

A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING TRUST BUILDING AND MAINTENANCE IN VIRTUAL ORGANIZATIONS

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ABSTRACT

The issue of trust development in traditional organizations has been widely discussed in the academic literature for several years. Recently, scholars have also studied trust development in temporary groups and have noted some fundamental differences between the manner in which trust develops in traditional organizations and the manner in which it develops in temporary groups. Virtual organizations are a new type of organization characterized by traits of both traditional organizations and temporary groups. This paper integrates the literature on trust in virtual organizations and the perspectives of trust development in both traditional organizations and temporary groups to develop a process-based framework which facilitates the understanding of trust development in the virtual organization setting.

INTRODUCTION

Recent years have witnessed dramatic advances in information and communication technologies (ICT), enabling new methods of collaboration among geographically distributed organizations (Kikrman, Rosen, Tesluk, and Gibson 2004; Montoya-Weiss, Massey, and

Song 2001). The novel opportunity provided by advanced ICT and the increasingly intense competition facing organizations have led many to take advantage of global virtual organizations (VOs) (Montoya-Weiss, Massey, and Song 2001). Due to the numerous forms and structures VOs take, there is no universally accepted definition of the term VO. However,

Ken Peppers acted as the senior editor for this paper.

Gwebu, K., J. Wang, and M. Troutt, "A Conceptual Framework for Understanding Trust Building and Maintenance in Virtual Organizations," *Journal of Information Technology Theory and Application (JITTA)*, 9:1 2007, 43-63.

for the purposes of this paper, a VO is defined as “any organization form characterized by a temporary collection of geographically dispersed individuals, groups, or organizations that must trust each other and work together with the support of advanced information communication technology in order to explore a business opportunity that could otherwise not be explored” (Wang and Gwebu 2005). Examples of VOs include online auction sites, virtual product development teams, and virtual software development teams.

It is generally agreed that trust assumes an important role in the development and survival of VOs. Unlike in a traditional organization, VOs are characterized by lateral rather than vertical relationships (Snow and Miles, 1992). Vertical control, hierarchical authority, and formalized organizational procedures and policies are typically absent in VOs. Consequently, trust may act as a substitute for traditional control mechanisms by reducing transaction costs, minimizing uncertainty and risk, and helping in conflict and friction resolutions (Bromiley and Curley 1992; Cummings and Bromiley 1996; Jarvenpaa, Knoll, and Leidner 1998; Limerick and Cunningham 1993; Morris and McManus 2002; Sheppard and Tuchinsky 1996).

Although trust is pivotal in ensuring the existence and successful functioning of VOs, literature on trust development in such organizations is relatively underrepresented. Hence, the primary purpose of this paper is to propose a process-based framework that captures the manner in which trust develops in the VO setting. While trust building occurs at multiple levels of a VO, we only focus on trust at the individual level for the current study.

This study differs from the extant research on VO trust building in two important ways. First, most studies in the extant literature fall into the category of variance research which tends to focus on predicting and explaining the value of dependent variables (in this case, the level of trust) based on the values of other variables (antecedents/precursors of trust). Yet this approach provides little insight into how those values are established. Rather than focusing on identifying precursors of trust in VOs, this study draws on process theory and

CONTRIBUTION

This paper contributes to the current literature of VO trust building as follows. First, it takes a novel approach and focuses on the processes rather than the antecedents of trust building in VOs. This process-based approach is crucial for practical reasons, thus VO managers should find the paper interesting. Second, by considering the differences among traditional organizations, the proposed framework better captures the manner trust is developed and sustained in VOs. Appropriate strategies are vital to building and maintaining trust in virtual collaboration. By proposing and examining three trust building processes, this study considers in detail various activities and strategies in each process that foster the development of trust in a VO setting. Such a process approach provides answers to the question of how trust is built and sustained among VO members thereby deepening VO managers’ understanding and facilitating more effective managerial interventions.

