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# Attitudes and Behaviors in Online Communities: Empirical Studies of the Effects of Social, Community, and Individual Characteristics

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Attitudes and Behaviors in Online Communities: Empirical Studies of the Effects of Social,  
Community, and Individual Characteristics

Attitudes and Behaviors in Online Communities: Empirical Studies of the Effects of Social,  
Community, and Individual Characteristics

A dissertation submitted in partial fulfillment  
of the requirements for the degree of a  
Doctor of Philosophy in Business Administration

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## **ABSTRACT**

Online communities and communities of practice bring people together to promote and support shared goals and exchange information. Personal interactions are important to many of these communities and one of the important outcomes of personal interactions in online communities and communities of practice is user-generated content. The three essays in the current study examines behavior motivation in online communities and communities of practice to understand how social and personal psychological factors, and user-generated influence attitudes, intentions and behaviors in online communities.

The first essay addresses two research questions. First, how does social capital influence exchange and combination behaviors in online communities of practice? Second, how does absorptive capacity moderate the impact of exchange and combination behaviors on individual and community performance outcomes? Using a sample of 187 participants recruited from online communities of practice, the results of this study support the hypothesized relations between social capital, and exchange and combination behaviors. Additionally, the moderating role of absorptive capacity is also supported.

The second essay draws on social identity and personal motivation theories to examine the following research questions. First, how do social identity, and extrinsic and intrinsic motivations influence knowledge seeking and sharing behaviors in online communities? Second, how do knowledge seeking and sharing behaviors affect satisfaction with a community? Third, how do extrinsic and intrinsic motivations moderate the outcomes of knowledge seeking and sharing behaviors? To answers these research questions, a sample of 152 participants were recruited from a number of online communities. The results of this study indicate that intrinsic and extrinsic motivations are significant predictors of knowledge seeking and sharing behaviors

in online communities, and these behaviors also have a positive impact on satisfaction. Only one of the dimensions of social identity has a positive impact on knowledge seeking and sharing behaviors in online communities.

Using the theoretical lenses of elaboration likelihood model and social presence, this study investigates two research questions. First, how do social presence, source credibility, and content quality influence attitudes and intentions towards online communities? Second, how does knowledge affect those relationships? The research questions are investigated in a 2X2X2 factorial experiment with random assignment of 256 participants to one of the eight online communities. The results support all the hypothesized direct effects; two of the three hypothesized mediated relationships are also supported. The result provides insights into attitude formation, informs research on online communities and user-generated content, and has implications on the management and support of online communities.

The results from the three studies inform research on online communities by providing insights into behavior motivations and outcomes, and the role of user-generated content. The findings are discussed in detail, along with theoretical and practical implications, and directions for future research.

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## **I. INTRODUCTION**

For many organizations, knowledge is an important resource that can improve organizational performance. Prior research on knowledge management underscores the importance of knowledge as a critical organizational resource with the potential to facilitate both organizational and individual performance (Nonaka, 1994; Grant, 1996; Nahapiet and Ghoshal, 1998; Becerra-Fernandez and Sabherwal, 2001). As organizations become more complex and reliant on knowledge to gain competitive advantage, online communities of practice are increasingly playing an important role in knowledge management strategies.

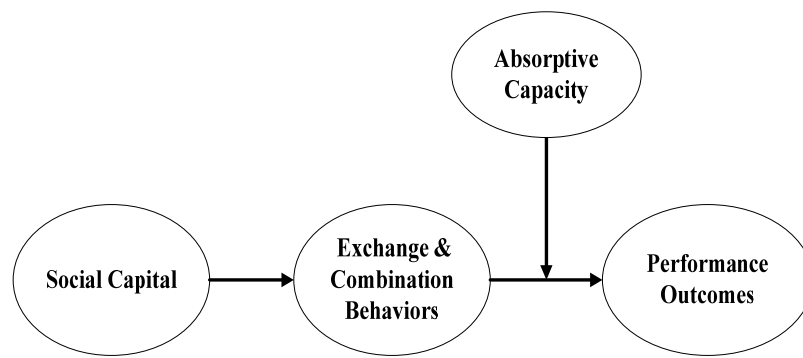
Many organizations support online communities of practice partly because of the potential contribution to individual and organizational performance (Williams and Cothrel, 2000; Lesser and Storck, 2001; Ardichvili et al., 2003; Wenger, 2004). Several organizations, including Intuit Inc, Kaiser Permanente, Xerox Corporation, World Bank, British Petroleum, Chevron Corporation, Ford Motors, Caterpillar Inc, Raytheon Company, IBM Global Services, and Sun Microsystems, support or sponsor online communities of practice (Orr, 1986; Williams and Cothrel, 2000; Gongla and Rizzuto, 2001; Lesser and Storck, 2001; Ardichvili et al., 2003).

The value of the online community software market was \$278.4 million in 2008 and it is expected to grow by 42 percent to \$1.6 billion in 2013 (Leggio, ZDnet 2009). The expected growth of the online community software industry reflects the growing importance of virtual communities to many organizations. The increase in the market value of the online community software industry suggests that organizations are investing in technologies to support virtual communities, some of which may be communities of practice.

Effective workplace practices and professional development require constant attention to the changing needs of employees and organizations. Online communities of practice have the



potential to improve employee and organizational performance because of the abilities of these communities to improve workplace practices by fostering knowledge creation on workplace practices (Brown and Duguid, 1991; Lesser and Storck, 2001; Ardichvili et al., 2003; Wenger, 2004). For example, when Dell Inc. launched ITNinja, an online community of practice for technical support personnel, the press release noted that the community “will help the IT community find answers to their software questions quickly so they can focus on innovation and do more” (Dell Inc, 2012).



*Figure 1. Research model*

Online communities of practice are important to the knowledge management strategies of many organizations. Hence, many organizations support communities of practice because of the expected value and benefits (Williams and Cothrel, 2000). However, the prior literature on communities of practice has not fully explored how exchange and combination behaviors influence performance outcomes in online communities of practice.

Wasko and Faraj (2005) investigated how personal motivations and social capital influence knowledge contribution. Specifically, the authors examined how social capital and personal motivations influence the helpfulness of contributions and the volume of contribution in online communities of practice. This study examines how personal motivations and social capital

influence exchange and combination behaviors. Unlike the study by Wasko and Faraj (2005), this study also investigates the impact of exchange and combination behaviors on individual and community performance and the moderating role of absorptive capacity. Thus, this study goes beyond the investigation of behavior motivations and explores the outcomes of these behaviors.

As depicted in Figure 1, this study examines the motivation of members of online communities of practice to engage in exchange and combination behaviors and how the outcomes of these behaviors can influence performance outcomes. To understand those behavior motivations in online communities of practice and also gain insights into the performance outcomes of those behaviors, this study examines two research questions:

How does social capital influence knowledge exchange and combination behaviors in online communities of practice?

How does absorptive capacity moderate the impact of exchange and combination behaviors on individual and community performance?

To answer those research questions, this study draws on the theories of social capital and absorptive capacity to explain the behavior motivations of exchange and combination behaviors and how organizations can benefit from the outcomes of these behaviors.

The informal structures and personal interaction in online communities of practice can overcome some of the challenges of exchanging and combining knowledge in organizations. The narratives, exchange of personal experiences and knowledge about work practices foster professional development and may increase the performance of members. The body of accumulated knowledge and shared experiences from collective expression of ideas are valuable to members and the community (Wegner, 2004; 2010). Those benefits, according to Millen et al. (2002), can translate into business performance and positive outcomes.

Understanding behavior motivations and the mechanisms through which organizations

can derive value from online communities of practice may inform research on communities of practice and also provide more insights into how these mechanisms can be strengthened. It may be easier for organizations and management to justify the sponsorship and support of online communities of practice to stakeholders if research can establish a relationship between communities of practice and performance outcomes.

The difference between communities of practice and online communities is blurred because both communities have overlapping characteristics and roles. The motivation for most communities of practice is to promote collective learning in a specific domain of practice (Wenger, 2000). Members of online communities of practice are practitioners who use the forums in their communities to exchange and share information as practitioners. On the other hand, members of online communities need not be practitioners and the goals of an online community may not be geared towards collective learning in a particular domain of human endeavor. Thus, the focus of communities of practice is relatively narrow compared to other online communities.

Online communities provide forums for personal interaction on the Internet. There are online communities that cater to friendships, romance, dating, learning, professional groups, education, healthcare, sports, book sharing and reviews, fashion and lifestyle, health, shopping, photo sharing, and consumer feedback (Parks and Floyd, 1996; Bagozzi and Dholakia, 2002). TripAdvisor, TripUp, Slashdot, Friendster, Yahoo Answers, EOpinion, Wikipedia, Flickr, YouTube and Yahoo Groups are examples of online communities.

Online communities are virtual groups of people driven by a shared goal, interests, need or activity to come together (Preece, 2001). Interaction among members of an online community is predominantly through computer-mediated communication, such as forums, emails, video

conferencing, instant messaging, blogs, chat rooms (Rheingold 1993). Although these online communities have different design features and use different technologies, they all enable users and members to exchange information and knowledge<sup>1</sup>. Regardless of the design and focus, online communities are important sources of information and knowledge to members, communities, and organizations.

According to a report published by Pew Research Center in 2001, about 90 million Americans have used the Internet to contact a group or seek information from a group (Horrigan, Pew Research Center, Internet and American Life Project, 2001). Online communities are important to many individuals and organizations. In 2008, Gartner Research estimated that by 2010, more than 60 percent of Fortune 1000 companies with a web site will connect to or host some form of online community (Gartner Research, 2008). The sustenance of those online communities depends on member participation, however, not all members are enthusiastic or motivated to participate.

A report published by Reuters indicated that only 0.16 percent of users on YouTube intend to upload videos, only 0.05 percent of users on Flickr load photos, and only 4.6 percent of all visits to Wikipedia are likely to edit content (Auchard, Reuters, 2007). Another study conducted by Deloitte also notes that getting people to participate in online communities is the biggest obstacle for most businesses (Deloitte, 2008). The desire to explain and understand participation in online communities has generated several studies (Cummings et al., 2002; Bagozzi and Dholakia, 2002; Wasko and Faraj, 2001, 2005; Arguello et al., 2006; Faraj et al.,

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<sup>1</sup> Information is data that is processed with identified patterns and structure. Knowledge is the application of information, it comprises of personal and acceptable beliefs. Nonaka (1994) defined knowledge as "justified true belief". Starbuck (1992) defined knowledge as expertise. The prior literature has sometimes distinguished knowledge from information (Alavi & Leidner, 2001; Earl, 2001; Nonaka, 1994)

2011).

In many online communities, only a small number of members actively participate in the community (Preece and Maloney-Krichmar, 2003; Preece et al., 2004). The 90-9-1 rule<sup>2</sup> has been used to explain unequal participation among members of online communities (Nielsen, 2006; Ochoa and Duval, 2008; Cobb et al., 2010; Stewart et al., 2010). The rule states that 90 percent of users are lurkers; nine percent are infrequent contributors; and one percent actively participates and accounts for most of the content. Participation in some Usenet groups also underscores the unequal participation among online community members (Cummings et al., 2002; Arguello et al., 2006).

Prior research has proffered several reasons, using various perspectives, to explain user motivation to contribute and participate in online communities. Motivational theories rooted in personality psychology have dominated the literature on behavior motivation in online communities. Some of the personal motivational factors cited in the prior literature include cost and benefits, career advancement, tangible benefits, rewards, incentives, enjoyment, personal gain, self-verification, and identity (Hendriks, 1999; Jarvenpaa and Staples, 2000; Wasko and Faraj, 2000; Ardichvili et al., 2003; Lakhani and von Hippel, 2003; Kankanhalli et al., 2005; Bock et al., 2005; Ma and Agarwal, 2007).

Other studies have cited socio-psychological factors to explain behavior motivation in online communities. Social capital and social identity are the dominant socio-psychological approaches for explaining user and member motivations in online communities (Bagozzi and Dholakia, 2002; Wasko and Faraj, 2005; Chiu et al., 2006). The contributions of those studies to the understanding of member motivations in online communities are significant. However,

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<sup>2</sup> This rule has been used to describe the general patterns of participation inequality in social media and online communities.

relatively few studies have examined personal and social psychological factors together in a single study to explain behavior motivations in online communities. Additionally, the prior literature has not fully investigated the outcomes of those behaviors.

Online communities provide opportunities to quickly transmit and circulate knowledge and information; hence, they are potential grounds for gauging and assessing consumer reactions and feedbacks. Interaction and dialogues in online communities can also play an important role in product development. Members and users benefit from online communities and many organizations also derive benefits from online communities. Since participation is important to the sustenance and vitality of any online community (Preece et al., 2004), understanding the underlying motivations for participation may be useful to the effective management and coordination of member participation. The focus of the current study is to investigate motivations for knowledge sharing and seeking behaviors in online communities.

Knowledge seeking and sharing are important aspects of knowledge management and have frequently been investigated in the context of organizations. However, knowledge exchange in self-organizing and emergent communities, such as online communities, has not been adequately explored. The prior literature has underscored the role of organizational structures in facilitating knowledge sharing. Hierarchical structures, rewards and incentives mechanisms, and coordination capabilities promote knowledge sharing and exchange in organizations (Dyer and Nobeoka, 2002; Tsai, 2002; Cabrera and Cabrera, 2002; Bartol and Srivastava, 2002; Ardichvili et al., 2003). In the absence of these structures and mechanisms in online communities, it is important to understand what drives knowledge seeking and sharing behaviors.

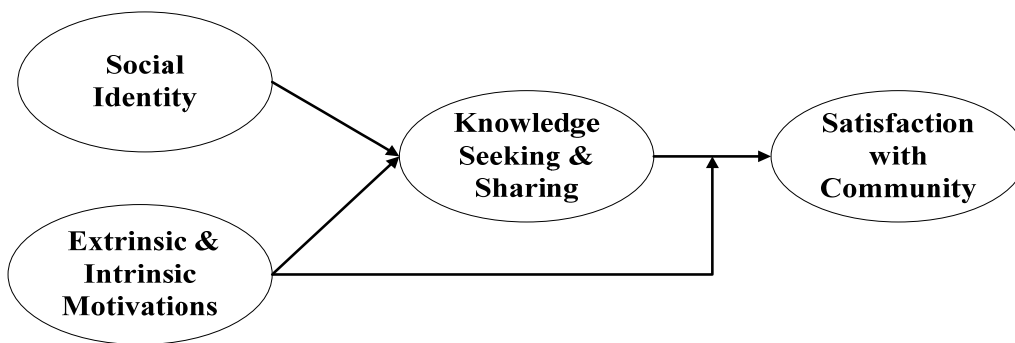
Drawing on both socio-psychology and personality psychology perspectives, the current study examines the motivations underlying knowledge seeking and sharing behaviors and the

outcomes of these behaviors in online communities. Hence, this study draws on personality psychology and socio-psychology perspectives to examine three research questions;

First, how do social identity, and extrinsic and intrinsic motivations influence knowledge seeking and sharing behaviors in online communities?

Second, how do knowledge seeking and sharing behaviors influence satisfaction with online communities?

Third, how do extrinsic and intrinsic motivations moderate the impact of knowledge seeking and sharing behaviors on satisfaction with an online community?



*Figure 2.* Theoretical model. This model presents the relationships among the constructs.

To answer those three research questions, this study draws on social identity and individual motivation theories to explain knowledge seeking and sharing behaviors in online communities. More specifically, this study seeks to explain how intrinsic and extrinsic motivations, and the three dimensions of social identity (cognitive, evaluative and affective) influence knowledge seeking and sharing behaviors and the consequent impact of these behaviors on satisfaction. Furthermore, this study investigates how extrinsic and intrinsic motivations moderate the impact of knowledge seeking and sharing on satisfaction. The theoretical model depicting the relationships among social identity, extrinsic and intrinsic motivations, and satisfaction with an online community is presented in Figure 2.

Using both social identity and personal motivational theories to explain behavior motivations and the outcomes of these behaviors in online communities may provide additional insights into what motivates members of online communities to seek and share knowledge. These insights can enrich our understanding of knowledge sharing and seeking behaviors in online communities and how intrinsic and extrinsic motivations moderate the impacts of these behaviors on satisfaction

Many websites provide users with the ability to create content which is consumed by other users. In 2004, 35 percent of Internet users in the US posted content. Among broadband users under the age of 30, 51 percent placed content on the Internet, 25 percent created blogs, and 41 percent posted content on their own sites (Vickery and Wunsch-Vincent, 2007). In addition to creating content, many users also rely on content created by others.

It was estimated that 70 million US Internet users will create some form of content online and user-generated content sites will earn \$1 billion in revenues from advertisement in 2007. It was expected that revenue from user-generated content sites will increase to \$4.3 billion in 2011(eMarketer, 2007). According to Market and Research, 116 million Internet users in the US consumed some form of user-created content in 2008, and this number is expected to increase to 155 million by 2013. Furthermore, the number of user-generated content creators will grow by similar proportions, reaching 115 million in 2013 (Market and Research, 2009).

Attitudes and intentions are influenced by the content generated in online communities. According to a survey conducted by Deloitte's Consumer Product Group, 62 percent of consumers read consumer-generated product reviews and purchase decisions of 80 percent of these readers are influenced by consumer product reviews (Deloitte's Consumer Products Group, 2007).



User-generated content is important to many consumers, and purchase decisions are influenced by content created by other consumers. The capacity of user-generated content to influence purchase decisions, brand affinity, and brand loyalty underscores the importance of user-generated content in marketing, branding, and advertising. Prior literature on user-generated content provides ample evidence of the impact of user-generated content on consumer attitudes and purchase intentions (Chevalier and Mayzlin, 2003; Dallarocas et al., 2007; Daugherty et al., 2008; Forman et al., 2008). The prior literature also notes that blogs influence the impressions of readers and when blogs are negative they increase readership (Aggarwal et al., 2012). Thus, prior literatures has demonstrated that user generated content can influence attitudes and intentions. However, the impact of the content quality and source credibility dimensions of user-generated content on attitudes towards online communities has not been fully explored in the extant literature.

The current study examines the persuasive impact of user-generated content on attitudes towards online communities and intentions to use community resources. The broad objectives of the current study are to examine the impacts of content quality, source credibility, and social presence on attitudes, and the moderating role of knowledge. As shown in Figure 3, the overarching research model examines the role of knowledge as an intervening variable in explaining the impact of source credibility, content quality, and social presence on attitudes towards an online community and intentions to use community resources.

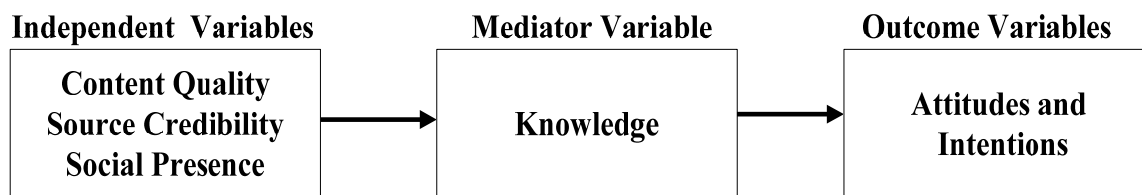


Figure 3. Theoretical model

Using the theoretical lenses of elaboration likelihood model (ELM) and social presence, the current study examines the following research questions;

How do content quality, source credibility, and social presence in online communities influence attitudes and intentions towards these communities?

How does knowledge of the individual affect the above relationships?

## II. ONLINE COMMUNITIES OF PRACTICE

Communities of practice are informal groups of people driven by a common practice or interest to share ideas, exchange information, seek advice, and help each other in a specific domain of interest related to practice. Through mutual interaction, narratives, and storytelling, members of a community of practice share their experiences and learn from each other (Brown and Duguid, 1991; Lesser and Storck, 2001; Ardichvili et al., 2003; Wenger, 2001, 2004). Using a social learning perspective, Wenger (2000) defined communities of practice on three dimensions; joint enterprise, mutual engagement, and shared repertoire.

Joint enterprise embodies the collective goals of a community to share information, knowledge, and personal experiences about a domain of interest. Mutual engagement provides the foundation for interpersonal interaction and negotiation of meaning from the discourse generated by a community. Shared repertoires are the symbols, norms, mores, identity, and values accumulated from interaction within a community. Communities of practice are different from other organizational forms such as project teams or work groups. They are defined by shared interests rather than by tasks or functional units, and members are not mandated to participate in these communities.

Although sponsored and nurtured by organizations, communities of practice are largely organic, emergent and self-organizing (Wenger, 2000, 2001, 2004; Wasko and Faraj, 2005). An overbearing control and management of a community of practice can stifle collaboration and interaction within the community (Brown and Duguid, 1991; Wenger, 2001). The delicate balance between management sponsorship and support, and the self-organizing and emergent nature of communities of practice is a management paradox for many organizations (Wenger, 2000).

Online communities of practice use predominantly computer mediated communication to facilitate interaction among members. Members of online communities of practice may engage in face-to-face interaction, however, interaction among members is mainly through computer mediated communication. Online communities of practice rely on online technologies such as forums, emails, video conferencing, instant messaging, blogs, chat rooms, virtual worlds, and twitters to facilitate communication and interaction among members (Wasko and Faraj, 2000).

The definition of an online community of practice highlights some important characteristics. First, members are bound together by common goals or domain of interests related to practice. Second, communities of practice are self-organizing and emergent, although they may be sponsored and supported by an organization. These communities may operate within or outside an organization. Third, membership is voluntary and may be limited to only members of an organization and affiliates or may be open to all who share in the common interest of the community. Last, members of an online community of practice communicate primarily through computer-mediated communication.

Examples of online communities of practice include Information Systems Communities of practice within the Project Management Institute, SEMNET, and Microsoft Technical Communities, and Intuit Communities. Brown and Duguid (1991) observed that online communities of practice are able to integrate working, learning and innovation because they are not bound by structured formal practices. The informal structures of communities of practice enable these communities to reflect more accurately on routines and knowledge on workplace practices than the standard operating procedures and manuals issued by organizations (Brown and Duguid, 1991; Orr, 1996).

The popularity of online communities of practice and the potential benefits have fueled

several studies to further understand these communities. One important stream of research on online communities of practice has focused on why members contribute their time and knowledge to sustain these communities. Several reasons, including intrinsic motivation, extrinsic motivation, social capital, and enabling conditions, have been cited to explain why members of online communities of practice contribute their knowledge (Ardichvili, 2003; Wasko and Faraj, 2005; Kankanhalli et al., 2005; Ma and Agarwal, 2007). This study builds on these prior studies by using social capital to investigate exchange and combination behaviors, the consequent impact on performance outcomes, and the moderating role of absorptive capacity.

Pan and Leidner (2003) observed that communities of practice are sources of vast amount of knowledge on practice because they are driven by a common interest to bring knowledge and practice together. The authors contended that through information technology, organizations can promote knowledge sharing globally across communities, a process that may lead to positive outcomes for organizations. The potential impact of communities of practice on performance outcomes in the health care industry has also been noted in prior studies. The informal networks, interpersonal interaction, and self-organizing nature of communities of practice facilitate the codification of knowledge among healthcare practitioners and also provide potential benefits to members (Bate and Robert, 2001; Swan et al., 2002).

Lesser and Storck (2001) also provided some insights into the impact of communities of practice on performance outcomes using a social capital perspective. The authors posited that by reducing response time, decreasing the learning curve, re-using knowledge and generating new ideas, communities of practice can increase the performance of organizations. However, the authors did not fully explain the mechanisms of how increase in knowledge sharing can improve performance outcomes.

The real value of knowledge lies in the application of that knowledge in resolving organizational-wide problems (Nonaka, 1994; Grant, 1996b; Szulanski, 1996; Argote and Ingram, 2000; Alavi and Leidner, 2001). Thus, this study seeks to understand how social capital influences exchange and combination behaviors, the consequent impact on performance outcomes, and the moderating role of absorptive capacity. Understanding the mechanisms of how absorptive capacity moderates the impact of exchange and combination may contribute to current research on knowledge management and online communities of practice.

The informal networks and interaction in communities of practice are conduits for information, knowledge, best practices, and ideas. Brown and Duguid (1991) posited that communities of practices foster learning and innovation in organizations because they create environments that facilitate narration, collaboration and social construction. Wenger (2000) averred that learning is a social process and organizational success depends on the design of a social learning environment in the form of communities of practice. According to Wenger (2000), communities of practice can improve organizational performance by facilitating social learning. However, the mechanisms of how organizations can leverage the outcomes of the learning environments induced by communities of practice are not well articulated.

The extant literature has documented the importance of online communities of practice in fostering knowledge on work practices and the potential value to organizations (Brown and Dugid, 1991; Lesser and Storck, 2001; Swan et al., 2002; Ardichvili, 2003). Inferences from prior studies suggest a link between communities of practice, knowledge, and performance outcomes; however, the mechanisms underlying this relationship have not been adequately explored. The current study attempts to provide a more in-depth examination of exchange and combination behaviors in online communities of practice and how absorptive capacity moderates

the impact of these behaviors on performance outcomes.

Organizations can maximize their benefits from the knowledge generated by communities of practice if they integrate that knowledge into business processes and leverage that knowledge to advance their strategic goals (Wenger, 2004; Miller et al., 2009). The extant literature has demonstrated that online communities of practice can enhance organization and individual performance because of their abilities to facilitate knowledge creation (Wenger, 2004; Miller et al., 2009). However, other studies have also noted that just creating online communities of practice does not lead to organizational performance (McDermott, 2000; Millen et al., 2002; Roberts, 2006). Other facilitating conditions, such as absorptive capacity and organizational routines, are necessary to derive value from online communities of practice. Those facilitating conditions foster the integration and application of knowledge across organizations.

Knowledge exchange and combination behaviors, by themselves, may not increase performance, performance outcomes from these behaviors require a deeper understanding of the mechanisms and processes of how organizations appropriate and integrate knowledge. Exchange and combination behaviors do not always translated into positive outcomes. Knowledge by itself does not translate into organizational performance. It is the transfer and application of knowledge to address organizational goals that lead to organizational performance (Grant, 1996; Szulanski, 2002).

In the context of online communities of practice, the potential benefits may be stifled by lack of appropriate organizational structures. For example, the reliance on formal documentation and standard operating procedures limits the potential of many organizations to integrate and leverage knowledge and know-how generated by communities of practice (Orr, 1996).

The transfer of knowledge from a community of practice to other parts of the

organization is contingent on many factors. The absorptive capacity of individuals, the type of knowledge, source and recipient dispositions, and interaction between the source and recipient influences the transfer of knowledge from source to recipient (Szulanski, 2002). Of particular interest to the current study is the role of absorptive capacity in the transfer of knowledge from communities of practice, and the integration of that knowledge into the knowledge structures of organizations.

Thus, the goals of this essay are twofold. First, it investigates how social capital motivates knowledge exchange and combination behaviors in an online community of practice. Second, it examines how absorptive capacity moderates the impact of exchange and combination behaviors on community and individual performance outcomes. The lack of formal structures of leadership and control in online communities of practice may increase the role of social capital in facilitating interpersonal interaction and behaviors that facilitate knowledge exchange and combination.

### **Social Capital**

Social capital is embedded in human relationship and provides the condition for other forms of capital, in particular human capital, to be exploited (Nahapiet and Ghoshal, 1998). Like other forms of capital, social capital complements and facilitates access to human capital. Individuals combine other forms of capital with social capital to achieve goals (Coleman, 1988). Like knowledge or trust, the value of social capital appreciates in value over time and with use, and it can complement other resources to create value (Nahapiet and Ghoshal, 1998; Alder and Kwon, 2002). Although difficult to quantify, social capital, like other forms of capital, requires investments and maintenance. Alder and Kwon (2002) defined social capital as

“[T]he goodwill available to individuals or groups. Its



source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor” (p.23).

Social capital is embedded in social structures developed through social interaction among individuals. Unlike other forms of capital, social capital is collectively owned and individuals can not appropriate social capital to the exclusion of others. The extant literature on social capital tends to agree that social capital inheres in social relations and interaction; however, it has focused on different aspects and dimensions of social interaction and relations to explain the sources and benefits of social capital.

Burt (2001) focused on the structure of relationships and how certain characteristics of the structure shape and influence the creation and access to social capital. On the other hand, Coleman (1988) opined that social capital is intrinsic to relational norms and values engendered by interpersonal interaction. Nahapiet and Ghoshal (1998) contended that the sources of social capital are intrinsic to both social structures and social relations engendered by interpersonal interaction.

The focus of this study is to understand how social capital inherent in communities of practice influences exchange and combination behaviors and the impact of these behaviors on performance outcomes. Combination and exchange behaviors enable the integration and internalization of knowledge. Combination involves the integration of existing and novel ideas and knowledge to create new knowledge, and exchange is a prerequisite for combination. Information, ideas and knowledge reside in different places and contexts. Exchange enables the transfer of knowledge from different places, and combination enables the integration of that knowledge (Nahapiet and Ghoshal, 1998).

In online communities of practice, exchange and combination behaviors are geared towards the integration of ideas, information and knowledge generated by interpersonal interaction within the community. Members exchange their professional and daily experiences regarding a task or an activity through forums, emails, story telling and conversations. Those exchanges enable community members to combine knowledge, information and ideas and create new knowledge that can potentially enhance task performance. To understand those exchange and combination behaviors, this study investigates how social capital motivates these behaviors.

Nahapiet and Ghoshal (1998) identified three dimensions of social capital; structural capital, relational capital, and cognitive capital. To examine how social capital inherent in communities of practice influence knowledge exchange and combination, the current study draws on the classification of social capital advanced by Nahapiet and Ghoshal (1998).

### **Structural capital**

As people interact and relate with each, social structures are formed that provide opportunities and facilitate access to information, control, and influence. Structural capital is the impersonal configuration of linkages and connections among individuals. Structural capital is concerned with the absence or presence of patterns of linkages and connections that define who and how actors in the network interact (Granovetter, 1985; Nahapiet and Ghoshal, 1998; Burt, 2001). Structural capital is the patterns of interaction, communication and channels through which many of the resources of the network are transmitted. How individuals perceive these structures influences their behaviors and intentions.

