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Exploring the antecedents of trust in virtual communities

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Although previous research has established that interpersonal trust and system trust are critical in shaping individual behaviour in virtual settings, the two perspectives have not been examined by IS researchers in virtual communities (VCs) simultaneously. Drawing from prior literature on trust and VCs, a research model for understanding the importance of trust in members and trust in system and their antecedents in VCs is presented. Six trust-building factors were identified using three trust-building bases (calculative base, relationship base and technology base). Data were collected from 324 members of a technical VC to test the model. The study shows that trust in members and trust in system have significant influences on knowledge sharing intention. The study also indicates that knowledge growth, perceived responsiveness and shared vision affect trust in members positively, while knowledge quality influences trust in system significantly. The study discusses the theoretical and managerial implications of this study and proposes several future research directions.

Keywords: virtual communities; knowledge sharing intention; trust; trust-building bases

1. Introduction

Supported by information technologies, virtual communities (VCs) provide an attractive place for individuals to exchange knowledge with others (Ridings *et al.* 2002). Previous literature suggests that success of VCs requires that their members be willing to share their knowledge with other members (Chiu *et al.* 2006). However, contributing knowledge in VCs seems difficult (Wasko and Faraj 2005). Some researchers argue that contributing knowledge to VCs could cause knowledge contributors to lose their benefits derived from knowledge (Wasko and Faraj 2005) and the rationale action for members in VCs is to use knowledge regardless of its provision (Wasko and Faraj 2000). In fact, researchers have found that more than 90% of members in VCs are regarded as lurkers – individuals who visit VCs on a regular basis but not posting frequently (Ridings *et al.* 2006). This research suggests that it is important to understand what encourages members to contribute their knowledge and make VCs more vibrant (Ridings *et al.* 2002, Chiu *et al.* 2006).

Prior literature indicates that trust, an implicit set of beliefs that the other party will behave in a dependent manner and will not take advantage of the situation (Gefen *et al.* 2003), plays an important role in helping members overcome the problems regarding

motivation to share knowledge (Ridings *et al.* 2002). This is because VCs are not formed by a specified organisation and members in VCs are typically strangers to one another (Ridings *et al.* 2002). The lack of shared work history and the absence of rich social cues make it harder for members in online setting to share knowledge with others (Kanawattanachai and Yoo 2002). Trust in this sense may act as a governance mechanism to rule out the potential presence of undesirable opportunistic behaviour and create an open environment for knowledge sharing (Hsu *et al.* 2007).

The concept of trust has been increasingly employed in the VCs literature. Several studies have found that interpersonal trust such as trust in members has a positive influence on knowledge sharing (e.g. Ridings *et al.* 2002, Chiu *et al.* 2006, Hsu *et al.* 2007). Given that trust is easy to be destroyed in the virtual settings (Kanawattanachai and Yoo 2002), some studies have begun to investigate the antecedent factors of trust in members using various trust-building bases such as calculative base and process base (e.g. Ridings *et al.* 2002, Lin *et al.* 2009, Fang and Chiu 2010). However, VCs are the information systems supported by communication technologies. Knowledge sharing in VCs may be affected by members' trust towards an information system (i.e. system trust) as well (Hsu *et al.* 2007). Prior studies also agree that

interpersonal trust and system trust are critical in shaping individual behaviour in the virtual settings (Ratnasingam 2005). Yet little research has been conducted to examine the impact of the two targets of trust on knowledge sharing, and to validate how to build the two targets of trust simultaneously.

Therefore, the objective of the study is to examine the importance and antecedents of trust in VCs by using existing literature of trust and VCs research. Specially, we address the following research questions: (1) Do trust in members and trust in system have positive effects on knowledge sharing intention? (2) What are the trust-building bases that can apply to VCs? (3) What emerging factors derived from these bases can build the two targets of trust? The findings may help both academics and practitioners gain insights into how to stimulate knowledge sharing in VCs. The paper is organised as follows: first, the perspectives of trust and trust-building bases are described as theoretical background. Then, we propose the research model and justify the relationships among the constructs. Subsequently, research methodology and data analysis are described. Finally, we present the conclusions and limitations.

2. Theoretical background

2.1. The nature and importance of trust in VCs

Trust has been studied in a variety of social science disciplines (Bhattacherjee 2002) and result in the numerous definitions for it (Hsu et al. 2007). In the study, we use the following definition by Mayer et al. (1995): 'the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' (p. 712). In essence, the definition highlights that trust is an individual's subjective belief that other people will perform expected behaviours and will not act opportunistically by taking advantage of the situation (Qureshi et al. 2009).

It is well established that trust is crucial in social interactions (Hsu et al. 2007), especially in a cyber environment in which social cues are notably missing (Riegelsberger et al. 2005) and there are not explicit norms to provide sufficient guarantees that others will behave as they are expected to (Ridings et al. 2002). One of the reasons that trust is so central is that it reduces social complexity by ruling out undesired, yet possible, future behaviour of others and thus increases one's belief that expected benefits through interactions can be fulfilled (Gefen et al. 2005). In this study, we believe that trust is especially important in the case of VCs, since the interactions between members in VCs are carried out in cyberspaces and there are no workable norms to rule knowledge sharing behaviour as well. Some researchers also agree that trust encourages open communication and knowledge sharing in the virtual settings (Ratnasingam 2005), including VCs (Ridings et al. 2002, Wasko and Faraj 2005).

Previous research argues that trust in the virtual settings can be divided into two forms of trust according to the targets of trust: interpersonal trust and system trust (Leimeister et al. 2005, Ratnasingam 2005). Ratnasingam (2005) further suggests that the two types of trust are important in the virtual setting because they can facilitate cooperation and information sharing among parties. Since knowledge sharing in VCs are seen as a kind of social interaction supported by information technologies (Hsu et al. 2007), interpersonal trust and system trust could be critical in shaping members' knowledge sharing in the context of VCs as well.

Interpersonal trust refers to 'one party's willingness to depend on the other party with a feeling of security even when negative consequences are possible' (Pennington et al. 2004, p. 199). Li et al. (2008) postulate that interpersonal trust takes place in the context of interpersonal relationship, indicating that the trustee is human being. Generally, interpersonal trust in VCs combines two types: trust in members and trust in management (Fang and Chiu 2010). Prior study suggests that knowledge sharing in VCs is the process by which knowledge is transferred from the members who possess it to those who seek it, and knowledge sharing in VCs is generally voluntary without shared norms and routines to guide members' knowledge sharing behaviour (Hsu et al. 2007). Thus, we believe that trust in members could be a major factor shaping knowledge sharing in VCs. The study focuses on trust in members.

On the other hand, system trust is defined as a belief that the proper impersonal structures have been put into place to support likelihood of successful social exchange (Pavlou 2002, Pennington et al. 2004). Leimeister et al. (2005) consider that system trust is based on the perceived reliability or reliance of an information system. Ratnasingam and Pavlou (2002) and Hsu et al. (2007) suggest that system trust arises among parties due to sound technical standards and mechanisms. Basically, trust in system reflects the willingness of the trustor to behaviourally depend on an information system to do a task (Li et al. 2008). That is, the trustee is a technology artifact.

Past studies argue that people usually treat information systems as social actors and full of personality (Wang and Benbasat 2005, Li et al. 2006). The interactions between users and information systems can increase the sense of understanding,

connection involvement and social identity, and may thus facilitate the development of trust between both parties (Li *et al.* 2006). Other scholars also posit that trust in a system and trust in a person is not fundamentally different because the system was designed, operated and controlled by people (Wang and Benbasat 2005). In fact, some studies have found that people usually respond to information systems socially and perceive that they possess human characteristics such as motivations and integrity through interactions (Wang and Benbasat 2005, Li *et al.* 2008). The perceived human characteristics in turn build social and trusting relationships with them (Wang and Benbasat 2005). By synthesising the above arguments, we may conclude that the information systems can be the objectives of trust. This standpoint is in line with Li *et al.* (2008) and Wang and Benbasat (2005).

