
Sociological factors affecting trust development in virtual communities

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Abstract: This study explores development of trust by people participating in Virtual Communities (VCs). The broad question in this research is to investigate common factors responsible for *trust development* in both virtual and physical worlds. The main sociological factors that influence trust in physical communities have been hypothesised for their contribution to the development of trust in VCs. A quantitative online survey instrument was developed and applied to an online community based on existing literature on sociology under two major categories: 'personal-level' and 'contextual-level'. Results confirmed significant contribution of the factors at both 'personal-level' and 'contextual-level'. Results also confirm some of the existing findings in related areas.

Keywords: sociological factors; trust; trust development; Virtual Communities; VCs.

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1 Introduction

Virtual Community (VC) is a phenomenon that some describe as ‘new social life forms’ (Stolterman *et al.*, 1999), and due to the ease in which communities can be established online, *e.g.*, via a forums and bulletin boards, they are spreading at a rate greater than physical societies. It is widely believed that despite its strong reliance on technology and physical distance between its participants, VCs are in fact online manifestations of physical communities. This prompts further investigations for better understanding of the ways various factors associated with physical communities operate in VCs (Abdul-Rahman and Hailes, 2000).

In the context of social phenomena, it is “...other people and their actions [that] make up the most important environment of our lives and those are the crucial targets of our own actions” (Sztompka, 1999, p.21). For this reason we place trust in people and services every day. According to Rutter (2001), “If we did not place our trust so routinely, life would be practically unliveable”. Trusting decisions are made everyday; we trust the food we eat and the train to take us to work. Trust is certainly a pre-condition for the existence of any society (Abdul-Rahman and Hailes, 2000).

By presenting a fresh sociological view of trust development in online environments, this research aims to aid in enhancements in future development of VCs. Many of today’s VCs utilise bulletin board style setups where people can create their own virtual identity by registering and participating in online discussions. For this reason it is very important to explore how people trust each other in a VC environment. The online presence is certainly different from the physical world. The broad question in this research is whether trust is developed differently or not. Despite strong emphasis in the literature on importance of trust in e-commerce transactions little attention has been given by researchers in the field of Information Systems to the sociological perspective of trust development in VCs and that how and in what ways (if any) this traditional view can be applied to VCs. To fill the gap, this study aims to discover application of the traditional sociological concepts of trust in Virtual Environments.

2 Literature review

Many empirical sociological studies on VC make references to the sociological definition of ‘community’. For instance Rothaermel and Sugiyama (2001) believe that VCs are similar to a “community of mind described by Tönnies (1957), except that it forms through an electronic communication medium and is not bound by space and time”.

It is important to realise that VCs are multidisciplinary and their definitions vary depending on the perspective used, which can include technology, commercial (including business, economics and e-commerce) and sociology (Gupta and Kim, 2004). However, regardless of perspective, the common core attributes of all VCs are:

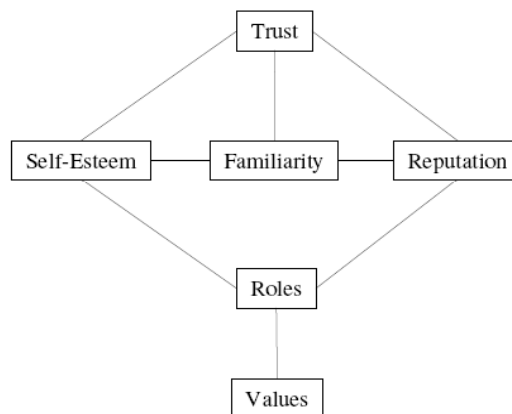
- People
- Shared goal and purpose which is the reason for being in the community
- Policies that govern use
- Interactions, activities and participation involving emotions

- Use of computer systems
- Shared social conventions, language and protocols (Gupta and Kim, 2004; Whittaker *et al.*, 1997).

