument was evaluated and modified based on initial findings from the pilot study. The changes made were predicted to strengthen the results and ensure that the items measure the constructs that they are intended to measure. The measurement model was reassessed using data collected from the main study to ensure accurate and reliable results in the measurement model. The structural model was then evaluated to test the hypotheses from the current research.

Demographic Analysis

This section depicts the descriptive statistics for the main study data collection. The main study consisted of 479 members of the Mississippi State University network on the SNS called Facebook. Participants were solicited by visiting various classrooms in different departments across campus. Table 14 displays the demographic data for the sample population of the main study.

Table 14

Demographic Frequency and Percentages (n=479)

Variable	Frequency	Percentage
Age		
< 20	114	23.8%
20 – 24	331	69.1%
25 – 29	24	5.0%
30 – 34	4	0.84%
35 – 39	4	0.84%
40 – 44	0	0.0%
45-49	1	0.21%
50-54	1	0.21%
Gender		
Male	264	55.1%
Female	215	44.9%
Ethnicity		
White	364	76.0%
Hispanic	5	1.04%
African American	96	20.04%
Asian	9	1.88%
Other	5	1.04%
Education		
Some College	453	94.57%
College Graduate	24	5.01%
Masters	1	0.21%
Ph.D	1	0.21%

Consistent with the demographics of the pilot study, the largest demographic of the main study consisted of white Americans between the ages of 20 and 24 with some college experience. The main study consisted of 264 male students (55.1%) and 215 female students (44.9%). Usage statistics for the sample population are displayed in Table 15.

Table 15
Reported Usage Statistics (n=479)

Variable	Average
Avg. Days Per Week	5.22
Minutes Per Day	41.14
Months Using	35.27
Average Friends	250-299
Total Friends:	
<50	21
50-99	18
100-149	19
150-199	41
200-249	42
250-299	31
300-349	40
350-399	23
> 400	244

The average Facebook member uses the SNS approximately 5 days per week with an average 41 minutes per day. The average user has been a member of Facebook for approximately three years (35 months) with an average of 250-299 friends on their contact list. These estimates are consistent with the results obtained from the pilot study showing reliability in the sample population used for the main study.

Data screening

Data screening techniques were used to ensure reliable responses from sample population. Responses that are not accurately filled out could potentially corrupt the integrity of the data collected. Three methods of data screening were used to ensure the reliability of the responses. The first data screening method evaluated the completeness of the survey by the respondent. Any survey with incomplete responses would not be usable in the statistical analysis and was therefore discarded.

The second method for data screening consisted of a filtering question used to test if the users were paying attention and giving honest answers. This consisted of a single item towards the end of the survey asking the users to rate their honesty on a scale of 1 to 7. This item follows the same pattern of other items so respondents who do not read the question carefully and put a response lower than 6 are discarded from the sample populations. Responses to the honesty question of 6 or 7 are deemed to be adequate ensuring honesty in the question. However, the limitation for this question is users who respond 6 and 7 to every question. In this situation the honesty question does not help in discarding invalid survey responses.

The third method for data screening carefully reviewed the responses given by users to evaluate if they put answers that made sense. For instance, if a user responded by saying they use Facebook ten days per week then it was apparent that the user was not reading the question carefully. In this situation, it was assumed that the user possibly did not read other questions carefully resulting in an unusable survey.

Data screening techniques are useful to increase the reliability of survey responses resulting in stronger and more statistically valid results. The data screening techniques

used in the current research resulted in the deletion of 15 participant’s responses resulting in 479 usable surveys. While the statistical effects of these 15 survey responses are minor, it is worth the effort to ensure that only valid data are being used increasing the rigor of empirical research.

Reliability Analysis

Reliability analysis was conducted during the pilot study to ensure consistency of the items used to reflect the construct. After modifications to the instrument based on the pilot study, reliability analysis was conducted again to ensure the quality of the updated instrument. Table 16 contains the coefficient alpha, composite reliability, and AVE for each of the constructs in the study.

Table 16

Reliability and Variance Analysis

Construct	Cronbach’s Alpha	Composite Reliability	Average Variance Extracted (AVE)
Content Quality	0.855	0.8549	0.5975
System Quality	0.790	0.8049	0.5800
Trust	0.958	0.9580	0.8200
Social Capital	0.859	0.8616	0.6733
User Satisfaction	0.891	0.8927	0.7333
Continued Use Intention	0.939	0.9496	0.8633

Using the 0.70 minimal coefficient alpha (Hair et al, 2005) as a measure for reliability, it can be concluded that the items do indeed reflect the construct they are intended to measure. Item level evaluation was conducted by reviewing the SMCs with a minimal value of 0.50 showing adequate reliability. As shown in table 16, item SQ4 is

the only item falling below this minimal level with an SMC of 0.42. After further review of the coefficient alpha, dropping this item would increase cronbach's alpha from 0.79 to 0.796. Based on theory and statistical reasoning, it was decided that SQ4 remain in the model. Composite reliability and AVE also give similar results that are consistent with the pilot study. All constructs exceed the minimal requirements for composite reliability at the 0.70 level (Hair et al, 2005) having composite reliabilities greater than 0.80. All constructs display adequate convergence on the construct exceeding the minimal AVE of 0.50 (Hair et al, 2005). The results from the main study are consistent with the results in the pilot study, which also satisfies the test-retest reliability method.

Confirmatory Assessment

Confirmatory assessment was conducted during the pilot study to evaluate the measurement model and ensure validity of the items being used. Based on the pilot study the survey instrument was modified to obtain a better fit ensuring that the items used truly reflect the construct they are supposed to measure. Confirmatory assessment was assessed again during the main study using CFA to test the validity of the new measurement model. Factor loadings of the measurement model for the main study are displayed in Table 17 along with t-values and SMCs.