This study is also expected to be interesting to the research community because it raises the awareness of the importance of a process-based approach in studying trust building in VOs. Researchers intending to empirically evaluate our proposed VO trust building processes will also find this paper useful due to the sample empirical indicators summarized in the paper.

seeks to describe the relevant processes and conditions under which the antecedents will lead to trust in VOs. Second, drawing on the three sources of trust specified in Lewicki and Bunker’s model (1995, 1996) (i.e., Knowledge-based trust (KBT), Calculus-based Trust (CBT), and Identification-based Trust (IBT)) as a classification scheme, we categorize and discuss in our conceptual framework three important processes (KBT, IBT, and CBT building processes) that are necessary in order for the antecedents-trust relationship to occur. Although we acknowledge the valuable insights from Lewicki and Bunker’s (1995, 1996) categorization scheme, we recognize that

Lewicki and Bunker's work is based on a more traditional work environment and cannot be completely extended into the VO context. To reflect the fundamental differences between traditional organizations and VOs, we draw from work on temporary groups and VOs and discuss how the manner in which trust building differs in a VO's existence as opposed to in a traditional organization or temporary groups.

The paper unfolds as follows. The next section provides a working definition of the term trust. This definition is necessary to mitigate misunderstanding as the term "trust" has been used differently in the academic literature. Thereafter, an in-depth review of the literature on trust-building theories in both traditional organizations and VOs follows. Using Lewicki and Bunker's (1995, 1996) classification scheme, we develop a process-based framework and propose various processes that are effective in building and sustaining trust in VOs. We further suggest candidate empirical indicators for the proposed framework and offer suggestions for future research.

DEFINITIONS

Trust

Although trust is a concept that has received attention from a broad collection of fields (Lewicki and Bunker 1995; Tyler and Kramer 1996), little consensus has been reached on the definition of trust due to disciplinary diversity and insufficient effort to integrate the differences in perspectives. In various studies, trust has been characterized as 1) a dispositional variable i.e., humans have the tendency to trust due to their faith in humanity (Rotter 1967), 2) a situational variable because sometimes people choose not to trust depending on different situational cues (Johnson-George and Swap 1982; Worchel 1979), 3) a behavior which is composed of actions that increase one's vulnerability to another whose behaviors are beyond one's control (Deutsch 1962; Zand 1972), 4) an expectancy held by individuals that other people's words or promises can be counted on

(Rotter 1980; Scanzoni 1979), and 5) an attitude that allows for risks and vulnerability in social contexts based on confidence in the intentions and behaviors of others (Kegan and Rubenstein 1973; Lewis and Weigert 1985).

The vast array of trust definitions reflects its multi-dimensional nature. In an effort to reconcile the differences in the definitions of trust, McKnight and Chervany (1996, 2001) review dictionary definitions of the term and more than 60 academic articles that provide definitions for trust. They find that these definitions together cover two types of trust: impersonal trust (structural/institutional) and personal trust (dispositional, cognitive, affect, and behavioral). They voice their concern that the term trust has been too narrowly defined, particularly in empirical studies, failing to capture its prolific meaning (McKnight and Chervany, 1996, 2001). To resolve this problem, some researchers have suggested that the various dimensions of trust be reconciled into a sensible set of constructs that adequately cover its different aspects (McKnight and Chervany, 1996, 2001). For instance, Mayer, Davis, and Schoorman (1995) included three constructs in their model: propensity to trust, trust, and perceptions of trustworthiness (cognitions). McKnight and Chervany (1996, 2001) reconcile the various types of trust into five distinct but related constructs: disposition to trust, institutional-based trust, trusting intention, trusting beliefs, and trusting behavior. What these models have in common is some combination of trusting dispositions, cognitions, willingness/intentions, and behaviors.

Following the advice of McKnight and Chervany (1996, 2001) we use a set of related constructs rather than a single narrowly defined construct to define trust. Rather than "reinventing the wheel", we adopt the three constructs from McKnight and Chervany's model (1996, 2001), i.e., trusting beliefs, trusting intention, and trusting behavior to cover the rich meaning and important aspects of the trust concept. Table 1 summarizes the definition of each of the three constructs.

Table 1: Constructs Used to Define Trust.