The types and nature of social networks, specifically the intensity, density, frequency, and multiplicity, influence the creation, distribution, and access to social capital (Granovetter, 1973; Burt, 1997). For example, weak ties may be suitable for the transfer of new and diverse

information, but less suitable for the transfer of tacit knowledge. Structural links are conduits for resources, such as information, knowledge, influence, respect, and reputation, and also facilitate access to resources. Furthermore, the positions of actors within those linkages determine their access to network resources.

Through social structures, social network members share ideas, information and knowledge to support individual and collective goals of the network. Network structure is important for the performance of any collective (Granovetter, 1973; Burt, 2001). Network structure and patterns of communications are often evaluated by the intensity, density and frequency of the interaction among members of a network. Actions, behaviors and access to community and network resources are influenced by the extent to which actors in the network are linked together. This study focuses on how structural capital influences exchange and combination behaviors in online communities of practice.

Members of online communities of practice, like other virtual communities, rely on computer-mediated communication to interact with each other. Although some community members may engage in face-to-face interaction, community members predominantly rely on computer mediated communication to interact. Thus, computer communication technology plays an important role in defining structural relations and social network among community members. A typical online community of practice may use email, instant message, electronic forums, twitter, and video conferencing to communicate and share information and knowledge. Hence, the structural relations in online communities of practice are also reflected and shaped by computer-mediated communication.

As individuals join and participate in the activities of online communities of practice, structures and patterns of connections and interpersonal interactions are established. These

structures and patterns define how members of the community relate to each other. The content and dialogue of the discourse determine how community members perceive the intensity, frequency and density of relationships in the community. Information and knowledge are shared, exchanged, and combined through story telling, narration of personal experiences, metaphors, and conversations. The information, knowledge, and ideas generated in a community of practice are important sources of value to the community and members (Brown and Duguid, 1991; Davenport and Prusak, 2000).

The perceived structures, connections and communications patterns are conduits through which those resources are transmitted and distributed. Hence, members' perceived position in a social network determines their access to resources, which in turn influences their intentions, attitudes, and behaviors. Those perceptions of structural capital influence status, respect and reputation within a community of practice. This study aims to examine how structural capital generated by an online community of practice impacts exchange and combination behaviors.

### **Relational capital**

The relational view of social capital focuses on the norms, obligations, reciprocity and trustworthiness inherent in social interaction as determinants of social capital (Coleman, 1988; Putnam, 1995; Alder and Kwon, 2002). The norms, reciprocity, and trustworthiness in social relations define behaviors and attitudes and discourage selfish behaviors. Norms are consensus that guide collective action and facilitate cooperation within a community (Reagans and McEvily, 2003).

Norms, social mechanisms of enforcement, and sanctions promote behaviors that foster the pursuit of collective goals. The value and benefits of social capital is mainly derived from the resources generated by social interaction. Those resources may include information, knowledge,

respect, reputation, status and influence. The norms, trust, identification, and reciprocity that link individuals together also facilitate the creation, distribution and transfer of those resources (Nahapiet and Ghoshal, 1998; Kankanhalli et al., 2005).

Behaviors and attitudes are shaped and defined by relationships developed through past interpersonal interactions. The basis of relational capital is the interpersonal relations that actors in the network have developed with other actors over periods of interactions (Granovetter, 1992). The norms, trustworthiness, reciprocity, goodwill and values that develop over time as people interact with each other in a network form the basis of relational capital. Individual perceptions of those relationships influence their disposition and behavior intentions. Through those relationships, members of a social network develop pro-social attitudes that influence their interaction with other members (Coleman and Coleman, 1994; Nahapiet and Ghoshal, 1998).

Through protracted interactions with others in a social network, individuals develop trust, obligations, and reciprocity that eventually guide behaviors and actions. Once interpersonal relations are developed within a collective, individuals identify with the goals of the group and may even define their identity with reference to the group. Trust and trustworthiness is critical to relational capital. Those trusting relations and the consequent obligations and reciprocity that bind members of a social network together influence actions and behaviors (Coleman and Coleman, 1994; Nahapiet and Ghoshal, 1998; Kale et al., 2000; Borgatti and Cross, 2003).

Norms and values can shape the actions and behavior of actors in a social network, even in the absence of enforcement structures. Subtle threats of social exclusion and ostracization compel members of the network to behavior in a certain way (Coleman and Coleman, 1994; Lin, 1999). The affective and personal relationships developed with other members of a social network promote identification, commitment and a sense of responsibility to the group. Those

norms and the social mechanisms of enforcement and sanctions elicit behaviors and actions that promote collective goals (Coleman, 1988; Nahapiet and Ghoshal, 1998; Kale et al., 2000).

Relational capital and the consequent obligations and reciprocity ensure that individuals' behaviors and attitudes are oriented to social goals, which in turn facilitate the realization of personal goals. Those behaviors may include participation, sharing of ideas and information, seeking help, helping others, knowledge sharing, and empathizing with others in a social network.

In online communities of practice, individual behaviors and attitudes are guided by their perceptions of the norms and values of the community. The levels of commitment and identification with a community influence how members behave and engage in community activities. Online community of practice members with high levels of relational capital identify strongly with the community and engage in acts that create resources for the community and eventually enhance the capacity of community members. Reciprocity, trust and identification with an online community of practice imply commitment and alignment of members' interest and goals to the community.

Members of an online community of practice are motivated by community norms to exchange knowledge, help others, advise others, swap stories, share personal experiences and support others in the community. Ideas, information, and the knowledge generated by those pro-social behaviors are resources available to all members of a community of practice. The norms and values underlying an online community of practice must be shared and understood by all members. Cognitive capital is fundamental to the shared understanding of those norms of reciprocity and collective responsibility.

### **Cognitive capital**

Cognitive capital is the shared interpretations, understanding, and language that facilitate

collective action. Cognitive capital enables meaningful exchange among individuals and provides a frame of reference for behaviors and actions (Wasko and Faraj, 2005; Inkpen and Tsang, 2005; Chiu et al., 2006). Shared understanding, interpretation, and meaning bind a community together and facilitate the achievement of community goals (Nahapiet and Ghoshal, 1998).

Shared expectations are the result of shared experiences among members of a social network. In electronic communities, such as online communities of practice, shared expectations, language and symbols are fundamental to the identity of the community. Community members' perceptions of shared understanding and consequent mutual expectations shape behaviors. In any group or community, members with high cognitive capital are more likely to participate and actively engage in group activities because they understand the needs of the group (Wasko and Faraj, 2005; Robert et al., 2008).

Community members with high levels of cognitive capital understand and interpret the needs of the community better than members with less cognitive capital. Members' participation in an online community of practice is fostered by a mutual understanding of expectations, language and symbols. Interaction in online communities of practice are mostly through computer-mediated communication, thus it is difficult to transmit non-verbal cues and other subtle cues of communications. This makes shared understanding more important for effective communication and personal interaction.

Most of the interaction in online communities are informal and may involve story telling, conversation, exchange stories and accounts of personal experiences regarding practice, thus shared understanding is important. Perceptions of shared experiences and mutual understanding facilitate exchange and combination behaviors. Shared understanding also provides a frame of

reference for members of online communities to comprehend the norms and values that guide behavior expectations and attitudes within a community. Thus, cognitive capital binds relational and structural capital in communities of practice. The interactions of all three forms of social capital facilitate the creation of resources that may enhance individual capacity and performance.

### **Absorptive Capacity**

Absorptive capacity is the ability of an organization to identify relevant knowledge, assimilate, and apply that knowledge to enhance performance (Cohen and Levinthal 1990). This ability is influenced by prior knowledge and the diversity of the firm's knowledge base. According to the definition advanced by Cohen and Levinthal (1990), absorptive capacity of the firm has three dimensions: abilities to identify new relevant knowledge; assimilate that knowledge; and apply that knowledge for commercial ends.

The first dimension focuses on relevant prior knowledge of organizations and the abilities to recognize the value of new knowledge. Thus, a certain level of relevant prior knowledge is necessary to identify the value of new knowledge. This implies that organizations must have some fundamental insights related to the new knowledge to perceive the value inherent in the new knowledge. Without this basic understanding, organizations are unable to evaluate the usefulness of new knowledge and less likely to recognize the potential of that knowledge. The diversity of existing knowledge is also important in recognizing the value of new knowledge (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998). Diversity of knowledge increases the potential of identifying new knowledge from diverse and novel sources. Knowledge diversity extends the firm's ability to source a wide range of new relevant knowledge.

The second dimension of absorptive capacity is the ability to integrate knowledge into existing knowledge structures. When organizations recognize the value of new relevant



knowledge, they can only leverage this knowledge if they integrate and assimilate the new knowledge. The value of new knowledge is not realized until that knowledge is integrated into existing knowledge structures (Lane and Lubatkin, 1998). Just recognizing new knowledge is not enough to improve performance outcomes. The abilities of organizations to assimilate and integrate knowledge are influenced by knowledge acquisition, storage and transfer processes within the organization. The underlying knowledge management processes, routines, rules, norms and values determine the abilities of organizations to integrate knowledge (Cohen and Levinthal, 1990; Szulanski, 1996; Lane and Lubatkin, 1998).

The third dimension of absorptive capacity is the ability to apply new knowledge to commercial ends to increase performance outcomes. The real value of knowledge comes from the application of that knowledge to resolve problems, pursue innovation, improve performance, and meet organizational objectives. The ability of an organization to apply knowledge to enhance performance will depend on the goals and objectives of the organization and the abilities of the organization (Szulanski, 1996; Lane and Lubatkin, 1998).

Internal processes and structures, as well as expertise regarding new knowledge, are important for the application of new knowledge. Hence, the absorptive capacity of an organization is dependent on prior knowledge and the ability to identify new and relevant knowledge, integrate that knowledge into existing knowledge structures, and the application of that knowledge (Cohen and Levinthal, 1990; Roberts et al., 2012).

Absorptive capacity is a multi-level construct focused on the abilities to recognize, assimilate and integrate new knowledge at the individual and organizational levels. At the individual level, absorptive capacity is the ability of an individual to value others knowledge, integrate, and internalize that knowledge, and apply that new knowledge to enhance efficacy.

Similarity and diversity in prior knowledge influence how individuals perceive new knowledge. Absorptive capacity facilitates the process of associating new ideas and views to prior experiences.

Shared understanding, existing knowledge structures, diversity of knowledge among members, and organizational communication structures influence the absorptive capacity of individuals, which in turn, impacts the absorptive capacity of organizations (Cohen and Levinthal, 1990; Borgatti and Cross 2003; Matusik and Heeley, 2005). Absorptive capacity of an individual is enhanced when new knowledge is related to existing knowledge structures of the individual (Lane and Lubatkin, 1998).

The prior literature on absorptive capacity has focused on explaining and understanding how organizations transfer and leverage knowledge from either external or internal sources. A major theme in studies on absorptive capacity is aimed at understanding how organizations can leverage external sources of knowledge such as knowledge from partners, clients, customers and the external environment (Mowery et al., 1996; Lane and Lubatkin, 1998; Simonin, 1999; Stock et al., 2001; Ko et al., 2005). Other studies have focused on how knowledge within units of the organizations can be transferred to the appropriate units and leveraged to enhance performance outcomes (Szulanski, 1996; Tsai, 2001; Pavlou and El Sawy, 2006).

In a study of inter firm knowledge transfer, Lane and Lubatkin (1998) observed that the relative absorptive capacity of firms is dependent on the similarities and characteristics of the firms, and the relative absorptive capacity of each firm. This observation was also underscored by Ko et al. (2005). The authors noted that related prior knowledge is important in the transfer of knowledge from a consulting firm to the client's firm. Hence, the abilities of firms to learn from each other is dependent on similarities of basic knowledge structures, knowledge management

processes and the firms abilities to recognize, integrate and apply new knowledge.

Certain organizational mechanisms, processes, and structures can improve cross-functional knowledge transfer and application (Jansen et al., 2005). Knowledge transfer within organizational units and the application of that knowledge also depends on the absorptive capacity of the organizational unit and the network position of the organizational unit (Tsai, 2001). In addition to the absorptive capacity of an organization, Szulanski (1996) observed that the type of knowledge can also influence knowledge transfer among organizational units. Absorptive capacity can also enhance the effectiveness of new product development teams, especially how they integrate and apply new knowledge into the product development process (Pavlou and El Sawy, 2006).

Organizational knowledge and cognition are distributed across and within organizational units. A critical aspect of knowledge management processes is transferring knowledge to parts of the organization where it is most needed and useful (Alavi and Liedner, 2001). Sometimes organizational units with knowledge and information are not aware where this knowledge would be most useful and beneficial. Moreover, organizational units that can potential use the knowledge are not aware of the existence of the knowledge (Huber, 1991).

The absorptive capacity of an organization enables it to locate, retrieve and apply knowledge more efficiently and effectively. Knowledge exchange and combination among members of communities of practice can generate new knowledge. However, the value of that knowledge depends on how well an organization is able to locate, integrate, and leverage that knowledge across the organization.

Existing knowledge enables the organization to identify relevant new knowledge within the discourse and dialogues generated by interpersonal interaction in communities of practice.

Diversity of knowledge is also important for identifying and integrating knowledge generated by communities of practice. When the knowledge bases of firms are diverse, they are more likely to recognize the value of new knowledge from different and multiple sources, including online communities of practice.

In the context of communities of practice, if an organizational knowledge base is not diverse, then the organization may lack the ability to recognize the potential of a community of practice as a source of knowledge and may not take advantage of the information and knowledge generated in the community. The dialogues, conversations and discourse generated by communities of practice are sources of knowledge for many of their members.

However, the real value of that knowledge is the ability of an organization to integrate and assimilate that knowledge into the existing knowledge structures of the organization. Knowledge management structures and processes such as incentives, compensations, routines and organizational commitment to knowledge management (Pavlou and El Sawy, 2006) can determine how knowledge generated by communities of practice are assimilated and integrated for eventual use and application across an organization (Alavi and Liedner, 2001).

In the case of communities of practice, knowledge may be scattered across the dialogues, conversations, emails, chat messages and forums. Organizations ought to have structures, processes, routines and mechanisms to ensure that the knowledge embedded in the discourse of communities of practice is integrated in existing knowledge structures. As members of communities of practice interact and converse about job related experiences, they combine and exchange knowledge and information from their experiences, thus creating new knowledge. This new knowledge may be useful and valuable to other units within the organization.

Prior literature has underscored the potential benefits of communities of practice to

organizations (Williams and Cothrel, 2000; Lesser and Storck, 2001; Ardichvili et al., 2003; Wenger, 2004). However, the mechanisms of how organizations can benefit from the activities of online communities of practice have not been adequately examined. The relationship between online communities of practice and organizational performance are usually inferred from the abilities of communities of practice to facilitate knowledge creation and the potential value of knowledge to organizations. While logical, those inferences do not provide adequate explanation of the mechanisms of how communities of practice influence performance outcomes. Communities of practice are one of the many knowledge management strategies of organizations and the importance of knowledge management strategies in improving the performance of organizations are well document in prior research (Nonaka, 1994; Nahapiet and Ghoshal, 1998; Argote and Ingram, 2000; Alavi and Leidner, 2001).

The capabilities to assimilate and apply new knowledge are necessary to integrate knowledge generated by communities of practice and leverage that knowledge to improve performance outcomes. Absorptive capacity provides those capabilities. It is desirable for organizations to integrate the knowledge and information generated in online communities of practice into organizational processes and routines; however, this is not an easy undertaking for many organizations. An examination of the role of absorptive capacity in the integration of knowledge generated by online communities of practice may provide further insights into the challenges faced by organizations in leveraging the outcomes of exchange and combination behaviors.

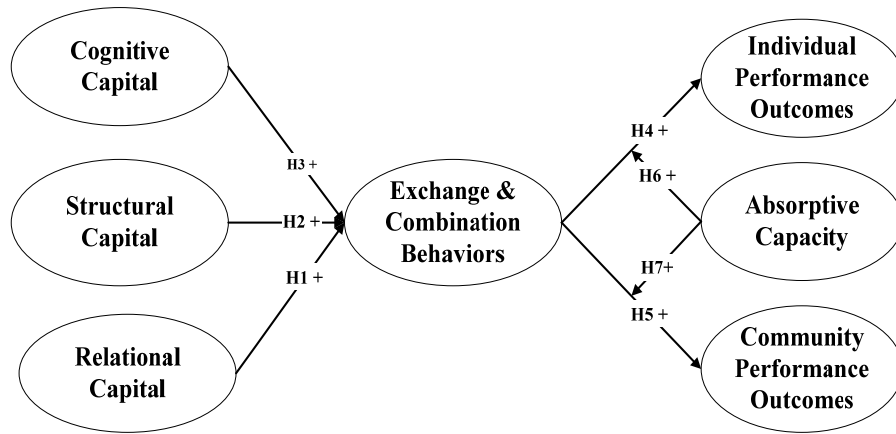


Figure 1. Hypothesized research model

The personal relationships, social networks, trust, respect, reputations, connections, and values that develop through personal interaction in an online community of practice engender social capital. This social capital, in turn, encourages combination and exchange behaviors within the community. The performance outcomes of those behaviors depend on the absorptive capacity of the organization. As shown in Figure 1, the current study examines the relationship between social capital, exchange and combination behaviors, the moderating role of absorptive capacity, and performance outcomes.

### Hypotheses Development

This section advances arguments for the hypothesized relationship between social capital and exchange and combination behaviors. More specifically, how the three dimensions of social capital: cognitive capital; structural capital; and relational capital motivate exchange and combination behaviors and the moderating role of absorptive capacity.

Most online communities of practice are self-organizing, emergent, and evolve as members join and participate in the activities of the communities. Over time, relationships are built through personal interactions, and values and norms are established that guide behaviors

and attitudes within those communities. Most of those norms and values are not written but understood by community members.

Those norms and values ensure that members are not motivated by self-seeking interests but guided by the collective goals of the community (Coleman, 1988; Leena and van Buren, 1999). Some of those values and norms may include trust, empathy, and commitment to the community, goodwill, reciprocity, and collective obligations (Coleman, 1988; Alder and Kwon, 2002; Levin and Cross, 2004). Trust, according to Tsai and Ghoshal (1998), promotes cooperative behaviors that are fundamental to exchange and combination behaviors.

According to Kale et al., (2000), relational capital is the mutual trust, respect, and friendship among individuals and has important implications for performance outcome in inter-firm alliances by fostering learning, exchange, and transfer of information and knowhow. Similarly, in the context of online communities of practice, mutual trust and respect engendered by relational capital can facilitate knowledge exchange and combination behaviors.

Relational capital encourages cooperation and the exchange of information and knowledge (Kale et al., 2000; Capello and Faggian, 2005). Borgatti and Cross (2003) also argued that information seeking is a function of the relationship between individuals. How individuals seek information is influenced by their relationship with others. Chiu et al. (2006) opined that the trust, reciprocity and identification fostered by relational capital facilitate knowledge sharing (Wasko and Faraj, 2005). Wilson (1997) also noted that the cooperation and collective sense of responsibility fostered by relational capital facilitate participation in problem-solving.

In the context of online communities of practice, relational capital motivates members to act in the interest of the collective. The norms and values in an online community of practice are sources of relational capital that influence behaviors and attitudes. When relational capital is high

among community members, they are more likely to trust the community and membership, and also engage in exchange and combination behaviors. Trust and norms of reciprocity facilitate exchange and combination behaviors and encourage members of online communities of practice to share their knowledge, seek advice, swap stories, help others, solve problems, and advance the collective goals of the community. Thus, interaction among members of online communities of practice fosters relational capital that subsequently motivates exchange and combination behaviors.

Community interactions intensify relationships among members, foster relational capital, and promote attitudes and behaviors to support the collective goals of the community. The trust, reciprocity, and obligations that accompany perceptions of relational capital foster knowledge and exchange behaviors. Hence, when relational capital is high, members are more likely to engage in exchange and combination behaviors. Thus, this study advances hypothesis H1;

**H1:** Relational capital has a positive impact on exchange and combination behaviors in an online community of practice.

The social ties and network that individuals develop through interaction influence their behaviors. Knowledge sharing and exchange behaviors are influenced by social structures. Nahapiet and Ghoshal (1998) noted that the ties among members of a social network provide the opportunities for combination and exchange of information. Social structures and network ties influence knowledge transfer processes by motivating individuals within the network to exchange and share information and knowledge (Reagans and McEvily, 2003). The nature, intensity and frequency of those network ties and structures can influence information sharing.

Strong ties are more frequent and intense and thus better suited for the transfer of tacit knowledge (Ghoshal and Nahapiet 1998; Hansen, 1999). Weak social network ties are also



sources of structural social capital because they influence access and distribution of resources. The social network ties within a group can foster the diffusion of diverse ideas (Granovetter, 1985; Krackhardt, 1992; Hansen, 1999).

The current study expects that in the context of online communities of practice, the social network and ties among members can facilitate the sharing, exchange, and combination of ideas. The density, frequency and intensity of interactions among members of an online community of practice create patterns and structures of communication and interactions. How members perceive those communication structures and patterns influence their attitudes, and behaviors to exchange and combine information within the community.

The structural links created by interpersonal interaction and an individual's position within that structure are predictors of collective action and responsibilities (Burt, 1992; Putman, 1995; Reagans and McEvily, 2003). In a study of knowledge contribution in electronic communities, Wasko and Faraj (2005) argued that the position of an individual in a social network will influence their participation in the community. Similarly, in an online community of practice, a member's position in the social network can motivate exchange and combination behaviors. Structural ties among members of a community of practice can facilitate the transfer of knowledge and encourage members to share personal experiences and knowledge.

Structures and connections are established as community members interact, share information, tell stories about their experiences, seek help and advice, and help each other (Wasko and Faraj, 2005). Some of those structures may be strong, others may be weak; nonetheless, those structural ties encourage information exchange and combination. Thus, structural capital in an online community of practice can facilitate the transfer of tacit and explicit knowledge and also motivates exchange and combination behaviors. Following this logic,

this study advances hypothesis H2:

**H2:** Structural capital has a positive impact on exchange and combination behaviors in an online community of practice.

In an online community of practice, cognitive capital encompasses the shared understanding and meaning among members of the community. Although members of an online community of practice are driven by shared interests around a practice, they also come from different backgrounds and are influenced by context and personal experiences. Consequently, shared meaning, mutual understanding, and a common language are necessary for effective communication. Prior studies provide ample evidence that common language, shared understanding, common culture, and shared goals facilitate the exchange and combination of information (Nonaka, 1994; Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998).

In online communities of practice, when members have common understanding about the practice and professional domain, they are more likely to exchange and combine information. Reagans and McEvily (2003) averred that common knowledge or shared understanding facilitates the transfer of knowledge. Inkpen and Tsang (2005) also noted that shared culture and shared goals can facilitate knowledge sharing among organizations. Other studies have underscored the importance of shared language and context in knowledge exchange and sharing (Orr, 1996; Nahapiet and Ghoshal, 1998). Individuals are more likely to share information and exchange ideas if they share a common understanding and language (Sabherwal and Becerra-Fernandez, 2005; Wasko and Faraj, 2005; Chiu et al., 2006; Roberts et al., 2008). Thus, the current study expects that the shared understanding among members of an online community of practice facilitates exchange and combination behaviors.

When cognitive capital is high, it is easy for members to interact and understand each

other. As members of online communities of practice interact, norms and values emerge that shape attitudes and behaviors. Shared understanding and common language enable members of those communities of practice to internalize community norms, and negotiate their interactions within the community. Understanding the norms and values of the community requires a shared understanding and language (Coleman, 1988). Mutual understanding of obligations and shared behavior expectations are defined and understood as cognitive capital increases with personal interaction (Wasko and Faraj, 2005; Roberts et al., 2008).

Higher levels of mutual understanding among members of a collective facilitate dialogues, story telling, exchange, and combination of knowledge. As members of an online community of practice share and exchange stories and ideas, the community develops a shared understanding, common vocabulary, systems of meaning, and mutual interpretations of the dialogue and the discourse. Cognitive capital can ameliorate some of the barriers and challenges to knowledge exchange, codification of tacit knowledge, and the combination of knowledge in an online community of practice. This study expects that as common and shared understanding increase among members of a community of practice, exchange and combination behavior will also increase. This relationship is formally stated and tested in hypothesis H3;

**H3:** Cognitive capital has a positive impact on exchange and combination behaviors in an online community of practice.

The knowledge and information generated through interpersonal interaction within communities of practice are inherent to the community and members of the community and may enhance the capacity of the members to be effective in their jobs. The combination and exchange of information and knowledge within an online community of practice create both tacit and explicit knowledge. Exchange is the transfer of explicit knowledge among individuals (Nonaka,

1994; Nahapiet and Ghoshal, 1998; Sabherwal and Becerra-Fernandez, 2005). Combination involves the integration of explicit and tacit knowledge leading to the creation of new knowledge (Nonaka, 1994; Nahapiet and Ghoshal, 1998).

Combination can create new knowledge by linking previously unconnected knowledge together to create new knowledge (Collins and Smith, 2006). Knowledge creation through exchange and combination can create value and eventually lead to individual and organizational performance (Grant, 1996b; Tsai and Ghoshal, 1998; Sabherwal and Becerra-Fernandez, 2005; Collins and Smith, 2006). Moreover, the transfer and application of that knowledge to the execution of a task or problem solution adds value and can enhance the capacity of the recipient (Szulanski, 1996; Argote and Ingram, 2000).

In the context of online communities of practice, when members engage in exchange and combination behaviors, they transfer and integrate knowledge, information, and ideas within the communities through dialogues, conversations, and interpersonal interactions. The transfer and integration of information and knowledge within an online community of practice exposes members to more information and knowledge. The exchange and combination processes create value and enhance the capacity of the members as well as the community. The enhanced capacity due to exposure to new sources of information and integration of knowledge and information increases individual performance.

When knowledge is shared, transferred, and integrated to create new knowledge, the capacity of an online community of practice to support individual members also increases. Hence, members may view their communities positively and feel that their communities are performing as expected. Following this logic, it is expected that combination and exchange of behaviors within an online community of practice will enhance the effectiveness of the community and

members. Those relationships are formally stated in hypotheses H4 and H5;

**H4:** Exchange and combination behaviors have a positive impact on individual performance.

**H5:** Exchange and combination behaviors have a positive impact on community performance.

Although exchange and combination behaviors can potentially increase individual performance, it is only when the knowledge is transferred and applied across the organization that these performance gains can be realized. Szulanski (1996) argued that knowledge transfer is contingent on the source of the knowledge, the recipient of the knowledge, the nature of the knowledge, and the context. According to Szulanski (1996), the context encompasses the organizational structures, processes, and environment that may facilitate or hinder the transfer and application of knowledge. It has also been noted that individual characteristics, organizational structures, technology, social ecology, organizational culture, and routines within an organization can dramatically affect the transfer and application of knowledge (McDermott, 1999; Gupta, 2000; Brown and Duguid, 2000; Alavi and Leidner, 2001).

The transfer and application of knowledge is not easy, especially when knowledge is tacit and context specific. Explicit knowledge is codified and does not present the challenges of transfer and application posed by tacit knowledge (Grant, 1996b; Sabherwal and Becerra-Fernandez, 2005). The real value of knowledge embedded in online communities of practice lies in the transfer and application of that knowledge across the organization. Consequently, the capabilities of an organization to transfer and apply knowledge across the organization are important in enhancing individual and community performance outcomes. This capability is dependent on the absorptive capacity.

Absorptive capacity encompasses the abilities of individuals and organizations to

recognize the value of new knowledge generated by communities of practice, integrate that knowledge into existing knowledge structures, and also apply that knowledge in task execution, problem-solving, and organizational routines. It is the interaction of the absorptive capacity and the knowledge generated by communities of practice that enhances individual and community performance outcomes.

In addition to the absorptive capacity of individuals, processes, structures, organizational culture, technology and managerial orientation also facilitate the transfer and application of knowledge. Those elements of absorptive capacity are instrumental in the transfer of knowledge from online communities of practice and the application of that knowledge across an organization. Lack of those enabling organizational capabilities can stifle the transfer and application of knowledge across the organization. Thus, the performance impact of knowledge engendered by a community of practice is moderated by the absorptive capacity of an organization. Those relationships are hypothesized in H6 and H7;

**H6:** The positive impact of exchange and combination behaviors on individual performance is moderated by absorptive capacity, such that the impact is amplified when the levels of absorptive capacity is high.

**H7:** The positive impact of exchange and combination behaviors on community performance is moderated by absorptive capacity, such that the impact is amplified when the levels of absorptive capacity is high.

Knowledge is considered an important resource for most organizations (Grant 1996; Nonaka, 1996; Davenport and Prusak, 2005). Knowledge plays an important role in the resolution of problems, innovation, creativity, effective decision making, and research and development. Hence, many organizations undertake knowledge management projects and adopt knowledge management strategies. Online communities of practice are one of the several strategies that organizations initiate to manage knowledge. The performance outcomes of

exchange and combination behaviors in a community of practice are dependent on the absorptive capacity.

### **Study Design**

A pilot study was conducted to ensure that the questionnaires in the survey for the study have been appropriately refined to suit the context of the study. A group of graduate students were asked to review the online survey for the study and provide feedback. A total of 30 participants completed the survey and provided feedback and suggestions. Based on the feedback of participants in the pilot study, some of the questions in the surveys were revised. A second pilot study was conducted with some of the same participants. A total of 20 participants reviewed and completed the survey in the second pilot study. Feedback from participants in the second pilot study did not require changes to the survey.

Participants for the actual study were recruited from a number of online communities of practice. Request for participants and a link to an online survey were sent to community managers and forum moderators of a number of online communities of practice to be distributed to members. The survey was completed by 194 participants from five online communities of practice. Out of the 194 participants, 165 were recruited from Spiceworks, 21 from Project Management Institute (PMI). Spiceworks is an online community of practice for IT professionals from small to medium size business. The community has several categories of forums, including cloud computing, databases, email, hardware, Linux, virtualization, programming, and security.