Table 17

Factor Loadings for Main Study Measurement Model

	Content Quality	System Quality	Trust	Social Capital	User Satisfaction	Continued Use Intent	t value	SMC
CQ1	0.70						16.53	0.49
CQ2	0.80						19.97	0.65
CQ3	0.80						19.85	0.64
CQ4	0.78						19.14	0.61
SQ2		0.81					19.11	0.65
SQ3		0.82					19.32	0.67
SQ4		0.65					14.63	0.42
TNT1			0.88				24.26	0.77
TNT2			0.89				24.70	0.79
TNT3			0.93				26.71	0.86
TNT4			0.93				26.88	0.87
TNT5			0.90				25.34	0.81
SC1				0.83			20.95	0.69
SC2				0.83			20.80	0.68
SC3				0.81			20.17	0.65
SAT1					0.87		22.93	0.75
SAT2					0.84		21.75	0.70
SAT3					0.87		22.96	0.75
CUI1						0.92	26.43	0.85
CUI2						1.00	31.80	1.00
CUI3						0.86	23.56	0.74

*All t-values significant at the p=0.01 level.

Convergent validity is used to determine the extent to which the items converge on a construct. Research suggests that items should exhibit a factor loading of 0.70 (Garver & Mentzer, 1999). There is a single item containing a factor loading less than the recommended 0.70 or higher. Item SQ4 has a factor loading of 0.65 falling just below the minimal requirement for convergent validity. Further analysis would be required before making any determinations about the removal of this item. All other items show adequate to strong convergent validity on the constructs they are proposed to reflect.

Table 18

Construct and Item Level Discriminant Evaluation

	Content Quality	System Quality	Trust	Social Capital	User Satisfaction	Continued Use Intent
CQ	0.60					
SQ	0.31	0.58				
Trust	0.36	0.34	0.82			
SC	0.28	0.33	0.34	0.67		
US	0.39	0.56	0.46	0.57	0.73	
CUI	0.22	0.32	0.20	0.28	0.40	0.86
Item Level Evaluation (Modification Indices)						
CQ1	--	0.00	0.09	2.30	0.03	0.26
CQ2	--	0.13	0.43	0.36	0.81	0.17
CQ3	--	0.27	0.00	5.29	6.26	0.10
CQ4	--	0.03	0.79	0.25	3.27	1.41
SQ2	0.24	--	1.13	1.77	1.21	0.58
SQ3	2.30	--	1.41	0.81	5.38	0.23
SQ4	1.83	--	0.03	0.31	2.18	0.14
TNT1	0.18	0.74	--	0.02	0.57	1.27
TNT2	4.78	1.11	--	0.08	0.47	0.40
TNT3	2.32	0.00	--	1.13	1.91	0.01
TNT4	1.79	1.72	--	0.00	0.40	0.03
TNT5	2.64	0.11	--	1.68	0.98	0.01
SC1	0.12	0.76	1.07	--	0.03	0.23
SC2	1.53	0.65	2.38	--	2.51	0.55
SC3	0.85	3.03	7.14	--	2.11	0.07
SAT1	3.88	0.45	6.35	1.07	--	9.23
SAT2	0.44	0.39	2.21	1.04	--	9.15
SAT3	1.80	0.01	15.32	3.98	--	0.04
CUI1	0.40	0.78	0.15	2.07	2.36	--
CUI2	1.20	4.48	0.22	10.77	6.60	--
CUI3	9.43	7.40	0.10	17.18	6.58	--

Discriminant validity was also tested for the main study at the construct level and the item level. The correlations coefficients between constructs and the modification indices used to measure item level discriminant validity are displayed in table 18. User satisfaction displays moderately high correlation coefficients with system quality and social capital having coefficients of 0.56 and 0.57 respectively. However, to display

adequate discriminant validity between the constructs, the average variance extracted of each construct must be greater than the squared correlation between the two constructs (Hair et al, 2005). The AVE for all the constructs exceeds the squared correlations between any two constructs. Based on these results, it can be concluded that there is adequate discriminant validity between the constructs. Discriminant validity at the item level was also assessed by evaluating the modification indices. Items SAT3, CUI2, and CUI3 displayed marginally high modification indices indicating slight correlation on other constructs. Overall, adequate discriminant validity was displayed at both the construct level and the item level of analysis.

Model Evaluation

Model evaluation is used to test the overall fit of the data to the model to show significance. LISREL provides a series of goodness of fit (GOF) measures used to evaluate the fit of the model. The hypothesis tested here evaluates the fit of the data to the model. Table 19 lists the GOF measures used to test the overall fit of the model.

Table 19

Goodness of Fit Measures

Index	Proposed Model
Chi-square (χ^2)	315.95 (p=0.00)
Degrees of Freedom (df)	178
Chi-square/df ratio	1.775
Room Mean Square Error of Approximation (RMSEA)	0.039
Root Mean Square Residual (RMR)	0.040
Goodness of Fit Index (GFI)	0.94
Adjusted Goodness of Fit Index (AGFI)	0.93
Normed Fix Index (NFI)	0.96
Comparative Fit Index (CFI)	0.98

The first measure used to test the overall fit of the model was the chi-square test for goodness of fit with the null hypothesis being that the data fits the model perfectly (Hair et al, 2005). The chi-square has a p-value of 0.00 showing that the model does not fit the data, however, the ratio of chi-square to the degrees of freedom was acceptable at 1.775 falling below the required level of 5 (Kelloway, 1998). Chi-square is a function of sample size and can therefore be problematic as a measure of GOF when sample sizes are large (Hair et al, 2005).