Empirical evidence provided by past research has explained the central role of trust in VCs. For example, Ridings *et al.*'s (2002) study postulates that trust in members affects an individual's desire to share and access knowledge. The study of Ridings *et al.* (2006) reports that the trust in members is significantly linked to the motivation to participate in the conversation. Chiu *et al.* (2006) indicate that trust in members is associated with quality of knowledge sharing. Hsu *et al.* (2007), on the other hand, posit that trust in members evolves over time and influences knowledge sharing positively. Lin *et al.* (2009) and Fang and Chiu (2010) also point out that interpersonal trust significantly influences knowledge sharing behaviour.

Based on the above arguments, we recognise that many studies of VCs have begun to validate the relationship between trust in members and knowledge sharing; little research, however, has been conducted to examine the influence of system trust on knowledge sharing. Hence, our study aims to validate the relationships between trust in members, trust in system and knowledge sharing in the context of VCs. In addition, several researchers argue that trust seems to be fragile in the virtual settings (Jarvenpaa and Leidner 1999, Kanawattanachai and Yoo 2002). Thus, it is important to advance our understanding of what may build trust and how trust can be maintained trust in VCs as well (Ridings *et al.* 2002).

2.2. Trust-building bases in VCs

Past studies agree that trust can be formed by different factors (McKnight *et al.* 1998, Li *et al.* 2008). In the current research, we use trust-building bases as the strategies and methods to explore the factors that can be used to provide foundation for trust formation, following Lander *et al.* (2004) and Li *et al.* (2008). As a matter of fact, researchers in the various disciplines have identified a number of categories of trust-building base, including calculative base, process base, characteristic base, institutional base and personality base (Zucker 1986, Williamson 1993, Adler 2001, Ba and Pavlou 2002, Luo 2002, Gefen 2004, Li *et al.* 2008). Although some researchers have found that personality base (dispositional trust) may influence trust formation (Gefen *et al.* 2005), people who have a dispositional trust may not trust others in some situations (Panteli and Sockalingam 2005). Thus, personality base is excluded in the study.

Prior research of trust has employed trust-building bases to explore the antecedents of trust in the various contexts, including VCs (see Table 1). The calculative base stresses that trust is based on one's subjective assessment of the costs and benefits derived from creating and sustaining a relationship (Ba and Pavlou 2002). Trust will emerge when one believes that the other party will perform action that is beneficial to him/her (Rousseau *et al.* 1998). The perspective has been used to validate the antecedent factors of trust in the setting of VCs. For instance, in the setting of VCs, Fang and Chiu (2010) postulate that four types of justice are the important determinants of interpersonal trust (trust in members and trust in management). Lin *et al.* (2009) and Ridings *et al.* (2002) indicate that reciprocity has a positive effect on trust in members.

Process trust-building base, also termed familiarity base (Adler 2001, Ba and Pavlou 2002) and knowledge base (Li *et al.* 2008), posits that trust is created primarily through repeated interaction (Adler 2001, Ba and Pavlou 2002). The repeated interactions in turn increase understanding of what, why and when others do what they should do, thus providing a framework to predict other's future actions and help people build their trust (Gefen 2002). Actually, the standpoint is similar to Doney and Cannon's (1997) prediction process which suggests that one can predict the trusted party's future behaviour based on the knowledge of how this party behaved in the past. Research on this view has found that familiarity (Gefen 2002, 2004, Slyke *et al.* 2006) and perceived others' confidential information (Ridings *et al.* 2002) have significant effects on trust formation.

The characteristic base, on the other hand, stresses that trust could be driven by the similarity between people (Luo 2002, Gefen 2004). The greater degree of similarity implies the higher similarity of background expectations and greater level of shared understanding between people (Luo 2002). In this sense, similarity enables people to create a felling of shared ethical and moral habits, and thus allows people to believe that others' behaviours are appropriate and ethical (Gefen 2004). As such, trust can be created. Several researchers have employed this concept to examine the

Table 1. A summary of prior studies on trust-building bases.

Study	Context	Trustee	Trust-building base	Findings
Ba and Pavlou (2002)	E-commerce	Trust in online vendor	Calculative – positive rating (PR) and negative rating (NR)	PR → trust and NR → (−) trust
Fang and Chiu (2010)	Virtual communities	Trust in members and trust in management	Calculative – distributive justice (DJ), Interpersonal justice (IPJ), procedural justice (PRJ) and informational justice (IFJ)	DJ → trust in members, IPJ → trust in members, PRJ → trust in management and IFJ → Trust in management
Gefen (2000)	E-commerce	Trust in online vendor	Process – Familiarity (FM); Personality – Disposition to trust (DT)	FM → trust, DT → trust
Gefen et al. (2003)	E-commerce	Trust in online vendor	Calculative – Calculative – based(CB), Process – familiarity (FAM), institutional – structural assurance (SS), structural normality (SN) and perceived ease of use (PEOU)	CB → trust, SS → trust, SN → trust and PEOU → Trust
Gefen (2004)	IT implementation	Inter- organisational trust	Process – Process-based trust (PBT), characteristic – characteristic-based trust (CBT), institution – institution-based trust (IBT)	PBT → trust, CBT → trust and IBT → trust
Gefen et al. (2005)	IT adoption	Trust in system	Personality – propensity to trust (PT), characteristic – socio-cultural similarity (SCS)	PT → trust and SCS → Trust
Lim et al. (2006)	E-commerce	Trust in vendor	Institutional – portal affiliation (PA) and customer endorsement (CE)	CE → Trust
Lin (2009)	Virtual communities	Trust in members	Calculative – reciprocity (RE)	RE → trust
Ridings et al. (2002)	Virtual communities	Trust in members	Calculative – perceived responsiveness (PR), Process – Other's confiding personal info (CPI), Personality – Disposition to trust (DT)	PR → trust, CPI → trust and DT → trust
Slyke et al. (2006)	E-commerce	Trust in vendor	Process – familiarity (FM)	FM → trust
Wu and Tsang (2008)	Virtual communities	Trust in members	Calculative – benefit attractions (BT), characteristic – shared value (SV), personality – tendency to trust (TT), institution – monitoring (MT) and privacy policies (PP)	BT → trust (competence, integrity, benevolence and predictability), SV → trust (competence, integrity, benevolence and predictability), TT → trust (benevolence), MT → trust (competence, integrity, benevolence and predictability), PP → trust (competence, integrity and predictability)

antecedent factors of trust for different trust targets in various contexts (e.g. Gefen 2004, Gefen et al. 2005, Wu and Tsang 2008).

In fact, the arguments of process base and characteristic base are in line with the key assertion of social capital theory, which suggests that frequent and

close social interaction (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998, McEvily *et al.* 2003) and a shared vision (Tsai and Ghoshal 1998) promote trust. Prior literature also agrees that social relationships play important roles in shaping knowledge sharing in VCs (Wasko and Faraj 2005, Chiu *et al.* 2006). Hence, this study integrates the two trust-building bases and proposes the relationship base to validate the link between personal relationships and trust formation in VCs.