Additionally, four participants were recruited from Bank of America Small Business Community, two participants from Flexera Software Community, and two participants from Cisco Learning Network. Seven of those surveys were excluded from the analysis because they were incomplete, thus 187 observations were used for the analysis.

Among the participants, 60 percent were males and 40 percent were females. Twelve percent of the participants have completed only high school, 32 percent have some university education, 20 percent have completed undergraduate education, and 35 percent have some post graduate education. The ages of the participants are distributed as follows: 12 percent are between the ages of 18 and 20; 55 percent are between the ages of 21 and 30; and 17 percent are between the ages of 31 and 40; 11 percent are between the ages of 41 and 50; and 5 percent are above 50 years of age

## **Measures**

The analysis was done using structural equation modeling with maximum likelihood method in Stata/IC 12.1 for Windows. The constructs in this study were measured by scales developed and tested in prior studies, and all responses were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The number of observations, means and standard deviation for all the items in each scale are listed in Table 1.

The items in all the scales were tested for reliability by evaluating the loading of each observed item to ensure that it loaded reasonably high. Loadings of observed indicators below 0.6 ( $\lambda < 0.60$ ) were examined in relation to other loadings on the construct to ensure that the average variance extracted (AVE) is at least 0.5. Observed indicators with low loadings were excluded from the measurement model.

Social capital was conceptualized with three dimensions: relational capital; structural capital; and cognitive capital. Relational capital was measured by a five-item scale developed by Kale et al. (2000). Two items in the scale were dropped and three were retained. The mean and standard deviation for the scale are reported in Table 1. Structural capital was assessed by a scale developed by Chiu et al. (2006) and adapted to the context of this study. The scale consisted of



four items and after a review of the factor loadings one item was dropped from the scale. As reported in Table 2, the reliability of the three-item scale is 0.79. The cognitive dimension of

Table 1: Descriptive Statistics*		
Items	Mean	Std. Dev.
Relation2	3.57	0.97
Relation3	3.50	1.04
Relation4	3.63	0.87
Struct1	3.56	1.02
Struct2	3.67	1.01
Struct4	3.73	0.96
Cognit3	3.92	0.85
Cognit4	3.94	0.83
Cognit6	3.87	0.90
Exch1	3.83	0.88
Exch2	3.68	0.95
Exch3	3.66	0.96
Exch4	3.84	0.91
Exch5	3.84	0.88
Exch6	3.89	0.86
IndPerf1	3.60	0.96
IndPerf2	3.51	0.94
IndPerf3	3.63	0.92
Acap1	3.49	0.94
Acap2	3.61	0.94
Acap3	3.68	0.89
Acap4	3.67	0.85
ComPerf1	3.56	0.94
ComPerf2	3.59	0.96
ComPerf3	3.60	0.99
ComPerf4	3.66	0.96

\* 187 observations

social capital was measured by a six-item scale developed by Chiu et al. (2006) and Tsai and Ghoshal (1998). Three items in this scale were dropped because of low factor loadings; the alpha value for the revised three-item scale is 0.77.

	1	2	3	4	5	6	7	AVE	$\alpha$
1. Exchange	<b>0.74</b>							0.54	0.88
2. Relational	0.52	<b>0.71</b>						0.50	0.72
3. Structural	0.49	0.58	<b>0.75</b>					0.57	0.79
4. Cognitive	0.73	0.41	0.44	<b>0.76</b>				0.58	0.77
5. Individual Performance	0.24	0.24	0.06	0.12	<b>0.84</b>			0.71	0.85
6. Community Performance	0.34	0.34	0.40	0.19	0.51	<b>0.82</b>		0.67	0.89
7. Absorptive Capacity	0.31	0.28	0.30	0.20	0.35	0.38	<b>0.73</b>	0.54	0.78

Square root of the AVE in the diagonal;  $\alpha$  = Cronbach's Alpha  
\*AVE =  $\Sigma(\lambda^2) / \Sigma(\lambda^2) + \Sigma(1 - \lambda^2)$  (Chin 1998)

Exchange and combination was assessed by a six-item scale developed by Collins and Smith (2006). The scale was adapted to the context of communities of practice, and it measured perceptions of information exchange and combination behaviors among community members. All the items in the scale loaded fairly well and were retained. As reported in Table 2, the alpha for this scale is 0.88. Absorptive capacity was measured with a six-item scale adapted from Szulanski (1996). Two items were excluded from the scale because of low loadings. Four items were retained and the alpha for the four-item scale is 0.78. Absorptive capacity is measured as a uni-dimensional construct although the definition implied a multidimensional construct. The six items in the uni-dimensional scale are intended to tap into all the dimensions of the construct. Although two items were excluded from the scale, the remaining items fairly tap into the three dimensions of the construct.

Individual performance was assessed with a five-item scale adapted from Davis (1989), and Gefen and Ragowsky (2005); two of the items were dropped. Community performance outcome was measured by a four-item scale adapted from Goodhue and Thompson (1995). The alpha ( $\alpha$ ) values for the scales are listed in Table 2. The questionnaires for all the scales are listed in Appendix A.

Absorptive capacity is an organizational level construct and community performance is a community level construct, however, both constructs are measured at the individual level. Thus, the unit of analysis for absorptive capacity and community satisfaction is at the organizational and community levels respectively, and the level of analysis is at the individual level. This study relied on individuals to collect data on absorptive capacity and community satisfaction because of the focus on individuals' perceptions of their organizations' absorptive capacity and the influence of those perceptions on the individuals' satisfaction with a community.

A measurement model was tested to ascertain how well it fits the data. The baseline measurement model in which none of the error terms were correlated was refined by correlating the error terms and the latent variables. The error terms and latent variables were correlated based on the values of the modification indices and the p-values of the covariances. Modification indices above 8 were examined and the items involved covaried. The covariances included in the measurement model are listed in the footnote<sup>3</sup>. The measurement model was evaluated by a set of fit indices.

The fit indices include RMSEA, CFI, TLI, SRMR, chi-square, and relative chi-square. For the RMSEA and SRMR indices, values less than or equal to 0.05 are considered good; and values less than or equal to 0.08 are considered fair (Byrne, 1998; MacCallum et al, 1996). For the Tucker-Lewis Index (TLI), values above 0.95 are good fitting models, and values between 0.90 and 0.95 are considered fair. Models with values below 0.90 are unacceptable (Bentler and

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<sup>3</sup> (RELATE\*COGNITIVE RELATE\*STRUCT RELATE\*ACAPZ RELATE\*EXCHANGE RELATE\*COMM\_SAT RELATE\*INDIV\_SAT COGNITIVE\*STRUCT COGNITIVE\*ACAPZ ) (COGNITIVE\*EXCHANGE COGNITIVE\*COMM\_SAT STRUCT\*ACAPZ STRUCT\*EXCHANGE STRUCT\*COMM\_SAT ACAPZ\*EXCHANGE ACAPZ\*COMM\_SAT ACAPZ\*INDIV\_SAT EXCHANGE\*COMM\_SAT INDIV\_SAT\*ACAPZ COMM\_SAT\*INDIV\_SAT EXCHANGE\*INDIV\_SAT ) (e.cpf1\*e.cpf3 e.cpf3\*e.cpf4 e.ccg6\*e.ccg3 e.acapz1\*e.acapz3 e.crl2\*e.crl3 e.crl2\*e.crl4 e.ipf1\*e.ipf3 e.acapz4\*e.acapz3 e.acapz1\*e.acapz4)

Bonnet, 1980; Schumacker and Lomax, 2004). More recent suggestions state that the cut-off criteria should be  $TLI \geq .95$  (Hu and Bentler, 1999). The CFI should be at least 0.90 to accept a model (Bollen, 1989). This value indicates that the model captures 90 percent of the covariances in the data. More recently a value of  $CFI \geq 0.95$  is recognized as indicative of good fit (Hu and Bentler, 1999). In general, for the TLI and CFI values, models with overall fit indices of less than .9 are inadequate (Bentler and Bonett, 1980; Hooper et al., 2008).

There are no consensuses on the cut-off criteria for many of these fit indices, however, there seems to be a range of values that are deemed acceptable or unacceptable. For example an RMSEA value of 0.09 or CFI value of 0.85 is an unacceptable fit index. There is an on-going discussion on the threshold values for some of those fit indices and what the appropriate cut-off values should be and whether these cut-offs should be generalized to all models and all disciplines (Lance et al., 2006; Fan and Sivo, 2007).

The model was evaluated with a combination of fit indices recommended by Hu and Bentler (1999). The chi-square and p-value for the measurement model were [ $\chi^2 (270) = 469.36$ ;  $p\text{-value} > 0.05$ ]. The chi-square and corresponding p-value indicated that the model is not a good fitting model. However, because of the sensitivity of the chi-square test, the chi-square test must be interpreted cautiously. The relative or normed chi-square minimizes some of the drawbacks of the chi-square measure of model fitness. The relative chi-square index is computed by the ratio of the chi-square and degrees of freedom ( $\chi^2/df$ ). Although there is no consensus regarding an acceptable ratio for this statistic, it is recommended that the relative chi-square value for acceptable models be equal to or less than three [ $\chi^2/df \leq 3$ ] (Ullman, 2001; Carmines and McIver, 1981).

The fit indices for the revised measurement model are as follows: [RMSEA = 0.06; CFI =

0.92; SRMR = 0.06; TLI = 0.90;  $\chi^2 / df = 1.74$ ]. The RMSEA and the SRMR values are all within the threshold of good fitting models. The relative chi-square value of 1.74 is also within the range of a good fitting model. Both the TLI and CFI are below 0.95, but they meet the 0.90 value, thus, the measurement model is acceptable. The observed indicators and latent items in the measurement model are used for the analysis of the measurement scale and hypotheses.

The alpha value for each scale meets the threshold value of 0.7 recommended in prior studies (Hair et al., 2006). A correlation matrix and the AVE for each latent construct are listed in Table 2. Convergent and discriminant validity are evaluated by two criteria. First, the square root of the AVE by a construct from its indicators should be at least 0.70. Secondly, the square root of the AVE should exceed that construct's correlation with other constructs (Chin, 1998; Fornell and Larcker, 1981). The square roots of the AVEs are listed in the diagonal in Table 2. Based on the results reported in Table 2, all the scales meet the required threshold for convergent and discriminant validity.

### **Hypotheses Testing**

In this section the hypotheses advanced are evaluated and tested using a moderation model. The hypotheses are evaluated by reviewing the size, direction and significance of the path coefficients. The moderation model is developed using the steps followed by Mathieu et al. (1992) and reviewed by Cortina et al. (2001). The method recommends that for each of the latent constructs, the observed items for the construct are summed up and then standardized. As shown in Figure 2, absorptive capacity moderates the impact of exchange and combination behaviors on individual and community performance outcomes.

$$r_{\xi_1, \xi_2} = [(r_{\xi_1, \xi_1} * r_{\xi_2, \xi_2}) + r_{\xi_2, \xi_2}^2] / (1 + r_{\xi_2, \xi_2}^2)$$

Where  $r_{\xi_1, \xi_2}$  is the reliability of the product and  $r_{\xi_1, \xi_1}$  and  $r_{\xi_2, \xi_2}$  are the reliabilities of the components of the product and  $r_{\xi_2, \xi_2}^2$  is the square of the correlations between the components of the product. This value is used to set the lambda ( $\lambda$ ) value for the path from the latent product to its indicators. Hence, the observed indicators for exchange and absorptive capacity are summed up and standardized to create a new composite standardized scale for each construct. The measurement properties, i.e. the lambdas ( $\lambda$ ), for these composite scales are fixed using the square root of the scale reliabilities. The method is well documented by Cortina et al. (2001).

As depicted in Figure 1, the research model includes path from three exogenous variables (cognitive capital, structural capital, and cognitive capital) to exchange and combination behaviors. The model also includes paths from absorptive capacity to individual and community satisfaction. Additionally, the model includes paths from the product terms of exchange and combination behavior, and absorptive capacity to community and individual performance. The model was refined iteratively by evaluating the modification indices and p-values for the covariances. The covariances for the error terms and latent variables for the revised model are listed in the footnote below<sup>4</sup>.

The fit indices for the moderation model are [chi-square (136) = 260.45, p-value > 0.05; RMSEA = 0.07; CFI = 0.92; SRMR = 0.08; TLI = 0.90;  $\chi^2/df = 1.92$ ]. With the exception of the chi-square test, all the other fit indices are acceptable and within the threshold of recommended values for an acceptable model. Furthermore, two alternative models were evaluated.<sup>5</sup>

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<sup>4</sup> (RELATE\*COGNITIVE RELATE\*STRUCT RELATE\*ACAPZ COGNITIVE\*STRUCT COGNITIVE\*ACAPZ STRUCT\*ACAPZ ) (e.cpf3\*e.cpf4 e.cpf1\*e.cpf3 e.ccg3\*e.ccg4 e.crl1\*e.crl4)

<sup>5</sup> The first alternative model included only the main effects of absorptive capacity on the two aspects of performance. This alternative model had a higher chi-square to degrees of freedom

To account for control variables that may influence individual satisfaction and satisfaction with a community, levels of education, age, gender, and type of community were included in the model as control variables. When those control variables are included in the model, the fit indices are [chi-square (244) = 399.83, p-value > 0.05; RMSEA = 0.06; CFI = 0.91; SRMR = 0.06; TLI = 0.87;  $\chi^2 / df = 1.92$ ]. The TLI and CFI decreased, but the RMSEA and SRMR increased when the control variables are included in the model. As presented in Table 3, all the control variables are insignificant, thus the model without the control variable fits the data better than the model with the control variables.

## Results

None of the control variables influences individual satisfaction or satisfaction with an online community of practice. The results of the path coefficients are reported in Table 3 and also presented in Figure 2. Only one of the paths from the three dimensions of social capital (cognitive, relational, and structural) to exchange and combination behaviors was significant. As depicted in Figure 2, the path coefficient between cognitive capital and exchange and combination behavior is 0.80 (p-value < 0.01), providing support for hypothesis H3. Hypothesis H2 posits a positive relation between relational capital and exchange and combination. As

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ratio (2.11), a higher RMSEA (0.08), and a higher SRMR (0.09). The chi-square difference test between this model and the moderation model was non-significant. In light of this, and the significant interaction effects in the moderation model, the results from the moderation model were preferred. The second alternative model excluded the main effects of absorptive capacity on the two aspects of performance, and only included paths from the interaction between absorptive capacity and exchange and combination to the two indicators of performance. This alternative model also had a higher chi-square to degrees of freedom ratio (1.97), and SRMR (0.09) was also higher. The chi-square difference test between this model and the moderation model was non-significant. The moderation model has both direct paths and interaction paths to the two indicators of performance, hence it is more comprehensive. Thus, the results presented in the essay are preferred over the results from either of the alternative models.

reported in Table 3, hypothesis H2 was not supported, the value of the path coefficient is 0.08 (p-value > 0.10). As presented in Table 3, the hypothesized relationship between structural capital and exchange and combination was also not supported, the value of the beta coefficient is 0.09 (p-value > 0.10), thus, hypothesis H1 is not supported.

Table 3: Path coefficient			
	<u>Exchange</u>	<u>Individual Performance</u>	<u>Community Performance</u>
Structural	0.09		
Relational	0.08		
Cognitive	0.80***		
Absorptive Capacity		0.36***	0.37***
Exchange		0.15*	0.25***
Exchange X Absorptive		0.29***	0.25***
PMI		0.15	0.13
Spice		0.09	0.14
Cisco		0.06	0.12
BoA		- 0.03	- 0.01
Gender		- 0.06	0.0
High School		0.31	0.05
Undergraduate		0.44	- 0.02
Bachelors		0.47	0.11
Post-graduate		0.51	0.09
Age		0.01	- 0.01

\*p < 0.10; \*\*p < 0.05; \*\*\*p < 0.01

Notes: There are five communities, thus four dummy variables were created for the communities, and the reference group is Flexera Software Community. ( PMI = Project Management Institute; Spice = Spiceworks community; Cisco = Cisco Learning Network; BoA = Bank of America Small Business Community) Education has five categories, thus four dummy variables were created, and the reference group is the Other category. The age variable is a continuous variable (1 = 18-20; 2 = 21-30; 3 = 31-40; 4 = 41-50; 5 > 50) and the reference group for the gender category is male



These results indicate that cognitive capital is a stronger predictor of exchange and combination behaviors than relational or structural capital. This suggests that when members of online communities of practice have shared understanding and common knowledge they are more likely to engage in exchange and combination behaviors. Hypothesis H4, the positive effect of exchange and combination on individual performance outcomes was supported. As reported in Table 3 and presented in Figure 2, the hypothesized relationship is moderately significant, the value of the beta coefficient is 0.15 (p-value < 0.10).

The interaction of absorptive capacity and exchange and combination has a positive effect on individual performance as hypothesized in H6. The value of the path coefficient for that relationship is 0.29 (p-value < 0.01). This result implies that although members of online communities of practice did not feel that exchange and combination will increase their performance. However, they feel that their performance is dependent on organizational capabilities to identify, integrate and exploit knowledge generated by the community.

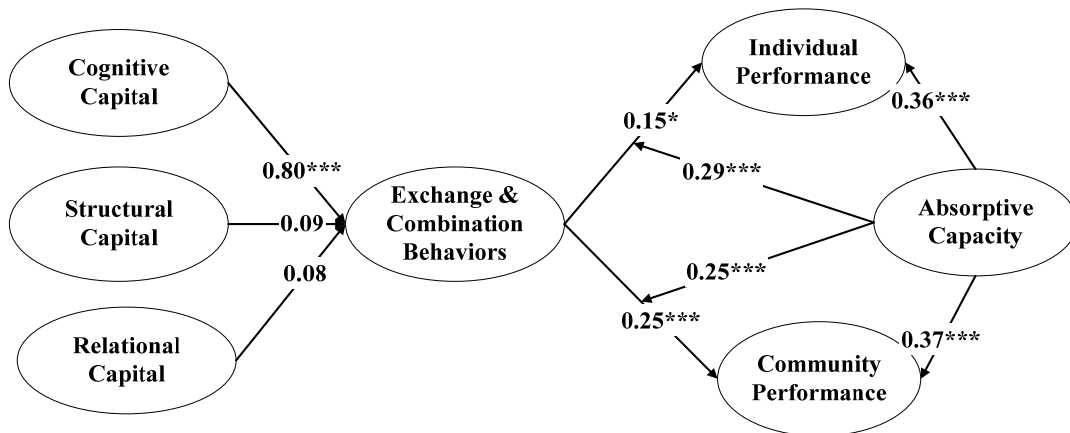


Figure 2. Path coefficient in moderation model. The model does not include the control variables. The control variables are listed in Table 3. \*p < 0.10; \*\* p < 0.05; \*\*\* p < 0.01

Exchange and combination has a positive effect on community performance, the beta coefficient is 0.25 (p-value < 0.01), thus providing support for hypothesis H5. For hypothesis H7,

the positive impact of the interaction term on community performance, the value of the path coefficient is 0.25 ( $p$ -value  $< 0.01$ ), providing support for the hypothesis. The interaction term between absorptive capacity and exchange and combination has a positive impact on both individual and community performance. As reported in Table 3 and presented in Figure 2, most of the hypotheses advanced in this study were supported by the model, except for hypotheses H1 and H2.

### III. **ONLINE COMMUNITIES AND KNOWLEDGE SEEKING AND SHARING**

Knowledge seeking and sharing are important and integral part of knowledge management. Knowledge management involves four basic processes of storing, retrieving, transferring and applying knowledge (Alavi and Leidner, 2001). Sharing and seeking knowledge are necessary for the four basic processes of knowledge management to occur. Thus, understanding the motivation for knowledge seeking and sharing behaviors in online communities has implications for knowledge management studies, especially in the context of online communities. It is the focus of this study to explore the personal and social psychology perspectives together to explain knowledge seeking and sharing behaviors and also provide a broader explanation of behavior motivation in online communities. Social identity is one of the socio-psychological perspectives often used to explain behavior motivations.

#### **Social Identity Theory**

Tajfel (1978) advanced the social identity theory to explain self-concept, attitudes and behaviors. The socio-cognitive process of how individuals develop social and personal identities, the implications on inter-group and intra-group dynamics, and the consequences on attitudes and behavior have been examined using the social identity theory. Tajfel (1981) defined social identity as “an individual self-concept which derives from his membership of a social group together with the value and emotional significance attached to that membership” (p.255).

The definition of social identity implies that the cognitive awareness, the value, and emotions attached to social identification with a group are fundamental to the awareness of self-concept. The cognitive, evaluative, and affective implications of social identity influence behavior, attitudes, and group interaction. The processes and mechanisms of defining ourselves and developing an identity are central to creating self-concept, which in turn defines our

behavior and intentions.

The groups that we associate with define our personal identity. Since most people associate with several social groups, self-concept is a combination of concentric levels of social identifications (Ashforth and Mael, 1989; Hogg et al., 1995). We define our social and personal identities based on the context and situation, and the social groups and identities that are most salient define attitudes and behaviors. Individuals self-regulate their behaviors based on the values and norms of the salient social group or identity.

Individuals segment their social environment to facilitate the process of defining themselves and others, and eventually how they interact and behave in any social context (Ashforth and Mael, 1989). These behaviors and attitudes are the results of the affective, cognitive and evaluative components of social identity (Bagozzi and Dholakia 2002; Jenkins, 2008). Prior studies acknowledged that social identity is a multi-dimensional construct with three conceptually different dimensions (Ellemers et al., 1999; 2004; Bergami and Bagozzi, 2000). Social identification comprises of three interactive psychological processes: cognitive; evaluative; and affective. Each of those processes influences the social identity individuals assume and consequent impact on behavior intentions.

### **Cognitive social identity**

Self-identity, according to the social identity theory, is based on social identification and how we define our identities in relation to social groups (Tajfel, 1978; Ashforth and Mael, 1989). The concept of the self and others are relative and comparative attributes. Jenkins (2008) defined identity as “the human capacity – rooted in language – to know who is who and hence what is what” (p.5). Social identity influences our motives, attitudes and behaviors. The cognitive processes of identifying and classifying others determine how we treat others in social

interaction. The social identities we assume for ourselves and ascribe to others influence our social interactions and behaviors.

The awareness and identification with a social group leads to self-categorization. Self-categorization is a cognitive process that facilitates personal identification as well as identification with a group (Bergami and Bagozzi, 2002). Categorization of oneself as a member of a group is a cognitive process that differentiates oneself from others and it is fundamental to the perception of in-group similarities and distinction from out-groups (van Knippenberg, 2000; Ellemers et al., 2004).

The concept of the self is a product of the interaction of social identity and personal identity. Self-concept is a combination of personal and social identification (Sierra and McQuitty, 2007). The nebulous boundary between social and personal identities enables individuals to adjust and redefine their identities through social interaction (Whetten and Godfrey, 1998). The cognitive process of identifying others and ourselves shape our social identity.

Cognitive social identity involves the identification with a social group or a sense of belonging to a group and the internalization of group norms, values and attitudes and an inclination to behaviors in support of collective goals. When we identify with a social group, our self-concept is linked to that group, and we are more likely to pursue interests that are compatible to the interests of the group.

When social identification with a group is salient, self-concept is defined in relation to that in-group and the norms and values of that group are assimilated. Attitudes, beliefs, and perceptions are congruent to the in-group and behaviors are aimed at fostering the interest and goals of the in-group. When group identification becomes less salient, behaviors, perceptions and

beliefs are influenced by personal and idiosyncratic characteristics. Membership of a group can be deactivated cognitively, thus making membership in the group less salient in the definition of self-concept (Terry et al., 1999; van Knippenberg, 2000).

As individuals interact with their environments, they go through a process of organizing and categorizing the self and their social environments to enable them relate to events or situations. People define and assess themselves in terms of others and group associations, they internalize the norms and values of groups, and also act to support the collective interests of groups. Social categorization determines what groups and collective goals are salient and when collective goals supersede individual and personal goals.

### **Evaluative social identity**

Self-identity is based on the existence of the self in a social context and interaction with in-groups and comparison to out-groups (Stets and Burke, 2000). The comparison and evaluation of social groups are fundamental to developing and projecting social identity. Through evaluative social identity, people evaluate their membership in a group negatively or positively. This process of ascertaining the value of a membership in a group is the basis of the evaluative dimension of social identity.

Individuals identify with social groups partly to enhance their self-esteem. The potential to enhance self-esteem through social identification is much stronger when the social group is presumed to be prestigious. Thus, individuals can enhance their self-esteem by identifying with a prestigious social group (Mael and Ashfort, 1992). Due to the desire to enhance our self-esteem, when we assess whether to identify with a group, evaluate the value associated with identifying with the group, and compare that with the value of not identifying with the group or identifying with an alternative group. This comparison and evaluative process is an integral part of social

identification and how we form social identities.

Brown (2000) noted that people have a desire to maintain positive social identity to enhance their self-esteem. Positive social identity develops partly from the favorable comparison of the in-group and relevant out-group. The evaluative process of social identity is derived from the in-group bias and the perception that the in-group is comparably better than the out-group. Hence, intergroup differentiation provides a basis for self-esteem in social identity.

People feel much better about themselves because they perceive the in-group more favorably than they perceive the out-group. The evaluative processes of comparing the in-group to the out-group, and the inclination to perceive the in-group favorably are sources of self-esteem (Brown, 2000). Evaluative social identity, though normative, is a source of self-esteem in social identity theory (Bagozzi and Dholakia, 2002). The self-worth that an individual associates with a membership in a group influences identification with the group and also fosters behavior to support the welfare of the group.

Norms and values that guide behaviors are shaped by social comparison with other groups. Through classification of the social environment and positioning within that classification, people evaluate themselves and develop personal and social identity (Ashforth and Mael, 1989; Brown, 2000). The desire to identify with a social group to enhance one's self-esteem is encouraged by in-group bias. Self-enhancement through group membership and a desire to favor the in-group over the out-group forms the basis of the evaluative component of social identification.

The subjective belief that one's group is better than others are fundamental to self-esteem and the evaluative process in social identity (Brown, 2000). Individuals identify with a group to gain social esteem because they share in the status and reputation of the group. For example, it is

important for professionals, regardless of their expertise and experience, to identify with other professionals, as these associations are perceived as a measure of their competency. Other factors that contribute to social and personal identification are prestige, in-group status and inter-group competition. How individuals define and evaluate themselves influence their behaviors, attitudes and interests they pursue. The evaluative dimension of social identity is derived from the perceived distinctiveness and prestige associated with the in-group and inter-group competition (Ashforth and Mael, 1989; Jenkins, 2008).

### **Affective social identity**

The affective process of social identity involves the emotional attachment to a group, the definition of the self in terms of the group, and the perception of the self as a representation of the group (Bagozzi and Dholakia, 2002). Through affection and identification, individuals develop emotional attachment to a group (Jenkins, 2008). The evaluative and cognitive processes of social identification foster emotional attachment to a social group (Ellemers et al., 2004). As positive evaluation of social identification with a social group increases, the affective commitment and emotional attachment to the group also increases and the link between the concept of the self and group identity becomes stronger (Ellemers et al., 199).

The affective and emotional attachment to a group fosters a sense of pride, pleasure and satisfaction of being associated with the group. Emotional attachment and affective commitment to a group induce individuals to define part of their self-concept in relation to the group. Social identity through emotional attachment leads to passion, enthusiasm and fervor for the collective goals of the group as well as the willingness to pursue the interests of the group. The emotions and affect that individuals attach to social identify is an important predictor of behaviors and attitudes toward the in-group and out-groups.



The social identity perspective has been used in empirical and theoretical studies to examine and investigate employee behavior motivation and attitudes in organizations. The theoretical relationship between employee behavior and social identification in organizations suggests that when employees' social identity is emotionally bound with an organization, they are more likely to support organizational goals (Ashforth and Mael, 1989, Hogg et al., 1995). Empirical studies investigating the relationship between social identity and employee behavior provide further support that affective dimension of social identity influences behaviors and attitudes of employees (Alvesson, 2000; Bergami and Bagozzi, 2000).

Emotional attachment to a group does not always lead to desirable behavior outcomes. Due to the multiple loyalties and groups associated with emotional attachment and social identities, the salient social identity may not always be associated with the focal organization. Personal identity can also supersede social identity when individuals do not feel a sense of belonging to a group or an organization. Professional identification and loyalty to other groups and third parties can undermine employee commitment in organizations (Alvesson, 2000).

When individuals are not emotionally attached to a group, they are less likely to pursue the collective goals of the group, unless they are sanctioned or penalized to do so (Ellemers et al., 2004). The conclusions of a study conducted on job satisfaction among public service workers indicated that social identification foster in-group and out-group mentality and can undermine employee loyalty (Brunetto and Far-Wharton, 2002).

Group and individual performance in the workplace are also influenced by affective social identity. Workers and work groups may be more diligent in their duties because they are motivated by their attachment, identification with their work groups, and loyalty to their co-workers. Hence, affective social identity and loyalties to workgroups and co-workers can lead to

individual and group performance (van Knippenberg, 2000). There is ample evidence in prior literature that affective social identity influences attitudes, motivation and behaviors in organization. A study conducted by Bergami and Bagozzi (2000) concluded that social identity plays a mediating role between the antecedents and effects of organizational citizen behavior.

A common theme in studies examining social identity and behaviors in organizations is that as employees' identification with their organizations increases, they internalize the norms and values, and also support the goals of the organizations (van Knippenberg, 2000; Ellemers et al., 2004). Social identity also provides explanation for consumer behavior and purchasing intentions. Identification with a community can influence brand loyalty and purchase intentions. For example, identification with a university athletic team can influence attitudes towards the team and a penchant to purchase items related to the athletic team (Sierra and McQuitty, 2007; Heere et. al., 2011).