The next set of measures used in this study to test the GOF was the RMSEA and RMR. Hair et al (2005) recommends RMSEA and RMR values of 0.10 or less while other authors argue that values of less than 0.05 show a good fit of the data to the model (Byrne, 1998). The current research shows values of 0.039 and 0.040 for the RMSEA and RMR GOF measures respectively indicating that the data fits the model. GFI and AGFI are two other measures used to assess GOF requiring values of 0.90 or higher (Bagozzi & Yi, 1988). The current model shows values for these indices at 0.93 and 0.94 respectively indicating sufficient fit of the data to the mode. Two other GOF measures that are related to each other are the NFI and CFI providing a measure of complete covariation in the data requiring values of 0.90 to show adequate fit (Bentler & Bonett, 1980; Byrne, 1998). The values for NFI and CFI are 0.96 and 0.98 respectively exceeding the 0.90 requirement indicating a good fit of the data to the model. Based on the results of the GOF statistics, it is concluded that the model shows good fit.

Model Estimation

The measurement model has shown statistical significance concluding that the items indeed reflect the construct they intend to measure. Attention is now focused on the structural model to evaluate the structural paths showing the relationship between the constructs being researched. First, the SMCs for the structural equations were evaluated. Social capital has an SMC of 0.18, showing that 18% of the variance is explained by its antecedents. Approximately 17% of the variance in the dependent variable of continued use intention is explained by user satisfaction, with 53% of the variance in user satisfaction being explained by its antecedents. The model estimation also evaluated the gamma paths and beta paths to show if the estimated relationships show statistical significance. Table 20 displays the path estimates and t-values for the proposed relationships along with the SMCs for the structural equations.

Table 20
Structural Path Estimates and t-values

Construct	Social Capital		User Satisfaction		Continued Use Intent.	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
Content Q	0.16	2.39	0.14	2.57	--	--
System Q	0.22	3.73	0.37	7.14	--	--
Trust	0.21	4.08	0.17	4.02	--	--
Social Cap	--	--	0.38	7.76	0.08	1.24
User Sat	--	--	--	--	0.39	6.42
Cont Use	--	--	--	--	--	--
SMC	0.18		0.53		0.17	

First, the current research evaluated the paths between the independent variables of content quality, system quality, and trust with the constructs they are proposed to

influence as displayed in Figure 10. Content quality has path estimates of 0.16 and 0.14 on the constructs of social capital and user satisfaction respectively. These paths are significant at the 0.01 level of significance based on t-values obtained from the output. System quality has path estimates of 0.22 and 0.37 on social capital and user satisfaction respectively significant at the 0.005 level of significance. Trust has path estimates of 0.21 and 0.17 on social capital and user satisfaction at the 0.005 level of significance. These relationships have been shown throughout the literature and remain consistent within the current study.

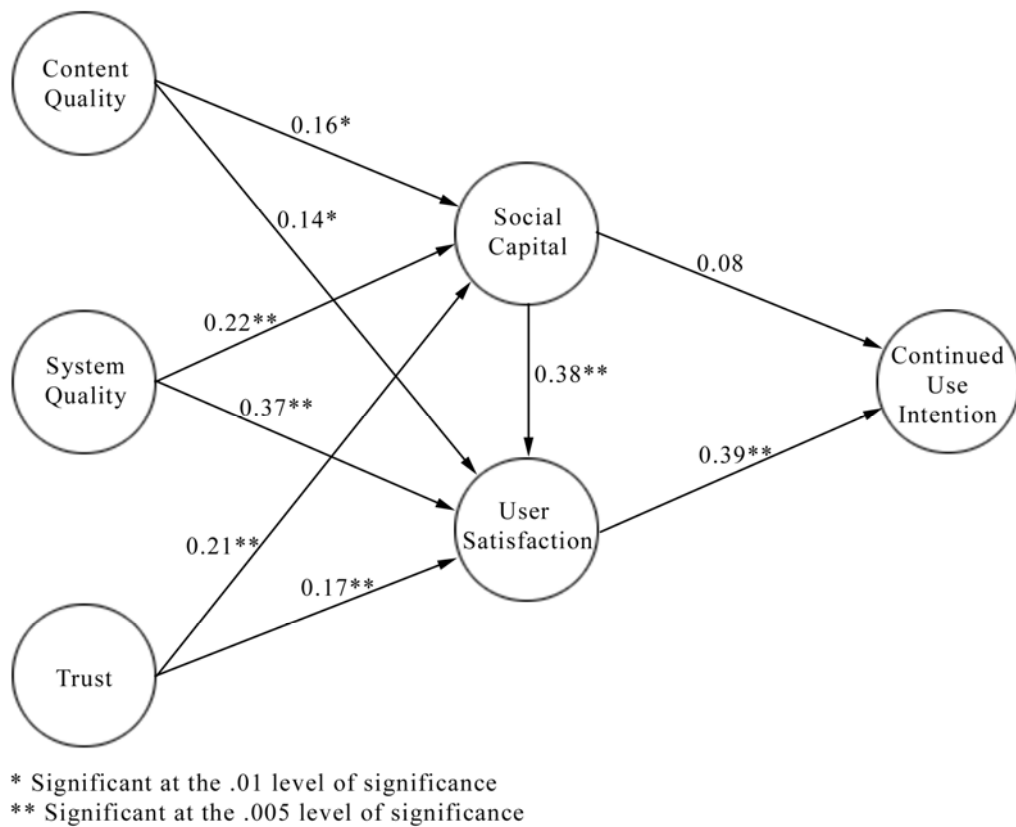


Figure 10

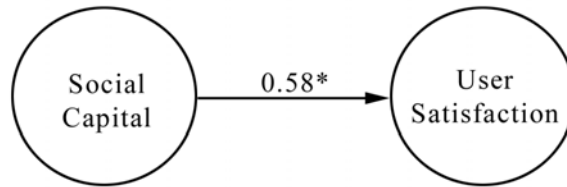
Structural Model with Path Estimates

The next set of relationships examined was the relationships between social capital, user satisfaction, and the dependent variable of continued use intention. The path of social capital to user satisfaction has a parameter estimate of 0.38 showing significance at the 0.005 level of significance. The relationship between user satisfaction and continued use intention has a parameter estimate of 0.39 at the 0.005 level of significance. However, the path between social capital and continued use intention does not show a significant relationship with a parameter estimate of 0.08. Based on the findings, there is a possible mediating effect of user satisfaction on the relationship between social capital and continued use intention. Further analysis should be conducted to determine the mediating effects of this relationship.