All definitions of VC revolve around the above common core concepts. For example, some researchers define VCs by focusing on “...the types of practical Virtual Communities [as opposed to the] metaphysical properties” (Li, 2004, p.271). One such definition is from Ridings *et al.* (2002) who sees VCs as “groups of people with common interests and practices that communicate regularly and for some duration in an organised way over the Internet through a common location or mechanism” (Li, 2004, p.273). The technologically orientated papers on the other hand tend to refer to VCs according to the technological platform on which it is delivered, *e.g.*, bulletin boards, listservs, *etc.* These technologies form the foundation of community interactions (Lazar *et al.*, 1999). Sociologists define VCs based on the strength and type of relationships and the way people bond in an online environment without the constraints of geographical location and ethnicity (Etzioni and Etzioni, 1999).

From a sociological perspective, joining VCs allow for knowledge exchange and relationship development (Gupta and Kim, 2004). To understand how this works, there are two basic actions that people can take in VCs and that is to receive information, and to give out information (Gupta and Kim, 2004). The concept of trust has been defined from a number of perspectives including sociology, philosophy and economics (Ebner *et al.*, 2004; Tung *et al.*, 2001). Under the technological perspective, trust is viewed as a system consisting of interacting agents that take on various roles, *e.g.*, a citizen, service provider, owner, *etc.* (Abdul-Rahman and Hailes, 2000; Carter and Ghorbani, 2004). Daneshgar *et al.* (2005) propose a framework for VCs with members playing various roles including ‘initial contributor’, ‘opposer’, ‘argumentor’, and ‘supporter’. A holistic view of trust is shown in Figure 1. According to this view, components that make up trust include self-esteem, familiarity, reputation, roles and values.

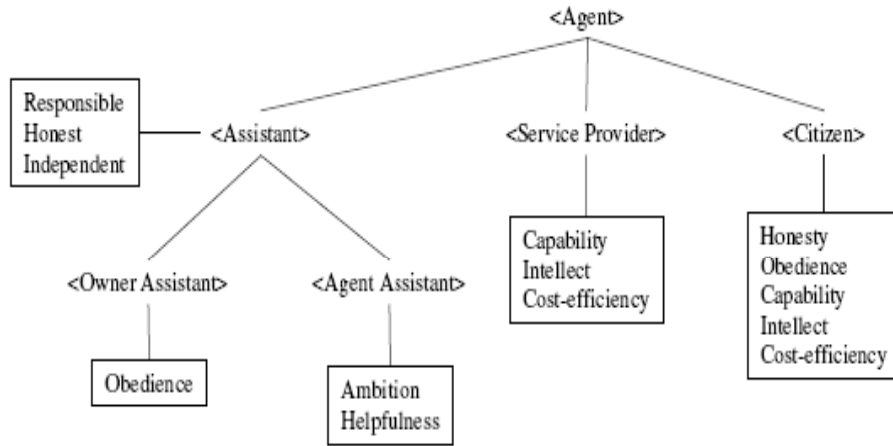
Figure 1 Concept dependency map



Source: Adapted from Carter and Ghorbani (2004, p.8)

Roles are then expanded to specific agents and are described with their relationships presented through a series of complex mathematical proofs and logic (see Figure 2).