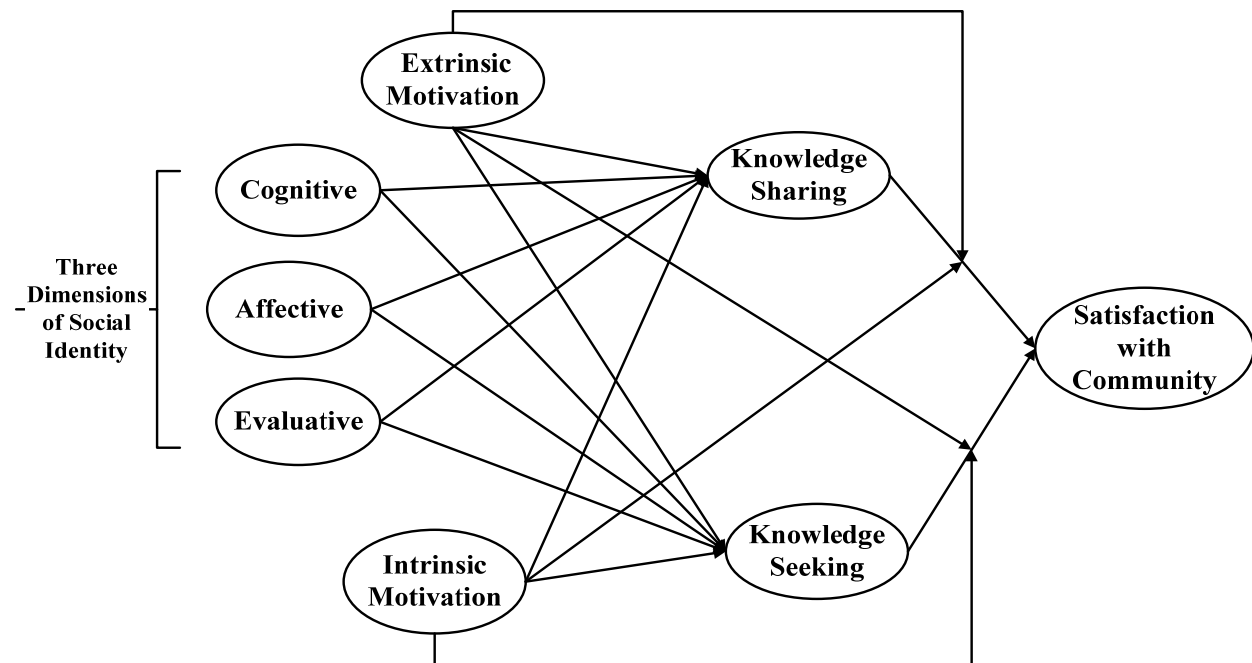


Figure 1. Research model. This model presents all the hypothesized relationships.

Drawing from these studies, the current study seeks to investigate how social identity influences knowledge seeking and sharing behaviors in online communities and the consequent impact on satisfaction. These relationships are depicted in the research model in Figure 1. In addition to social identity, individual motivation may also influence behaviors in online communities

### **Extrinsic and Intrinsic Motivations**

Human behavior and action are partly driven by personal motivations, thus, an examination of personal motivations has dominated attempts to understand human behavior and action (Pritchard et al., 1977; Ryan and Deci, 2000; Deci and Ryan 2000). Motivation is the “energy, direction, persistence and equifinality – all aspects of activation and intention” (Ryan and Deci, 2000b, p.69), Thus, motivation drives human behavior and is fundamental to perseverance in human action and behaviors. The definition of motivation also underlines the varied and multiple sources of motivation that drive human action or inaction. The motivations underlying human behaviors are driven by different goals and reasons, and are directed to the attainment of different goals. Personal motivations have been used to explain human behaviors in a variety of contexts.

The literature on personal motivations has drawn a distinction between intrinsic and extrinsic motivations (Pritchard et al., 1977; Ryan and Deci, 2000; Deci and Ryan, 2000). Behaviors that promote feelings of competency and self-determination are intrinsically motivated behaviors (Pritchard et al., 1977). Those behaviors include the need to be autonomous, competent, and relate to others, all of which are fundamental to social determination (Deci and Ryan, 2000). Behaviors driven by intrinsic motivations are perceived to be interesting, pleasurable and satisfying. Davis et al. (1992) define intrinsically motivated behaviors as the

“performance of an activity for no apparent reinforcement other than the process of performing the activity per se” (p.1112). Deci and Ryan (2000) defined intrinsically motivated behaviors as the “doing of an activity for its inherent satisfaction rather than for some separable consequence” (p.58).

Intrinsically motivated behaviors are fundamental to innate needs. These behaviors are enacted because individuals derive satisfaction and pleasure from engaging in the behaviors (Vallerand et al., 1992; Pelletier et al., 1995). The innate needs for humans to be autonomous, competent and connect to others are fundamental to intrinsically motivated behaviors. People have innate desires to realize certain goals and are intrinsically motivated to engage in behaviors and actions to attain those goals. Thus, individuals engage in intrinsically motivated behaviors because these behaviors are interesting in themselves and hence, satisfying (Pelletier et al., 1995).

In contrast to intrinsically motivated behaviors, extrinsically motivated behaviors are directed at securing tangible or intangible benefits that are not related to the behavior. Extrinsically motivated behavior is defined as the “performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself” (Davis et al., 1992, p.1112).

Many of the behaviors and activities that individuals engage in are extrinsically motivated. Behaviors directed towards the attainment of outcomes separate from the act are extrinsically motivated. In order to attain or realize certain goals, individuals engage in behaviors or actions unrelated to these goals. For instance, individuals may be motivated to engage in behaviors because of the potential for tangible rewards or benefits that may not be directly related to the act or behavior. Extrinsically motivated behaviors are directed towards the pursuit

of goals that are sensitive to consequences unrelated to the behavior. According to Deci and Ryan (2000b) extrinsically motivated behaviors “are not typically interesting, the primary reason people initially perform such actions is because the behaviors are prompted, modeled or valued by significant others” (p.73).

Tangible benefits, incentives, rewards, and the threat of social sanctions can all elicit extrinsically motivated behaviors. These extrinsically motivated behaviors are usually uninteresting behaviors. The focus of this study is to examine how extrinsic and intrinsic motivations influence knowledge seeking and sharing behaviors in online communities and the outcomes of these behaviors. Furthermore, this study investigates the moderating role of extrinsic and intrinsic motivations by examining how these motivations moderate the impact of knowledge seeking and sharing behaviors on satisfaction.

In information system research, intrinsic and extrinsic motivations have been used to explain behavior intention and actions. The technology adoption model (TAM) and various adaptation of the model have relied on extrinsic and extrinsic motivations to explain behavior intentions to adopt and use technology. TAM posits that perceived usefulness and perceived ease of use influence attitudes and intention to use technology (Davis, 1989).

The expectation that using a system will result in job performance is fundamental to perceived usefulness. Thus, the intention to use a technology because of the perception that usage can lead to positive performance outcomes is extrinsically motivated. On the other hand, perceived ease of use presumes that using a system is effortless and easy. Because users require less effort to use the system, they are likely to enjoy using the system. Hence, behaviors driven by perceived ease of use are intrinsically motivated behaviors (Teo et al., 1999; Venkatesh, 2000; Moon and Kim, 2001; van der Heijden, 2004; Shang et al., 2005).

Besides the intention to use a system, knowledge seeking and sharing behaviors, knowledge contribution behaviors, and member participations have been investigated using intrinsic and extrinsic motivations (Wasko and Faraj, 2000, 2005; Kankanhalli et al., 2005). In the open source software community, participation is motivated by a combination of intrinsic and extrinsic motivations. Members of open source community participate because they derive pleasure from the creativity of developing software for the community (Lakhani and von Hippel, 2003). Those studies underscore the importance of extrinsic and intrinsic motivations in explaining behavior intentions. This study builds on the prior literature by exploring how extrinsic and intrinsic motivations, and social identity influence knowledge seeking and sharing behaviors in online communities. Furthermore, this study also investigates the outcomes of knowledge seeking and sharing behaviors on satisfaction. Additionally, this study examines how extrinsic and intrinsic motivations moderate the impact of knowledge sharing and seeking behaviors on individual and community satisfaction.

### **Knowledge Seeking and Sharing in Online Communities**

Online communities are groups of people driven by mutual interests to come together to exchange ideas and information and support the achievement of collective goals in a virtual environment. Members of online communities usually do not meet face-to-face and computer technologies, such as chat, instant message, email, video conferencing, and bulletin boards, mediate their interactions (Preece and Maloney-Krichmar, 2003). There are many types of online communities with varying goals and objectives. While some of these online communities focus on specific domain of interest, others focus on a broad range of topics and are not limited by specific interests. Online communities cut across geographical boundaries and memberships are usually free and open to the public.

Online communities are different from face-to-face communities because they overcome the limitation of physical location and provide anonymity for users (Sproull and Faraj, 1997). The content of the discourse generated by online communities are sometimes accessible to the public, and membership is not required to peruse content. However, for most online communities, registration and membership are required for participation. Participation and memberships in online communities are voluntary, and members and users are free to disengage from these communities.

There are neither tangible incentives nor sanctions for not participating or rescinding membership. Although some online communities may have moderators, their roles are limited to policing the content with no formal authority over membership or participation. The anonymity provided by online communities gives members and users the freedom to behave as they choose. Hence, knowledge seeking and sharing behaviors in online communities are voluntary and not mandated or sanctioned by formal penalties.

Knowledge sharing involves making knowledge available to others and collaborating with others to solve problems (Cummings, 2004; Wang and Noe, 2010). The act of sharing knowledge involves divulging information and/or knowledge about personal experiences, beliefs and attitudes. In online communities, this act of sharing may be in response to questions or inquires on a topic of interest or just providing information perceived to be useful to members.

Knowledge seeking behaviors involves searching for information, help or advice in response to a need or an opportunity. Individuals seek knowledge to learn from the experiences of others (Wasko and Faraj, 2000). Knowledge seeking behaviors have implications on learning outcomes (Wasko and Faraj, 2000; Bock et al., 2005). When individuals seek and find knowledge that is useful, they internalize and learn from that knowledge, hence making them

more knowledgeable (Wasko and Faraj, 2000; Alevan et al., 2003).

Knowledge seeking can enhance the expertise of knowledge seekers, increase their knowledge base, and motivate them to share and contribute their knowledge (Wasko and Faraj, 2000; Bock et al., 2005). Knowledge sharing and seeking are both social processes that entail personal interactions among people, this is especially the case in online communities where seeking and sharing goes beyond dyadic relations. When members and users of online communities seek answers or request information, their requests are directed to the community as a whole and when they browse and search for relevant information, they are typically searching all the content generated by the community. Similarly, when members share their knowledge and experiences in online communities, they are interacting with the community as a whole.

Unlike online communities, organizations have formal structures, hierarchies and mechanisms that facilitate knowledge exchange (Nonaka and Takeuchi 1995; Nonaka, 1994). The firm based approach to examining knowledge creation underplays how specialized communities facilitated by network technologies are able to convene, interact and collaborate to create knowledge (Lee and Cole, 2003). Many online communities operate outside organizations and are mostly self-organizing; nonetheless, they provide members with the opportunity to exchange knowledge. Many online communities do not represent professional associations or groups, but are general interest communities focused on an area of interest or a range of interests. In spite of the lack of organizational structures, online communities foster and facilitate knowledge sharing and creation (Lee and Cole, 2003; Ren et. al., 2007).

Examining knowledge seeking and sharing behaviors and the motivations driving members of online communities to engage in these behaviors may provide further insights into



the mechanisms of knowledge exchange in self-organizing entities. Attempts to understand behavior motivation in online communities have been dominated by personal motivational and behavioral theories rooted in personality psychology.

Several of the studies in the prior literature on knowledge sharing and seeking in online communities have conducted their studies in the context of organizations. Hence, knowledge exchange and sharing in online communities that are not communities of practice or part of an organization have received relatively less attention.

**Table 1. A Sample of Studies on Behavior Motivation in Online Communities Since 2000**

<b>Authors and Year</b>	<b>Context</b>	<b>Types of Participation</b>	<b>Theoretical approach and perspective</b>	<b>Dependent Variable</b>
Wasko and Faraj, 2000	Online communities of Practice	Knowledge exchange	Moral obligation, community interest, perception of public good. Tangible and intangible returns, profession gains, lack of expertise,	Knowledge exchange
Bartol and Srivastava, 2002	Organizations	Knowledge sharing	Reward systems, intrinsic motivation	Theoretical study
Bagozzi and Dholakia, 2002	Online communities	Participation in community	We-intentions, based on social identity	We-Intentions
Ridings et al., 2002	Online communities	Give and get information	Trust, ability and benevolence	Desire to give information and get information
Ardichvili et al., 2003	Virtual knowledge-sharing communities in organizations	Participation in knowledge generation	Perception of knowledge as public good. Community and organizational interest, norms, organizations culture	Participation in knowledge generation
Ridings and Gefen, 2004	Online communities	Join a community	Exchange information, friendship, social support	Join online communities

**Table 1. (Continued) A Sample of Studies on Behavior Motivation in Online Communities Since 2000**

<b>Authors and Year</b>	<b>Context</b>	<b>Types of Participation</b>	<b>Theoretical approach and perspective</b>	<b>Dependent Variable</b>
Dholakia et al., 2004	Online communities	Consumer participation	Value perception group norms, social identity	Desires, we-intentions, participation behavior
Wasko and Faraj, 2005	Electronic network of practice	Knowledge contribution	Individual motivation and social capital	Knowledge contribution
Chiu et al., 2006	Online communities of professions	Knowledge sharing and knowledge quality	Social capital, social cognitive	Quality and quantity of knowledge sharing
Bagozzi and Dholakia, 2006	Linux User Group	Participation and we-intentions	Attitudes, emotions, perceived behavioral control, social identity	Visiting websites working with Linux, money spent on Linux, reading Linux literature
Ma and Agarwal, 2007	Online communities	Knowledge contribution	Technologies that support perceived identity verification	Knowledge contribution
Hsu et al., 2007	Online communities of professions	Knowledge sharing	Social cognitive theory, trust personal and environmental factors	Knowledge sharing behavior
Koh et al., 2007	Online communities	Posting and viewing	Leaders involvement, offline interaction, usefulness, IT infrastructure	Posting and viewing activity

A number of studies undertaken since 2000 to explain behavior motivation in online communities are listed in Table 1. Although not a comprehensive list of studies on behavior motivation in online communities, they reflect the trends and themes addressed by studies on

online communities and behavior motivations. As shown in Table 1, most of the studies have adopted different variants of personality psychological approaches to explain behavior motivations in online communities.

The desire to understand why users and members of online communities participate, contribute their time, and share information has led to several studies (Hendriks, 1999; Wasko and Faraj, 2000; Jarvenpaa and Staples, 2000; Lakhani and von Hippel, 2002; Bock et al, 2005; Kankanhalli et al., 2005; Ma and Agarwal, 2007). In a study of 27 online communities to understand why individuals participate and join online communities, study participants cited information exchange as the main reason for joining online communities (Ridings and Gefen, 2004). If information exchange is the main reason people join online communities, then investigating the motivation for knowledge seeking and sharing can inform research and practice.

General participatory behaviors have been studied to understand why users and members participate (Dholakia et al., 2004) or join online communities (Ridings and Gefen, 2004). Besides these general forms of participation, several studies have examined information and knowledge exchange behaviors (Wasko and Faraj, 2000, 2005; Bartol and Srivastava, 2002; Ridings et al., 2002; Chiu et al., 2006; Hsu et al., 2007). As shown in Table 1, most of the studies that have explored knowledge exchange and sharing, (e.g. Wasko and Faraj, 2000, 2005; Hsu et al., 2007), have done so in the context of communities of practice or online communities in the context of organizations. Only the study by Ma and Agarwal (2007) examined knowledge contribution in online communities that are not part of an organization.

The emphasis on personality psychology perspective to explain behavior motivation in online communities is a major theme in the prior literature on online communities and behavior

motivation. These perspectives emphasize on rewards, incentives, reputation, career advance, enjoyment, trust and self efficacy as drivers of knowledge exchange behaviors (Wasko and Faraj, 2000; Bartol and Srivastava, 2002; Ardichvili et al., 2003; Chiu et al., 2006; Hsu et al., 2007).

Relatively few studies used socio-psychological perspectives to explain behavior motivation in online communities. Social capital is one of the main socio-psychological perspectives often used to explain motivation and behavior in online communities (Wasko and Faraj, 2005; Chiu et al., 2006). Social identity is the other socio-psychological perspective that has been used to explain motivation and behaviors in online communities (Bagozzi and Dholakia, 2002; Dholakia et al., 2004).

The pursuit of collective goals and interests in online communities has been explained using social identification (Foster, 1996; Bergami and Bagozzi, 2000). Attitudes, behaviors and perceptions developed through social identification within an online community can influence member participation in these communities. Bagozzi and Dholakia (2002) opined that social identity is a powerful driver of desires and ‘we-intentions’ in online communities. The development of social identity and identification with an online community induce ‘we-intentions’ among members which motivate members to pursue the collective goals of the community rather than personal goals.

How online communities project their identities and facilitate social identification influences how members engage in community activities. Koh et al. (2007) noted that posting and viewing activities in an online community are influenced by social identification in offline interactions. According to the authors, face-to-face interactions foster social identification with an online community, which eventually influence intentions to participate in online community activities. Other studies have examined different types of behavior motivations in online

communities by using social identity (Bergami and Bagozzi, 2000; Bagozzi and Dholakia, 2002). Some studies integrate technology design and socio-psychological perspectives to explain behavior motivation in online communities (Ma and Agarwal, 2007; Koh et al., 2007).

This study draws on the prior literature on knowledge exchange in online communities; however, it takes a different approach by exploring and examining the motivation for knowledge sharing and seeking behaviors in online communities and the impact of those behaviors on satisfaction. Although prior literature has examined the motivation for participation and knowledge exchange behaviors in online communities, it has done so in the context of organizations. More so, relatively few studies have examined personal and social psychological factors together in the same study. Since knowledge seeking and sharing behaviors in online communities are social processes involving personal interaction among members, personal and social psychological perspectives may shed more light on these behaviors.

It is the focus of this study to understand how the evaluative, cognitive, and affective dimensions of social identity, as well as intrinsic and extrinsic motivations, drive members and users of online communities to seek and share knowledge. A potential contribution of the current study is to understand the consequences of knowledge seeking and sharing behaviors on satisfaction with an online community.

The prior literature on behavior motivations in online communities has not fully explored the consequences of these behaviors. The dependent variables in most of the studies listed in Table 1 are behaviors or intention. The consequences and effects of those behaviors have received relatively less attention in prior studies. Hence, the effects of participation on individual or community outcomes have not received the attention they deserve in the prior literature.

As shown in the research model in Figure 1, the current study examines the effects of

knowledge sharing and seeking behaviors on individual satisfaction with a community. It is the objective of this study to understand the consequences of these behaviors on individual satisfaction with a community and the moderating role of intrinsic and extrinsic motivations. These relationships are presented in the research model in Figure 1.

### **Hypotheses Development**

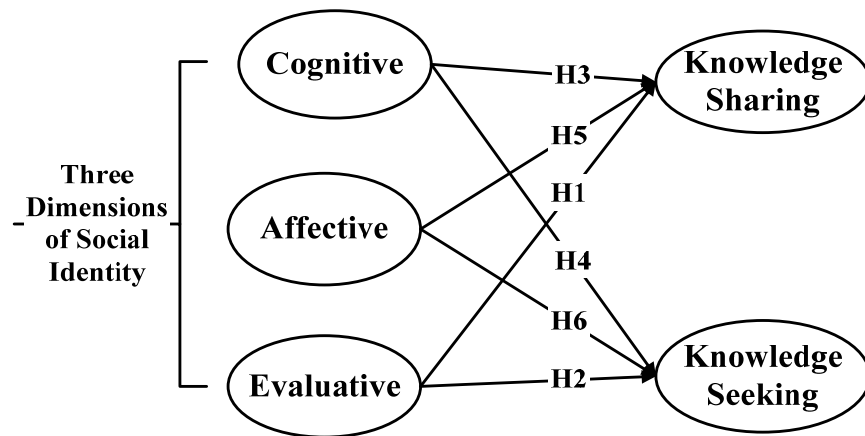
This section introduces the logic and arguments for the hypotheses in the research model presented in Figures 2 and 3. The model in Figure 2 depicts six of the hypothesized relationships between the three exogenous variables, and knowledge seeking and sharing behaviors. The research model in Figure 3 shows the remaining hypotheses that define the relationships among intrinsic and extrinsic motivation, knowledge seeking and sharing behaviors, and satisfaction with a community.

Through social identification and in-group bias, members of online communities establish mutual grounds for interpersonal interaction. Evaluative social identity and self-evaluation encourage group self-esteem, a comparison of the in-group and the out-group, and an inclination to favor the in-group (Hogg et al., 1995). Social identity theory presumes that people desire to maintain positive and favorable social identities to enhance their self-esteem and may leave a group if it is not worthy to identify with the group (Brown, 2000).

Through evaluative social identification, individuals evaluate in-groups members more favorable than out-groups (Ashforth and Mael, 1989; Hogg et al., 1995; Kane et. al., 2005). Evaluative social-identity is fundamental to the positive or negative self-esteem that individuals derive from their association with groups (Ashforth and Mael, 1989; Brown, 2000). Evaluative social identity influences behaviors and attitudes because of in-group and out-group comparison and in-group bias.

In-group bias and favoritism, and the need for positive distinction between in-groups and out-groups motivate behaviors perceived to increase in-group esteem (Kane et. al., 2005). Membership in online communities may induce in-group and out-group comparisons and encourage behaviors to support the in-group. These behaviors may include knowledge seeking and sharing behaviors. The inclination to perceive in-group members as loyal, honest, trustworthy and dependable can influence knowledge seeking and sharing behaviors.

The groups that individuals associate with influence how they evaluate themselves, others, and how they behave (Hogg et al., 1995). Attitudes and perceptions towards the in-group induce behaviors that support the interest of the in-group. In the context of online communities, knowledge sharing and seeking behaviors increase the sense of belonging to the group and increase perceptions of self-worth and self-esteem.



*Figure 2.* Research model with main effect relationships. For clarity, this model presents only the relationships between the three exogenous variables and knowledge seeking and sharing behaviors (hypotheses H1 to H6).

Evaluative social identity invokes a sense self-worth as individuals attach value to membership in a group (Bagozzi and Dholakia, 2006). The self-worth perceived from

membership in an online community may influence behaviors to support the collective goals of the community. Increased self-esteem through evaluative social identification with a community reinforces behaviors that support members and community goals (Bagozzi and Dholakia, 2002).

When members of online communities identify with a community, they tend to evaluate the community and members positively. In-group support and goodwill are reflected in pro-community behaviors, including knowledge sharing and seeking behaviors. When members of an online community feel that identifying with a community is valuable and beneficial, they will engage in acts to sustain the community. These acts may include knowledge sharing with the community and knowledge seeking from the community. Following this logic, this study expects that when members of an online community identify with a community, they subscribe to the values of the community due to perceived self-worth and are likely to share and seek knowledge in the community. The positive impact of evaluative social-identity on knowledge sharing and seeking behavior are stated in the following hypotheses:

- H1:** Evaluative social identity has a positive impact on knowledge sharing behaviors in an online community
- H2:** Evaluative social identity has a positive impact on knowledge seeking behaviors in an online community

Cognitive social identification involves the classification of the self, others and the environment. Social categorization of the self and others into in-groups or out-groups facilitates the classification of the social environment and interpersonal interaction (Hogg and Terry, 2000). When individuals categorize themselves with the in-group, they tend to define their self-concept and interests with the in-group in mind (Kane et al., 2005). When the interests of individuals are defined in terms of the in-group, they tend to engage in behaviors that support the collective interests of the group.

Cognitive self-identification and the consequent self-categorization, and the awareness of



belonging to a group lead to the pursuit of common goals. Individuals who identify with a group and categorize themselves as part of the group are self-aware of the collective goals of the group and assume those goals (Ashforth and Mael, 1989; Ashmore et al., 2004). In online communities, the collective commitment to the joint goals of the community can encourage knowledge seeking and sharing behaviors.

The cognitive awareness of belonging to a group and the shared identity that members assume induce them to engage in behaviors that support the joint goals of the group (Ellemers et al., 1999; Bagozzi and Dholakia, 2006). In the context of online communities, identification with a community induces members to perceive themselves as belonging to the community. This shared and collective identity through self-categorization and cognitive self-identification lead to perceived similarities with other members of the community and accentuates differences with other communities.

When individual identify with a group, their self-identity is defined with respect to the group and their behaviors are influenced by their self-identity (Ashforth and Mael, 1989; Hogg et al., 1995; van Knippenberg, 2000). The belief in in-group similarities and the favorable disposition towards the in-group can foster knowledge sharing and seeking behaviors among members of an online community. Members willingly share their knowledge and are desirous of helping others because they feel a sense of belonging and togetherness with other members.

Members of online communities seek and share knowledge in their communities because they identify with the members and community. The perceived distinction between the in-group and the out-group, and identification with the in-group induce trust and a desire to help. Thus, as cognitive social identity increases, online community members are more likely to seek and share knowledge in their community because of the in-group bias and their sense of belonging to the

community. It is expected that cognitive social identity and awareness of belonging to an online community increase motivation to engage in knowledge sharing and seeking behaviors. These relationships are formally stated in hypotheses H3 and H4

**H3:** Cognitive social identity has a positive impact on knowledge sharing behaviors in an online community

**H4:** Cognitive social identity has a positive impact on knowledge seeking behaviors in an online community

Affective social identification is the emotional attachment to a group. Affective commitment in organizations can lead to organizational citizens' behaviors and also influence behaviors that support the goals of the organization, specifically, lower turnover, job satisfaction, and job performance (Ellemers et al., 1999; Meyer et al., 2001; Bergami and Bagozzi, 2003). Affective commitment is a mindset that induces members of an organization to view their goals and values as congruent to the organization (Meyer et al., 2001). When individuals are emotionally attached to a group, they are more likely to direct their efforts to the collective goals of the community without any other inducements or threat of social sanctions (Ellemers et al., 2004).

The relationship between emotional attachment and pro-community behaviors may be stronger in online communities than in organizations, because of the voluntary nature of membership in online communities. When individuals are emotionally attached to a group, their behaviors are influenced by their attachment. Emotional attachment is a powerful driver of behavior, especially in the context of groups and collectives (Ellemers et al., 2004). When members are emotionally attached to an online community, they derive pleasure, joy and satisfaction from being part of the community.

Affective social identity with an online community facilitates behaviors to support the community. When members of online communities feel emotionally attached to a community,

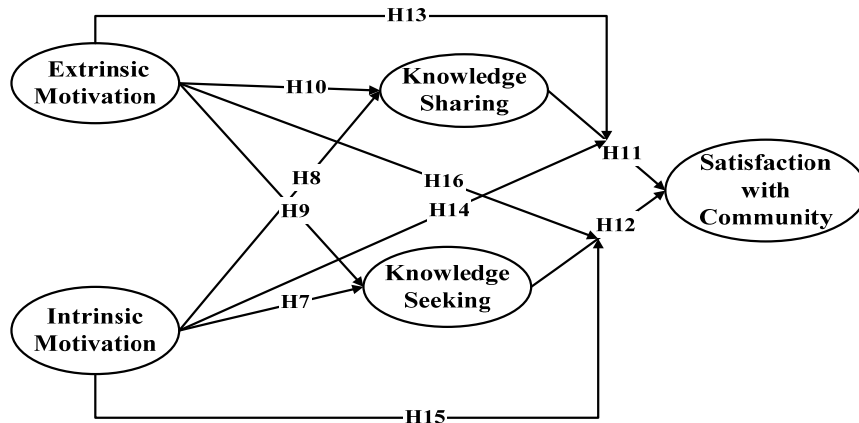
they are more likely to be fond of the community. This fondness induces behaviors intended to support the community, some of these behaviors may include knowledge sharing and seeking behaviors. Emotionally attached members of online communities are likely to engage in knowledge sharing and seeking behaviors because of their desire to be part of the community as well as the pleasure and joy they derive from being members and supporting the community.

The extant literature on affective commitment posits that emotional attachment to an organization elicits behaviors in support of the organization (Ashforth and Mael, 1989; Kane et. al., 2005). Similarly, when users and members are emotionally attached to an online community, they are likely to believe in the goals and values of the community. The belief in the collective goals of an online community due to emotional attachment encourages knowledge seeking and sharing behaviors. The relationships between the affective social identity and knowledge seeking and sharing behaviors are formally stated in hypotheses H5 and H6 as follows;

**H5:** Affective social identity has a positive impact on knowledge sharing behaviors in an online community

**H6:** Affective social identity has a positive impact on knowledge seeking behaviors in an online community

The remaining hypotheses (H7-H16) are presented in Figure 3. Individuals have certain innate needs and they are intrinsically motivated to engage in behaviors to meet those needs. The need for people to be autonomous, competent, and relate to others is fundamental to intrinsic motivation (Ryan and Deci, 2000, 2000b; Deci and Ryan, 2000). Intrinsically motivated behaviors are inherently rewarding, interesting, fulfilling, pleasurable, and enjoyable (Davis et al., 1992; Ryan and Deci, 2000).



*Figure 3.* Moderated hypothesized model. For clarity, this model presents only part of the research model. The moderated part of the model focuses on the outcome of knowledge seeking and sharing and the moderating role of extrinsic and intrinsic motivations (hypotheses H7-H16)

In online communities, knowledge seeking involves browsing content, querying content and seeking advice from the community. Knowledge sharing involves formulating and articulating experiences into knowledge and sharing that with the community or responding to queries or questions. Both knowledge seeking and sharing require effort and time (Constant et al., 1994; Markus, 2001; Kankanhalli et al., 2005). Similarly, in online communities, knowledge seeking and sharing impose some personal cost on members, but due to intangible or tangible benefits derive from these behaviors, members of these communities are motivated to engage in these behaviors. The joy, pleasure and personal satisfaction derived from knowledge seeking and sharing behaviors are enough to offset any personal cost associated with the behaviors

Individuals may join an online community because of the joy of being a member and the pleasure of interacting with others in the community. Because membership of an online community is pleasurable, intrinsically motivated individuals engage in behaviors to sustain their membership. Some of those behaviors may include knowledge seeking and sharing. Thus, intrinsically motivated members of online communities are likely to seek and share knowledge in their community because they derive pleasure from these behaviors (Wasko and Faraj, 2000,

2005; Kankanhalli et al., 2005).