The institutional base, also termed values base (Ba and Pavlou 2002), states that institutional structures and norms within an organisation provide a sense of security that may encourage one's confidence in other party's trustworthy behaviour and goodwill (Adler 2001, Ba and Pavlou 2002, Pavlou 2002). In this view, institutional factors present the needed environmental conditions (McKnight *et al.* 2002a) to provide broad supports for trust that sustain risk taking and trust behaviour in the future (Rousseau *et al.* 1998, Pennington *et al.* 2004). Some researchers have extended the concept to establish subsets of institutional trust-building base. For example, Ratnasingam (2005) proposes the term 'technological perspective of trust' to address the link between trust building and technical standards, security procedure and protection mechanism. Hsu *et al.* (2007) propose the term 'information-based trust' to describe that trust in VCs may arise due to sound technological mechanisms. Since VCs are cyberspaces supported by information technologies and there are not explicit regulations, external guarantors and legal laws to rule members' behaviour (Wasko and Faraj 2005). In the study, we argue that trust in VCs may emerge because of technical infrastructure rather than norms. As such, we propose the term 'technology base' to capture the subset of institutional trust-building base and suggest that members' trust may arise due to system characteristics such as technical competence, system reliability and content quality.

Based on the above arguments, we recognise that existing research on VCs has begun to use some trust-building bases to examine the antecedents of trust. However, research emphasising trust development is still scant. Further, while researchers have paid much attention to identifying the determinants of trust in members, few studies have been done to explore the factors affecting trust in system. To fill this gap, our study aims to use the three trust-building bases we proposed earlier to investigate the antecedent factors of trust in members and trust in system.

2.3. Research model and hypotheses

The research model for this study is shown in Figure 1. In the model, trust in members and trust in system are
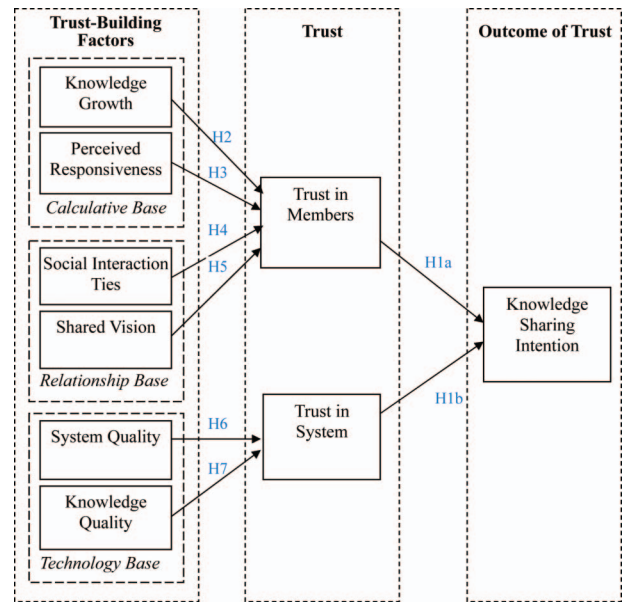

Figure 1.   Research model.

proposed to have positive effects on knowledge sharing intention, based on Ridings *et al.* (2002) and Wu and Tsang (2008). The two types of trust in turn are proposed to be affected by factors resulted from the three types of trust-building bases: calculative base, relationship base and technology base, following the standpoint of Lander *et al.* (2004) and Li *et al.* (2008).

The calculative base states that trust could be formed and sustained when people believe that they can receive positive outcome from other parties (Bhattacharya *et al.* 1998). Past research has highlighted two important benefit factors in the context of knowledge sharing: knowledge growth (Wasko and Faraj 2000, Bock *et al.* 2006) and perceived responsiveness (Ridings *et al.* 2002). The two variables are thus included in our model to understand their influences on trust. The relationship base posits that trust is formed through repeated interaction and increased social capital. Prior studies suggest that a shared value (Tsai and Ghoshal 1998, Lander *et al.* 2004) and social interaction ties (Tsai and Ghoshal 1998) may drive the development of trust. The two factors are therefore used in the model. The technology base, on the other hand, postulates that trust can be built because of system characteristics. Prior literature considers that the system characteristics of VCs can be classified into system quality and knowledge quality (Lin 2008). The two factors are included in the model to be the antecedents of trust.

On the other hand, past study argues that different types of trust may be likely to be built using various

trust-building bases due to the difference in the nature of trust targets (Doney and Cannon 1997). In the previous literature, researchers have found that trust in a person can be formed based on cost/benefit calculation and social relationship development (Paul and McDaniel 2004), while trust in an information system can be built through the assessment of technology quality (McKnight *et al.* 2002b, Corbitt *et al.* 2003). Based on the arguments, this study believes that factors derived from calculative base (knowledge growth and perceived responsiveness) and relationship base (social interaction ties and a shared vision) may have influences on trust in members, whereas the factors classified into technology base (system quality and knowledge quality) are considered as the determinants of trust in system. Each construct and hypotheses are discussed in the rest of this section.

2.3.1. *Trust and knowledge sharing intention*

Trust has been recognised as a central aspect in all kinds of relationships (Gefen *et al.* 2003). Some researchers indicate that people are more likely to help others and request for help in the trusting environment (Ridings *et al.* 2002). Others note that people are more willing to take part in joint activities such as knowledge sharing if trust exists in the environment they are in (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998, Ridings *et al.* 2002, McEvily *et al.* 2003). By synthesising the arguments, this study may conclude that trust in members and trust in system are important factors affecting their willingness to contribute knowledge in VCs. This is consistent with the assertion of the theory of planned behaviour that one's beliefs may significantly affect his/her intentions and sequential actions (Hampton-Sosa and Koufaris 2005).

Evidence for the relationship between trust and behavioural intention has been provided by many researchers. For example, in the context of VCs, researchers have found that trust in members has significant effect on desire to share knowledge (Ridings *et al.* 2002). Prior studies have provided empirical evidence to support the link between trust in system and intention to use information systems in the virtual setting, such as e-commerce (Li *et al.* 2006). Therefore, we may reasonably propose that trust in members and trust in system are related to members' intention to share knowledge.

> H1a: Trust in members is positively associated with knowledge sharing intention.

> H1b: Trust in system is positively associated with knowledge sharing intention.

2.3.2. *Knowledge growth and trust in members*

As a general rule, the major motivation for members to participate in VCs is to assess useful knowledge (Wasko and Faraj 2000). Past research agrees that members could increase their expertise by learning other members' experiences through communications (Wasko and Faraj 2000, Bock *et al.* 2006). Knowledge growth in this sense has been treated as the benefits that attract members to participate in VCs (Bock *et al.* 2006). From the view of calculative base, members may assess the benefits resulted from the increased expertise to determine whether they should trust other members. Once members obtain expected benefits, trust in other members could be therefore created. In the study of Wu and Tsang (2008), they have found that knowledge growth is an important antecedent of trust in members. Based on the above discussion, this study may reasonably assume that when members believe that they can increase their expertise from VCs, they will be more likely to build positive trusting beliefs towards other members.

> H2: Knowledge growth is positively associated with trust in members.

2.3.3. *Perceived responsiveness and trust in members*

Past studies argue that the existing of VCs depends on members' postings and responsiveness (Ridings *et al.* 2002). In general, the members who share their knowledge (knowledge contributors) often expect some type of response from others in lieu of their contribution in the future (Wasko and Faraj 2000, Ridings *et al.* 2002). In this view, knowledge contributors usually treat others' responsiveness as reciprocal benefits (Ridings *et al.* 2002). From the perspective of calculative base, trust can be created when one feels that the trustee cares about benefits of both parties (Wu and Tsang 2008). Past research using the perspective of calculative base has also found that reciprocity in exchange relationship (e.g. knowledge sharing) builds trust among members, while the absence of responsiveness impedes trust development (Ridings *et al.* 2000). Prior studies also have provided empirical evidence to support the link between others' responsiveness and trust in members in the setting of VCs (Ridings *et al.* 2002, Lin *et al.* 2009). Therefore, we may propose the following hypothesis.

> H3: Perceived responsiveness is positively associated with trust in members.