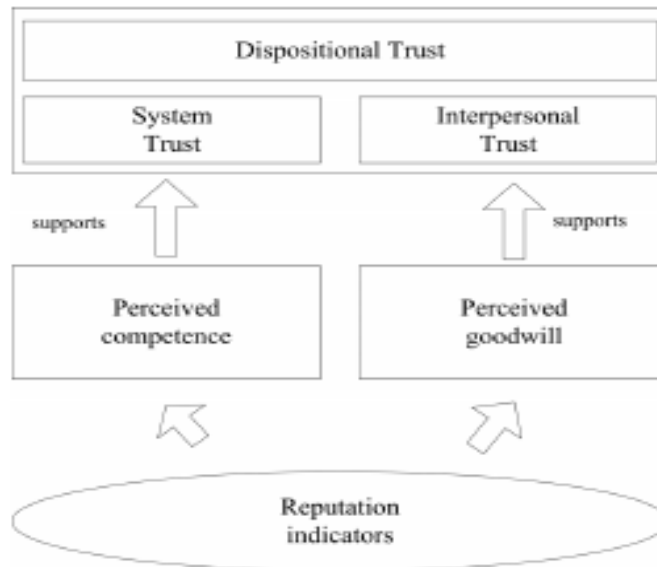
Figure 2 Value manifestation tree



Source: Adapted from Carter and Ghorbani (2004, p.11)

Ebner *et al.* (2004) transformed their trust model into a working prototype for virtual healthcare communities (see Figure 3).

Figure 3 Reputation indicators of trust



Source: Adapted from Ebner *et al.* (2004, p.2)

E-commerce studies examine the trust between people and transactional websites with an emphasis on value adding and enhanced customer trust. It is widely believed that online transactions and exchanges are characterised by uncertainty, anonymity, lack of control and potential opportunism (Grabner-Kräuter and Kaluscha, 2003; Tung *et al.*, 2001). For this reason many studies seek to find practical solutions that might be offered to encourage the development of trust among online consumers and retailer (Rutter, 2001).

And yet some E-commerce researchers focus on developing trust within a specific E-commerce environment such as E-auctions (Bewsell *et al.*, 2005; Rutter, 2001) and commercial VCs (Tung *et al.*, 2001) while others suggest general concepts and models of trust in e-commerce. For example, Wang and Emurian (2005) present a comprehensive coverage on trust, delving deeply into Human Computer Interaction (HCI) literature to find a reason why people trust technology, *e.g.*, via various trust cues on the websites such as smartly placed ads, images and working links. The most commonly used types of trust in both E-commerce and computer science papers are explained in the following two dimensions (Grabner-Kräuter and Kaluscha, 2003):

- 1 *Personal and Interpersonal trust* – this includes dispositional trust, trusting beliefs, intentions and trust related behaviours.
- 2 *Trust in the institution or environment* – this area includes system trust where a user trusts the environment in which the transaction/exchange occurs.

There are very few studies that focus on trust based on sociological definitions and the above is one such study. Another influential paper is by Ridings *et al.* (2002). Their research was on the antecedents of trust that aims to foster “voluntary online cooperation between strangers [participating] in VCs” (Ridings *et al.*, 2002, p.271). In this study, trust was placed in the middle as a mediating variable and was looked at from two sides: (1) what caused trust to develop, and (2) whether or not trust will predict a persons’ desire to exchange information. The focus however was not on trust development (as is the case in this study) but rather on the overall process of trust, from development to what happens after trust is placed. The three factors they considered to influence trust development were ‘perceived responsiveness’, ‘others’ confiding personal info’, and ‘disposition to trust’.

3 Hypotheses

This research focuses on examining how trust is developed in VCs using traditional sociological concepts of trust and arrived at the following set of hypotheses:

- H1 On a personal level an individual can determine the overall trustworthiness of another party within a VC by considering their reputation, performance and appearance.*
- H2 On a contextual level, accountability mechanisms and situational influences contribute to the development of overall trust.*

Furthermore, this article will examine relationships that exist among each of the above two groups of factors:

- H1A The factors under the personal level are all positively related with one another.*
- H2A The factors under the contextual level are all positively related with one another.*

The distinction between personal and contextual categories of factors that influence trust development in both H1 and H2 is based on a similar categorisation scheme provided by Grabner-Kräuter and Kaluscha (2003). These authors provided a long list of implied factors for each category however did not present an explicit list of factors. Using their implied list of factors, the authors explored the most important factors for the personal-level category through the first pilot study. These are: 'reputation', 'performance' and 'appearance'. The selection of the two factors 'situational' and 'accountability' is partly based on concepts with similar names by Sztompka (1999), although he did not present these concepts under any particular category. The analysis of results from the two pilot studies assisted authors in including these two factors under the 'contextual' category of factors. Various definitions used in this research are presented in Appendix.