The desire to interact, be part of a group, the joys of membership, and interaction with others influences members to engage in knowledge seeking and sharing behaviors. These desires intrinsically motivate members of online communities to share and seek knowledge from their communities. Since members may view membership with a community as fulfilling, interacting with members of the community by sharing knowledge and seeking information is pleasurable and satisfying. Following this logic, it is expected that intrinsically motivated members of online communities are more likely to seek and share knowledge in their community. Hence, the following hypotheses are advanced to test these relationships;

**H7:** Intrinsic motivation has a positive impact on knowledge seeking behaviors in an online community

**H8:** Intrinsic motivation has a positive impact on knowledge sharing behaviors in an online community

Extrinsically motivated behaviors are directed to meeting goals and objectives not related to the behavior. Behaviors aimed at attaining tangible and intangible benefits, social standing, reputation, and material rewards are extrinsically motivated (Davis et al., 1992; Pelletier et al., 1995; Ryan and Deci, 2000b, 2000). Extrinsically motivated individuals join online communities because of personal goals. These goals may include reputation, status, fame, meeting other people with similar interest, getting information, sharing information and knowledge.

In online communities, knowledge sharing can increase confidence, self-efficacy and knowledge sharing capabilities of the individual; this in turn can increase status, respect, and reputation. These are potential benefits expected from membership with an online community. In the context of online communities, extrinsically motivated individuals join online communities to achieve personal goals and knowledge seeking and sharing behaviors could be instrumental in

achieving these goals.

Extrinsic motivation influences attitudes towards knowledge sharing and knowledge sharing behaviors (Bock and Kim, 2002; Bock et al., 2005). Reciprocity and potential rewards can influence knowledge sharing behaviors in organizations (Lin, 2007). Organizational rewards image, identification and status are benefits that influence extrinsically motivated individual to share knowledge (Kankanhalli et al., 2005). In online communities of practice, potential benefits and value expected from knowledge contribution motivates knowledge sharing behaviors (Wasko and Faraj, 2005).

In online communities, knowledge sharing and seeking behaviors may be driven by extrinsic motivations. Members may want to be recognized as experts and knowledgeable within their communities, others may seek to enhance their capacity and be competent. These goals drive extrinsically motivated members of online communities to engage in knowledge sharing and seeking behaviors.

Due to the expectation that knowledge seeking and sharing behaviors are instrumental in realizing personal goals, members are willing to seek and share knowledge to meet those personal goals. Individuals desire to be part of the community and the expected value from a community may motivate members to seek and share knowledge in their community. Thus, knowledge seeking and sharing behaviors in an online community are means to achieving personal goals. Hence, extrinsic motivation influences knowledge seeking and sharing behaviors in an online community. These relationships are formally stated in hypotheses H9 and H10:

**H9:** Extrinsic motivation has a positive impact on knowledge seeking behaviors in an online community

**H10:** Extrinsic motivation has a positive impact on knowledge sharing behaviors in an online community

Knowledge exchange has been shown to increase performance in organizations (Cummings, 2004). Knowledge seeking and sharing can enhance the capacity of individuals. In the context of organizations, knowledge integration can have a positive impact on satisfaction (Sabherwal and Becerra-Fernandez, 2005). Similarly, in the context of online communities, knowledge sharing and seeking behaviors may also have a positive impact on satisfaction. Sharing knowledge, providing information through interaction, conversation, and responding to questions and other requests are important for the survival of any online community.

Knowledge sharing can enhance the reputation and image of the contributor and also facilitate reciprocal benefits. Knowledge sharing can also be satisfying because the behavior enhances knowledge self-efficacy and ability to make valuable contribution (Wasko and Faraj, 2000; Kankanhalli, 2005). Knowledge seeking by members of online communities involves posting questions, requests for help or browsing content in search of answers to questions. Knowledge seekers may enhance their self-efficacy and abilities. The knowledge that knowledge seekers acquire and reuse can enhance their capacity. Thus, the outcome of those behaviors can be satisfying to those who seek and share knowledge. According to Wasko and Faraj (2000), one of the reasons people participate in online communities is the satisfaction that participation brings them. Participation in online communities could involve knowledge seeking or knowledge sharing.

Members of online communities may feel that knowledge sharing and seeking behaviors, are satisfying. Thus, members of online communities who share and seek knowledge more frequently are more likely to be satisfied with their communities. Following this logic, this study expects that members of online communities who frequently engage in knowledge seeking and sharing behaviors are likely to be satisfied with their communities. These relationships are

hypothesized in H11 and H12.

**H11:** Knowledge sharing behavior has a positive impact on satisfaction with an online community.

**H12:** Knowledge seeking behavior has a positive impact on satisfaction with an online community.

Knowledge sharing and seeking behaviors are extrinsically and intrinsically motivated and these behaviors influence satisfaction. The motivations underlying knowledge seeking and sharing behaviors can also establish expectations and moderate the outcome of those behaviors. Outcome expectations are beliefs about the outcomes and consequences of actions or behaviors. These outcome expectations influence attitudes and behavior intentions (Ajzen and Fishbein, 1980; Shell et al., 1989; Compeau and Higgins, 1995). Thus, the perceived consequences of our behaviors influence how we perceive the behavior and our intentions. In online communities, outcome expectations have been linked to personal motivations and can influence intentions to share knowledge (Hsu et al., 2000).

In the context of online communities, two of the drivers of knowledge sharing and seeking behaviors are intrinsic and extrinsic motivations and these motivations also shape outcome expectations. Thus, the outcomes of knowledge sharing and seeking behaviors in online communities are also dependent on the underlying motivations. Generally, online community members have some expectations about the outcomes of their behavior. These expectations may include the capacity of the community to meet their extrinsic and intrinsic motivations to share and seek knowledge.

The joy and pleasure of helping others and contributing to online content motivate knowledge sharing and seeking behaviors in online communities. The outcome expectations of rewards, the joy of helping others, the pleasure of seeking advice, enhanced status, reputation, and recognition, can influence knowledge sharing and seeking behaviors in online communities



(Wasko and Faraj, 2000, 2005)

Members are satisfied with their online community when the community meets those expectations underlying the motivations. Thus, the impact of knowledge sharing and seeking behaviors on satisfaction with an online community depends on extrinsic and extrinsic motivations. Online community members are likely to be satisfied with their community when they feel that their community is meeting the outcome expectations underlying their behaviors. Hence, inherent motivations for seeking and sharing knowledge can influence an individual satisfaction with an online community. Thus, satisfaction with an online community depends on how well the community provides members with opportunities to meet their intrinsic and extrinsic motivations to share and seek knowledge. Thus, although knowledge sharing and seeking behaviors in online communities may influence satisfaction, these relationships are dependent on extrinsic and intrinsic motivations.

Following this logic, this study expects that online community members who frequently engage in knowledge sharing and seeking behaviors are likely to be satisfied with their communities. However, those relationships are moderated by extrinsic and extrinsic motivations. Those relationships are hypothesized in H13, H14, H15 and H16 as follows:

- H13:** The impact of knowledge sharing behavior on satisfaction with an online community is moderated by extrinsic motivation, such that the impact is amplified when the level of extrinsic motivation is high.
- H14:** The impact of knowledge sharing behavior on satisfaction with an online community is moderated by intrinsic motivation, such that the impact is amplified when the level of intrinsic motivation is high.
- H15:** The impact of knowledge seeking behavior on satisfaction with an online community is moderated by intrinsic motivation, such that the impact is amplified when the level of intrinsic motivation is high.
- H16:** The impact of knowledge seeking behavior on satisfaction with an online community is moderated by extrinsic motivation, such that the impact is amplified when the level of extrinsic motivation is high

## Study Design

An online survey was designed with questionnaire items previously validated in the prior literature. Requests for participants were sent to managers, moderators, and members of several online communities.

### Participants

Prior to the actual study, a pilot study was conducted using a small sample of graduate students and faculty. Thirty participants responded to the survey in the pilot study. In response to feedback and comments from the pilot study, some of items in the questionnaire were refined to suit the context of the study. In response to requests for study participants, 105 participants from Yuku online communities responded and participated in the study. Yuku is an online site that provides free software for the public to create and manage online communities. There are several categories of online communities within Yuku, including education, entertainment, music, movies, etc.

Additionally, 44 participants from communities.com also responded to the request to participate in the study, Communities.com provides a free service for the public to create and manage online communities. Twelve participants from several other online communities also responded to the request<sup>6</sup>. Overall, 161 participants completed the survey, and eight of the surveys were excluded because of incomplete answers. Thus, the analysis of the data used surveys from 153 participants.

Participants in the study were asked to complete questions on what motivates their knowledge seeking and sharing behaviors in their online communities. Out of the 153

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<sup>6</sup> These online communities comprise of groups from Yahoo Groups, Google Groups, cartalk.com and familyfocus community

participants, 40 percent were females and 60 percent were males. Ten percent of the participants have high school education, 45 percent have some college education, 30 percent have undergraduate degrees, 13 percent have graduate degrees, and 2 percent listed their education as other. Ten percent of the participants were between the ages of 18 and 20, and 54 percent were between the ages of 21 and 30. Twenty-one percent are between the 31 and 40 years and 15 percent are above the age of 40.

## Measures

The constructs in this study were measured by scales developed and tested in prior studies, and all responses were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The number of observations, means and standard deviation for all the measurement scales, and the number of items in each scale are listed in Table 2. The measurement model was evaluated using structural equation modeling in Stata I/C12.1.

Table 2: Descriptive statistics			
	Means	SD	No Items
Cognitive	10.34	2.58	3
Affective	10.54	2.66	3
Evaluative	10.50	2.52	3
Extrinsic	10.32	2.47	3
Intrinsic	11.04	2.16	3
Seeking	11.04	2.19	3
Sharing	10.84	2.35	3
Satisfaction	11.52	2.26	3

*Notes:* Number of observation 153

The items in all the scales were tested for reliability by evaluating the loadings of observed items to ensure that they loaded reasonably high. Loadings of observed indicators

below 0.6 ( $\lambda < 0.60$ ) were examined in relation to other loadings on the construct to ensure that the average variance extracted (AVE) is at least 0.5. Observed indicators with low loadings were excluded from the measurement model. The questionnaires in the survey are listed in Appendix B.

	1	2	3	4	5	6	7	8	$\alpha$
1. Cognitive	<b>0.73</b>								0.78
2. Affective	0.67	<b>0.72</b>							0.82
3. Evaluative	0.54	0.60	<b>0.78</b>						0.79
4. Extrinsic	0.57	0.60	0.65	<b>0.76</b>					0.75
5. Intrinsic	0.44	0.57	0.46	0.46	<b>0.71</b>				0.79
6. Seeking	0.43	0.54	0.41	0.44	0.57	<b>0.73</b>			0.75
7. Sharing	0.54	0.64	0.48	0.58	0.56	0.66	<b>0.74</b>		0.78
8. Satisfaction	0.43	0.52	0.40	0.33	0.68	0.51	0.58	<b>0.83</b>	0.84

Square root of the AVE in the diagonal;  $\alpha$  = Cronbach's Alpha  
\*AVE =  $\Sigma(\lambda^2) / \Sigma(\lambda^2) + \Sigma(1 - \lambda^2)$  (Chin 1998)

The social identity construct has three dimensions: cognitive, evaluative, and affective. The cognitive dimension was measured by an eight-item scale developed by Ellemers et al. (1999) and Mael and Ashforth (1992). Five of the items in this scale were dropped and three were retained. As listed in Table 3, the alpha for the three-item scale is 0.78.

The evaluative dimension of social identity was assessed by a scale developed by Ellemers et al. (1999), and Mael and Ashforth (1992) and adapted to the context of the study. The scale consists of six items. After a review of the loadings, three items were dropped from the scale. As reported in Table 3, the alpha for the scale with the three retained items is 0.79. An eight-item scale developed by Allen and Meyer (1990) measured the affective dimension of social identity. Five items in this scale were excluded because of low loadings. The alpha for the three-item scale is 0.82.

Intrinsic motivation was measured with an eight-item scale adapted from Davis et al. (1992) and Pelletier et al. (1995). Three items were retained from that scale. As reported in Table 3, the alpha for the three-item scale is 0.79. Extrinsic motivation was assessed by a seven-item scale developed by Pelletier et al. (1995) and adapted to the context of the study. Due to low loadings, four items were excluded from the scale. The alpha for the three-item scale is 0.75.

The knowledge seeking and knowledge sharing scales were adapted from Davenport and Prusak (1998). The knowledge seeking scale contains three items and all the items were retained. There are five items in the knowledge sharing scale and three of those were retained. The alpha values for the knowledge seeking and knowledge sharing scales are 0.75 and 0.78 respectively. A four-item scale developed by Wixom and Todd (2005) assessed satisfaction. One item in the scaled was excluded and the alpha for the three-item scale is 0.84. All the loadings and alpha values for the scales are reported in Table 3 and the items that make up each scale are listed in Appendix B.

A measurement model was tested to ascertain how well it fits the data. There were no constraints on the latent variables in the measurement model. The error terms and latent variables were correlated based on the values of the modification indices and the p-values of the correlations. The covariances included in the measurement model are listed in the footnote<sup>7</sup>. The measurement model was evaluated by a set of fit indices.

The fit indices include RMSEA, CFI, TLI, SRMR, chi-square, and relative chi-square. For the RMSEA and SRMR indices, values less than or equal to 0.05 are considered good; and values less than or equal to 0.08 are considered fair (MacCallum et al., 1996; Byrne, 1998). For the Tucker-Lewis Index (TLI) values above 0.95 are good fitting models, and values between

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<sup>7</sup> (e.cid3\*e.cid4 e.sat1\*e.sat4 e.cid4\*e.cid3 e.int1\*e.int4 e.sek3\*e.sek1) cid = cognitive social identity; sat = satisfaction; int= intrinsic motivation; sek = knowledge seeking

0.90 and 0.95 are considered fair. Models with values below 0.90 are unacceptable (Schumacker and Lomax, 2004; Bentler and Bonnet, 1980). More recent suggestions state that the cut-off criteria should be  $TLI \geq .95$  (Hu and Bentler, 1999).

The CFI should be at least 0.90 to accept a model (Bollen, 1989). This value indicates that the model captures 90 percent of the covariances in the data. More recently, a value of  $CFI \geq 0.95$  is recognized as indicative of good fit (Hu and Bentler, 1999). In general, for the TLI and CFI values, models with overall fit indices of less than 0.90 are inadequate (Bentler and Bonett, 1980; Hooper et al., 2008).

The model was evaluated with a combination of fit indices recommended by Hu and Bentler (1999). The chi-square and p-value for the measurement model were [ $\chi^2(220) = 338.31$ ;  $p\text{-value} > 0.05$ ]. The chi-square and corresponding p-value indicated that the model is not a good fitting model. However, because of the sensitivity of the chi-square test, it must be interpreted cautiously. The relative or normed chi-square minimizes some of the drawbacks of the chi-square measure of model fitness. The relative chi-square index is computed by the ratio of the chi-square and degrees of freedom ( $\chi^2/df$ ). Although there is no consensus regarding an acceptable value for this statistic, it is recommended that the relative chi-square value for acceptable models be equal to or less than three [ $\chi^2/df \leq 3$ ] (Carmines and McIver, 1981; Ullman, 2001).

The fit indices for the measurement model are as follows: [RMSEA = 0.06; CFI = 0.94; SRMR = 0.05; TLI = 0.92;  $\chi^2/df = 1.54$ ]. The RMSEA and the SRMR values are all within the threshold of good fitting models. The relative chi-square value of 1.54 is also within the range of a good fitting model. Both the TLI and CFI are below 0.95, but they meet the 0.90 value, thus, the measurement model is acceptable.

All the alphas for each scale meet the threshold value of 0.7 recommended in prior studies (Hair et al., 2006). A correlation matrix and the AVE for each latent construct are listed in Table 3. As reported in the Table 3 none of the correlation values is above 0.70. Convergent and discriminant validity are evaluated by two criteria. First, the square root of the AVE by a construct from its indicators should be at least 0.70. Secondly, the square root of the AVE should exceed that construct's correlation with other constructs (Fornell and Larcker, 1981; Chin, 1998). The square roots of the AVEs are listed in the diagonal in Table 3. Based on the results reported in Table 3, all the scales meet the required threshold for convergent and discriminant validity.

Self reported measures were used for all constructs and the data was collected during the same period, hence it is likely that variance in the measurement could be attributed to measurement method rather than the construct. Common method variance (CMV) may cause systematic measurement error and further bias the results of the analysis (Bagozzi and Yi, 1990; Podsakoff et al., 2003).

To assess the potential for CMV, the measurement model was evaluated using Harman's one-factor test and confirmatory factor analysis. All the 49 variables were entered into an exploratory factor analysis using principal components factor analysis with varimax rotation to determine the number of factors that may account for the variance in the variables.

The results indicated the presence of 10 distinct factors with eigenvalue greater than 1.0. The 10 factors together accounted for 68 percent of the total variance and the first factor accounted for 37 percent of the variance, thus, a general factor is not obvious. Based on those results, common method effect may not be pervasive and should not pose a threat to the rest of analysis and estimates. The prior literature has also noted that the Harman's single factor test is not robust and hence, insufficient to prove the absence of common method variance (Podsakoff

et al., 2003; Chang et al., 2010).

Thus, to further demonstrate that common method bias is not an issue, the theoretical measurement model was compared to a single factor model where the observed indicators for the measurement model were loaded onto a single factor. The covariances of the error terms in the single factor model were the same as those in the measurement model listed in footnote 3. The single factor model fit indices were [ $\chi^2(248) = 654.05$ ;  $p\text{-value} = 0.0$ ; RMSEA 0.10; CFI = 0.79; TLI = 0.77; SRMR = 0.08]. With the exception of the SRMR, all the indices for the single factor model are below the recommended threshold for a good fitting model.

Moreover, a chi-square difference test comparing the single factor model to the theoretical measurement model was [ $\Delta \chi^2(28) = 313.7$ ;  $p\text{-value} = 0.0$ ]. The chi-square difference test result indicated that there is a significant difference between the single factor model and the theoretical measurement model. Moreover, the fit indices for the measurement model are acceptable and better than the single factor model. This indicates that the theoretical measurement model fits the data better than the single factor model, suggesting that common method bias is not pervasive and should not pose a threat to the analysis and estimates.

## **Results**

The analysis and evaluation of the hypotheses were done using seemingly unrelated regressions (SUR) in Stata/IC 12.1. Regression analysis was considered appropriate because of the number of parameters, hypotheses in the model, and the sample size. The ideal recommended sample size for structural equation modeling is usually based on the 20:1 sample size to parameters ratio (Kline, 2011, p.12). With a sample size of 153, 8 constructs, 25 parameters, and 16 hypotheses, this study does not meet the recommended sample size to parameters ratio, thus,



the hypotheses were evaluated using SUR.<sup>8</sup>

Table 4: Regression coefficients		
	<u>Model 1</u>	<u>Model 2</u>
	Sharing	Seeking
Cognitive	0.09	0.05
Affective	0.27***	0.19**
Evaluative	-0.03	0.02
Extrinsic	0.23***	0.08
Intrinsic	0.27***	0.37***
R-square	0.52	0.40
*** p < 0.001; ** p < 0.01; *p < 0.05		

SUR is a generalization of a linear regression model comprising several regression equations. Each equation in the model has its own set of dependent variables and different sets of exogenous variables. Each equation is a valid linear regression and can be estimated independently using ordinary least square. However, SUR is considered more efficient, because the method combines information from the models and accounts for correlated errors, thus establishing a link between the models in the equation.

As presented in Table 4 under model 1, knowledge sharing behavior was regressed against the three dimensions of social identity, and extrinsic and intrinsic motivations. In Model 2, as reported in Table 4, knowledge seeking behavior was regressed against the three dimensions of social identity, and extrinsic and intrinsic motivations. Both of these models were tested together using SUR.

The coefficients of the regression are reported in Table 4. Based on the analysis of the

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<sup>8</sup> Furthermore, the model did not converge when evaluated using a structural equation model in Stata.

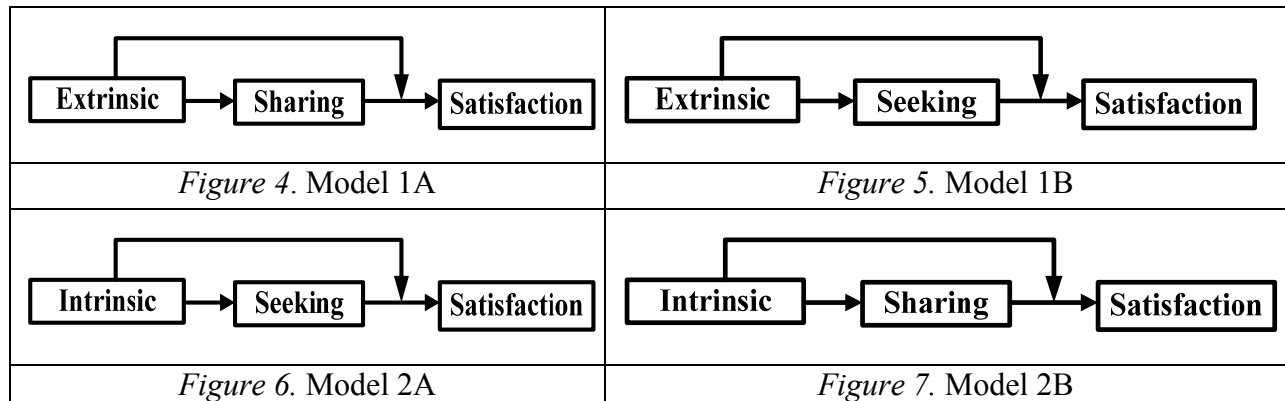
values, only one of the dimensions of social identity is significant in explaining knowledge seeking and sharing behaviors. The beta coefficient values for the evaluative and cognitive dimensions of social identity are insignificant. Thus, cognitive and evaluative components of social identity are not significant predictors of knowledge seeking and sharing behaviors in online communities. Hence, hypotheses H1, H2, H3, and H4 were not supported.

The hypothesized relationship between affective social identity and knowledge seeking and sharing behaviors were supported. Hypothesis H5, advanced a positive relationship between affective social identity and knowledge seeking, the beta coefficient is 0.19 ( $p < 0.01$ ). The beta coefficient value for the hypothesized relationship between affective identification and knowledge sharing is 0.27 ( $p < 0.001$ ), thus providing support for hypothesis H6. These results indicate that the emotional attachment to an online community is a much stronger predictor of knowledge sharing and seeking behaviors than the other two dimensions of social identity.

Hypothesis H7 posited a positive relationship between intrinsic motivations and knowledge seeking. As presented in Table 4, the beta coefficient result is 0.37 ( $p < 0.001$ ), thus supporting hypothesis H7. Similarly, hypothesis H8 advanced a positive relationship between intrinsic motivation and knowledge sharing. The value of the beta coefficient for the relationship is 0.27 ( $p < 0.001$ ), thus, the result supported hypothesis H8.

Hypothesis H9 advance a positive relationship between extrinsic motivation and knowledge seeking. The value of the beta coefficient for that relationship is 0.08 ( $p > 0.10$ ), thus hypothesis H9 was not supported. The hypothesized relationship between extrinsic motivation and knowledge sharing is significant. The value of the beta coefficients is 0.23 ( $p < 0.001$ ), thus providing support for H10. Hence, although extrinsic motivation is a significant predictor of knowledge sharing, its impact on knowledge seeking behaviors is insignificant. This may be

consistent with the underlying explanation of extrinsic motivations. Although knowledge seeking may eventually improve the capacity of the individual, in the short run it may not provide benefits beyond the behavior, thus the behavior may not be extrinsically motivated.



### **Moderated hypothesis**

The remaining hypotheses, H11 to H16, are the main effects and moderated relationships. These relationships are depicted in Figures 4 to 7 and tested using SUR. The models depicted in Figures 4 to 7 imply moderated mediated relationships, although only the moderated relationship are hypothesized in the current study. To test these hypotheses, the moderated relationships are evaluated using the steps recommended by Preacher et al., (2007).

Table 5: Moderation effect coefficients

	Model 1A	Model 1B	Model 2A	Model 2B
	Satisfaction	Seeking	Satisfaction	Sharing
Intrinsic	0.09	0.39***	0.01	0.55***
Extrinsic	0.49***		0.62***	0.59***
Seeking		0.60***	0.17**	0.54***
Sharing			0.28***	0.61***
Intrinsic X Seeking			0.04*	
Intrinsic X Sharing				0.0
Extrinsic X Seeking	0.05*			
Extrinsic X Sharing		0.06***		
R-square	0.29	0.19	0.38	0.34
			0.49	0.33
			0.51	0.32

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.10

All the exogenous variables (extrinsic motivation, intrinsic motivation, knowledge sharing, and knowledge seeking) are mean-centered and the interactions terms are derived from multiplying the mean-centered indicator variables. The dependent variable, satisfaction with a community is regressed against the mean centered and product variables. The results of the regression analysis are reported in Table 5. Hypotheses H11 and H12 are the main effects relationships and hypotheses H13, H14, H15, and H16 are the moderated hypotheses. Additionally, the mediated relationships were evaluated although not hypothesized. The results

of the mediation analysis are reported in Appendix C

Hypothesis H11 advanced a positive relationship between knowledge sharing and satisfaction, this relationship is supported in both model 2B and 1A as shown in Figures 4 and 7. As reported in Table 5, the beta coefficient values for the regression in model 2B is 0.28 ( $p < 0.001$ ) and for model 1A it is 0.60 ( $p < 0.001$ ). Thus, hypothesis H11 is supported in both models. Hypothesis H13 hypothesized that the impact of knowledge sharing on satisfaction with a community is moderated by extrinsic motivation. The beta coefficient for this relationship is 0.06 ( $p < 0.001$ ) is presented in Table 5, thus hypothesis H13 is supported.

Intrinsic motivation was hypothesized to moderate the impact of knowledge sharing on satisfaction. This relationship was advanced in hypothesis H14 and it is not supported. As reported in Table 5 under Model 2B, the coefficient is zero ( $p > 0.1$ ). This implies that when knowledge sharing behavior is intrinsically motivated, the impact of the behavior on satisfaction with community is not moderated by intrinsic motivation. Hypothesis H12 advanced a positive relationship between knowledge seeking and satisfaction with a community. This relationship is supported by the values of the beta coefficient reported in Table 5 under Model 2A and Model 1A. In Model 2A the beta coefficient is 0.17 ( $p < 0.05$ ) and in Model 2B it is 0.49 ( $p < 0.001$ ). Thus, both models provide support for hypothesis H12.

Hypothesis H15 hypothesized that the impact of knowledge seeking behavior on satisfaction with a community is moderated by intrinsic motivation. The beta coefficient for this relationship is 0.04 ( $p < 0.10$ ) as reported in Table 5 under model 2A. Thus, the results provide partial support for hypothesis H15.

**Table 6: Hypotheses**

	Hypothesis	Supported
H1	Evaluative social identity has a positive impact on knowledge sharing behaviors in an online community.	No
H2	Evaluative social identity has a positive impact on knowledge seeking behaviors in an online community.	No
H3	Cognitive social identity has a positive impact on knowledge sharing behaviors in an online community.	No
H4	Cognitive social identity has a positive impact on knowledge sharing behaviors in an online community.	No
H5	Affective social identity has a positive impact on knowledge sharing behaviors in an online community.	Yes
H6	Affective social identity has a positive impact on knowledge seeking behaviors in an online community.	Yes
H7	Intrinsic motivation has a positive impact on knowledge seeking behaviors in an online community.	Yes
H8	Intrinsic motivation has a positive impact on knowledge sharing behaviors in an online community.	Yes
H9	Extrinsic motivation has a positive impact on knowledge seeking behaviors in an online community.	No
H10	Extrinsic motivation has a positive impact on knowledge sharing behaviors in an online community.	Yes
H11	Knowledge sharing behavior has a positive impact on satisfaction with an online community.	Yes
H12	Knowledge seeking behavior has a positive impact on satisfaction with an online community.	Yes
H13	The impact of knowledge sharing behavior on satisfaction with an online community is moderated by extrinsic motivation, such that the impact is amplified when the level of extrinsic motivation is high.	Yes
H14	The impact of knowledge sharing behavior on satisfaction with an online community is moderated by intrinsic motivation, such that the impact is amplified when the level of intrinsic motivation is high.	No
H15	The impact of knowledge seeking behavior on satisfaction with an online community is moderated by intrinsic motivation, such that the impact is amplified when the level of intrinsic motivation is high.	Partial
H16	The impact of knowledge seeking behavior on satisfaction with an online community is moderated by extrinsic motivation, such that the impact is amplified when the level of extrinsic motivation is high.	Partial

Extrinsic motivation is hypothesized to moderate the impact of knowledge seeking behavior on satisfaction with a community. This relationship was advanced in hypothesis H16.

As reported in Table 5 under Model 1A, the coefficient is 0.05 ( $p < 0.10$ ), thus, H16 is moderately supported. The results of the hypotheses testing are summarized in Table 6, eight of the sixteen hypotheses advanced in the study are supported, two are moderately supported and six are not supported. Although not hypothesized, the models presented in Figures 5 to 8 indicate moderated mediated relationships. These relationships are evaluated using non-linear combination and bootstrap computation.<sup>9</sup>

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<sup>9</sup> The moderated mediated relationships are evaluated by assessing the conditional indirect effects. To compute the conditional indirect effects, the regression coefficient for the mediator, as an independent variable and a dependent variable are required. Those values are obtained using seemingly unrelated regression. The conditional indirect effects are computed at three different values of the moderator; low, medium, and high. These relationships are not hypothesized and the outputs are reported in Appendix C.