Constructs	Definition
Trusting Belief	The extent to which one believes in (and feels confident in this belief) the trustworthiness of the other person in a given situation
Trusting Intention	The extent to which one party is disposed to depend on the other party in a given circumstance with a feeling of confidence, despite the possibility of negative consequences
Trusting Behavior	The extent to which one party relies on the other party in a particular situation with a feeling of confidence, despite the possibility of negative consequences

Source: (Mcknight and Chervany, 1996)

The selection of the three constructs is appropriate for the purpose of this study for the following reasons. First, consistent with the focus of this study, which seeks to develop a conceptual framework of trust development at the individual level in VOs, the three constructs are defined at an individual level of analysis (Mcknight and Chervany, 1996). Moreover, the definition of trusting intention and trusting behavior encompasses risks and dependence, two core components that are vital to both trust and VOs. Giffin (1967) posits that risks (in our definition, we make use of the term “negative consequences” instead), is what makes trust vital and problematic. Nevertheless, risk is also an indispensable component of a VO due to its dispersed and virtual nature. By definition, a VO is an organization where members temporarily convene to explore and exploit a business opportunity. Thus, dependence among members is inevitable in order to successfully consummate the paramount objectives of the VO. Dependence is also an indispensable factor in a trust relationship because if one does not have to depend on others, one does not need to trust (Mcknight and Chervany, 1996). Third, using these three constructs rather than one general construct “trust” helps us cover the rich and broad meaning of the concept.

In their extensive review of trust definitions used in the literature, McKnight and Chervany (1996, 2001) identified a preponderant use of cognitions (beliefs, expectations), emotions (confidence, security), and behaviors, indicating the importance of these aspects of the concept of trust. Trusting

intention (willingness to depend) and trusting belief are cognitive-based constructs while trusting behavior is a behavior-based construct (depends). Hence, the three constructs and the manner by which they are defined encompass a combination of the important aspects of trust commonly identified by scientific work. In addition, these constructs can be arranged under the broad nomological structure of Fishbein and Ajzen's (1975) much supported Theory of Reasoned Action (TRA): beliefs (Trusting Beliefs) lead to intentions (Trusting Intention), which in turn leads to behaviors (Trusting Behavior). Finally, as will be discussed later, using these three constructs also facilitates scientific measurement and empirical investigation of the trust concept.

LITERATURE

Research on Antecedents of Trust in VOs

Issues related to trust and VOs are gaining increasing attention from researchers in various fields (Jarvenpaa, Shaw, and Staples, 2004). For instance, trust has been examined in the context of knowledge sharing among virtual alliance (Panteli and Sockalingam, 2005), virtual teams, and internet transactions (Ganesan, 1994; Gefen, Karahanna, and Straub, 2003; Lee and Turban, 2001). Most of these studies take the variance approach and primarily focus on identifying antecedents of trust in VOs. Antecedents commonly identified in these studies include dispositional trust (Gefen, Karahanna, and Straub, 2003) and structural security and assurance (Gefen, Karahanna, and Straub, 2003; Lee and Turban, 2001). While a

variance approach may improve our understanding of the relationship between trust and its antecedents, it affords little or no insight into the process through which this antecedents-trust relationship is established. For example, a variance approach may document that perception of structural assurance and identification with the VO are positively related with the level of trust. Nevertheless, it provides minimal attention to how the desired perception of structural assurance and high level of VO identification can be achieved and how the antecedents-trust relationship emerges, develops, grows or terminates over time. Hence, knowledge regarding the strength of trust and its antecedents only provides a necessary, but insufficient, condition to understand trust building in VOs. Figure 1 depicts Langley's (1999) view of the essential difference between variance and process theories (Langley, 1999). A process approach complements the variance approach by providing additional insights into the relevant processes, activities, and events that are necessary to move from state A (no/low trust) to state B (high trust).