2.3.4. Social interaction ties and trust in members

Prior literature states that interpersonal trust is the product of repeated social interactions (Tsai and Ghoshal 1998, Rousseau *et al.* 1998, Ridings *et al.* 2002). The assertion of social capital theory also reports that ongoing social interactions strengthen network density and closure and thus promote trust in a person (McEvily *et al.* 2003). Tsai and Ghoshal (1998), on the other hand, note that frequent interactions allow individuals to know one another, thereby are more likely to perceive others as trustworthy. Ridings *et al.* (2002) also address that the history of interactions generally permits individuals to perceive others' reliability and dependability that are needed for trust development. Based on the arguments, we may propose that social interaction ties will influence trust in members positively.

> *H4: Social interaction ties are positively associated with trust in members.*

2.3.5. Shared vision and trust in members

A shared vision, as noted by Morgan and Hunt (1994), 'is the extents to which partners have beliefs in common about what behaviours, goals, and policies are important or unimportant, appropriate or inappropriate, and right or wrong' (p. 25). Tsai and Ghoshal (1998) postulate that 'a shared vision embodies the collective goals and aspiration of the members of an organisation' (p. 467). They also argue that a shared vision could be viewed as a bonding mechanism that may bring and keep members within an organisation together (Tsai and Ghoshal 1998). Trust will thereby arise among individuals who think they share a common objective and value (Koehn 2003) because individuals with shared goal and value usually expect that they work for a common goal and believe that others will not take advantage of others to pursue their self-interest (Tsai and Ghoshal 1998). Prior study has provided empirical evidence to support the relationship between share vision and trust in members in VCs. Therefore, the above arguments lead to the following hypothesis.

> *H5: Shared vision is positively associated with trust in members.*

2.3.6. System quality and trust in system

System quality refers to the desired characteristics of information systems, such as reliability (DeLone and McLean 2004), ease of use, and stability (DeLone and McLean 2004, Kulkarni *et al.* 2007). Several researchers have found that system quality determines the establishment of trust towards an information system (Corbitt *et al.* 2003, Ratnasingam 2005, Hsu *et al.* 2007). Wang and Benbasat (2005) posit that ease of use demonstrates that system providers have expended much effort in designing the information systems, and that they care about users. Users may thus increase their trust in systems. McKnight *et al.* (2002b) also suggest that perceived high quality of a website enables users to have trusting beliefs about the website's competence, integrity and benevolence, thus enhancing user's trust towards the website. The studies on e-commerce have reported that the technical characteristics have significant influence on trust in system (e.g. McKnight *et al.* 2002b, Corbitt *et al.* 2003). Since VCs are the systems supported by information technologies, we may reasonably assume that system quality may affect trust in system as well.

> *H6: System quality is positively associated with trust in system.*

2.3.7. Knowledge quality and trust in system

Knowledge quality refers to quality of knowledge, including its relevance, timeless, comprehensibility and completeness (Kulkarni *et al.* 2007). Various studies have suggested that the quality of knowledge embedded in VCs builds customers' trust (Luo and Najdawi 2004, Leimeister *et al.* 2005). This is because when members perceive that the knowledge resided in VCs is high quality, they may consider that VCs have the ability to gather, organise and present quality knowledge and add value for members (Luo and Najdawi 2004) and have benevolent intention to provide adequate quality knowledge (Song and Zahedi 2007). In contrast, if members feel suspicious about the knowledge quality, they may doubt the ability of VCs and tend to distrust the knowledge they are unfamiliar with (Luo and Najdawi 2004). The study of Song and Zahedi (2007) has provided empirical evidence to reveal the relationship between knowledge quality and trusting in system in the setting of virtual setting. Thus, we may propose that system quality may affect trust in system in the setting of VCs as well.

> *H7: Knowledge quality is positively associated with trust in system.*

3. Research methodology

3.1. Measurement development

Table 2 provides formal definitions of the constructs. Items in the questionnaire were developed by either adapting measures that had been validated by prior

Table 2. Formal definitions of constructs.

Construct	Definition	Key references
Knowledge growth	The degree to which a member believes that participation in VCs may lead to the increased expertise.	Bock *et al.* (2006)
Perceived responsiveness	The degree to which a member believes that other members in VCs would response questions he/she posts.	Ridings *et al.* (2002)
Social interaction ties	A member's perception of the strength of relationship and the frequency of communication with other members in VCs.	Chiu *et al.* (2006), Tsai and Ghoshal (1998), Nahapiet and Ghoshal (1998)
Shared vision	A member's perception of the common value, goal, and vision about knowledge sharing with other members of VCs.	Chiu *et al.* (2006)
System quality	A member's perception of system characteristics such as ease of use, stability, and safety.	Kulkarni *et al.* (2007)
Knowledge quality	A member's perception of quality of knowledge of various kinds, such as relevance, timeliness, completeness, comprehensibility, applicability.	Kulkarni *et al.* (2007)
Trust in members	A member's belief in the ability, reliability, goodwill and honesty of members of VCs.	Kankanhalli *et al.* (2005)
Trust in system	A member's belief in the ability, reliability, goodwill and honesty of VCs.	Kankanhalli *et al.* 2005
Knowledge sharing intention	The degree to which a member believes that he/she will engage in knowledge sharing act.	Bock *et al.* (2005), Ridings *et al.* (2002)

research, or by converting the definition of items developed based on the relevant theory and prior studies into questionnaire format (Bock *et al.* 2005). A pretest of the questionnaire is performed using three experts in the IS area to assess logical consistencies, ease of understanding, question item sequence adequacy and context fitness. Overall, the experts indicated that the questionnaire was relatively clear and easy to complete. Several minor modifications were made to the wording and question item sequence based on comments from the experts. Following the pretest, an online pilot test involving 20 master students who have been members of VCs was carried out to test the feasibility of this study. The instrument was then modified slightly in accordance with those comments. For all measures, a seven-point scale was used with anchors ranging from strongly disagree (1) to strongly agree (7). The questionnaire items are listed in Table 3.

The items assessing intention to share knowledge was adapted from Ridings *et al.* (2002) to reflect an individual's willingness to contribute his/her knowledge. The items for measuring trust in members and trust in system VCs were adapted from Pavlou (2002) and Pavlou and Gefen (2005). The items focused on an individual's perception of VCs and of the members' ability, reliability, goodwill and honesty. The items measuring knowledge growth were adapted from Bock *et al.* (2006) to reflect an individual's perception about their increased expertise from participating VCs. The

items for measuring perceived responsiveness were adapted from Ridings *et al.* (2002). The items emphasised an individual's perception as to the quantity and quickness of others' responsiveness to his/her posts.

Items for measuring social interaction ties were adapted from Chiu *et al.* (2006). The items focused on close relationships, time spent in interactions and frequent communication with other members. Items for measuring shared vision was adapted from Chiu *et al.* (2006) to reflect an individual's perception about members' common goal, vision and value about knowledge sharing. The items measuring system quality were adapted from Wu and Wang (2006) and developed based on McKnight *et al.* (2002a) to reflect an individual's perception about the information system characteristics of VCs, such as ease of use and stability. Knowledge quality was measured with items adapted from Staples *et al.* (2002) and Wu and Wang (2006). This measure focused on assessing an individual's perception of quality of knowledge embedded in VCs, such as timeless, completeness, comprehensibility and applicability.

3.2. Survey administration

Following Wasko and Faraj (2000) and Chiu *et al.* (2006), data for testing research models were collected from members of a technical VC. In this study, BlueShop, a well-known community in Taiwan, is

Table 3. Summary of measurement scales.