#### **IV. ONLINE COMMUNITIES AND USER-GENERATED CONTENT**

A community is a social unit of interacting people who share values, norms and proximity. A community is held together by social cohesion and members help each other to realize the collective goals of the community. Like traditional communities, online communities are virtual groups of people driven by a shared goal, interest, need or activity to come together and interact with each other to further that goal (Preece, 2001).

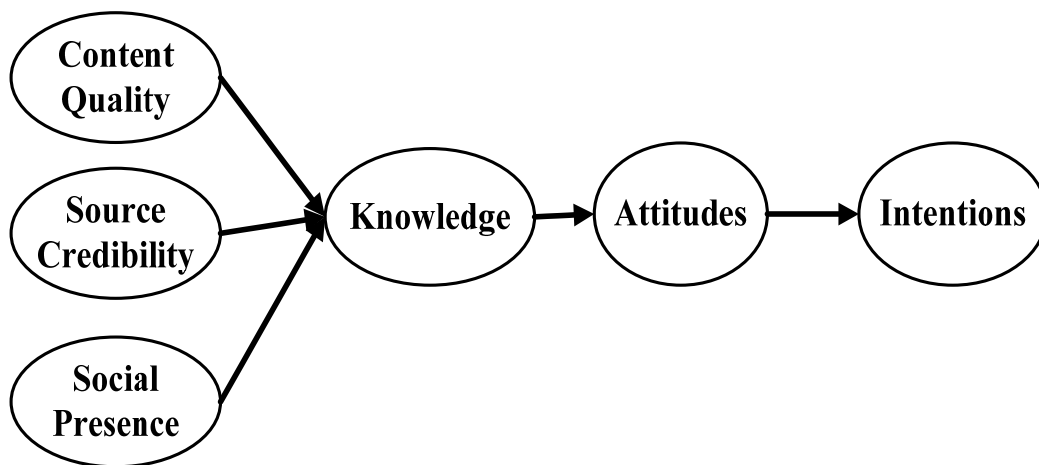
The distinguishing characteristic of online communities is the predominant use of computer-mediated communication to facilitate interaction among members. Members of online communities may engage in face-to-face interaction, however, interaction among members is predominantly through computer-mediated communication (Rheingold 1993). Online communities rely on online technologies such as forums, emails, video conferencing, instant messaging, blogs, chat rooms, virtual worlds, and twitters to facilitate communication and interaction among members (Wasko and Faraj, 2000; Ling et al., 2004; Preece et al., 2004).

Unlike traditional communities, online communities are not limited by space or physical proximity. Anyone can join an online community regardless of physical location or nationality. The underlying technology enables online communities to attract membership, regardless of geographical location, nationality or physical location (Preece, 2001; Preece et al., 2004; Ling et al., 2004). Examples of online communities include Cartalk.com, Yahoo Wikipedia, MySpace, Facebook, Amazon.com, Yahoo! Answers, Askville, and Eopinions.com.

Large amounts of content are created as members of online communities interact, share ideas and information, and exchange experiences using a variety of computer-mediated communication mediums. The volume, quality, frequency, and credibility of content generated by online communities are important indicators of the success and vitality of communities.



User-generated content in the form of product reviews are important to many organizations. Online sales of books, movies, and audio compact discs have been linked to consumer product reviews and certain characteristics of reviews have also been shown to influence sales (Chevalier and Mayzlin, 2003; Dallarocas et al., 2007; Dhar and Chang, 2007; Forman et al., 2008). For example, product reviews on vacation destinations, hotels, and services influence consumers' perceptions, and are important for the performance of many firms in the tourism industry (Litvin et al., 2008; Ye et al., 2011). Purchase intentions, brand loyalty, attitudes towards products, and behavior intentions in the market place are all partly influenced by user-generated content (Dwyer, 2007; Brown et al., 2007; Lee et al., 2008; Cheong and Morrison, 2008; Shao, 2009).



*Figure 1.* Research model. In the model knowledge mediates the impact of content quality, source credibility and social presence.

Thus, there is ample evidence in research that user-generated content influences consumer behavior and intentions. Although the impact of user-generated content on consumer behaviors has been studied, the impact of user-generated content on attitudes toward an online community, and the mediating role of knowledge have not been fully examined. As depicted in Figure 2, this study examines how knowledge mediates the impact of content quality, source

credibility, and social presence on attitudes. The quality and credibility of content generated by online communities can influence attitudes and intentions towards these communities and are signals to potential members and existing members. However, those influences also depend on individual knowledge.

### **Elaboration Likelihood Model**

Persuasive events and information affect attitude formation and adjustment, and eventually behaviors. Various theories and models have been used to explain persuasion and attitude formation. Two of the dominant theoretical models, the heuristic-systemic model (HSM) and ELM, explain how persuasive stimuli are evaluated and the consequent impact on attitude formation and adjustment (Chaiken, 1980; Petty and Cacioppo, 1984, 1981; Ratneshwar and Chaiken, 1991).

Both the HSM and the ELM argue that attitude formation is the result of a dual mechanism of processing persuasive information or event. The HSM approach distinguishes between heuristic and systemic processing of persuasive message. In the systemic processing of persuasive information, attitude formation is the results of active and cognitive evaluation of persuasive argument. Thus, the systemic process requires more effort, motivation and capacity to evaluate persuasive arguments. Because the content of an argument is consciously evaluated in the systemic process, attitude formation relies predominately on the quality of the persuasive argument in a message and less on heuristic cues. The orientation of individuals in systemic processing is more deliberate and analytical, hence, all relevant information about the persuasive argument of a message are factored into the formation of attitude judgments.

In contrast, the heuristic processing of persuasive message minimizes information processing, and requires less effort. In the heuristic process, attitudinal changes are based on the

evaluation of persuasive cues. Heuristic cues, such as the reputation, credibility and expertise of the source, and the perceptions of the majority influence attitude formation in heuristic processing. Persuasion through the heuristic process relies on the context of a persuasive message. Persuasion and changes in attitude through the heuristic process requires relatively less motivation and cognitive capacity (Chaiken, 1980; Chaiken and Maheswaran, 1994).

Similar to the HSM, the ELM advances a central route and peripheral route of persuasion. The ELM has often been empirically tested and supported in several disciplines, including marketing (Petty et al., 1983; Bitner and Obermiller, 1985; Andrews and Shimp, 1990) and information systems (Mak et al., 1997; Sussman and Siegal 2003; Angst and Agarwal, 2009). The ELM framework explains of how persuasive information or events influence attitudes. The current study focuses on ELM to examine the persuasive influence of UCG on attitudes and intentions towards an online community.

The framework postulated by ELM incorporates contextual factors, individual, and message characteristics to explain persuasion and attitude formation (Petty and Cacioppo, 1981, 1986). Attitudinal changes in response to a persuasive message, according to the ELM framework, can be attributed to the message strength and the likelihood that the recipient will elaborate on the information (Petty and Cacioppo, 1981, 1986). Message content, personal relevancy of message, context, ability, and motivation influence how individuals process and evaluate persuasive stimuli.

ELM advances a continuum of elaboration likelihood, anchored at one end by the central route of persuasion, where likelihood of elaboration is high, and at the opposite end by peripheral route of persuasion, where likelihood of elaboration is low. The central and peripheral routes of persuasion are at the opposite end of a continuum; however, these routes are not mutually

exclusive. Thus, the central and peripheral routes of persuasion can interact to shape attitude formation and intentions. Variations in attitude changes are partly due to individual differences in motivation and ability to elaborate on a message. Situational factors and recipient characteristics will impinge on the persuasive process and the likelihood of elaboration (Petty and Cacioppo, 1986, 1983).

In the central route of persuasion, relatively high levels of cognitive efforts are expended to elaborate on a message to ascertain veracity and argument quality. Persuasion and attitude formation through the central route requires an active engagement of cognitive processes. Motivation and ability are necessary to exert the effort and time to consciously elaborate on the quality of a persuasive message. Persuasion through the central route is more enduring and a better predictor of behaviors than the peripheral route (Petty and Cacioppo, 1981, 1984; Bitner and Obermiller, 1985).

Attitudes and intentions formed through the central route of persuasion, according to the ELM, are more enduring. Persuasion and attitudinal changes in the central route are the results of deliberate evaluation, reflection, and assimilation of pertinent information. The effort and ability required to elaborate on a message, make attitude changes through the central route of persuasion more stable and relatively more powerful predictor of intentions and behaviors than persuasion through the peripheral route.

Motivations to elaborate on a persuasive message are driven by personal interest or the relevancy of the message to the recipient. Individuals with ability and motivation are more likely to elaborate on persuasive message. When individuals lack ability and motivation, persuasion is usually through the peripheral route and attitude formation and judgment are based on the evaluation of contextual cues.

Unlike the central route, the peripheral route requires relatively less cognitive effort because individuals rely on contextual cues to evaluate content and attitudinal changes are less enduring. The likelihood of elaboration is low in the peripheral route of persuasion because of the reliance on contextual cues in the evaluation of persuasive message. In the peripheral route of persuasion, partly because individuals lack ability and motivation to scrutinize information, they resort to less effortful process. Contextual cues, such as the charisma of the source, popularity of the source, identity of the source, affinity to the source, source expertise, and presentation style are important in persuasion through the peripheral route. The emphasis on contextual cues means less cognitive effort is exerted in evaluating message content. When individuals are not able to judge the quality of a message because they lack the ability and motivation to do so, then persuasion is usually through the peripheral route.

The ELM framework underlines several important elements in the persuasive process. First, the likelihood of elaboration is on a continuum, with high likelihood of elaboration at one end where persuasion is through the central route and low likelihood of elaboration at the other end where persuasion is through the peripheral route. Second, the central and peripheral routes of persuasion can co-occur and may jointly influence judgment and attitude formation. Third, variations in elaboration are influenced by motivation and ability of individuals.

The ELM theoretical framework has been used to explain how individuals process and internalize content and the consequent changes in attitudes and behavior. The ELM framework has also been used to explain the adoption of information and technology (Sussman and Siegal, 2003; Bhattachajee and Sanford, 2006; Angst and Agarwal, 2009). Mak et al. (1997) used the ELM framework to examine how participation in the design of a system influences attitudes and intentions to use the system. There is evidence in the extant literature that certain aspects of user-

generated content can influence attitudes and intentions. The inclusion of identity descriptive information, such as the identity of a reviewer, geographical location, nickname, birthday and real name influences how the information is perceived and processed (Ma and Agarwal 2007; Forman et al. 2008). Certain aspects of user created product reviews, such as the tone and reviewer characteristics influence consumer perception.

The ELM framework has also been used to explain how consumers react to advertising, product reviews, websites, e-commerce sites, and how the persuasive arguments presented are internalized and processed (Yang et al., 2006; Dhar and Chang, 2007; Pan and Zhang, 2011). In a study examining the drivers of online communities, Koh et al. (2007) concluded that the on-going provision of content as well as usefulness of content can increase participation on online communities. The extant literature has investigated different aspects of user-generated content and their impact on consumer attitudes and intentions.

Building on those studies, the current study seeks to explain how the quality and credibility dimensions of user-generated content influence attitudes towards an online community and intentions to use community resources. Although there is empirical evidence that user-generated content influences attitudes, research has not adequately addressed the impact of user-generated content on attitude formation and the role of knowledge in the context of online communities. The impacts of user-generated content on attitudes towards an online community, the persuasive mechanisms, and the potential role of an intervening variable have received relatively less attention in prior studies. Many of the studies have focused on the impact of user generated product reviews on consumer behavior and attitudes.

As shown in Figure 2, the current study draws on ELM to examine the persuasive impact of content quality, source credibility, and social presence on attitudes and intentions and the role

of knowledge as a mediator. In an online community, perceived social presence of others and the ability of the supporting technology to facilitate the awareness of others can influence attitudes towards the online community.

### **Social Presence**

The extant literature has advanced various definitions of social presence. Short, Williams, and Christie (1976) defined social presence as the “degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships”. Biocca et al. (2003) defined social presence as “a sense of being with another” in a computer-mediated communication environment. Tu and McIsaac (2002) defined social presence as the measure of “the feeling of community” in a computer-mediated communication environment. The concepts of immediacy and intimacy are fundamental to most definitions of social presence (Gunawardena and Zittle, 1997; Tu and McIsaac, 2002; Biocca et al., 2003).

Other concepts, such as co-presence and tele-presence, are frequently used to signify the perception of awareness in interpersonal interaction. Tele-presence underscores the use of technology to foster awareness of others and a sense of shared space among geographically separated members of a group (Buxton, 1992; Steuer, 1993). Co-presence is the mutual perception and access to each other in either a virtual or physical co-location environment (Nowak and Biocca, 2003; Biocca et al. 2003; Ma and Agarwal 2007). The current study focuses on the concept of social presence to explain the impact of user-generated content on attitudes towards online communities. Social presence is a sense of physical space and being together perceived by individuals when they interact with each other. Social presence is projected on three dimension; sense of place and physical presence, sense of another, and sense of being together. Two main underlying dimensions of social presence are; immediacy and intimacy

(Short et al., 1976; Gunawardena and Zittle, 1997). The salience of social interaction, especially immediacy and intimacy, influences how social presence is perceived.

Immediacy is the psychological distance inherent in personal interaction and intimacy is the physical distance in interpersonal interaction. Formality, tone, and personability, as well as other non-verbal cues, can influence immediacy in social interaction and social presence.

Intimacy in personal interaction is transmitted by non-verbal cues such as smiles, eye contact and physical distance. In face-to-face interaction, intimacy is easily transmitted by the closeness and physical proximity inherent in the interaction (Gunawardena and Zittle, 1997; Biocca et al., 2003).

Common threads in the definitions of social presence are socio-psychological, cognitive processes, and the objective reflection of the communication media. Thus, although the communication media facilitates social presence through the transmission of the presence of others, social presence is ultimately measured by individual perceptions of others in social interaction. Because of the reliance on computer-mediated communication in online communities, social presence is important in creating a sense of community and a sense of belonging among members of online communities.

In an online community, social presence is dependent on how members of the community perceive physical space, the presence of others, and how the underlying technology facilitates these perceptions. In online communities, as individuals interact with each other, the technology mediating their interactions can facilitate or impede the perceptions of social presence. Unlike face-to-face interactions, computer-mediated communication is less personable and may constrain the transmission of social presence and contextual cues (Rovai, 2002). The underlying technology in computer-mediated communication determines the levels of perceived



social presence. For example, video conference may evoke a higher level of social presence than instant message or email. The richness of the communication media in online communities influences the level of perceived social presence on the social presence continuum. Additionally, the level of social presence is also dependent on how members of a community feel connected to others in the community.

Parts of the content generated in online communities, such as emoticons, avatars, greetings and introductions, may project a sense of social presence. Emoticons reflect context and affect in text and written communication and project the presence of others. Avatars are the virtual representation of the self in online communities. Social presence in online communities is reflected in the nuances of text and other communication artifacts. These artifacts evoke a sense of togetherness, physical involvement and the presence of others.

In many computer-mediated communication learning environments, the intimacy and immediacy evoked by the communication environment influence student satisfactions with the learning environment (Christophel and Gorham, 1995; Rourke et. al., 2001; Richardson and Swan, 2003). Social presence also increases student performance in web-based learning environments (Picciano, 2002). According to Rovia (2002), social presence can foster a sense of community and facilitate student satisfaction in distance learning environments. In a study of computer-mediated communication conference, Gunawardena and Zittle (1997) concluded that social presence is a strong predictor of satisfaction and can increase positive socio-emotional experience. When students feel a sense of awareness of other students and instructors in online learning environments, they engage more in class discussion and are satisfied with the learning experience.

The presence of others and physical space encourage social behaviors and compel

members of online communities and groups to constrain their behaviors. In a study of group interactions and social presence, Sia et al. (2002) noted that technology mediated communication among group members can increase group polarization because of limited communication of non-verbal cues and decrease in social presence. The perception of social presence among group members can also facilitate consensus among a group and contribute to group performance outcomes (Yoo and Alavi, 2001).

Certain design features in online communities can facilitate social presence and also influence members' motivation to participate and engage in community activities. Ma and Agarwal (2007) noted that community artifacts that support virtual co-presence, such as persistent labeling, self-presentation, and deep profiling influence knowledge contribution in online communities. Thus, how others are socially represented may elicit an awareness of the presence of others and encourage interactions within online communities and groups.

As members of an online community interact with each other, they perceive the presence of others and adjust their attitudes. If they perceive a community to be very effective in projecting social presence, they may develop positive attitudes towards the community. The underlying technology and the design of an online community can constrain or amplify the social presence projected by user generated content. Addressing others by names, using emoticons, welcome messages, immediate response, feedback, expletive and exclamation can all influence immediacy and intimacy among members of an online community. User-generated content has the ability to transmit intimacy through the expression of feelings, greetings, compliments and reference to others. In online communities, the content generated through member interaction can signal social presence to members and potential members.

The feeling of community is fundamental to person-to-person interactions. Online

communities that are unable to project social presence in their discourse and dialogues eventually undermine cohesiveness within the community. The awareness of others and the appreciation of others in interpersonal interactions can influence how individuals feel about a community (Tu and McIsaac, 2002). Intimacy and immediacy reflected in user-generated content influence the level of social presence in online communities and can impact the quality of the communication.

### **Knowledge**

Knowledge plays an important role in attitude formation, intentions and behaviors. According to Davenport and Pruzak (2000), knowledge is a dynamic mix of experiences, values, contextual information and expert insight that provide the basis for evaluating new experiences. Hence, our experiences, contexts and insights are sources of knowledge. Knowledge also influences how we react and evaluate our environment, experiences and others. In the context of this study, knowledge influences how individuals react and process content generated by online communities.

As noted by Petty and Cacioppo (1981, 1986), knowledge influences how individuals process content and the consequent changes in attitudes. Knowledge determines the amount of cognitive effort exerted in processing a message or persuasive information (Wright, 1973) and the consequent changes in attitudes and intentions. Thus, the ability and motivation to process information depend on knowledge. Knowledgeable individuals have some inkling about the content or information they process, thus, they are able to process the information more easily than individuals with less knowledge.

Within the ELM framework, knowledge motivates and enables individuals to evaluate persuasive information. This motivation and ability may influence how attitudes are adjusted and

formed by individuals (Petty and Cacioppo, 1981; 1986). Thus, knowledge influences how individuals process and evaluate persuasive stimuli. Drawing on the extant literature on knowledge, this study examines the mediating role of knowledge .

Prior studies indicate that knowledge influences how individuals seek, process, and integrate information. Knowledge also influences learning and decision making, and facilitates the acquisition of new knowledge (Punj and Staelin 1983; Johnson and Russo, 1984; Rao and Monroe, 1988). In consumer behavior studies, there is empirical evidence that consumers with product knowledge are able to learn new information more easily because they have the knowledge schemas to integrate new information (Johnson and Russo, 1984).

Knowledgeable individuals are more likely to process and integrate information easily than individuals lacking knowledge. In a study examining how consumers seek information, Punj and Staelin (1983) noted that knowledge or prior memory structures influence the amount of external information that consumers seek. The types of opportunities identified and exploited by entrepreneurs are influenced by their knowledge. Shane (2000) noted that entrepreneurs discover opportunities related to their knowledge. Thus, knowledge defines our search criteria for information, facilitates evaluation and the creation of knowledge schemas from new content.

Brucks (1985) also noted that knowledge facilitates the acquisition and search for information. Knowledge shapes and influences how individuals look for information and also how they integrate that information into their knowledge structures. Knowledge affects the choices and decision making processes of individuals'. The amount of information that individuals can recall and how much information they are able to internalize are all influence by their knowledge (Recht and Leslie, 1980; Johnson and Russo, 1984; Taft and Leslie, 1985; Bettman et al. 1988).

In the context of online communities, individuals look for relevant information and then integrate parts of that information based on their knowledge schemas. The choices and decisions that individuals make about online communities are also shaped by their knowledge. Knowledge provides a reference for evaluating content and information, and making choices about the content.

### Hypotheses Development

The research model in Figure 3 evaluates the role of knowledge as a mediator between the three exogenous variables (content quality, source credibility, and social presence) and attitudes towards an online community. The research model in Figure 3 shows that the impacts of content quality, source credibility, and social presence on attitudes toward an online community are mediated by knowledge.

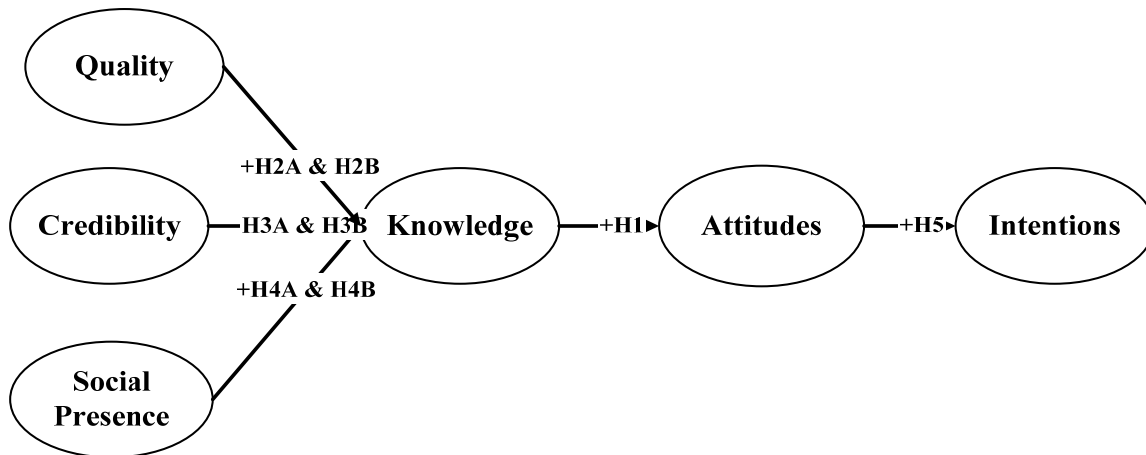


Figure 2. Mediation model showing the mediating role of knowledge

Electronic communities are rich sources of information for members and prospective members. Many forms of content are generated as members interact with each other and participate in community activities. This content reflects the image of the community to the

public and provides an important source of information to members and potential members. The content generated by an online community provides potential members with insights into the dynamics of the community and what to expect from the community. How individuals perceive content quality, source credibility, and social presence may influence how they react to the content generated by an online community. Similarly, knowledge can influence how individuals react and interact with user created content in online communities.

Knowledge is the belief and values accumulated through experience, and inferences from information or communication. According to Nonaka et al., (2001), “knowledge is a dynamic process of justifying personal belief towards the truth”. Knowledge forms the basis of our beliefs and values and it dynamically evolves as we interact with others and our environment. Because knowledge is fundamental to our belief system and influences the perceptions of truth, it also affects our attitudes. Bettman and Park (1980) observed that the absence or presence of knowledge influences the types of information processed by an individual and the underlying heuristics.

Knowledge can influence how individuals react to information and adjust their attitudes (Petty and Cacioppo, 1981, 1984; Rao and Monroe, 1988). In the context of an online community, knowledge also influences how individuals perceive content generated by a community and how they interact with and react to the content, and the consequent attitudinal changes.

For example, if the dialogue on a topic in a forum is objective and credible, users who are knowledgeable on the topic are more likely to make positive attitudinal changes and adjustment towards the community because they have the capacity to ascertain the veracity and credibility of the dialogue. On the other hand, individuals who are not familiar with the topic of discussion in a

forum may not have the ability to objectively evaluate the dialogue and content. This lack of ability to objectively evaluate content may lead to negative attitudes towards a community even when the content is credible and excellent. Following this logic, this study posits that knowledge will have a positive impact on attitudes towards an online community. This relationship is formally stated in hypothesis H1.

**H1:** Knowledge has a positive impact on attitudes towards an online community.

Community members and potential members may rely on content generated by a community to form attitudes about the community. When individuals evaluate content or information, they elaborate on the logic of the content and may adjust their attitudes (Petty and Cacioppo 1986). Content quality can influence attitudes and intentions. In a study of web site content, Rieh (2002) opined that information quality influences how users evaluate and assess content provided by websites. Lederer et al. (2000) also suggested that information quality on web sites influences user attitudes and intentions towards the web site. Nicolaou and McKnight (2006) also noted in their study of inter-organizational data exchange that perceived information quality influences users' intentions and attitudes. In a study of blogs, Aggarwal et al. (2012) concludes that readers may form an impression of a firm by reading blogs and negative posts may also increase readership. Thus, there is some evidence in the prior literature that the content of user-generated content can influence attitudes

Similarly, when individuals perceive content in online communities to be relevant and logical, their attitudes towards these communities are more likely to be favorable. However, those changes in attitudes may depend on other intervening variables. The impact of content quality on attitudes is moderated and/or mediated by knowledge. Knowledge influences

motivation and ability to elaborate on content. Relevant knowledge enables individuals to elaborate on the issue-relevancy of a message and rely less on contextual cues (Ratneshwar and Chaiken 1991; Sussman and Siegal 2003).

Knowledgeable individuals have the ability to evaluate content logic than less knowledgeable individuals. Theories of consumer choice have established a link between consumer information processing and knowledge (Rao and Monroe, 1988; Rao and Sieben, 1992). Consumers with knowledge are able to acquire new information and process existing information more easily than consumers who lack knowledge (Marks and Olson, 1981).

Knowledge provides evaluative criteria and heuristics for assessing information content. In a study of how hypertext content is processed, Potelle and Rouet (2003) opined that knowledge enables individuals to construct knowledge schemas for processing and comprehending hypertext information. Studies in the psychology of learning also suggest that knowledge influences the amount of information that individuals recall from reading a text (Recht and Leslie, 1980; Taft and Leslie, 1985).

Prior literature provides ample evidence that knowledge influence how individuals seek, process, integrate and learn from information (Punj and Staelin 1983; Johnson and Russo, 1984; Rao and Monroe, 1988). Similarly, in the context of user-generated content and online communities, this study opines that knowledge moderates and mediates the impact of content quality on attitudes toward an online community.

In the context of online communities, this study expects that as content quality increases, favorable changes in attitudes towards a community also increases, however these changes are more salient for individuals with knowledge. Knowledge also mediates the impact of content quality on attitudes. The impact of content quality on attitudes is transmitted through knowledge.



Knowledge influences how content is processed and integrated and the consequent changes in attitude formation. Hence, the current study tests the following hypotheses:

**H2A:** Content quality has a positive impact on attitudes towards an online community.

**H2B:** Knowledge mediates the impact of content quality on attitudes towards an online community.

In many online communities, large amounts of content are generated through interaction among members and most of the content are unstructured and in the form of text. Many users and potential members of communities may rely on contextual cues to evaluate content. Source credibility is one of the many contextual cues used in evaluating the persuasive influence of content (Petty and Cacioppo, 1986; Ratneshwar and Chaiken, 1991). Source credibility plays an important role in how individuals perceive information and the consequent changes in attitudes.

Individuals are more likely to change their opinions in response to information when the origin of the information is attributed to a credible source (Hovland and Weiss, 1951). Sternthal et al. (1978) also note that when information sources are credible and trustworthy, they exert a greater persuasive influence on information recipients. Hence, when information recipients perceive information sources to be credible, they are more likely to favorably change their attitudes. In a study of consumer perceptions of risks, Grewal et al. (1996) note that source credibility can influence how consumers perceive risks involved in new purchases. In the context of online communities, when the source of the content is perceived to be credible, individuals may also infer that the content is logical and this may reflect favorably on the community. Perceived source credibility is a reflection of the character of the community and can persuade members and potential members to perceive the community favorably.

Perceptions of source credibility are beliefs in the integrity and veracity of the source, but it

is also dependent on the knowledge of individuals. Knowledge is the combination of personal experiences, values, insights and contextual cues. Knowledge shapes how we process information and the consequent changes in attitudes (Petty and Cacioppo, 1984, 1981).

Knowledge may influence how credibility is perceived. Knowledge influences how individuals search for information, evaluate information, and integrate information into their knowledge structures (Brucks, 1985; Rao and Monroe, 1988).

Knowledge establishes criteria for evaluating and processing information (Rao and Sieben, 1992). Knowledge can facilitate how individuals evaluate source credibility. Individuals with knowledge may be able to determine if a source is credible more easily than individuals with no knowledge. In the context of online communities, knowledgeable individuals have some idea about the content generated by these communities. This knowledge enables them to form opinions and beliefs about the credibility of the source. Individuals who are more knowledgeable are able to discern the credibility of the source of content more easily than less knowledgeable individuals. Thus, it is expected that knowledge will mediate the impact of source credibility on attitudes. Hence, the impact of perceived source credibility on attitudes towards a community is transmitted through knowledge. Those relationships are tested and stated in the following hypotheses;

**H3A:** Source credibility has a positive effect on attitudes towards an online community.

**H3B:** Knowledge mediates the positive impact of source credibility on attitudes towards an online community.

Social presence is the awareness that there are others sharing a physical space in a virtual community. It is reflected in the immediacy and intimacy of the communication within a community. Immediacy is reflected by the psychological closeness of the interaction, and intimacy by physical closeness through familiarity in personal interaction (Gunawardena and

Zittle, 1996). Several aspects of the content generated by online communities can reflect social presence of others in these communities. The extent of social presence facilitated by online content will depend on how it is presented. Greetings, introductions, welcome messages, emoticons and information on members and who is currently online engender social presence in an online community. When individuals review user-generated content embedded with artifacts that foster social presence, they feel the presence of others, and believe their actions and behaviors will elicit responses and reactions from the community.

In online learning environments, social presence has been found to play an important role in learning and teaching effectiveness. Those findings are based on the logic that social presence facilitates social interaction, the communication of social and non-verbal cues, and mitigates social isolation. In online learning environments, social presence fosters interpersonal interaction, increases social identification and eventually improves performance outcomes (Gunawardena and Zittle, 1996; Tu and McIsaac, 2002; Richardson and Swan, 2003; Kehrwald, 2008). When online communities fail to project social presence, communication becomes impersonal and the dialogue is less engaging and member interest in the community may degenerate (Tu and McIsaac, 2002).