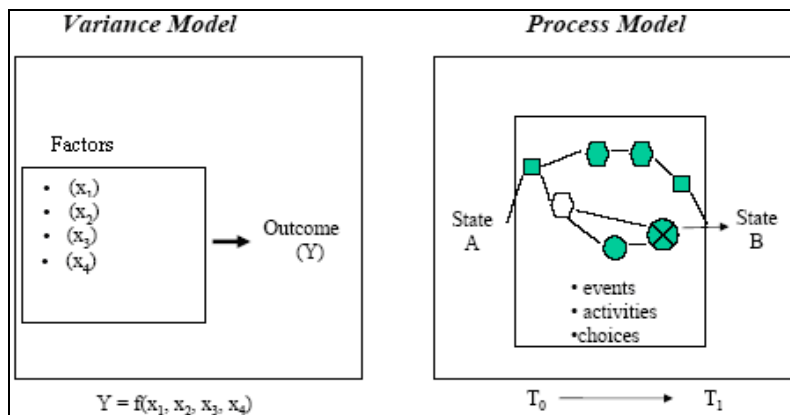
Sources of Trust in Traditional Organizations

To identify activities, processes, and events that are necessary for trust development in VOs, we examine an array of related streams of literature in the subsequent section. Although certain differences exist between VOs and traditional organizations, the work on

trust development in traditional organizations is relatively more mature and can offer some valuable insights on how trust can develop and be maintained in the virtual context. Over the years, Lewicki and Bunker's Trust Development Model (1995, 1996) for traditional organizations has gained considerable attention in mainstream scholarly literature. Therefore, we begin by reviewing this model and discussing the relevance of their classification of three sources of trust (i.e., CBT, KBT, and IBT) to the current study. We then analyze this model in detail and investigate the extent to which it can be applied to the VO setting.

Lewicki and Bunker's trust model (1995, 1996) has been selected for evaluation for two reasons. First, we believe that Lewicki and Bunker's classification (1995, 1996) has significant relevance to virtual organizations. We will demonstrate in subsequent paragraphs that KBT, CBT, and IBT are three important sources of trust in VOs.

Second, most models of trust pay little if any attention to the influence of non-instrument motivations on trust building although researchers have argued that the conceptualization of trust should incorporate the role of both instrumental and non-instrumental motivations in trust judgments and choices (Tyler and Kramer, 1996). The instrumental model of trust building posits that people are motivated to maximize their own



Source: Adapted from Langley (1999)

Figure 1: Difference between Variance and Process Theories

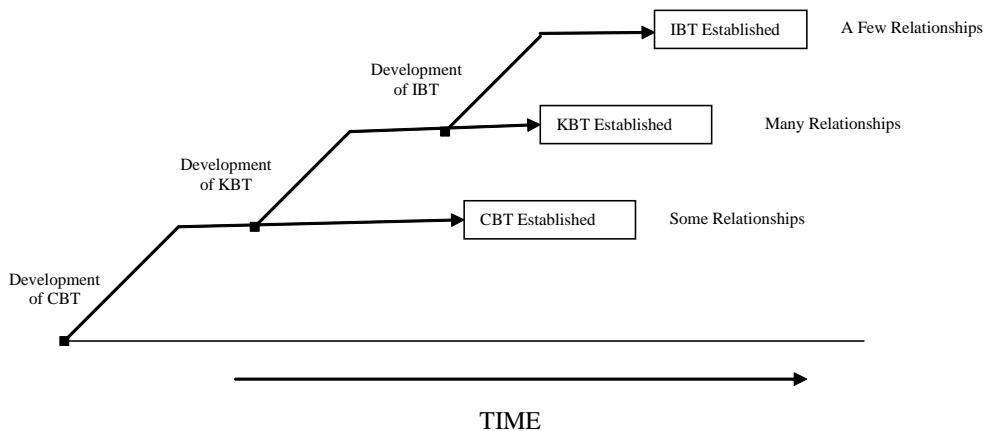
gains and minimize their losses and react to others from a self-interested, instrumental perspective. This perspective argues that people make decisions on whether or not they will engage in trusting relationships based on rational calculations. People's willingness to trust is based on their intuitive calculation of the probability of future cooperation (Williamson 1993), or their estimates of the likelihood that others will reciprocate that trust, or their calculation of the rewards for trusting behavior and punishment for violation of trust (Tyler and Kramer 1996). Although the instrumental model has wide support, social scientists have found that this model is inadequate for explaining people's trust in others. They suggest that in some situations, people's motivations to trust are non-instrumental based. Evidence of non-instrumental motivation to trust is provided by moral obligation, the social bond people share with others in the community, or the identification people have with an organization (Tyler and Kramer 1996). For instance, strong identification with a group or an organization enhances people's trusting behavior. When identification with a group or an organization is strong, cooperators are found to continue to trust and cooperate with others in the group regardless of other people's behavior. Also, cooperators do not leave groups even when it is in their best interest to do so (Orbell, van de Kragt, and Dawes 1988). Lewicki and Bunker's (1995, 1996) KBT, CBT, and IBT classification incorporates trust driven by both instrumental and non-instrumental motivations. CBT views trust from a rational perspective and centers on the calculus of self-interest, whereas IBT derives from a social perspective and centers on moral duty, commitment, and collective identity. Using this classification scheme, we are able to identify processes and activities that promote both instrumental and non-instrumental motivations of trust.