Three conditions must be met in order to establish mediation between an independent and dependent variable (Baron & Kenny, 1986). First, the independent variable must significantly affect the mediating variable in the original equation. Second, the independent variable must affect the dependent variable in the absence of the mediating variable. The third condition used to establish mediation involves the result of the independent variable on the dependent variable after the mediating variable is included in the model. If the effect of the independent variable decreases due to the inclusion of the mediating variable, then it can be concluded that there is mediation. If the independent is shown to have no affect on the dependent variable after inclusion of the mediating variable then there is perfect mediation between the independent variable and the dependent variable (Baron & Kenny, 1986).

To test for mediation, the relationship between be independent variable of social capital and the mediator was evaluated. All other constructs were removed so that this

relationship could be tested in isolation. Figure 11 displayed the results SEM results of the relationship between social capital and user satisfaction.

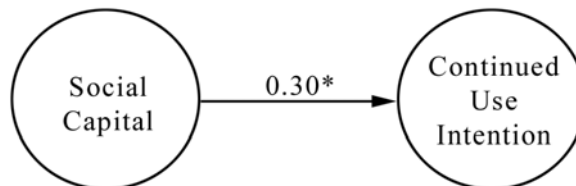


* Significant at the .005 level of significance

Figure 11

Social Capital in Relation to User Satisfaction

As shown in figure 11, there is a positive relationship between social capital and user satisfaction at the 0.005 level of significance. Next, the relationship between social capital and continued use intention was tested. The results of the relationship between these two constructs is displayed in figure 12.

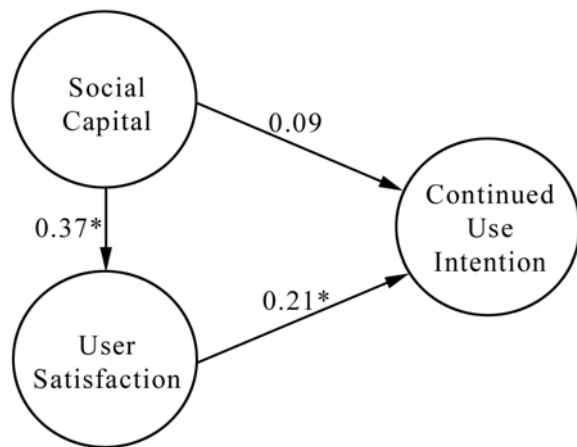


* Significant at the .005 level of significance

Figure 12

Social Capital in Relation to Continued Use Intention

The SEM results of the structural model including only social capital and continued use intention show that there is a significant relationship between these two constructs. Social capital is shown to positively influence continued use intention at the 0.005 level of significance. In order to show that there is a mediating affect, the relationship between these two constructs must decrease after the inclusion of the mediator. Figure 13 displayed the SEM results between social capital and continued use intention when the proposed mediating variable of user satisfaction is included.



* Significant at the .005 level of significance

Figure 13

Mediating Results of Social Capital to Continued Use Intention

After the inclusion of user satisfaction, the relationship between social capital and continued use intention is shown to be insignificant. Based on these results, it is concluded that there is perfect mediation between social capital and continued use intention through user satisfaction.

Discussion

Research has shown that SNSs often fail due to their inability to generate enough social capital for their members to sustain continued use (Ludford et al, 2004). The current study researched factors leading to a successful SNS by incorporating social capital theory (Bourdieu, 1985; Coleman, 1988; Putnam, 1993) and the theory of IS success (DeLone & McLean, 1992). The culmination of these two theories has led to a new model, the SNS success model, which has demonstrated significant statistical evidence in explaining continued use intention.

The anticipated results previously displayed in past research depicting the relationship between content quality, system quality and user satisfaction were as expected. These relationships have been established and confirmed in previous studies (Petter et al, 2008; Rai et al, 2002; Seddon, 1997; Want, 2008) and remain consistent in the current research showing that content quality and system quality positively influence user satisfaction. A SNS where users provide accurate and complete information will positively influence the user's satisfaction with the SNS. In the same regards, if the SNS system interface is easy to use and provides quality features, the users will exhibit a higher sense of satisfaction with the SNS.

The relationships between content quality, system quality, and trust to social capital displayed consistent results with research conducted on social capital theory (Hazleton & Kennan, 2000). Content quality is related to the content dimension of social capital and is concerned with the information that is shared within the community (Hazleton & Keenan, 2000). This depends upon users sharing accurate and complete information in order to build social capital. System quality is related to the structural

dimension within social capital theory and is concerned with access to other members within the network (Widén-Wulff & Ginman, 2004). A system that is reliable and easy to use will allow convenient access to other members resulting in an increased level of social capital. Trust is associated with the relational dimension of social capital that is concerned with the expectations and obligations of members within the community (Hazleton & Keenan, 2000; Widén-Wulff & Ginman, 2004). When users feel they can trust other members within the community, they will experience higher levels of social capital. These findings confirm previous research that has been conducted prior to combining the two research streams in the context of SNSs.