In the field of information technology, prior studies have established that perceived social presence influences perceptions of usefulness and ease of use of system (Karahanna and Straub, 1999). In e-commerce environments, prior studies have also suggested that social presence can facilitate loyalty among consumers because their perceptions of social presence influence perceptions of usefulness, trust and enjoyment (Gefen and Straub, 2003; Gefen and Straub, 2004; Cry et al., 2007). Based on the empirical results from the extant literature, this study expects that social presence will positively impact attitudes towards an online community.

Social presence involves the awareness of others, awareness of physical space, and interaction with other (Steuer, 1993; Tu and McIsaac, 2002; Biocca et al., 2003). All the three dimensions of social presence may depend on knowledge. Knowledge has been noted to influence how individuals seek, process and integrate information and may also influence decision making (Johnson and Russo, 1984; Bettman et al., 1988). Hence, knowledge may influence how an individual perceives the setup, configurations of an online community, and how information is presented. The awareness of physical space in online communities may be influenced by knowledge. Knowledge on a topic of discussion in a forum in an online community can provide insights into the dialogue and also influences perception of social presence in the community.

Knowledge facilitates interaction and interpersonal communication among members of online communities. Knowledge plays an important role in social presence and may influence how social presence affects attitudes by mediating the impact of social presence on attitudes. The perceptions of others in online communities may depend on the knowledge. When individuals are knowledgeable, they are more likely to discern the subtlety in the dialogue and content generated by personal interaction in online communities. Thus, knowledgeable individuals are more likely to perceive social presence projected by user created content. Perceptions of social presence in user-generated content influence attitudes towards an online community and how individuals feel about the community. If individuals do not feel that a community is populated by others, then they are less likely to form positive attitudes about the community.

The perceptions that there are others in an online community are signals to individuals that when they join and engage in community activities, at least, part of their goals and expectation will be met. However this relationship is mediated by knowledge. Following this logic, those

relationships are tested and formally stated in the following hypotheses;

**H4A:** Social presence has a positive impact on attitudes towards an online community.

**H4B:** Knowledge mediates the positive impact of social presence on attitudes towards an online community

Attitudes are the results of judgments from evaluating our environment, others, and ourselves. Individuals form attitudes based on beliefs, subjective norms, and personal disposition (Ajzen, 1991). Behavior intentions and actual behaviors are influenced by attitudes formed by evaluating our environment. Attitudes comprise of an individual's positive or negative evaluation of people, objects, event, activities or the general environment. Prior literature on intentions and attitudes indicates that there is a positive relationship between attitudes and intentions. Attitudes towards an object influence intentions and eventually behaviors (Ajzen, 1991).

Attitude is one of the main determinants of intentions in the technology acceptance model that seeks to explain adoption and use of technology in a variety of contexts (Davis, 1989; Taylor and Todd, 1995; Venkatesh et al., 2003). These studies provide empirical support for the relationship between attitudes and intentions in the context of computer technology adoption. Similarly, in the context of online communities, behaviors aimed at using community resources and participating in a community are also influenced by attitudes.

When individuals form attitudes about user-generated content, both cognitive and affective, it informs their intentions about the online community that generated the content. User-generated content is a byproduct of interaction and dynamics within an online community; hence attitudes formed about user-generated content translate into behavior intentions towards the community. As shown in the research model in Figure 3, favorable attitudes towards a community influence intentions to use community resources. When individuals evaluate user-generated content from

an online community, they may form positive or negative attitudes towards the community. When individuals have positive attitudes towards content generated by a community, they are favorably inclined to the community and believe their goals and expectations will be met by the community. A favorable disposition towards community content induces positive attitudes towards the community and intentions to use community resources. Thus, a positive attitude is more likely to induce individuals to use community resources. Hence, this study predicts hypothesis H5.

**H5:** Attitude towards an online community has a positive impact on intentions to use community resources.

### **Study Design**

This section outlines the design of the study, methodology, procedures for participants, and the measurement scales used in the surveys. An experimental study was designed using online communities developed specifically for this study. The online communities were designed using Yuku, a free online tool for creating online communities. The focal interest of the online communities was job interview tips, job search strategies, writing resumes, and interacting with recruiters. The experimental design involved the manipulation of three factors, each with two levels. The independent variables manipulated in the 2X2X2 factorial study design are content quality, source credibility, and social presence. As shown in Table 1, the study design manipulated three factors with high or low values in eight experimental groups.

	Social Presence		Content Quality		Source Credibility	
	High	Low	High	Low	High	Low
Group 1	X		X		X	
Group 2	X		X			X
Group 3	X			X	X	
Group 4	X			X		X
Group 5		X	X		X	
Group 6		X	X			X
Group 7		X		X	X	
Group 8		X		X		X

Content quality was manipulated by changing the argument quality and logic underlying the content. In contrast to the flawed logic in the low level of content quality group, in the high level group, the arguments and logic are cogent, coherent and rational. As summarized in Table 2, in the low level content quality group, content related to job search, resume writing, and interviewing skills is interjected with incoherent arguments and flawed logic.

Social Presence		Source Credibility		Content Quality	
High	Low	High	Low	High	Low
Use of photos of contributors and smiley in dialogue. Welcome message	No smiley, photos or avatars of contributors. No welcome messages	Signatures of contributors reflect professional experience and level of expertise.	No signatures for most contributors. Those with signatures did not have the expertise	Content is logical, constructive and persuasive	Content is not logical and contradicts accepted norms about the topic

Perceived social presence was manipulated by changing how content and messages are presented and framed to community members. Content projecting high levels of social presence contains messages that are more personable, such as greetings, welcome messages, smileys, and introductions. Those messages use emoticons and avatars to project presence and infuse affect in the dialogues. As presented in Table 2, for the manipulation of social presence, features, such as

the use of photos or avatars of contributors, use of smiley, and welcome messages were manipulated to simulate high and low social presence.

Source credibility was manipulated by the amount of information available on content contributors and how the information was presented. In the low level of source credibility group, participants have scanty information on members and contributors. When information is revealed about contributors, the information projects the lack of expertise of the contributor. In the high source credibility group, information on content contributors was easily available and the information underscores the expertise of content contributors. Table 2 presents a summary of the features manipulated in the online communities. Source credibility was manipulated by using the signature of contributors to provide or exclude brief information about their professional background. Study participants in each group were instructed to review the content, contributors in the community, and information presentation, and then complete a survey.

### **Pilot Study and Manipulation Check**

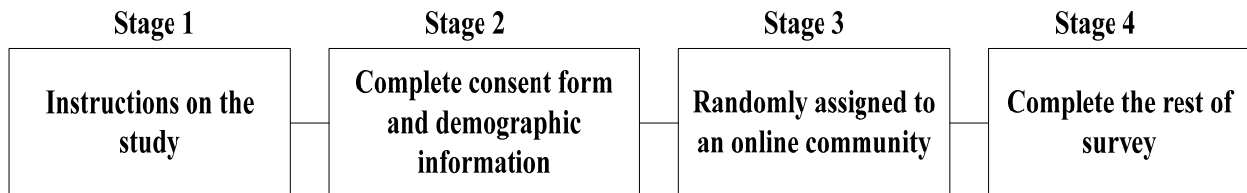
After the online communities were created and populated with members and content, graduate students and some faculty were asked to review the communities, the experimental design, and questionnaire, and provide feedback. In response to the feedback and comments, some of the survey items were further refined to suit the context of the study and certain features of the online communities were also improved. Feedback from the pilot study suggested that the dialogue in the online communities adequately simulated dialogue in real online communities.

A check of the manipulations is important in determining whether the manipulations are effective (Strenthal et. al 1978; Purdue and Summers, 1986). Hence, a manipulation check was conducted to evaluate the differences in means in the independent variables among the different levels of the experimental factors. Specifically, the manipulation check assessed how participants



assigned to the high or low levels of the experimental factors perceived the following independent variables: content quality; source credibility; and social presence.

Participants in the manipulation check study were recruited from Amazon Mechanical Turk and randomly assigned to one of the eight experimental groups. As shown in Figure 4, in the first stage of the experiment, participants were instructed that they will visit an online community, and evaluate the content and presentation of information, peruse the dialogue, and review information about contributors. A link to an online survey was provided in the instructions. In the second stage of the experiment, participants were presented with a consent form with the option to decline or agree to participate in the study. Once the consent form is completed and participants agree to participate in the study, they were asked to complete demographic information.



*Figure 3. Stages in the study*

In the third stage of the experiment, as shown in Figure 4, participants were randomly assigned to one of the eight online communities created specifically for the study. Once participants have completed reviewing the content and dialogue in their assigned online community, they proceeded to the final stage of the experiment. In the final stage of the experiment, participants completed the rest of the questionnaire in the survey. As a manipulation check, there was a question about the topic of discussion in the online community. Participants who failed to answer the manipulation check question correctly were excluded from the study.

Questionnaires in the survey included questions on participants' perceptions of content

quality, source credibility, and social presence. The pilot study for the manipulation check recruited 120 participants; six of the participants were excluded because of incomplete questionnaire or failure to answer correctly the manipulation check question in the survey. Surveys from 114 participants were evaluated for the pre-test manipulation check. Each participant was paid \$0.25 for participation. The goal of the manipulation check was to determine if there are mean differences among the low and high groups in the experimental design.

	Social Presence		Source Credibility		Content Quality	
	High	Low	High	Low	High	Low
No.	59	55	49	65	56	58
Means	20.7	18.35	12.8	11.2	15.88	10.46
p-value	0.01		0.03		0.001	

Only three independent variables relevant to the experimental factors were evaluated in the manipulation check study. Significant differences in means indicate that the manipulations of the three factors are effective. The results of the manipulation check are reported in Table 3. The difference in means between low and high social presence groups was significant, the mean for the high group is 20.7 and the mean for the low group is 18.35 (p-value < 0.05). The results were also significant for source credibility. Similarly, the difference in means between the high and low content quality groups was also significant. The mean for the low group is 10.46 and the mean for the high group is 15.88 (p-value < 0.001). These results indicate that there is significant difference between the high and low groups in each of the factors manipulated in the experiment.

### Analysis

The actual study recruited 268 participants from Amazon Mechanical Turk. These

participants did not participate in the pilot study. Out of the 268 participants recruited, twelve participants were excluded because they failed to complete the survey or failed to answer correctly the manipulation check question. Participants were recruited from US residents only and each participant was paid \$0.50.

The participants were made up of 133 males and 123 females. High school graduates accounted for 13 percent of the participants, 43 percent have some college education, 27 percent have undergraduate degrees, 15 percent have post-graduate degrees, and 2 percent has other educational qualifications. The age distribution is as follows; 59 percent of the participants are 30 years or younger, 31 percent are between the ages of 31 and 50, and about 10 percent are over 50 years.

A second manipulation check was conducted to determine whether there was a significant difference in means between the high and low groups. The test was conducted for the respective independent variables. For example, under the content quality factor, a t-test was conducted to evaluate whether there was a significant difference between the high and low groups on how they perceived content quality. The results of the t-test are presented in Table 4. The results indicate that there is a significant difference in means between the high and the low groups within each factor manipulated in this study.

	Social Presence		Source Credibility		Content Quality	
	High	Low	High	Low	High	Low
No.	123	133	124	132	138	118
Means	27.6	12.26	4.7	12.31	16.48	6.83
p-value	0.001		0.001		0.001	

## Measures

The analysis was done using Stata/IC 12.1 for Windows and structural equation modeling with maximum likelihood method. The constructs in this study were measured by scales developed and tested in prior studies, and all responses were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The items in all the scales were tested for reliability by evaluating loading of each observed item to ensure that it loaded reasonably high.

Loadings of observed indicators below 0.6 ( $\lambda < 0.60$ ) were examined in relation to other loadings on the construct to ensure that the average variance extracted (AVE) is at least 0.5. Observed indicators with low loadings were excluded from the scales. Cronbach's alpha, means and standard deviation for all the scales are presented in Table 5.

Knowledge was assessed with a 4-item scale adapted from Bhattacharjee and Sandford (2006). Intentions to use community resources were assessed with items developed by Venkatesh et al. (2003). There are four items in this scale; three of the items were retained after examining the loadings of the items. The measure for source credibility is made up of a four-item scale and one item was dropped leaving three items. This scale was adapted from Shaffer (1987) and McKinney et al. (2002). Social presence was measured with a six-item scale adapted from Gunawardena and Zittle (1997). All the items in this scale were retained and the Cronbach's alpha is 0.95, as reported in Table 5.

The content quality scale is made of four items developed by Bhattacharjee and Sandford (2006). All the items in this scale were retained and the Cronbach's alpha is 0.92. Individuals' attitudes towards an online community were assessed with a scale previously developed by Herr et al. (1991), Taylor and Todd (1995), and Bhattacharjee and Sandford (2006). The scale consists of four items with an alpha of 0.95.

	No. of Observations	Mean	SD	No of Items	Items Retained	Cronbach's Alpha
Content Quality	256	11.27	4.80	4	4	0.92
Source Credibility	256	8.63	3.84	4	3	0.95
Knowledge	256	14.03	3.55	4	4	0.89
Social Presence	256	17.29	7.31	6	6	0.95
Intentions	256	7.33	3.66	4	3	0.97
Attitudes	256	12.86	5.09	4	4	0.94

The means, standard deviations, the number of items in each scale, and Cronbach's alpha for the scales are presented in Table 5. The alpha values reported for each scale meet the threshold value of 0.7 recommended in prior studies (Hair et al., 2006). All the items for the measures are listed in Appendix D.

A measurement model was tested using the constructs listed in Table 5. The measurement model was iteratively revised by evaluating the modification indices and correlating some of the latent variables and error terms of observed indicators. Covariances between latent variables were constrained to zero if the covariances were insignificant. For example, the covariance between knowledge and quality was constrained to zero because it was insignificant. The covariances between the latent variables as well those between the error terms are listed in the footnote below<sup>10</sup>.

The measurement model was evaluated by a set of fit indices to ascertain how well it fits the data set. The fit indices include RMSEA, CFI, TLI, SRMR, chi-square, and relative chi-square. The recommended threshold values of some of the fit indices for acceptable models are

<sup>10</sup> (e.q2\*e.q4 e.a2\*e.a4 e.p1\*e.p5 e.q1\*e.q2 e.q1\*e.q4 e.p2\*e.p3 e.p2\*e.p6 e.p2\*e.p4 e.a1\*e.a3 e.a2\*e.a4 e.p4\*e.p6 e.p3\*e.p4 e.p5\*e.p3 e.p3\*e.p6 e.k2\*e.k3 )  
 ( KNOWLEDGE\*PRESENCE INTENT\*ATTITUDE QUALITY\*INTENT KNOWLEDGE \*ATTITUDE PRESENCE\* ATTITUDE QUALITY\*ATTITUDE KNOWLEDGE\*CREDIBILITY PRESENCE\*ATTITUDE CREDIBILITY\*ATTITUDE)

as follows: [RMSEA  $\leq$  0.06; CFI  $\geq$  0.95; SRMR  $\leq$  0.8; TLI  $\geq$  0.95] (Hu and Bentley, 1999). The chi-square and p-value for the measurement model were [ $\chi^2$  (230) = 448.3; p-value  $>$  0.05].

Relative chi-square index is one of the indices for evaluating model fit. The relative chi-square index is computed by the ratio of the chi-square and degrees of freedom. It is recommended that the relative chi-square value for acceptable models be equal to or less than three [ $\chi^2 / df \leq 3$ ] (Carmines and McIver, 1981; Ullman, 2001). Thus, the fit indices for the measurement model are [RMSEA = 0.06; CFI = 0.97; SRMR = 0.06; TLI = 0.96;  $\chi^2 / df = 1.95$ ]. Thus, all the fit indices meet the recommended threshold for acceptable models.

Table 6: Correlation Matrix							
	AVE	1	2	3	4	5	6
1. Knowledge	0.66	<b>0.81</b>					
2. Credibility	0.74	0.26	<b>0.86</b>				
3. Presence	0.68	0.42	0.01	<b>0.84</b>			
4. Quality	0.60	0.17	-0.01	0.03	<b>0.77</b>		
5. Attitudes	0.80	0.30	0.17	0.23	0.52	<b>0.90</b>	
6. Intentions	0.91	0.11	-0.04	0.02	0.35	0.63	<b>0.96</b>
Diagonal (bold) is square root of AVE							
AVE = $\Sigma(\lambda^2) / \Sigma(\lambda^2) + \Sigma(1-\lambda^2)$ (Chin, 1998)							

Inter-construct correlations and AVEs of all constructs are reported in Table 6. Most of the correlation values are below 0.5, except for the correlations values between attitudes and content quality as well as attitudes and intentions. Convergent and discriminant validity were evaluated by two criteria. First, the square root of AVE by a construct from its indicators should be at least 0.70. Secondly, the square root of the AVE should exceed that construct's correlation with other constructs (Fornell and Larcker, 1981; Chin, 1998). The square root of the AVEs are listed along the diagonal. Based on the results reported in Table 6, all the scales meet the required threshold for convergent and discriminant validity.

The research model in Figure 3 was iteratively refined by examining modification indices

and correlating the latent exogenous variables and error terms of observed indicators with high modification indices. Based on modification indices and the p-values of correlations, the latent exogenous variables were also covaried or the covariances constrained to zero. The latent exogenous variables and error term co-varied in the model are listed the footnote<sup>11</sup>.

The steps recommended by Baron and Kenny (1986) were followed to ascertain if the mediation model supports a mediated relationship. First, the simple direct effect was tested to determine if there is a potential for mediation. In this step the simple direct effects from all the exogenous latent variables (content quality, source credibility, and social presence) to attitudes were evaluated to ascertain if the relationships are significant.

In step two, the indirect effects were tested to determine if the relationships between the predictors and the mediator, and the mediator and the criterion are significant. The final step is to add the direct effect while controlling for the indirect effects. The stipulation for partial or full mediation is that the indirect effects must be significant while controlling for the direct effects.

There is full mediation if the direct effect is insignificant while controlling for the indirect effect; however, if the direct effect is significant, but attenuates when the indirect effects are included in the model, then there is partial mediation. The covariances among the latent exogenous variables and the error terms of the observed indicators are listed in the footnote<sup>12</sup>.

The fit indices for the mediation model are [chi-square (226) = 462.10, p-value > 0.01; RMSEA

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<sup>11</sup> (KNOWLEDGE\*CREDIBLE KNOWLEDGE \*PRESENCE KNOWLEDGE \*QUALITY )  
(e.p1\*e.p4 e.p1\*e.p5 e.q1\*e.q2 e.p2\*e.p3 e.p2\*e.p6 e.p2\*e.p4 e.a1\*e.a3 e.a2\*e.a4 e.p4\*e.p6  
e.p3\*e.p4 e.p5\*e.p3 e.p3\*e.p6 e.k1\*e.k3 e.k2\*e.k3 e.k4\*e.k3 e.q2\*e.q4 e.q2\*e.q1)

<sup>12</sup> (e.p1\*e.p4 e.p1\*e.p5 e.q1\*e.q2 e.p2\*e.p3 e.p2\*e.p6 e.p2\*e.p4 e.a1\*e.a3 e.a2\*e.a4 e.p4\*e.p6  
e.p3\*e.p4 e.p5\*e.p3 e.p3\*e.p6 e.k1\*e.k3 e.k2\*e.k3 e.k4\*e.k3) (CREDIBILITY\*PRESENCE  
QUALITY\* CREDIBILITY PRESENCE\*QUALITY KNOWLEDGE\*PRESENCE  
KNOWLEDGE \* CREDIBILITY KNOWLEDGE \*QUALITY)

= 0.06; CFI = 0.96; SRMR = 0.06; TLI = 0.96;  $\chi^2 / df = 2.04$ ]. All the fit indices meet the recommended threshold for good fitting models, thus, the model is acceptable. The hypothesized mediated relationships and their respective path coefficients are discussed in the hypotheses testing section.

### **Hypotheses Testing**

Alternative models were evaluated to ascertain if these models fit the data and also support alternative hypotheses. A main effect and moderation models were evaluated and a comparison of these alternative models and the mediation model indicated that the mediation model performs better than the alternative models. The comparisons of the models are reported in Appendix E.

The value of the path coefficient from knowledge to attitudes towards an online community is 0.34 (p-value < 0.01) providing support for H1 which hypothesized a positive relationship between knowledge and attitudes toward an online community. The path coefficient for the hypothesized relationship between content quality and attitudes towards an online community is 0.57 (p-value < 0.01) providing support for H2A which hypothesized a positive relationship between content quality and attitudes toward an online community. As reported in Table 7, source credibility has a positive impact on attitudes towards an online community, the path coefficient is 0.15 (p-value < 0.01), supporting H3A.

The path coefficient reported in Table 7 provides support for the hypothesized positive relationship between social presence and attitudes towards an online community, thus H4A is supported, the path coefficient is 0.24 (p-value < 0.01). Hypothesis H5 posits a positive relationship between attitudes towards an online community and intentions to use community resources. That relationship is supported and the path coefficient is 0.65 (p-value < 0.01).



Hypotheses H1, H2A, H3A, H4A, and H5 are supported.

**Table 7: Mediation Model Path Coefficients**

	<u>Simple Direct Effect</u>		<u>Indirect Effect</u>		<u>Total Effects</u>	
	Attitudes	Intentions	Attitudes	Intentions	Attitudes	Intentions
Credibility	0.15***		0.29***		0.12**	0.28***
Social Presence	0.24***		0.43***		0.18***	0.45***
Content Quality	0.57***		0.15***		0.55***	0.16**
Knowledge		0.34***		0.65***	0.12*	
Attitudes		0.65***		0.65***		0.65***

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

The path coefficients and their significance levels for the hypothesized mediated relationship are reported in Table 7. Following the Baron and Kenny (1986) method, the simple direct effect, indirect effect and total effect were evaluated to ascertain mediation. As reported in

Table 7, all the paths from the independent variables to attitude are significant. The path coefficients for those relationships are summarized in Table 7 under Simple Direct Effect. The paths coefficients of the indirect effects of the three independent variables on attitudes are listed under Indirect Effect in Table 7. The path coefficients for the simple direct effect and indirect effects are listed under Total Effects in Table 7.

The significance of the indirect effects was evaluated using a Sobel test, and the p-values for the indirect effects from the Stata output. Both of these values are reported in Table 8. Hypothesis H2B, H3B, and H4B hypothesized mediated relationships and were tested using the steps recommended by Baron and Kenny (1986). The results did not support hypothesis H2E, which hypothesized that the impact of content quality on attitudes will be mediated by knowledge. The indirect effect from content quality to attitudes (Quality→Knowledge→Attitudes) was insignificant (p-value > 0.10), as reported in Table 8. Thus, hypothesis H2B was not supported.

Table 8: Sobel Test of Indirect Effects

	<u>Sobel Test</u>			<u>SEM Values *</u>
	Test Statistics	Std. Error	p-value	p-value
Credibility→Knowledge→ Attitudes	1.82	0.02	0.07	0.07
Presence→Knowledge→ Attitudes	1.91	0.03	0.06	0.06
Quality→Knowledge→ Attitudes	1.62	0.01	0.11	0.10

\* p-values from Stata output

The hypothesized mediated relationship between source credibility, knowledge and attitudes (Credibility→Knowledge→ Attitudes) was supported. The path coefficient from source credibility to attitudes is 0.15 (p-value < 0.01). When the indirect effects are included in the model, the path is still significant but the beta coefficient declines to 0.12 (p-value < 0.01), thus

the direct effect declined by 0.03 when the indirect effect is included in the model. Furthermore, as reported in Table 8, the result of the Sobel test indicates that the path coefficient of the indirect effect is significant (p-value < 0.10). Thus, providing support for partial mediation for hypothesis H3B.

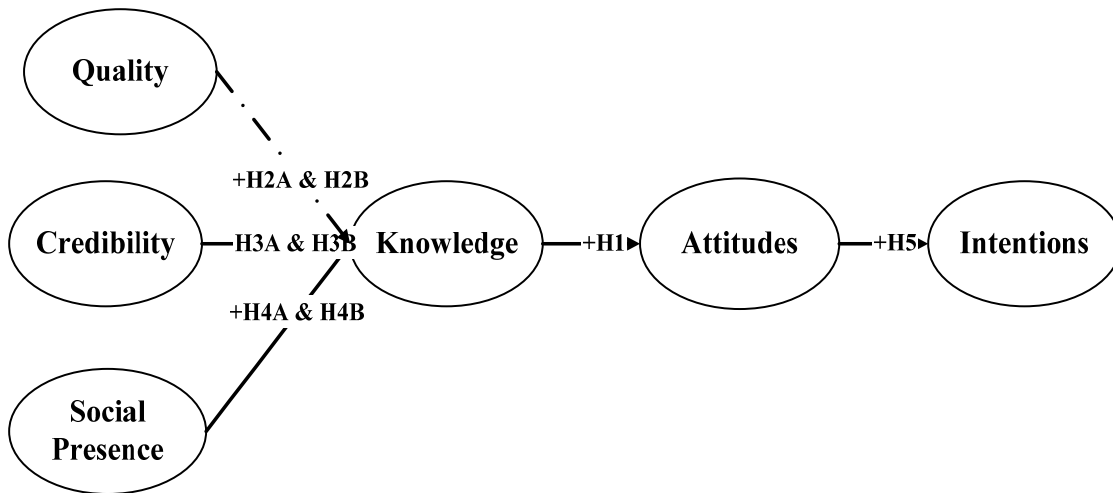


Figure 4. Mediated model and supporting hypotheses  
Notes: Solid lines are paths supported by the results

The hypothesized mediated relationship between social presence and attitudes (Presence→Knowledge→ Attitudes) is also supported. As presented in Table 8, the path coefficient of the indirect effects is significant (p-value < 0.10). The path coefficient for the simple direct effect is 0.24 (p-value < 0.01) and when the indirect effect is controlled for, the value attenuates to 0.18 (p-value < 0.01). Thus, the direct effect decreases by 0.06 when the indirect effect is included in the model, thus, providing support for partial mediation and hypothesis H4B. A summary of the supporting and non-supporting hypotheses are provided in Table 9 and a graphical representation is also provided in Figure 5.

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**Table 9: Hypotheses and Models**

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## Hypotheses

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H1	Knowledge has a positive impact on attitudes towards an online community	Y
H2A	Content quality has a positive impact on attitudes towards an online community	Y
H2B	Knowledge mediates the impact of content quality on attitudes towards an online community	N
H3A	Source credibility has a positive impact on attitudes towards an online community	Y
H3B	Knowledge mediates the positive impact of source credibility on attitudes towards an online community	M
H4A	Social presence has a positive on attitudes towards an online community	Y
H4B	Knowledge mediates the positive impact of social presence on attitudes towards an online community	M
H5	Attitude towards an online community has a positive impact on intentions to use community resources	Y

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*Notes Y = Supported Hypothesis; N = Unsupported Hypothesis; M: Moderately Significant*

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## **V. DISCUSSIONS, IMPLICATIONS, AND FUTURE DIRECTIONS**

The first study relied on self-reported measures to collect data on satisfaction with the community and absorptive capacity. These perceptions of absorptive capacity and community performance may not be objective, but they reflect the perceptions and attitudes of study participants. Supplementing those measures with objective measures may enhance the quality of the scales in the study. In spite of this shortcoming, this study contributes to the literature on communities of practice.

Communities of practice play an important role in the knowledge management strategies of many organizations. It is not a coincidence that many organizations, including IBM Corporation, Microsoft Inc., Xerox Inc., Intuit Inc., and the World Bank, support communities of practice. The goal of this first study is to underline the role of social capital in motivating exchange and combination behaviors in online communities of practice. Additionally, this study also attempts to demonstrate that the impact of exchange and combination behaviors on performance outcomes is dependent on absorptive capacity.

Several studies in the prior literature have cited social capital as a predictor of participation, knowledge sharing, and information seeking in electronic communities (Lesser and Storck, 2001; Wasko and Faraj, 2005 ; Chui et al., 2006; ), and in organizations (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998; Tsai, 2001). This first study provides additional empirical support that social capital can influence behaviors, specifically exchange and combination behaviors in online communities of practice. In this study, cognitive capital is a strong predictor of exchange and combination behaviors in online communities of practice, but neither relational nor structural capital.

Prior studies on knowledge sharing suggest that common knowledge and shared

understanding are important in motivating knowledge sharing and contribution (Brown and Duguid 1991; Orr 1996; Lesser and Storck, 2001; Becerra-Fernandez and Sabherwal, 2001; Wasko and Faraj, 2005). Common knowledge, common context, mutual understanding, and shared language are important predictors of exchange and combination behaviors. The results of this study are consistent to the prior literature on the relationship between cognitive capital and exchange and combination behaviors. The results suggest that in the context of online communities of practice the three dimensions of social capital may not have the same impact on exchange and combination behaviors.

This first study was not able to demonstrate that relational capital influences exchange and combination behaviors. This result is consistent with the findings of Wasko and Faraj (2005). One plausible reason that may account for this result is the anonymity in online communities of practice. Anonymity of online interaction and lack of an effective means or mechanisms for enforcing social sanctions may render relational capital an insignificant predictor of exchange and combination behaviors. Although anonymity in online environments can encourage participation and minimize the influence of status, it can also discourage participation. It may be of interest to future research to examine the conditions under which relational capital encourages or discourages knowledge sharing behaviors in online communities of practice.

Structural capital was also not a significant predictor of exchange and combination behavior. Structural capital presumes that there is frequency, intensity and patterns of interaction and communication. Those communication and interaction patterns may be nebulous in virtual communities and thus, not a significant predictor of exchange and combination behaviors. Faraj et al. (2011) observed that online communities are fluid and are in constant flux as membership, boundaries, and resources change over time.