4 Research methodology

This study uses an online quantitative survey instrument for measuring personal and contextual constructs that influence trust building in VCs. According to Leedy and Ormrod (2005), participants may be more truthful when anonymous than they would be in face-to-face interviews especially when dealing with personal matters. An online questionnaire would provide desired anonymity to the respondents. Owing to space limitation details of the questionnaire will not be presented in this article and the readers may obtain a copy of the questionnaire from the authors. Two pilot studies were conducted as preliminary investigations as well as to test the survey instrument. Descriptive statistics were used to analyse the demographics and multiple selection questions. The Pearson 'r' correlation method was used to analyse the Likert scales and to test associations among the concepts.

5 Population selection criteria

The main criterion for selection of target population was the degree of reliance of the community on members' trust for their best performance and results. According to Madge and O'Connor (2006) parents make up a large proportion of those internet users seeking help for not only themselves but also for their family members. The internet is increasingly being recognised as a place for social support (Sarkadi and Bremberg, 2005). For this reason the Parental VCs were selected for the two pilot tests. These VCs often deal with the parental issues from childbirth to family life and they are very popular. Many parents use these VCs as a form of social interaction as well as a place to ask for advice/help. The bulk of the discussions involve giving information or advice to another party in the form of help, suggestion or aid. Such advice is often very personal and to accept it would require trust. This compliments the goal of the study very well, as the objective here is to gauge just how trust is developed among the VC participants. The main survey was distributed among the Australian Parental VCs only.

6 Summary of results

Table 1 shows a summary of results for this study.

Table 1 Pearson correlations between measures of trust development

<i>Measures</i>	<i>Correlation</i>	<i>Total reputation</i>	<i>Total appearance</i>	<i>Total performance</i>	<i>Total situational factors</i>	<i>Total accountability</i>	<i>Total overall trust</i>
Total reputation	'r'	1	0.774	0.781	0.658	0.656	0.608
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
	(N)	(316)	(316)	(316)	(316)	(316)	(316)
Total appearance	'r'	0.774	1	0.829	0.699	0.726	0.588
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000
	(N)	(316)	(316)	(316)	(316)	(316)	(316)
Total performance	'r'	0.781	0.829	1	0.693	0.721	0.627
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000
	(N)	(316)	(316)	(316)	(316)	(316)	(316)
Total situational factors	'r'	0.658	0.699	0.693	1	0.823	0.588
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
	(N)	(316)	(316)	(316)	(316)	(316)	(316)
Total accountability	'r'	0.656	0.726	0.721	0.823	1	0.655
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000
	(N)	(316)	(316)	(316)	(316)	(316)	(316)
Total overall trust	'r'	0.608	0.588	0.627	0.588	0.655	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	(N)	(316)	(316)	(316)	(316)	(316)	(316)

In the above table, all correlations are significant at the 0.01 level (2-tailed), and none is negative. This implies that high score on one factor is associated with high score on the other. In this case, all the trust development factors are positively correlated. The strength of a relationship can be determined by its 'r' value. A value of 0 indicates no relationship and a value of 1.0 means a perfect positive correlation. The significance of the strength is gauged on the basis of the following recommendations (Pallant, 2005):

- Small Strength $r = 0.10$ to $r = 0.29$
- Medium Strength $r = 0.30$ to $r = 0.49$
- Large Strength $r = 0.50$ to $r = 1.0$.

Table 1 shows strong relationships between each pair of factors. More specifically, analysis of results confirmed significant relationships among, reputation, performance and appearance in one hand, and between the situational factors and accountability on the other hand.