Construct	Measure	Factor loading
Knowledge Growth (KG) (composite reliability = 0.92) (Strongly Disagree/Strongly Agree) (1–7 scale)		
KG1	The members in the BlueShop community help me learn new things.	0.92
KG2	The members in the BlueShop community help me master new skills.	0.96
KG3	The members in the BlueShop community help me acquire innovative ideas.	0.77
Perceived Responsiveness (PR) (composite reliability = 0.89) (Strongly Disagree/Strongly Agree) (1–7 scale)		
PR1	The members in the BlueShop community are very responsive to my posts.	0.83
PR2	I can always count on getting a lot of responses to my posts.	0.88
PR3	I can always count on getting responses to my posts fairly quickly.	0.86
Social Interaction Ties (SIT) (composite reliability = 0.90) (Strongly Disagree/Strongly Agree) (1–7 scale)		
SIT1	I maintain close social relationships with members in the BlueShop community.	0.86
SIT2	I know members in the BlueShop community on a personal level.	0.90
SIT3	I have frequent communication with members in the BlueShop community.	0.83
Shared Vision (SV) (composite reliability = 0.86) (Strongly Disagree/Strongly Agree) (1–7 scale)		
SV1	The members in the BlueShop share the vision of helping others solve their professional problems.	0.76
SV2	The members in the BlueShop share the same goal of learning from each other.	0.86
SV3	The members in the BlueShop think cooperation is important.	0.83
System Quality (SYQ) (composite reliability = 0.81) (Strongly Disagree/Strongly Agree) (1–7 scale)		
SYQ1	I feel that the BlueShop community is easy to use.	0.73
SYQ2	I feel that the BlueShop community is stable.	0.92
Knowledge Quality (KQ) (composite reliability = 0.87) (Strongly Disagree/ Strongly Agree) (1–7 scale)		
KQ1	The BlueShop community provides up-to-date knowledge.	0.75
KQ2	The BlueShop community provides sufficient knowledge.	0.80
KQ3	The knowledge provided by BlueShop is meaningful and understandable.	0.88
KQ4	The knowledge or information provided by BlueShop is important and helpful for my work.	0.75
Trust in Members (TRM) (composite reliability = 0.91) (Strongly Disagree/Strongly Agree) (1–7 scale)		
TRM1	Members in the BlueShop community are in general reliable.	0.87
TRM2	Members in the BlueShop community are in general honest.	0.84
TRM3	Members in the BlueShop community are in general competent to help others enhance their knowledge.	0.85
TRM4	The members in the BlueShop community will do everything within their capacity to help others.	0.84
Trust in System (TRS) (composite reliability = 0.89) (Strongly Disagree/Strongly Agree) (1–7 scale)		
TRS1	I feel that the BlueShop community is reliable.	0.79
TRS2	I feel that the BlueShop community is honest.	0.88
TRS3	I fell that the BlueShop community is likely to care for members' welfare.	0.81
TRS4	I feel that the BlueShop community is competent to help members enhance their knowledge.	0.79
Knowledge Sharing Intention (KSI) (composite reliability = 0.95) (Strongly Disagree/Strongly Agree) (1–7 scale)		
KSI1	I will come to the BlueShop community to share knowledge I know about a particular subject with other members.	0.96
KSI2	I will come to the BlueShop community to share my skills and abilities with other members.	0.94

selected because it is an open community dedicated to sharing knowledge about database, programming, IT security, operation system and many other domains (Chiu *et al*. 2006). Knowledge sharing among members is an effective way to meet their needs for seeking required knowledge in the rapidly changing information systems filed. In order to target respondents, a banner with a hyperlink connecting to the Web survey was posted on the homepage and the discussion forum of BlueShop. Thirty randomly selected respondents were offered an incentive in the form of gift certificate amounting to NT\$ 500 to increase the response rate. The returned questionnaires were initially screened for usability and reliability; 324

responses were found to be complete and valid for data analysis. Table 4 lists demographic information about the respondents.

4. Data analysis and results

The model was tested using structural equation modelling (SEM) as implemented in LISREL. We began with assessing measurement model to ensure the reliability, convergent validity, and discriminant validity of the model. The reliability was examined using the composite reliability values. As shown in Table 3, the values of composite reliability ranged from 0.81 to 0.95, well above the common acceptance level of 0.70

(Gefen *et al.* 2000). Previous literature stresses that convergent validity is adequate when factor loading higher than 0.7 and constructs have an average variance extracted (AVE) of at least 0.5 (Fornell and Larcker 1981). Table 5 shows that all AVEs are greater than 0.5 and all items exhibited a factor loading higher than 0.7 on their respective constructs. The results suggest that convergent validity is acceptable. In addition, Table 4 shows that all the square roots of AVE values exceed the correlation between the construct and other constructs in the model, indicating the adequate discriminant validity of constructs in the model (Fornell and Larcker 1981).

Once the measurement was adequate, we tested the hypotheses by reviewing the parameters in the structural model. For models with good fit, the ratio of chi-square to the degree of freedom (χ^2/df) should be less than 5. The non-normed fit index (NNFI), and comparative fit index (CFI), should exceed 0.9. The commonly accepted value of root mean square error of approximation (RMSEA) should not exceed 0.08 (Chiu *et al.* 2006). For the current structural model, χ^2/df is 2.64 ($\chi^2 = 863.01$, $df = 327$), NNFI is 0.98, CFI is 0.98, and RMSEA is 0.07. The results demonstrate the model fit indices are within accepted thresholds.

Figure 2 illustrates the estimated coefficients and their significance in the structural model. Most paths are significant, except for those between social interaction ties and trust in members ($\beta = 0.01$, $t = 0.20$) and system quality and trust in system ($\beta = 0.03$, $t = 0.50$), meaning that hypotheses 4 and 6 are not supported. As expected, trust in members and trust in system exhibits strong effects on knowledge sharing intention ($\beta = 0.39$, 0.35; $t = 6.57$, 5.77) so that hypotheses 1a and 1b are supported. Furthermore, knowledge growth, perceived responsiveness and shared vision have significant effects on trust in members ($\beta = 0.29$, 0.22, 0.46; $t = 5.66$, 3.59, 6.70, respectively). The results support hypotheses 2, 3 and 5. Finally, trust in system is strongly predicted by knowledge quality ($\beta = 0.81$; $t = 0.97$), Thus, hypothesis 7 is supported.

In addition, the above findings show that trust in members and trust in system are two important determinants of knowledge sharing intention. We examined the correlation between trust in members and trust in system and found that the correlation between the two constructs is 0.71. The high correlation between the two constructs may result in multicollinearity and obscure the relationships between constructs (Thatcher and Perrewe 2002). To test multicollinearity, we calculated variable inflation factor (VIF) for the constructs in the model. According to Hair *et al.* (1998), multicollinearity results when VIF

Table 4. Demographics of samples.

Demographics	Number of responses	Percentage of responses
Gender		
Male	244	75.30
Female	80	24.70
Age (yr)		
<20	13	4.01
21–30	211	65.12
31–40	77	23.77
41–50	15	4.63
51–60	7	2.16
>60	1	0.31
Education		
High school or below	19	5.86
College (2 years)	39	12.04
University	193	59.57
Graduate school or above	73	22.53
Work experience		
<1 year	86	26.54
1–2 years	63	19.44
2–3 years	39	12.04
3–5 years	47	14.51
6–10 years	44	13.58
>10 years	45	13.89
Member history		
<3 months	31	9.57
3–6 months	30	9.26
6 months – 1 year	42	12.96
1–2 years	81	25.00
2–3 years	56	17.28
>3 years	84	25.93
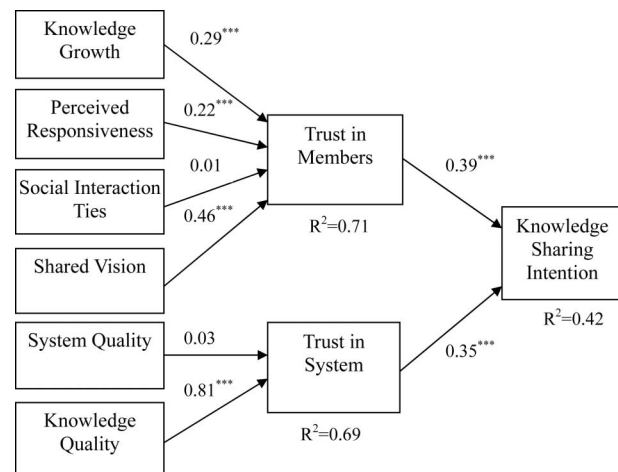
Model fit:

$\chi^2 = 863.01$ (df= 327)

NNFI=0.98, CFI=0.98, RMSEA=0.07
Significance level: ***p value<0.001

Figure 2. SEM analysis of research model.