The effects of content quality and system quality have a significant impact on the users' perception of social capital and user satisfaction. Also, these are components of the SNS success model that administrators of the SNS can control. The SNS can influence a user's perceived social capital and their level of satisfaction by paying close attention to these factors. System quality is directly controlled by the administrators and developers of the SNS. Content quality can be influenced but not directly controlled. While the accuracy of information may not be completely controllable, validation procedures can be put in place to ensure the completeness of information. By requiring a minimal level of information to be entered in order to sign up for the SNS, timely and complete information can be satisfied. Also, having SNS rules and regulations in place that will enable administrators to remove false information can increase the accuracy of the information on the SNS. By putting in place measures that ensure accurate, timely and complete information by members of the online community, users will have an increase in their perception of the quality of the content that other members provide.

The administrators of the SNS can also control the quality of the system that they provide by taking measures to increase the systems usability and making sure that the SNS is easily accessible. Having a domain name that is easy to remember and locate helps the users find the website and access it easily. For instance, Facebook and MySpace have website names that make accessing the website very convenient and easy for users. Many other communities with complicated names make access more difficult decreasing the user's ability to return and participate in the SNS. Also, having a flexible system that is fast and easy to use also increases the user's ability to access different parts of the SNS resulting in an increase in their perception of social capital and user satisfaction.

The first new contribution in the current research is the inclusion of trust within the IS success model and its relationship with user satisfaction. In the context of SNS, trust has shown to be a significant factor in explaining social capital and user satisfaction. While this contribution proves to be significant, it comes without surprise due to previous research conducted showing the importance of trust in SNSs (Ridings et al, 2006; Ziegler & Golbeck, 2007). However, its inclusion in the SNS success model is a key component in explaining social capital and user satisfaction. Based on the results from this study, trust has been shown to positively influence social capital and user satisfaction. Members of an SNS who feel that other members they connect with are trustworthy will perceive higher levels of social capital and also will be more satisfied with the SNS.

The SNS can also take measures to increase trust among members of the SNS. One method could involve better validation measures to ensure that people are who they say they are when they join the SNS. In the early years of Facebook, they limited access

to university students and required a valid university email address in order to sign up. This validated that members belonged to the university increasing the likelihood that they are who they say they are. It also increased the trust in other members when people interact. This is one of the reasons that Facebook was able to immediately compete against the SNS called MySpace that was the dominant player at the time. Both Facebook and MySpace had similar features, high quality systems, similar requirements for content quality, but the one thing that gave Facebook the edge at the time was validation procedures that increased the level of trust. Based on the model from the current study, this would have led to a higher level of social capital and user satisfaction, ultimately affecting the user's intention to continue using the SNS. Another method for increasing the level of trust is by having online moderators that can be contacted when fake profiles are identified or inappropriate behavior occurs. People who act inappropriately or create fake accounts should have their profile removed ensuring high integrity among the members of the SNS. These are some of the measures that could be taken to increase members' trust in the SNS leading to an increase in the perception of social capital and user satisfaction.

The most important contribution made by the current research is the inclusion of social capital in the IS success model used to explain continued use intention in the context of SNSs. The net benefit in the SNS success model is captured as continued use intention. It has been shown that social capital leads to information exchange and continued use (Ludford et al, 2004; Tsai & Ghoshal, 1998). User satisfaction has been cited continuously as a direct influence of continued use intention (Bhattacharjee, 2001; Bhattacharjee et al, 2008; Chen, 2007; Cheung & Lee, 2009). It was therefore postulated

that social capital and user satisfaction both would positively influence continued use intention. In conjunction with IS success literature, it was also predicted that perceived value influenced user satisfaction (Wang, 2008). In the context of SNSs, perceived value is being measured as social capital and was therefore predicted to positively influence user satisfaction.

The relationship between user satisfaction and continued use intention is consistent with previous research (Bhattacharjee, 2001; Bhattacharjee et al, 2008; Chen, 2007; Cheung & Lee, 2009). Users with a high level of satisfaction with the SNS are more likely to continue using the SNS. The relationship between social capital and user satisfaction also proved to be significant. Users who had higher levels of social capital were more satisfied with the SNS than users with low levels of social capital. However, the relationship between social capital and continued use intention was not supported. It was then determined that the relationship between social capital and continued use intention was fully mediated by user satisfaction.

The implication of this is that user satisfaction is the main construct that influences continued use intention. This is something that many SNS administrators are most likely aware of. However, what this research provides are the antecedents that lead to user satisfaction that cause a user to continue using the SNS. Social capital was shown to have the strongest influence over user satisfaction followed by system quality. The SNS can control system quality directly but must take measures in order to indirectly influence social capital through the use of content quality, system quality, and trust. System quality also has the strongest influence on social capital out of the three independent variables. Therefore, it is concluded that a SNS should set their primary

focus on increase the quality of the system in order to directly influence the users' satisfaction and indirectly influence satisfaction through social capital. Additional measures should then be taken to increase content quality and trust to the best of their ability. Content quality and trust are more difficult to control but as demonstrated earlier, there are measures that can be taken to maximize the users' perception and increase the results.

Summary

CFA and SEM were used to test the measurement model and structural model of the pilot study and main study. The pilot study conducted the initial test for validity and reliability on the measurement model. Based on the conclusions of the pilot study, the instrument was modified and then used to conduct the main study. The measurement model was revalidated during the main study to test for reliability of the measures and consistency between the two studies. The structural model was then evaluated to test the hypotheses postulated in the current research. Table 21 shows the results of the hypotheses indicating the relational paths that are shown to be significant. With the exception of hypotheses 4b (H_{4b}), all proposed hypotheses are supported. Goodness of fit measures provides sufficient evidence that the model fits the data.