For Situational Factors, presence of a broad range of topics in a VC contributed the most to trust building as it allows people to research about the area and form their own judgement of trustworthiness. For accountability, the existence of forum rules and policies had the highest number of responses.

As shown in Table 1, significant correlations exist between reputation and performance, appearance and performance, and situational factors and accountability. The first two correlations represent the growing area of identity and recognition research on the internet and the findings of this study compliments current studies (Chan, 2004; Lee, 2006; Donath, 1998). The association between situational factors and accountability offers an explanation to how accountability mechanisms works hand in hand with the VC environment in order to create a sense of responsibility within an individual. Lee (2006) and Watson (1997) both look into this 'invisible influence' in their studies. Table 2 presents relationship between each of the factors with the trust development factor as a whole.

Table 2 Pearson correlations between measures of trust development with overall trust

<i>Measures</i>	<i>Correlation</i>	<i>Total overall trust</i>
Total reputation	'r'	0.608
	Sig. (2-tailed)	0.000
	(N)	(316)
Total appearance	'r'	0.588
	Sig. (2-tailed)	0.000
	(N)	(316)
Total performance	'r'	0.627
	Sig. (2-tailed)	0.000
	(N)	(316)
Total situational factors	'r'	0.588
	Sig. (2-tailed)	0.000
	(N)	(316)
Total accountability	'r'	0.655
	Sig. (2-tailed)	0.000
	(N)	(316)

Note: All correlation are significant at the 0.01 level (2-tailed).

In Table 2, Accountability has the highest correlation with the overall trust ($r = 0.655$, $n = 316$, $P < 0.0005$), which can be explained by structure of the VC and heavy presence of active moderators in the sample environments. The Appearance had the lowest correlation with the overall trust ($r = 0.588$, $n = 316$, $P < 0.0005$). This may be related to the fact that majority of members are long-term members and therefore are more familiar

with each other on the VC, and would therefore rely less on the superficial aspects in their trustworthiness assessments. All factors had shared variances above 35% with overall trust.

Testing validity

The overall Cronbach Alpha coefficients was 0.916 for the Overall Trust, 0.708 for Reputation, 0.856 for Appearance, 0.829 for Performance, 0.899 for Situational Factors, and 0.870 for Accountability. Reputation was slightly lower; this could be due to the wording of the questions in the survey and the fact that reputation is not easy to gauge in an online environment. Despite this, all values exceeded the reliability threshold of 0.7 therefore the scales can be considered to be internally consistent in measuring the factors of trust development as well as overall trust.

7 Limitations

The authors recognise the following limitations for this research:

- The main survey was distributed among Australian Parental VCs. So assuming that mainly Australians participate in such VCs, results may not apply to overseas parental VCs.
- The trusting impulse of each individual, *i.e.*, the degree of trustfulness embedded in the personality based on learned tendencies, as well as cultural values and norms, may have influenced survey responses. This research however is focused on the 'reflected trustworthiness' (Sztompka, 1999, p.101), which involves making an assessment of trustworthiness based on cues. Both culture and individual disposition to trust is out of the scope for this research.
- Scales used have not been previously validated by IS literature due to the relatively new area of Virtual Communities and very limited studies on trust. More work is needed to enhance the validity of such trust development scales.
- In terms of statistical limitations, correlation studies are designed to investigate the associations between pairs of variables and not to establish the cause and effect relationships. The latter would need different investigation methods.

8 Future work

Below is a list of potential opportunities that authors will be considering in their future works:

- Replicating this study in other domains for increasing external validity of the results.
- Further validation of the scales that were used for measuring trust development factors in VC.
- Through extensive data mining operations and more advanced statistical methods, either identifying new factors contributing to trust development, or further confirming the current ones, or both.