Table 5. Correlations of latent variables and AVE.

	AVE	KG	PR	SIT	SV	SYQ	KQ	TRM	TRS	KSI
KG	0.79	**0.89**								
PR	0.74	0.50	**0.86**							
SIT	0.74	0.23	0.40	**0.86**						
SV	0.67	0.57	0.60	0.37	**0.82**					
SYQ	0.69	0.45	0.42	0.22	0.46	**0.82**				
KQ	0.64	0.62	0.48	0.36	0.56	0.62	**0.80**			
TRM	0.73	0.63	0.61	0.32	0.68	0.54	0.62	**0.85**		
TRS	0.67	0.59	0.51	0.35	0.65	0.60	0.71	0.75	**0.82**	
KSI	0.90	0.62	0.51	0.40	0.56	0.31	0.50	0.57	0.58	**0.95**

Note: Diagonal elements (in bold) are the square root of the Average variance extracted (AVE). Off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

exceeds 10. Our results show the VIF did not exceed 2.13, indicating that the problem of multicollinearity does not influence the results of the study.

5. Discussion

5.1. Key findings

In this study, we propose a theoretical model to investigate what factors may affect a member's trust towards members and information system of VCs, which in turn influences their knowledge sharing intention. The results show that there is a positive relationship between knowledge growth and trust in members. The finding is similar to Ferrin and Dirks (2003), reporting that intrinsic benefit is also a vital predictor of trust development in VCs. On the other hand, the results indicate that perceived responsiveness play an important role in increasing one's trust in members as well. This finding is consistent with the studies of Lin *et al.* (2009) and Ridings *et al.* (2002), providing additional evidence to suggest that others' responsiveness could be seen as a kind of reciprocity that may build trust in VCs.

The study also shows that a shared vision has significant influence on trust in members. This finding is in line with prior studies (Wu and Tsang 2008), indicating that building shared values, goals and interests is a strong motivator for the establishment of trust in VCs. Directly contrary to expectations, the results report the insignificant relationship between social interaction ties and trust in members. This finding is similar to Wasko and Faraj (2005), providing additional support for the argument that social capital may not develop in the virtual setting because of the lack of shared history, interdependence and co-presence in VCs.

Another surprising result is that system quality does not have significant influence on trust in system, even though many researchers agree that technical capability and mechanism play an important role in nurturing users' trust in the virtual setting (e.g. McKnight *et al.* 2002b, Corbitt *et al.* 2003, Ratnasingam 2005, Hsu *et al.* 2007). One plausible explanation for this finding may be that providing adequate system quality is not costly in the virtual context (Kim *et al.* 2004). It is easy for online service providers to achieve adequate system quality that may thus make individuals hard to evaluate the trustworthiness of VCs. Another possible explanation for the finding may be due to the members' experience of VCs use. As noted by Karahanna *et al.* (1999), perceived ease of use for an information system is important for users. However, as experience with system increases over time, the concerns of ease of use seem to decline. Further study could be done to validate whether the effect of system quality on trust is moderated by the users' experience with system.

Finally, as expected, when members believe that knowledge embedded in VCs is relevant, timeless, comprehensible, and complete, they may tend to trust information system of VCs. The finding is consistent with the assertion of prior studies in the virtual settings (Luo and Najdawi 2004, Leimeister *et al.* 2005, Song and Zahedi 2007), reporting that knowledge quality is also an important antecedent factor affecting trust formation in VCs.

5.2. Implications for research and practice

The results provide important implications for research and practice. First, empirical results indicate that trust in members and trust in system have significant effects upon knowledge sharing intention. The findings contribute to the previous literature by indicating that nurturing members' trust in members is insufficient for encouraging knowledge sharing, and developing members' trust in system is also important to lead to greater level of knowledge sharing. In fact, the current study, to the best of our knowledge, is one of the earliest studies to empirically validate the link

between the two types of trust and knowledge sharing intention. This also contributes to advance our enhanced understating of the role of trust in system that has been overlooked in the literature of VCs.

Second, although the importance of trust has been widely touted, few studies have been conducted to examine the antecedents of trust. By proposing the three trust-building bases that can apply to the context of VCs, this study identifies the antecedent factors of trust. For researchers, the study provides potentially a new perspective on developing interpersonal trust (trust in members) and system trust (trust in system) in VCs. This is another contribution of this study. However, previous literature argues that trust can be built by various types of trust-building bases, such as transference and capability (Leimeister *et al.* 2005). Further studies examining the link between trust and knowledge sharing should integrate these trust-building bases to investigate the antecedents of trust in the context of VCs.

Third, the results show that an individual's intrinsic benefit (i.e. knowledge growth) and extrinsic benefit (i.e. perceived responsiveness) may affect the establishment of interpersonal trust in VCs. According to the theory of motivation crowding effect (Osterloh and Frey 2000), extrinsic motivation often undermines the effect of intrinsic motivation (Huber 2001). Further study should examine whether the effect of knowledge growth on trust in members will be affected by perceived responsiveness over time. Finally, the results of this study indicate that knowledge quality impacts most strongly upon trust formation. Prior studies (e.g. McKnight *et al.* 1998, Tan and Thoen 2001, Pavlou 2002) argue that the importance of institution-base mechanism may decline when the relationship among people develops as time. Further study should employ longitudinal view to verify whether the effect of knowledge quality on trust formation will take this route in the virtual setting, as Pavlou (2002) argues.

In addition to the implications for research, this study also provides several interesting implications for the management of VCs to facilitate trust and knowledge sharing behaviour in VCs. The implications are also helpful for the organisations, since more and more people take part in VCs to seek knowledge to resolve the problems at work (Chiu *et al.* 2006, Hsu *et al.* 2007) and many organisations attempt to increase their business performance by promoting intra-organisational knowledge sharing through VCs (Lin 2008). First, to help members increase their expertise, management of VCs may develop some strategies to make knowledge visible. This can be done by using yellow pages of knowledge possessors to help members to locate people who possess knowledge they need (Alavi and Leidner 2001). Second, prior research has found that people who regularly share knowledge with others may receive a quick response when they themselves ask for help (Kankanhalli *et al.* 2005). To increase responsiveness from others, managers can invite experienced knowledge contributors to describe how they have benefited from knowledge sharing (Kankanhalli *et al.* 2005). Managers of VCs may also develop some strategies or mechanisms, such as providing a reward system to encourage their members to response the questions arisen by other members quickly (Chiu *et al.* 2006).

The study of Panteli and Sockalingam (2005) posits that the interaction may enhance the development of shared values, goal and mutual understanding among people. Similarly, McEvily *et al.* (2003) note that the past interaction history with members of collectivity may allow an individual to assess the similarity (congruent value) between him/her and other members to determine his/her perception as to trustworthiness of collective entity. Thus, to facilitate the shared vision about knowledge sharing, management of VCs should develop strategies that can facilitate the interaction among members. This may be done by holding face-to-face meeting or seminars and invite experienced members and professional instructor to share their experience of knowledge sharing with members of VCs (Chiu *et al.* 2006). By doing so, members may advance their understanding of the members' common goals and values in VCs.