Table 21

Hypotheses and Results

Hypothesis		Supported?
H _{1a}	Content quality will positively affect social capital in the context of SNS.	Supported
H _{1b}	Content quality will positively affect user satisfaction in the context of SNS.	Supported
H _{2a}	System quality will positively affect user satisfaction in the context of SNS.	Supported
H _{2b}	System quality will positively affect social capital in the context of SNS.	Supported
H _{3a}	Trust will positively affect social capital in the context of SNS.	Supported
H _{3b}	Trust will positively affect user satisfaction in the context of SNS.	Supported
H _{4a}	Social capital will positively affect user satisfaction in the context of SNS.	Supported
H _{4b}	Social capital will positively affect continued use intention in the context of SNS.	Not Supported
H ₅	User satisfaction will positively affect continued use intention in the context of SNS.	Supported

CHAPTER V

CONCLUSION, IMPLICATIONS, AND LIMITATIONS

Since commercialization, the Internet has gone through many transformations paving the way for the success of social software such as SNSs. The current research established a theoretically grounded model depicted factors leading to the success of a SNS. The model was then tested to give statistical support for the hypotheses proposed. This chapter gives an overview and conclusion of the research that was conducted along with implications of the results. Then, limitations of the study and future research will be discussed.

Conclusion

As the Internet continues to evolve, the way in which people interact and use the Internet continues to evolve as well. From the origins of research into commercialization and commerce, the Internet has once again evolved into what is now regarded as Web 2.0 (O'Reilly, 2005) with the inclusion of SNSs. While the number of SNSs continues to increase, very few are successful and most do not survive (Ma & Agarwal, 2007). With numerous SNSs unable to survive, it is important to research the factors that have led to a few rising to the top and being successful.

Drawing on the traditional theories of IS success and social capital theory, this study explores the factors that lead to a successful IS system in the context of SNSs. The origins of IS success stem from the evaluation of IT systems from an organizational point of view (DeLone & McLean, 1992) and has since evolved through various respecifications and adapted to many different contexts. The current research applies the IS success model in the emerging area of research known as SNSs. The IS success model is combined with social capital theory to create a model outlining factors that lead to a successful SNS. Social capital theory is a well established theory that describes the emotional benefits that participating parties gain through information exchange within a community (Adler, 2001; Field, 2003; Williams, 2006). This emotional benefit is used to describe the SNS user's motivation for participating in the SNS. Based on the amalgamation of these two theories, the SNS success model was developed to explain factors leading to continued use of SNSs.

The SNS success model was tested first using a pilot study to refine the instrument. Based on a sample of 220 students in the College of Business at Mississippi State University, the instrument was refined to increase its explanatory power. The modified survey instrument was then administered to a sample of 479 members of the Mississippi State University network on the Facebook SNS. The results were used to test and evaluate the hypotheses proposed by the current research. While it can be shown that social capital alone influences the user's intention to continue using the SNS, the model used in the current research suggests that this relationship is fully mediated by user satisfaction. This suggests that social capital causes users to participate in social networking via SNS but the particular SNS that they choose to use is dependent upon

satisfaction with the SNS itself. Content quality, system quality, and trust are factors that are shown to increase participant's social capital and user satisfaction.

Implications

The current research has several implications for both practitioners and academicians. It is well recognized that users who are not satisfied with the information system will discontinue usage (Bhattacharjee, 2001; Bhattacharjee et al, 2008). When the number of SNS alternatives is abundant, user satisfaction can serve a greater role in understanding continued usage as a mediator and moderator for other factors. SNS administrators are likely to understand the need for users to be satisfied in order to encourage continued use. However, significant factors that affect user satisfaction have yet to be established in the context of SNSs. The current research presents the SNS success model to help practitioners understand factors that lead to a successful information system in the context of SNSs.

This research has demonstrated that user satisfaction is the primary component that affects continued use intention. The goal for practitioners should be focused on understanding the factors that influence user satisfaction in order to positively affect continued use intention. Content quality and system quality are two factors that have been previously shown to positively affect user satisfaction. SNS administrators are unable to control a user's feeling of satisfaction. However, they can affect other factors such as content quality and system quality in order to increase the users perception of satisfaction with the SNS.

Content quality is concerned with timely, accurate, and complete content when users are filling out information on their profile. While ensuring the accuracy of information might be difficult and out of the control of the SNS administrator, policies can be put in place that ensure the completeness of the information provided. When a user signs up for a SNS, the SNS could require a minimal amount of information to be provided in order to create the profile. This would keep users from creating a profile with no content on it ensuring timely and complete information, thus increasing the members' perception of content quality. System quality is concerned with the usability and accessibility of the SNS itself. This factor is under direct control of the SNS administrators. There are many programming tactics and functionality concerns that the SNS can take in consideration to improve the accessibility and usability of the SNS. Ease of navigation is one method, allowing the user to easily navigate through the SNS. Giving the user the ability to easily find other members and connect with their friends is another system feature that can be enhanced to improve the user's perception of system quality. Ensuring that the SNS is active 24 hours a day 7 days a week improves the accessibility of the SNS. Also, having a domain name that is easy to remember, allowing the user to return without having problems locating the SNS on the Internet will also increase their perception of system quality.

Another factor that has been shown to significantly affect user satisfaction is trust. Trust is concerned with the honesty and integrity of members within a SNS. One major problem that threatens the integrity of the SNS is the ability to create multiple profiles and fake accounts. When the SNS Facebook was first established, they required users to have a valid university email account in order to join. This was their method of ensuring

the integrity of its members. Another example of increasing trust in SNS comes from the popular SNS called Cyworld in South Korea. Users must register with a government agency by giving their social security number and other personally identifiable information prior to being allowed to sign up. Once the user is verified, they are given a user ID to create their account ensuring that they are who they say they are. While this might be extreme by American standards, there are other less costly ways that SNS could validate users and ensure integrity on the SNS. The use of moderators could also help ensure honesty and integrity within the SNS. If users act inappropriately or fake profiles are reported, the moderators could investigate the user and remove the profile. This would ensure proper behavior and limit the number of fake profiles on the site increasing trust within the SNS.