- Delve into a particular factor, and investigate what happens after trust is placed (*e.g.*, cohesion and formation of a sense of community).
- Exploring both situational factors as well as patterns of people's trust development in virtual communities: is it the advice?, the social emotional support?, the sincerity?, the information?, the environment?.
- Examining how this socially-grounded concept of trust development in VCs changes over time, and how it evolves (Bhattacharjee, 2006).
- Examining the influence and disposition of trust on trust development.
- Considering the cultural impacts on an individual's propensity to trust.

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Appendix

Definitions

Following definitions have been adopted in this study:

Performance

Performance is defined as the actions of an individual, their present deeds conduct and results. In physical world, performance is measured by sporting times, exam marks, share prices and other competitions. People are also judged by their performance at face value. Therefore it is an area that is most prone to manipulations (Sztompka, 1999). In line with the above real life examples, indicators of performance in a VC can be:

- Responsiveness of an individual (Ridings *et al.*, 2002)
- Comprehensive and elaborate replies
- The total number of posts.

Appearance

Appearance is defined by looking at physical looks and demeanour. In physical societies it refers to external characteristics such as ethnicity, age, gender, body language, smile dress, prestigious house and car, *etc.*, and is closely related to how individuals present/show their personality, identity and status. The features that aid in trust development is largely dependant on the individual and their own circumstances, but in general, “people tend to trust others who are similar to them and to distrust those who are dissimilar from them [because] we are merely better at predicting the behaviour of those most like ourselves” (Sztompka, 1999, pp.79–80). For VCs, keeping in mind that this assessment of trust is purely superficial, members can develop trust based on:

- The number of hits and views in of a thread
- Appearance of a members’ signature and profiles
- English in posts are well worded, good mannered and polite
- Members’ current age, gender, sex and situation.

Contextual level

The above concepts relate to acquiring some knowledge or information about potential targets of trust. In order to consider trust development as a whole, some features of the external context also need to be explored within which the interactions take place. The relevant concepts in this category are: Accountability and Situational factors, and are explained below:

Accountability

The sociological definition of accountability deals with the “enforcement of trustworthiness [including] the presence of agencies monitoring and sanctioning the conduct of the trustee” (Sztompka, 1999, p.87). In physical life situations accountability is present in every day trades and in every contract that is signed. Accountability enhances the development of trust because it changes the “trustee’s calculation of interests” (Sztompka, 1999). In the realm of the internet, accountability has been explored extensively by numerous e-commerce literatures with focus on enhancement measures such as authentication and authorisation in the technology (Ishaya and Mundy, 2004; Wang and Emurian, 2005) and those who investigate how individuals present themselves online (Lee, 2006; Donath, 1998). It is believed that “accountability of self presentation in cyberspace should be understood as a context dependent phenomenon” (Lee, 2006, p.3). It is entirely up to the member to develop trust to a particular member, and to decide whether or not this piece of information or this member is trustworthy. Some factors associated with the accountability in VCs also relate to anonymity/visibility and structural arrangements (Sztompka, 1999, pp.89–90). Some of these factors are:

- Whether a user is registered or anonymous
- Personal information in profiles (*e.g.*, e-mail address, instant messenger, *etc.*)
- The presence and actions of moderators.

Situational factors

These are defined as features of the setting in which the trust development takes place. The environments in which members interact and give/receive information form a big part in their decision to accept a piece of information or trust a particular member. Under the sociological perspective one major situational factor would be the size of a community. It is generally believed that trust is easier to come by in close-knit, small, intimate communities as opposed to anonymous urban crowds. This is due to the mutual visibility of all members; and it decreases the cost of monitoring activities. Another situational factor relates to the perception of the surroundings. People tend to trust the safety of clean, elegant parks and streets than dirty, dark and vandalised surroundings. The final factor to consider is ‘self policing mechanism(s)’ such as law and order in physical societies (Sztompka, 1999, pp.95–96). In VCs, situational factors of trust development include the actual design of the VC, *e.g.*, bulletin board style and graphics, as explored by Wang and Emurian (2005) for e-commerce websites, as well as the content.