Finally, prior study argues that an organisation can introduce the knowledge domain experts to repack the knowledge provided by members and filter out the duplicate and erroneous contributions to ensure that shared knowledge are valuable to their members (Teo 2005). In the setting of Wikis, management also employs peer review processes to ensure the quality of shared knowledge (Kane and Fichman 2009). As such, in order to improve knowledge quality of VCs, management may use knowledge domain experts and peer review processes to identify, evaluate and repack knowledge shared by members. In addition, management may also deploy a variety of incentive systems to encourage their members to raise good questions and contribute quality knowledge to answer those questions (Kulkarni *et al.* 2007).

5.3. Conclusion and limitations

This study develops and tests a theoretical model to examine the antecedents of trust in members and trust in system using three distinct trust-building bases in VCs. The results show that knowledge growth, perceived responsiveness, shared vision and knowledge quality may determine the development of trust in VCs. By providing empirical evidence regarding the

significant influence of these factors on trust building, this study believes that the findings of this study have contributed to the development of a richer understanding of what factors may create members' trusting beliefs in VCs.

Although the results of this study provide several interesting and useful findings, the recent study still has some limitations. First, using members in a VC as subjects may limit the generalisability of the findings to other types of VCs. Further study is needed to examine the extent to which the findings of this study can be applicable in various types of VCs. Second, another limitation of this study is the concerns of internal validity. As the measures were gathered through self-report at a single point in time, this study may suffer from common method variance, although this study has employed three procedural remedies to diminish method variance, following Podsakoff *et al.* (2003): guaranteeing the respondent anonymity, controlling the retrieval cues promoted in the questionnaire and keeping the questions simple, specific and more focused. However, past literature indicates that common method bias usually results in high correlations (Vance *et al.* 2008). The correlation matrix (see Table 5) shows all the correlations to fall below the cut-off value of 0.9 (Vance *et al.* 2008) and the test for collinearity reports that the correlation does not significantly impact the results (Thatcher and Perrewe 2002). Thus, common method variance does not appear to influence the validity of the findings of the study.

Third, many researchers agree that trust is a dynamic phenomenon that will change with time (Kanawattanachai and Yoo 2001, Panteli and Sockalingam 2005, Hsu *et al.* 2007). Therefore, an idea for research design is that researchers should employ longitudinal perspective to validate the influence of trust development on individuals' knowledge sharing intention and behaviour and identity what factors may impact the trust development over time. Finally, since the focus of this study is active participants and this study did not investigate members who had ceased to participate in VCs, and members who do not log onto the VCs, the results of this study may also suffer from self-selection bias, similar to Chiu *et al.* (2006) and Wasko and Faraj (2005).

References

Adler, P.S., 2001. Market, hierarchy and trust: the knowledge economy and the future of capitalism. *Organization Science*, 12 (2), 215–234.

Alavi, M. and Leidner, D.E., 2001. Review: knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quarterly*, 25 (1), 107–136.

Ba, S. and Pavlou, P.A., 2002. Evidence of the effect of trust building technology in electronic markets: price premiums and buyer behavior. *MIS Quarterly*, 26 (3), 243–268.

Bhattacherjee, A., 2002. Individual trusty in online firms: scale development and initial test. *Journal of Management Information Systems*, 19 (1), 211–241.

Bhattacharya, R., Devinney, T.M., and Pillutla, M.M., 1998. A formal model of trust based on outcomes. *The Academy of Management Review*, 23 (3), 459–472.

Bock, G.W., *et al.*, 2005. Behavioral intention formation knowledge sharing: examining roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, 29 (1), 87–111.

Bock, G.W., Kankanhalli, A., and Sharma, S., 2006. Are norms enough? The role of collaborative norms in promoting organizational knowledge seeking. *European Journal of Information Systems*, 15, 357–367.

Chiu, C.M., Hsu, M.H., and Wang, T.G, 2006. Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories. *Decision Support Systems*, 42, 1872–1888.

Corbitt, B., Thanasankit, T., and Yi, H., 2003. Trust and ecommerce: a study of consumer perceptions. *Electronic Commerce and Research and Application*, 2, 203–215.

DeLone, W.H. and McLean, E.R., 2004. Measuring e-commerce success: applying the DeLone & McLean information systems success model. *International Journal of Electronic Commerce*, 9 (1), 31–47.

Doney, P. and Cannon, J., 1997. An examination of the nature of trust in buyer-seller relationships. *Journal of Marketing*, 61 (2), 35–51.

Fang, Y.H. and Chiu, C.M., 2010. In justice we trust: exploring knowledge-sharing continuance intentions in virtual communities of practice. *Computers in Human Behavior*, 26, 235–246.

Ferrin, D.L. and Dirks, K.T., 2003. The use of rewards to increase and decrease trust: mediating processes and differential effects. *Organization Science*, 14 (1), 18–31.

Fornell, C. and Larcker, D.F., 1981. Evaluating structural equation models with unobservables and measurement error. *Journal of Marketing Research*, 18 (1), 39–50.

Gefen, D., 2002. Nurturing clients' trust to encourage engagement success during the customization of ERP systems. *Omega*, 30, 287–299.

Gefen, D., 2004. What makes an ERP implementation relationship worthwhile: linking trust mechanisms and ERP usefulness. *Journal of Management Information Systems*, 21 (1), 263–288.

Gefen, D., Karahanna, E., and Straub, D.W., 2003. Trust and TAM in online shopping: an integrated model. *MIS Quarterly*, 27 (1), 51–90.

Gefen, D., *et al.*, 2005. Cultural diversity and trust in IT adoption: a comparison of potential e-voter in the USA and South Africa. *Journal of Global Information Management*, 13 (1), 54–78.

Gefen, D., Straub, D.W., and Boudreau, M.C., 2000. Structural equation modeling and regression: guidelines for research practice. *Communication of the Association for Information Systems*, 4 (7), 1–77.

Hair, J.F. Jr., *et al.*, 1998. *Multivariate data analysis*. 5th ed. Upper Saddle River, NJ: Prentice Hall.

Hampton-Sosa, W. and Koufaris, M., 2005. The effect of web site perceptions on initial trust in the owner company. *International Journal of Electronic Commerce*, 10 (1), 55–81.

Hsu, M.H., *et al.*, 2007. Knowledge sharing behavior in virtual communities: the relationship between trust, self-efficacy, and outcome expectations. *International Journal Human-Computer Studies*, 65, 153–169.

Huber, G.P., 2001. Transfer of knowledge in knowledge management systems: unexplored issues and suggested studies. *European Journal of Information Systems*, 10, 72–79.

Jarvenpaa, S.L. and Leidner, D.E., 1999. Communication and trust in global virtual teams. *Organization Science*, 10 (6), 791–815.

Kanawattanachai, P. and Yoo, Y., 2002. Dynamic nature of trust in virtual teams. *Journal of Strategic Information Systems*, 11 (3–4), 187–213.

Kane, G.C. and Fichman, R.G., 2009. The shoemaker's children: using Wikis for information technology teaching, research, and publications. *MIS Quarterly*, 33 (1), 1–17.

Kankanhalli, A., Tan, C.Y.B., and Wei, K.K., 2005. Contributing knowledge to electronic knowledge repositories: an empirical investigation. *MIS Quarterly*, 29 (1), 113–143.

Karahanna, E., *et al.*, 1999. Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23 (2), 183–213.

Kim, H.W., Xu, Y., and Koh, J., 2004. A comparison of online trust building factors between potential customers and repeat customers. *Journal of the Association for Information Systems*, 5 (10), 392–420.