Social capital is another factor that has been shown to influence user satisfaction. While the SNS administrator cannot directly influence a users perception of social capital, the same factors that are used to increase user satisfaction will also increase the users' perception of social capital. By taking actions to increase the users perception of content quality, system quality, and trust, the SNS administrators will be able to influence the users perception of social capital and user satisfaction, ultimately increase their continued use intention.

There are also implications that can play a role in academic research in the area of SNS success. This study establishes a model for success in the new and emerging area of SNS research. By understanding the underlying factors leading to continued use intention and the success of SNSs, researchers can move forward in showing the effects that result from this new trend in technology and communication. This research also

reveals a critical component in the relationship between social capital and use that had yet to be established in prior research. It had been shown that social capital leads to information exchange and continued use (Ludford et al, 2004; Tsai & Ghoshal, 1998). However, this research uncovers the mediating affects of user satisfaction on this relationship. This gives researchers a better understanding of the relationship between social capital and use that can be applied to other contexts beyond SNSs.

Limitations And Future Research

There are several limitations to the current study that can be address in future research. First, the investigation of IS success factors in the context of SNS is relatively new. Researchers should be cautious when generalizing the current findings to other SNSs and various user groups. While the current researched used Facebook to test the SNS success model, future research should test and validate the current findings using other SNSs such as MySpace, Friendster, Twitter, and so on.

Second, while university students are a good representation of SNS users, particularly Facebook users, the sample represents a homogeneous group of students from a single university within the southeastern region of the U.S. Further testing and validation using a broader sample of SNS users across a heterogeneous pool of participants would increase the generalizability of the study.

Third, the possible effects of social influence on continued use intention was not captured in the current study. Social factors can play a strong role in the building of social capital and should be looked at more in depth in future research. In addition to social factors, cross-cultural research regarding SNSs should be explored. The use,

influence, and behaviors of SNSs could vary depending on cultural differences among the users. For instance, requirements to sign up for a SNS vary from country to country. In South Korea users are required to give provide their social security number (SSN) and other identifiable information just to create a profile. This shows differences in the values of trust and what is important to that culture. In the United States, users are likely to not use a SNS that asks for their SSN. It is likely that trust in the members outweighs trust in the SNS, or it could be that stronger security measures are in place for SNS in South Korea that are not in place in the United States. Future research could uncover this type of phenomenon and other cultural differences.

Fourth, trust is a multi-dimensional construct that could be viewed at many different levels. With trust being measured based on members that have made a connection, there are several aspects of trust that are left to be explored. Future research could view trust in the entire SNS and not just the community within the SNS that each person is a member of. Trust in the SNS itself could also play a critical role in the success of SNSs. There are also other dimensions of trust that could be explored in future research as well.

Fifth, the view that continued use intention is the only net benefit of SNSs is another limitation. Future research should look at other net benefits concerning attitudinal properties such as affective commitment. It is possible that users continue using the system because they have been members so long and it has become routine. Affective commitment could look at other aspects of the net benefit to understand users' behaviors. Other factors such as positive word of mouth could be explored to understand how users talk about the system, which leads to other members potentially joining the

community. This paves the way for social factors, gender differences, and cultural differences within SNS usage. Research into the actual use of SNS should also be conducted to gather a stronger understanding of how users interact with each other and how social capital is formed.

Sixth, the use of self-reported scales administered to the users who report on all independent and dependent variables could lend itself to common method bias. Objective and subjective measures could be used in future research to evaluate the correlation between them.

Seventh, the current research was conducted at a single moment in time. It is possible that current users who have intended to continue using the SNS will discontinue prior to their reported intention. Future research should conduct a longitudinal to evaluate the success of a SNS over time increasing our understanding of the SNS success model constructs and their relationships.

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APPENDIX A
SURVEY INSTRUMENT

APPENDIX A: SURVEY INSTRUMENT

Q-1: Continued use intention is concerned with frequent future use of the Social Networking Site (SNS) by the members of the community. Think about continued use intention when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
I will continue to use the SNS							
1. for the next 3 months	1	2	3	4	5	6	7
2. for the next 6 months	1	2	3	4	5	6	7
3. for the next 12 months	1	2	3	4	5	6	7

Q-2: Content quality is concerned with the accuracy, timeliness, and completeness of information provided to the SNS by the users within the community. Think about content quality when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
The Facebook community provides:							
4. Timely content	1	2	3	4	5	6	7
5. Accurate content	1	2	3	4	5	6	7
6. Complete content	1	2	3	4	5	6	7
7. Useful content	1	2	3	4	5	6	7

Q-3: System quality is concerned with the consistency of the system interface, availability, ease of use, quality of features provided. Think about system quality when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
The SNS (Facebook) system is:							
8. Reliable	1	2	3	4	5	6	7
9. Convenient to access	1	2	3	4	5	6	7
10. Easy to use	1	2	3	4	5	6	7
11. Flexible	1	2	3	4	5	6	7

Q-4: Trust is concerned with degree to which the trusting party feels that members of the online community have high integrity, are honest, and reliable. Think about trust when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
The online community in general:							
12. has people I can rely on	1	2	3	4	5	6	7
13. has high integrity	1	2	3	4	5	6	7
14. can be trusted	1	2	3	4	5	6	7
15. has people I have great confidence in	1	2	3	4	5	6	7
16. can be counted on to do what is right	1	2	3	4	5	6	7

	Strongly Disagree		Neutral			Strongly Agree	
The people on my friends list:							
17. are those who I can rely on	1	2	3	4	5	6	7
18. have high integrity	1	2	3	4	5	6	7
19. can be trusted	1	2	3	4	5	6	7
20. are those who I have great confidence in	1	2	3	4	5	6	7
21. can be counted on to do what is right	1	2	3	4	5	6	7