As the interest, attention, and focus of a virtual community changes, members could be at different points of entry, exit, active participation or passive engagement, depending on the ebb and flow of the community. This fluid and dynamic nature of virtual communities may reduce the ability of structural capital to influence exchange and combination behaviors. The dynamism of online communities of practice may make interaction and communication patterns and structures less relevant to behavior motivation among members. This may explain why structural capital is not a significant predictor of exchange and combination behaviors in virtual communities.

Only a limited number of online communities participated in the second study. These online communities are not representative of all online communities. Hence, the results of this second study may not generalize to all online communities. This study also examined a single socio-psychological factor and personal motivational factors to explain knowledge seeking and sharing behaviors in online communities. Besides those factors, others can influence knowledge sharing and seeking behaviors in online communities. Moreover, all the measures in this study are self-reported measures. Nonetheless, this study has implications on research and practice.

By examining socio-psychological and personality motivational factors together in a single study, this second study provides further insights into how these factors influence knowledge seeking and sharing behaviors in online communities. The results of the study provide support for emotional attachment as a significant predictor of behaviors. Emotional attachment to an online community has a significant impact on knowledge seeking and sharing behaviors. Prior studies on effective commitment have also shown that emotional attachment to organizations fosters organizational citizen behavior (Ellemers et al., 1999; van Knippenberg, 2000; Bergami and Bagozzi, 2000). Thus, the results of this study are consistent with prior

studies and provide additional support for the impact of emotional attachment on behaviors

However, this second study did not find the other dimensions of social identity to be significant predictors of knowledge sharing and seeking behaviors. A number of reasons may account for this outcome. First, in online communities, because membership is voluntary and members can disengage from a community at anytime, emotional attachment to a community may be a relatively stronger predictor of behaviors. Second, the social identity theory suggests that there are multiple and competing social identities and the salient identity in any context may have a dominant influence on behaviors and attitudes. Moreover, personal identity can also surpass social identity when the sense of belonging to a group or community is weak (Alvesson, 2000). Consequently, the evaluative and cognitive dimensions of social identity may have less of an impact in the context of online communities.

Third, loyalty to an online community is one of the many social identities that compete for dominance. Due to the anonymity of online communities and virtual nature of these communities, they may be less salient. Thus, cognitive social identification with online communities may not be salient enough to influence knowledge seeking and sharing behaviors. Fourth, personal motivational factors may exert a relatively stronger influence on knowledge seeking and sharing behaviors in an online community. These reasons may explain the insignificance of the evaluative and cognitive dimensions of social identity in explaining knowledge seeking and sharing behaviors in online communities.

If affective social identity influences knowledge seeking and sharing behavior in online communities, then it may be important for managers of online communities, moderators and organizations to understand how they can enhance affective social identity. One way of accomplishing that is creating a feeling of belonging among members of the community, keeping



members informed about the community and impressing on the members that they are part of a special community and their membership is appreciated. All those actions can increase emotional attachment and encourage participation in a community.

The results of this study indicate that intrinsic motivation is a significant predictor of knowledge sharing and seeking behaviors in online communities. However, extrinsic motivation is significant predictor of knowledge sharing behaviors, but not knowledge seeking behaviors. This result is consistent with prior studies examining behavior motivations in several contexts (Kankanhalli et al., 2005; Wasko and Faraj, 2005). The studies by Kankanhalli et al., (2005), Wasko, and Faraj (2005) are relevant to the current study because they examined knowledge contribution behaviors in different contexts.

Wasko and Faraj (2005) did not find a significant relation between intrinsic motivation and the volume of knowledge contribution. Kankanhalli et al. (2005) also averred that the impact of extrinsic and intrinsic motivations on the use of knowledge management systems is not the same. Those results are consistent with the results of this study. Although extrinsic motivations influence knowledge sharing, it was not a significant predictor of knowledge seeking. On the other hand, intrinsic motivations influenced both knowledge seeking and sharing behaviors.

The second study contributes to the extant literature on personal motivation, and knowledge sharing and seeking behaviors by examining the outcomes of those behaviors, specifically, how the motivations interact with the behaviors to influence outcomes. Intrinsic and extrinsic motivations establish some expectations for behavioral outcomes; these motivations can interact with the behavior to influence the outcome of the behaviors. Based on the results of this study, the interaction of the motivations and behaviors, and the consequent outcomes depend on the underlying motivations. In the case of knowledge seeking and knowledge sharing, the

motivations underlying the behaviors can determine the impact of the behaviors on satisfaction with an online community.

In the third study, the experimental design of online communities in a contrived environment may not accurately reflect user experiences in real online communities. Usually, when individuals review user-generated content, they have some intentions and purpose and the use of experimental design in the current study may not fully capture all aspects of that experience. While the study sought to simulate real online communities, all the dimensions of a real interactive web experience are difficult to implement in an experiment; however, the design was necessary to manipulate the variables in the research model.

This third study focused on knowledge, content quality, source credibility, and social presence; however, there are other contextual and individual factors that may also influence attitudes towards an online community. In spite of those shortcomings, this study provides insights into the persuasive impact of user-generated content, especially, how content quality, source credibility, and social presence influence attitudes in the context of online communities and the role of knowledge.

Prior studies on user-generated content have focused on the impact of user created content on consumer behavior (Chevalier and Mayzlin, 2003; Dallarocas et al., 2007; Dhar and Chang, 2007; Forman et al., 2008), other studies on online communities have focused on understanding individual motivation to contribute content (Lakhani and von Hippel, 2003; Wasko and Faraj, 2005; Kankahalli et al., 2005). The current study contributes to these two streams of research by providing further insights into how the persuasive influence of user-generated content can shape attitudes and intention towards an online community.

Considering that about 155 million Internet users in the US will consume some form of

user-created content in 2013 (Market and Research 2007, 2009), examining how the quality of the content and the credibility of the sources influence attitudes has practical and research implications. In online communities, because the content is not structured and oftentimes not controlled, content quality and source credibility may be more important in influencing attitudes and intentions to use community resources. This study provides additional insights into user created content and attitude formation in online communities by comparing three competing models and also explicating the role of knowledge in the persuasive process of user generated content. The study makes three major contributions to research on user generated content and virtual communities.

First, by teasing out the quality and credibility dimensions of user-generated content and examining the impact of each of these dimensions on attitudes towards an online community, this study provides further insights into user-generated content as a persuasive object. Examining the impact of those two dimensions on attitudes unravels some of the complexity of user-generated content and provides an opportunity for future research to explore other dimensions of user-generated content. It is insightful that the analysis of the result indicates that content quality has a stronger impact on attitudes than source credibility, however, the impact of source credibility is mediated by knowledge and content quality is not.

Prior literature has focused on the impact of user-generated content on purchase intentions and brand loyalty (Dellarocas, 2003; Dhar and Chang, 2007; Forman et al., 2008). The impact of user-generated content on attitudes, purchase intentions and brand loyalty underscores the importance of user-generated content in marketing (Dallarocas et al., 2007; Forman et al., 2008). By demonstrating that user-generated content has multiple dimensions that influence attitudes towards an online community, this study provides further insights into the persuasive

impact of user-generated content, especially in the context of online communities.

Second, by integrating social presence and ELM in a single study, the current study informs research on social presence and ELM in the context of online communities and user-generated content. Furthermore, examining user-generated content from a social presence perspective sheds more light on the complexity of user-generated content. Individuals may perceive a virtual community positively or negatively depending on how the dialogue and presentation of content project social presence. Perception of social presence in a virtual community engenders positive attitudes towards the community. By integrating ELM and social presence perspectives, the study provides new insights into how contextual cues, content quality, knowledge and social presence influence attitudes and intentions.

Third, examining the intervening role of knowledge, specifically, how knowledge mediates the impact of source credibility and social presence provides further insights into the application of ELM in understanding virtual communities. The positive relationships between content quality, source credibility, and social presence, and attitudes are intuitively apparent, but the role of knowledge as an intervening variable broadens our understanding of user-generated content as a persuasive object. The mediation and moderation models suggest that knowledge may mediate and/or moderate the impacts of content quality, source credibility, and social presence on attitudes. Although only the mediated relationships are supported, the moderation model suggests that there is potential for a moderated relationship. Future research can explore those moderated relationships and other intervening variables to further understand user-generated content as a persuasive object.

This third study informs research on the importance of user-generated content and how the quality and credibility dimensions of user-generated content, as well as social presence,

influence attitude formation in online communities. Furthermore, the role of knowledge as an intervening variable was explored to gain further insights into user-generated content as a persuasive object. The importance of user-generated content in attitude formation and intentions has practical implications for organizations that support and manage online environments that facilitate user creation of content. By demonstrating the persuasive mechanisms of user-generated content and its impact on attitudes and intentions, this study provides further evidence to organizations that user-generated content is important and should be managed like other organizational resources.

### **Discussions**

The first study contributes to current research by extending focus beyond participation and behavior motivations in online communities of practice to outcomes of these behaviors. This study examined two performance outcomes, individual and community performance outcomes, to understand the outcomes of exchange and combination behaviors in online communities of practice. Thus, this study informs research on online communities of practice by establishing a link between the antecedents of exchange and combination behaviors and performance outcomes. The results of this study indicate that exchange and combination can improve the performance of a community and individuals.

Furthermore, the absorptive capacity of organizations is important in leveraging the outcomes of exchange and combination behaviors in online communities of practice. Absorptive capacity moderated the impact of exchange and combination behaviors on both individual and community performance outcomes. The outcomes of exchange and combination behaviors improve individual and community performance, furthermore, the combined effects of these behaviors and absorptive capacity also has significant effect on individual and community

performance.

Many organizations struggle to transform some of the potential benefits of online communities of practice into real value. Organizational capabilities to identify, integrate and exploit knowledge generated by communities of practice are important for individual and community performance. Absorptive capacity plays an important role in leveraging the outcomes of exchange and combination behaviors in online communities of practice. Thus, this study relates absorptive capacity to exchange and combination behaviors in online communities of practice and performance outcomes.

By demonstrating that absorptive capacity of an organization plays an important role in leveraging the potential benefits of communities of practice, this study provides new insights into the relationship between communities of practice and the absorptive capacity of an organization. The results of this study are consistent with prior studies that demonstrate that absorptive capacities foster organizational learning and exploiting new knowledge (Szulanski, 1996; Lane and Lubatkin, 1998; Tsai, 2001).

Participants for this study were recruited from a limited set of communities of practice. Future studies can explore the research questions addressed by this study with a wider range of online communities of practice to provide a stronger basis for generalizing the results. Nonetheless, the result of this study has practical implication for organizations, management, forum moderators and community managers.

Inferences from the analysis suggest that cognitive capital is a much stronger predictor of exchange and combination behaviors in online communities of practice. Hence, strategies and online community design features that foster a shared language and understanding among members of a community of practice will facilitate exchange and combination behaviors.

The results of this study suggest that exchange and combination behaviors can potentially improve performance outcomes. However, organizations can maximize those performance outcomes if they develop the capabilities to integrate and exploit knowledge generated by those behaviors. Thus, organizations seeking to benefit from online communities of practice should make an effort to implement processes and routines that will enable them to identify, integrate and exploit knowledge generated by these communities.

The benefits of online communities of practice are difficult to justify in most organizations. The activities of members in online communities of practice and participation in these communities are voluntary and outside the formal responsibilities of employees. Furthermore, organizations may have to provide the infrastructure, technology and support for those communities. By establishing a link between exchange and combination behaviors and performance outcomes, this study has practical implications for organizations. Management and organizations can justify the sponsorship and support of online communities of practice to stakeholders by citing the potential benefits and how to leverage these benefits.

The conclusions of this study are noteworthy in contributing to the understanding of communities of practice, social capital, absorptive capacity, and performance outcomes. By explaining how social capital influences knowledge exchange and combination behaviors, this study provides additional evidence that social capital can influence behaviors in virtual communities. Furthermore, this study shows that the three dimensions of social capital may not have the same impact on behavior motivations in virtual communities.

This is an opportunity for future research to examine how the three dimensions of social capital influence behavior motivations and the factors that may mediate or moderate that relationship in virtual communities. Demonstrating that absorptive capacity is an important

organizational capability provides justification for organizations to pursue policies to strengthen this capability if they contemplate supporting or creating online communities of practice.

By going beyond the motivation and consequent behaviors, and investigating the outcomes of the behaviors, in this case satisfaction with the community, this second study informs research on personal motivation, behaviors, and outcomes in the context of online communities. Additionally, investigating how the outcomes of the behaviors are dependent on the level and type of motivation provides further insights beyond behavior motivation and into the outcomes of these behaviors.

When knowledge sharing behavior is intrinsically motivated, the outcome of the behavior on community satisfaction is not moderated by the underlying motivation, but that is not the case with knowledge seeking. The impact of extrinsically motivated knowledge seeking behavior on satisfaction with a community is moderated by the underlying motivation. Whether intrinsically or extrinsically motivated, the impact of knowledge sharing behaviors on satisfaction with a community is moderated by the underlying motivation. This has implication on moderators and organizers of online communities. Understanding the motivations underlying behaviors in an online community can help online community managers manage the outcomes of these behaviors.

The extant literature on intentions to use a computer system posits that the use of a system will depend on the underlying motivations, and the perceived ease of use and usefulness of the computer system (Davis et al., 1992, Venkatesh, 2000). Extrinsically motivated users are more likely to use a system if they perceive the system to be useful. Thus, when a system is useful, extrinsically motivated users are more likely to use the system because the system will enable these users achieve their goals by using the system. On the other hand, intrinsically motivated users are more likely to use a system if the use of the system is enjoyable and



pleasurable. Thus, users who are intrinsically motivated are more likely to use the system if the use of the system is easy and effortless.

In the context of online communities, design features that facilitate ease of use, such as navigation and interaction with others in the community, may appeal to intrinsically motivated members. Similarly, extrinsically motivated users are more likely to use a system if it facilitates the attainment of personal goals. Some of the reasons why individuals join online communities are to interact with others of similar interests, reputation, status, respect, and learning. Hence, design features that facilitate the attainment of these personal goals may be important to extrinsically motivated users.

The result of this third study has practical implications for organization and managers of online communities. For community managers, forum moderators, management and organizations, it is important to understand that the content generated by an online community is a reflection of the image of the community and can influence attitudes and intentions towards the online community. Sustained participation and membership are some of the major challenges of many online communities (Preece, 2001; Preece et al., 2004; Ling et al., 2004). Thus, an understanding of how content quality and source credibility influence attitudes and intentions to use community resource has practical implications for management of online communities. A deeper understanding of the persuasive impact of user-generated content may help organizations sustain the growth and development of their online communities and avoid some of the common pitfalls and failures.

### **Future Directions**

Future research can examine specific design features in online communities to understand further how these features influence behavior motivations. If the design of an online community

has implication on the behaviors of memberships, then it is important for practitioners to pay attention to design features in online communities. Although anonymity is important in online communities and can encourage participation among members, persistent personality through personal profiles is also necessary to manage a reward system that will track past participation and encourage future participation. Future research should examine technology design features in online communities to gain better insights into technology design and effective management of online communities. Future research can focus on design features that will support some level of anonymity and yet provide persistent profiling capabilities to encourage participating. This focus may provide further insights into the design of effective online communities.

The results of all three studies indicate that although social and personal psychological factors play a role in motivating user participation and involvement in online communities, these factors elicit varied behaviors and intentions for different reasons. For example, extrinsic and intrinsic motivations may induce knowledge seeking behaviors for different reasons and the underlying technology design features may also foster or mitigate the realization of those motivates. Future research on design features and online communities can examine how different design features interact with intrinsic and extrinsic motivations in the context of online communities.

Thus, design features that strike a delicate balance between meeting the intrinsic and extrinsic motivations of users can play an instrumental role in online communities. Specifically, future research should examine how to design online communities that will encourage active participation by stimulating user enjoyment and also incorporating a reward system in the design that will reward users who participate

As different variants of online communities emerge and play important roles in business and society, it is noteworthy for future research to explore how these design dynamics will fare in other online contexts, such as crowd-sourcing and collective intelligence. In crowd-sourcing, problems are relayed to a community in the form of an open call for solutions. Community members submit solutions in response to the call. Members may be rewarded or compensated in the form of status, reputation, recognition, prizes, recognition or monetarily. Members of a crowd sourcing communities are motivated by the benefits from participation. Collective intelligence is the effective recruitment of skills and know-how from distributed intelligence. It focuses on using and coordinating the collective intelligence of a community. Those variants of online communities are aimed at encouraging collaboration among strangers to accomplish a task or solve a problem. To provide further insights, future research should investigate what kinds of design features are important in those contexts and how do personal motivations and social psychology influence participation?

In those online community environments, anonymity and persistent profiling are both important in encouraging users to freely share their knowledge and ideas as well as reward members for their contribution. As research attempts to understand participation and design of online communities in various contexts, future research should investigate what design features are critical to the success of different types of online forums and how should these design features be designed and implemented to achieve the intended goals. Online community managers and organizations that develop online community software ought to include design features that make it easy for members to navigate and use the system and facilitate the attainment of personal goals.

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## VII. APPENDIX

### Appendix A

	Items (Structural Capital)	Retained
cst1	Members of this community maintain close social relationships with each other.	Yes
cst2	Members of this community spend a lot of time interacting with each other.	Yes
cst3	Members of this community know each other at a personal level.	No
cst4	Members of this community have frequent communication with each other.	Yes

	Items (Relational Capital)	Retained
crl1	There is close personal interaction among members of this community	No
crl2	The relationships among members of this community are characterized by mutual respect.	Yes
crl3	The relationships among community members are characterized by personal friendship	Yes
crl4	The relationships among community members are characterized by mutual trust	Yes
crl5	The relationships among community members are characterized by high reciprocity	No

	Items (Cognitive Capital)	Retained
cgc1	Members of this community share the same ambitions with other members	No
cgc2	Members of this community are enthusiastic about pursuing collective goals.	No
cgc3	When interacting with other members of this community we use common terms or jargons	Yes
cgc4	During discussions among members of this community we use understandable communication patterns	Yes
cgc5	Members of this community share the same goal of learning from each other	No
cgc6	When communicating with other members of this community we use understandable narrative forms.	Yes

	Items (Exchange and Combination)	Retained
xch1	Community members exchange and combine knowledge to learn from each other	Yes
xch2	Members of this community are proficient at combining and exchanging ideas to solve problems or create opportunities	Yes
xch3	Members of this community do a good job of exchanging and combining new ideas	Yes
xch4	Community members are capable of exchanging and combining their	Yes

	expertise to accomplish their goals	
xch5	Community members are willing to exchange and combine ideas with other members of the community.	Yes
xch6	Community members frequently exchange and combine ideas to find solutions to problems	Yes

	Items (Individual Performance)	Retained
ipf1	Using community resources improves my job performance	Yes
ipf2	Using community resources increases my productivity on the job	Yes
ipf3	Using community resources enhances my effectiveness on the job	Yes
ipf4	I derive benefits from this community	No
ipf5	I find community resources to be useful in my job	No

	Items (Community Performance)	Retained
cpf1	This community has a positive impact on effectiveness in this organization	Yes
cpf2	This community has positive impact on productivity in this organization	Yes
cpf3	This community plays an important role in this organization	Yes
cpf4	This community plays a valuable role in this organization	Yes

	Items (Absorptive Capacity)	Retained
acapz1	My organization or employer has a common language to deal with new information	Yes
acapz2	My organization or employer has vision of what it is trying to achieve	Yes
acapz3	My organization or employer has the necessary skills to implement ideas	Yes
acapz4	My organization or employer has the technical competence to absorb new knowledge	Yes
acapz5	In my organization it is well known who can help solve problems	No
acapz6	Management in my organization has the competence to absorb new information	No



## Appendix B

Items ( Cognitive)		Retained
sid1	When someone criticizes this community, it feels like a personal insults	No
sid2	I am very interested in what others think about this community	No
sid3	When I talk about this community I usually say ‘we’ rather than ‘they’	Yes
sid4	When someone praises this community, it feels like a personal compliment	Yes
sid5	If a story in the media criticized this community, I would feel embarrassed	No
sid6	I am like other members of this community	No
sid7	I identify with other members of this community.	No
sid8	This community is an important reflection of who I am	Yes

Items (Evaluative)		Retained
cid1	People think highly of this community	No
cid2	It is considered prestigious to be a member of this community	Yes
cid3	People from other communities look up to this community	Yes
cid4	This community is considered one of the best	Yes
cid5	This community has a good reputation	No
cid6	I feel good about this community	No

Items (Affective)		Retained
eid1	I enjoy discussing this community with others	No
eid2	I am very happy to be a member of this community	No
eid3	I think that I could easily become as attached to another community as I am to this one ®	No
eid4	I feel like ‘part of the family’ in this community	No
eid5	I feel ‘emotionally attached’ to this community	Yes
eid6	This community has a great deal of personal meaning for me	Yes
eid7	I feel a strong sense of belonging to this community	Yes
eid8	I like to continue my membership with this community	No

Items ( Intrinsic Motivation)		Retained
int1	I feel a lot of personal satisfaction as a member of this community	Yes
int2	I am excited to be a member of this community	Yes
int3	I like the feeling of being totally immersed when I participate in this community	No
int4	I am satisfied as a member of this community	Yes
int5	I feel intense emotions when I participate in this community	No
int6	It is enjoyable to be part of this community.	No
int7	It is pleasant to be a member of this community	No
int8	I have fun as a member of this community	No

Items ( Extrinsic motivation )		Retained
ext1	I am a member of this community because I feel well regarded by people that I know	No
ext2	I am part of this community because, in my opinion, it is one of the best ways to meet people online.	Yes
ext3	I am part of this community because of the prestige	Yes
ext4	I am a member of this community because people around me think it is important	Yes
ext5	I am part of this community to show others how good I am	No
ext6	I am a member of this community because it is one of the best ways to maintain good relationships with others	No
ext7	I am part of this community because it is the best way to develop other aspects of myself	No
Items( Knowledge Sharing )		Retained
shk1	I frequently participate in knowledge sharing activities in this community	Yes
shk2	I usually spend a lot of time sharing knowledge in this community	Yes
shk3	When participating in this community, I usually actively share my knowledge with others	Yes
shk4	When discussing a complicated issue, I usually follow-up on the discussion	No
shk5	I usually involve myself in discussions of various topics rather than specific topics	No
Items(Satisfaction)		Retained
sat1	Overall the benefits I get from this community is very satisfying	Yes
sat2	I am very satisfied with the benefits I receive from this community	Yes
sat3	All things considered, I am very satisfied with this community	No
sat4	Overall my interaction in this community is very satisfying	Yes
Items( Knowledge Seeking)		Retained
sek1	I frequently participate in knowledge seeking activities in this community	Yes
sek2	I usually spend a lot of time conducting knowledge seeking activities in this community	Yes
sek3	When participating in this community, I usually actively seek knowledge from others	Yes

## Appendix C

Table 7: Moderated mediated coefficients*				
	Model 1A	Model 1B	Model 2A	Model 2B
	Sharing	Seeking	Seeking	Sharing
Low Extrinsic Motivation	0.15***	0.25***		
Medium Extrinsic Motivation	0.19***	0.33***		
High Extrinsic Motivation	0.24***	0.42***		
Low Intrinsic Motivation			0.05	0.16***
Medium Intrinsic Motivation			0.10**	0.17***
High Intrinsic Motivation			0.15***	0.18***

\*\*\* p < 0.01; \*\*p < 0.05; \*p < 0.10

**Notes:** This output is generated by using non linear combinations. The coefficients are reported for the different levels of extrinsic and extrinsic motivations and their impacts on the indirect effects of extrinsic and intrinsic motivations on satisfaction

Table 8: Moderated mediated coefficients*				
	Model 1A	Model 1B	Model 2A	Model 2B
	Sharing	Seeking	Seeking	Sharing
Low Extrinsic Motivation	0.15***	0.25***		
Medium Extrinsic Motivation	0.19***	0.33***		
High Extrinsic Motivation	0.24***	0.42***		
Low Intrinsic Motivation			0.05	0.16***
Medium Intrinsic Motivation			0.10*	0.17***
High Intrinsic Motivation			0.15***	0.18***

\*\*\* p < 0.01; \*\*p < 0.05; \*p < 0.10

**Notes:** This output is generated by using bootstrap with 5000 replications. The coefficients are reported for the different levels of extrinsic and extrinsic motivations and their impact on the indirect effects of extrinsic and intrinsic motivations on satisfaction

The result indicates the there is no difference between the bootstrap and nonlinear combination methods in computing the coefficient for the moderated indirect effects. With the exception of low intrinsic motivation, the indirect effects of extrinsic and extrinsic motivations on satisfaction are moderated.

Table 9: Mediation Analysis

	Seek	Share	Satisfaction	Indirect effects	Total indirect effects
Intrinsic	0.20***	0.41***	0.55***		
Extrinsic	0.47***	0.39***	-0.11*		
Seek			0.04		
Share			0.31***		
Intrinsic-->Share-->Satisfaction				0.12***	
Intrinsic-->Seek-->Satisfaction				0.02	
Extrinsic-->Share-->Satisfaction				0.12***	
Extrinsic-->Seek-->Satisfaction				0.01	
Intrinsic-->Share-->Seek-->Satisfaction					0.14***
Extrinsic-->Share-->Seek-->Satisfaction					0.12***

\*\*\* p < 0.01; \*\*p < 0.05; \*p < 0.10

Further analysis was done to evaluate the mediation effect using seemingly unrelated regression (SUR). Table 9 displays the results. Based on the results, the path from seek to satisfaction is insignificant, and all the indirect effects involving seek were also insignificant, however the total indirect effects are significant. These are supplemental analysis since mediation relationships were not hypothesized. Additionally, the results of the moderated mediation analysis are displayed in Table 8

## Appendix D

<b>Credibility Questions</b>		<b>Retained</b>
c1	How trustworthy are the forum contributors in the community?	Yes
c2	To what extent are the forum contributors' experts on job search skills?	Yes
c3	To what extent are the forum contributors knowledgeable on job search skills?	Yes
c4	How reliable are the forum contributors on job search skills?	No

<b>Items</b>	<b>Content Quality Questions</b>	<b>Retained</b>
q1	The information provided by this community is informative	Yes
q2	The information provided by this community is helpful.	Yes
q3	The information provided by this community is valuable.	Yes
q4	The information provided by this community is persuasive	Yes

<b>Items</b>	<b>Social Presence Questions</b>	<b>Retained</b>
p1	Messages in this community are personal	Yes
p2	Conversing with others will be comfortable in this community	Yes
p3	Introducing myself will be comfortable in this community	Yes
p4	Participating in discussions will be comfortable in this community	Yes
p5	Interacting with others will be comfortable in this community	Yes
p6	My point of view will be acknowledged by other participants in this community	Yes

<b>Items</b>	<b>Intentions Questions</b>	<b>Retained</b>
i1	I intend to use resources from this community	Yes
i2	I predict I will use resources from this community when I get the opportunity	Yes
i3	I plan to use resources from this community	Yes
i4	I will avoid using resources from this community ®	No

<b>Items</b>	<b>Attitudes Questions</b>	<b>Retained</b>
	How would you rate your attitude towards this community? Bad/Good	
a1	Foolish/Wise	Yes
a2	Unimportant/Important	Yes
a3	Unfavorable/Favorable	Yes
a4	Undesirable/Desirable	Yes

<b>Items</b>	<b>Knowledge Questions</b>	<b>Retained</b>
k1	I am knowledgeable in writing a resume	Yes
k2	I am knowledgeable in interviewing for a job	Yes
k3	I am knowledgeable in searching for a job	Yes
k4	I am an expert at interacting with recruiters	Yes

## Appendix E

The fit indices for the main effect, moderation, and mediation models are reported in Table 1. Based on the CFI, TLI, RMSEA, and SRMR threshold values for good fitting models, the three models fit the data fairly well. Based on the chi-square difference test, the three models are comparable.

Table 1: Model Comparison			
	Main Effect	Mediation	Moderation
df	228	226	298
Chi-Square	463.21*	462.10*	531.37*
$\chi^2$ /df	2.03	2.04	1.78
RMSEA	0.06	0.06	0.06
AIC	14195.71	14198.60	20265.19
BIC	14536.05	14546.03	20644.52
CFI	0.97	0.96	0.97
Tucker-Lewis	0.96	0.96	0.96
SRMR	0.06	0.06	0.06
* p > 0.05			

The BIC and AIC values reported in Table 1 indicate that the main effect and mediation models are better models than the moderation model. Additionally, none of the three moderated relationships are supported in the moderation model. On the other hand, the mediation model supports two of the three hypothesized mediated relationships, additionally; the mediated model is more comprehensive than the main effect model. Based on those reasons, the mediation model is a better model than the other two alternative models.

Additional analysis was conducted using ANOVA to evaluate interactions among the manipulated variables. All the one-way ANOVA results are significant and only the interaction of social presence and content quality is significant. The other interactions, including the three way interaction are insignificant

## Appendix G

March 21, 2013

### MEMORANDUM

TO: Richard Kumi  
Rajiv Sabherwal

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-03-562

Protocol Title: Online Communities

Review Type: 1 EXEMPT 0 EXPEDITED 0 FULL IRB

Approved Project Period: Start Date: 03/21/2013 Expiration Date: 03/20/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form Continuing Review for IRB Approved Projects, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 500 participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval prior to implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change. If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).



March 21, 2013

MEMORANDUM

TO: Richard Kumi  
Rajiv Sabherwal

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-03-563

Protocol Title: User Generated Content

Review Type: 1 EXEMPT 0 EXPEDITED 0 FULL IRB

Approved Project Period: Start Date: 03/21/2013 Expiration Date: 03/20/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form Continuing Review for IRB Approved Projects, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

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If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).

March 21, 2013

MEMORANDUM

TO: Richard Kumi  
Rajiv Sabherwal

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-03-561

Protocol Title: Communities of Practice

Review Type: 1 EXEMPT 0 EXPEDITED 0 FULL IRB

Approved Project Period: Start Date: 03/21/2013 Expiration Date: 03/20/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form Continuing Review for IRB Approved Projects, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

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If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).