Koehn, K., 2003. The nature of and conditions for online trust. *Journal of Business Ethics*, 43, 3–19.

Kulkarni, U.R., Ravindran, S., and Freeze, R., 2007. A knowledge management success model: theoretical development and empirical validation. *Journal of Management Information Systems*, 23 (3), 309–347.

Lander, M.C., *et al.*, 2004. Trust-building mechanisms utilized in outsourced IS development project: a case study. *Information & Management*, 41 (4), 509–558.

Leimeister, J.M., Ebner, W., and Krcmar, H., 2004. Design, implementation, and evaluation of trust-supporting components in virtual communities for patients. *Journal of Management Information Systems*, 21 (4), 101–135.

Li, D., Browne, G.J., and Wetherbe, J.C., 2006. Why do Internet users stick with a specific Web Site? A relationship perspective. *International Journal of Electronic Commerce*, 10 (4), 105–141.

Li, X., Hess, T.J., and Valacich, J.S., 2008. Why do we trust new technology? A study of initial trust formation with organizational information systems. *Journal of Strategic Information Systems*, 17, 39–71.

Lim, K.H., *et al.*, 2006. Do I trust you online, and if so, will I buy? An empirical study of two trust-building strategies. *Journal of Management Information Systems*, 23 (2), 233–266.

Lin, H.F., 2008. Determinants of successful virtual communities: contributions from system characteristics and social factors. *Information & Management*, 45, 522–527.

Lin, M.J., Hung, S.W., and Chen, C.J., 2009. Fostering the determinants of knowledge sharing in professional virtual communities. *Computers in Human Behavior*, 25, 929–939.

Luo, X., 2002. Trust production and privacy concerns on the Internet: a framework based on relationship marketing and social exchange theory. *Industrial Marketing Management*, 31, 111–118.

Luo, W. and Najdawi, M., 2004. Trust-building measures: a review of consumer health portals. *Communications of the ACM*, 47 (1), 109–113.

Mayer, R.C., Davis, J.H., and Schoorman, F.D., 1995. An integrative model of organizational trust. *Academy of Management Review*, 20 (3), 709–734.

McEvily, B., Perrone, V., and Zaheer, A., 2003. Trust as an organization principle. *Organization Science*, 14 (1), 91–103.

McKnight, D.H., Choudhury, V., and Kacmar, C., 2002a. Developing and validating trust measures for e-commerce: an integrative typology. *Information Systems Research*, 13 (3), 334–359.

McKnight, D.H., Choudhury, V., and Kacmar, C., 2002b. The impact of initial consumer trust on intentions to transact with a web site: a trust building mode. *Journal of Strategic Information Systems*, 11 (3–4), 297–323.

McKnight, D.H., Cummings, L.L., and Chervany, N.L., 1998. Initial trust formation in new organizational relationships. *The Academy of Management Review*, 23 (3), 473–490.

Morgan, R.M. and Hunt, S.D., 1994. The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58 (3), 20–38.

Nahapiet, J. and Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23 (2), 242–266.

Osterloh, M. and Frey, B.S., 2000. Motivation, knowledge transfer, and organizational forms. *Organization Science*, 11 (5), 538–550.

Panteli, N. and Sockalingam, S., 2005. Trust and conflict within virtual inter-organizational alliances: a framework for facilitating knowledge sharing. *Decision Support Systems*, 39 (4), 599–617.

Paul, D.L. and McDaniel, R.R. Jr., 2004. A field study of the effect of interpersonal trust on virtual collaborative relationship performance. *MIS Quarterly*, 28 (2), 183–227.

Pavlou, P.A., 2002. Institution-based trust in interorganizational exchange relationships: the role of online B2B marketplaces on trust formation. *Journal of Strategic Information Systems*, 11, 215–243.

Pavlou, P.A. and Gefen, D., 2005. Psychological contract violation in online marketplaces: antecedents, consequence, and moderating role. *Information System Research*, 16 (4), 372–399.

Pennington, R., Wilcox, H.D., and Grover, V., 2004. The role of system trust in business-to-consumer transactions. *Journal of Management Information Systems*, 20 (3), 197–226.

Podsakoff, P.M., *et al.*, 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903.

Qureshi, I., *et al.*, 2009. Understanding online customer repurchasing intention and the mediating role of trust: an empirical investigation in two developed countries. *European Journal of Information Systems*, 18, 205–222.

Ratnasingam, P., 2005. Trust in inter-organizational exchanges: a case study in business to business electronic commerce. *Decision Support Systems*, 39 (3), 525–544.

Ratnasingam, P. and Pavlou, P.A., 2002. Technology trust: the next value creator in B2B electronic commerce. *In*: *Proceedings of the 2002 IRMA international conference, Seattle, WA* 19–22.

Ridings, C.M., Gefen, D., and Arinze, B., 2002. Some antecedents and effects of trust in virtual communities. *Journal of Strategic Information Systems*, 11, 271–295.

Ridings, C.M., Gefen, D., and Arinze, B., 2006. Psychological barriers: lurker and poster motivation and behavior in online communities. *Communications of the Association for Information Systems*, 18, 329–354.

Riegelsberger, J., Sasse, M.A., and McCarthy, J.D., 2005. The mechanics of trust: a framework for research and design. *Int. J. Human-Computer Studies*, 62, 759–781.

Rousseau, D.M., *et al.*, 1998. Not so different after all: a cross-discipline view of trust. *Academy of Management Review*, 23 (3), 393–404.

Slyke, C.V., *et al.*, 2006. Concern for information privacy and online consumer purchasing. *Journal of the Association for Information Systems*, 7 (6), 415–444.

Song, J. and Zahedi, F.M., 2007. Trust in health infomediaries. *Decision Support Systems*, 43, 390–407.

Staples, D.S., Wong, I., and Seddon, P.B., 2002. Having expectations of information systems benefits that match received benefits: does it really matter? *Information & Management*, 40, 115–131.

Tan, Y.-H. and Thoen, W., 2001. Toward a generic model of trust for electronic commerce. *International Journal of Electronic Commerce*, 5 (2), 61–74.

Teo, T.S.H., 2005. Meeting the challenges of knowledge management at the housing and development board. *Decision Support Systems*, 41, 147–159.

Thatcher, J.B. and Perrewe, P.L., 2002. An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy. *MIS Quarterly*, 26, 381–396.

Tsai, W. and Ghoshal, S., 1998. Social capital and value creation: the role of intrafirm networks. *Academy of Management Journal*, 41 (4), 464–476.

Vance, A., Elie-Dit-Cosaque, C., and Straub, D., 2008. Examining trust in information technology atrifacts: the effects of system quality and culture. *Journal of Management Information Systems*, 24, 73–100.

Wang, W. and Benbasat, I., 2005. Trust in and adoption of online recommendation agents. *Journal of the Association for Information Systems*, 6 (3), 72–101.

Wasko, M.M. and Faraj, S., 2000. "It is what one does": why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*, 9 (2–3), 155–173.

Wasko, M.M. and Faraj, S., 2005. "It is what one does" Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29 (1), 35–58.

Williamson, O.E., 1993. Calculativeness, trust, and economic organization. *Journal of Law and Economics*, 36 (1), 453–486.

Wu, J.H. and Wang, Y.M., 2006. Measuring KMS success: a respecification of the DeLone and McLean's model. *Information & Management*, 43, 728–739.

Wu, J.J. and Tsang, S.L., 2008. Factors affecting members' trust belief and behaviour intention in virtual communities. *Behaviour & Information Technology*, 27 (2), 115–125.

Zucker, L.G., 1986. Production of trust: institutional sources of economic structure: 1840–1920. *In*: B. Staw and L. Cummings, eds. *Research in Organizational Behavior*, 53–111.