Q-5: Social capital is concerned with the intangible emotional benefits gained through relationships within the online community. Think about social capital when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
Within the online community:							
22. there is someone I can turn to for advice about making very important decisions	1	2	3	4	5	6	7
23. there are several people I can talk to when I feel lonely	1	2	3	4	5	6	7
24. there are several people that I feel comfortable discussing intimate personal problems with	1	2	3	4	5	6	7

Q-6: User satisfaction is concerned with one's overall feelings of the virtual community and interaction with other members. Think about user satisfaction when answering the following questions:

	Strongly Disagree		Neutral			Strongly Agree	
25. I am pleased with my interactions within the virtual community	1	2	3	4	5	6	7
26. The virtual community has met my expectations	1	2	3	4	5	6	7
27. Overall, I am satisfied with the online Community	1	2	3	4	5	6	7

Q-7: The following questions are used to gather demographic data to better understand the respondents participating in this survey. Please answer these as accurately as possible.

Age: < 20 _____
20-24 _____
25-29 _____
30-34 _____
35-39 _____
40-44 _____
45-49 _____
50-54 _____
> 54 _____

Gender: Male _____
Female _____

Ethnicity: White _____
Hispanic _____
African-American _____
Asian _____
Other _____

Education: High School _____
Some College _____
College Graduate _____
Masters _____
Ph.D. _____
Other _____

How many days per week do you currently use Facebook: _____

How many minutes per day do you currently use Facebook: _____

How long (months) have you been a member of Facebook: _____

Approximately many total Facebook friends do you have:

Less than 50 _____

50-99 _____

100-149 _____

150-199 _____

200-249 _____

250-299 _____

300-349 _____

350-399 _____

400 or more _____

APPENDIX B
STRUCTURAL EQUATION MODEL

APPENDIX B: STRUCTURAL EQUATION MODEL

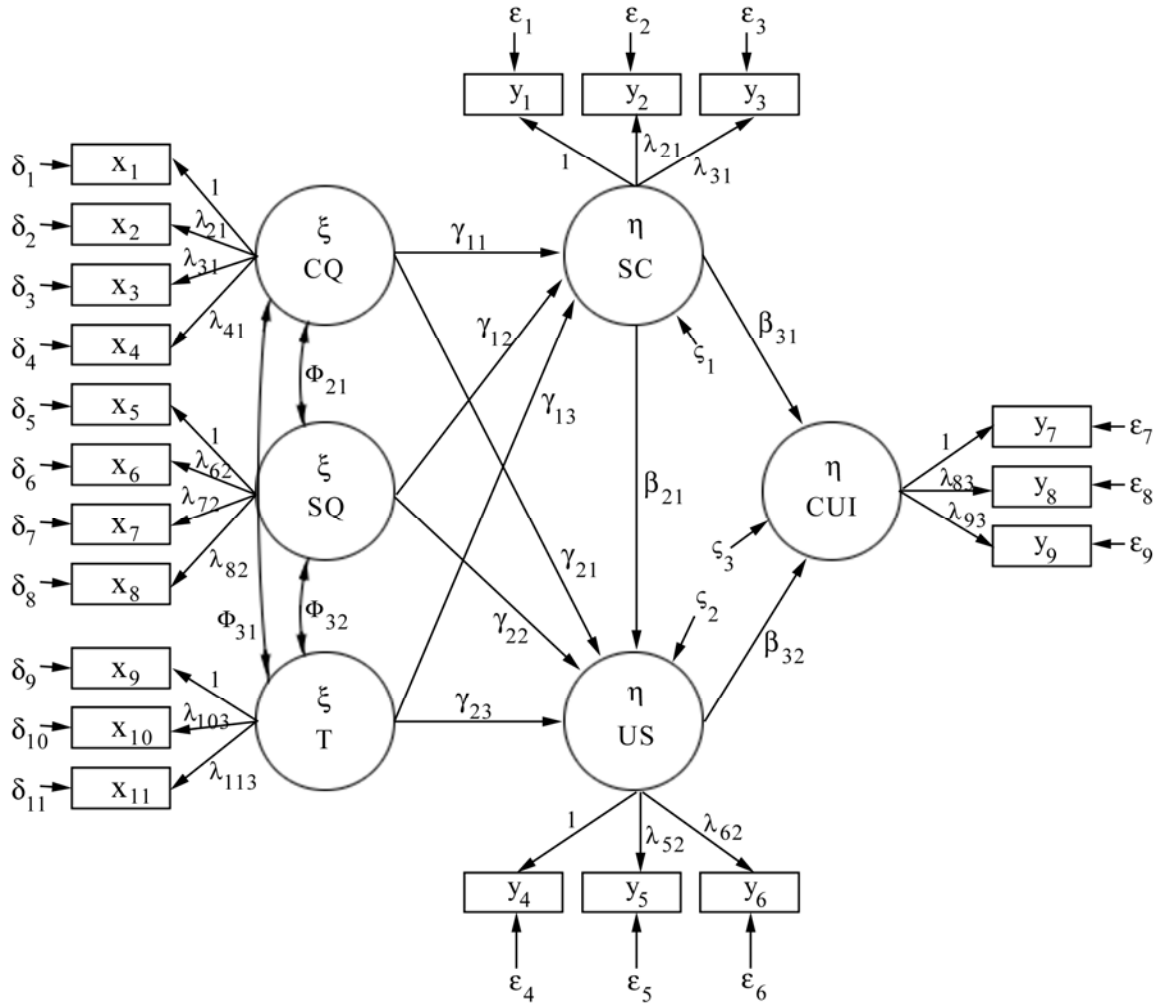


Figure 14

Full Structural Equation Model

Legend

- CQ = Content Quality
- SQ = System Quality
- T = Trust
- SC = Social Capital
- US = User Satisfaction
- CUI = Continued Use Intention