Lewicki and Bunker (1995, 1996) develop their model based on a framework proposed by Shapiro, Sheppard, and Cheraskin (1992). This framework introduces three sources of trust: Deterrence-based Trust, Knowledge-based Trust, and Identification-based Trust. Lewicki and Bunker expanded

this framework and formulated a dynamic model of trust development. Figure 2 depicts Lewicki and Bunker's trust development model. Based on this view, trust develops gradually through direct personal interactions and communications. They argue that corresponding to different stages of work relationships, trust evolves and changes from Calculus-based (similar to the Deterrence-based Trust proposed by Shapiro, Sheppard, and Cheraskin), to Knowledge-based, and ultimately to Identification-based Trust. All steps in this model occur sequentially, with KBT occurring only after CBT has been established and IBT occurring after KBT and CBT have both been established. However, they also caution that in some relationships, trust may not develop beyond the first or second stage.

Deterrence-based trust (DBT) /Calculus-based trust. DBT primarily stems from the fear of chastisement for breaching trust. Arguably, a plausible threat of punishment may be a key motivator in this type of work relationship (Shapiro, Sheppard, and Cheraskin 1992; Lewicki and Bunker 1996). CBT on the other hand, arises from both the fear of punishment for contravening trust in a relationship and the rewards for conserving the trusting relationship (Lewicki and Bunker 1996). Its fundamental premise is that people base their decisions to engage in or persist in a trusting relationship on their rational calculation of the punishment and rewards.

Knowledge-based trust. The theory behind KBT argues that to some extent people tend to depend on the behavioral predictability of the involved parties to make rational judgments of whether or not to trust. This is consistent with the rational choice model of trust building (Tyler and Kramer 1996). Information is therefore a critical element for the development of KBT since such information may enable individuals to anticipate others' actions more precisely (Kelley and Stahelski 1970). In turn, behavior predictability improves trust (Lewicki and Bunker 1996; Shapiro, Sheppard, and Cheraskin 1992).



Source: Adapted from Lewicki and Bunker (1996)

Figure 2 - Stages of Trust Development

Identification-based trust. Key ingredients which are essential for the establishment of IBT are a mutual understanding and appreciation of each other’s desires, wants and intentions. The basic premise behind IBT is that people in the same group or organization are inclined to behave in a more trustworthy manner towards one another other than they do to outsiders. Sheppard and Tuchinsky (1996) argue that with high levels of consensus and empathy, people can effectively act on each other’s behalf because they believe that their own interests will be met and protected.

A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING TRUST DEVELOPMENT IN VOS

A variance approach focuses on predicting the value of outcomes or dependent variables (the level of trust in this case) based on the value of other variables (antecedents/precursors of trust) in the system. As pointed out previously, this approach is limited as it provides little or no insight regarding how those values are established. In response to this limitation, we adopt a different approach and develop a process-based

framework of trust building in VOs. Figure 3 depicts our proposed conceptual framework. The curved arcs indicate necessary processes of trust building and maintenance in VOs and are the focus of this research. As can be seen from the figure, we use the three sources of trust identified in Lewicki and Bunker’s (1996) model and categorize important trust building activities and events into CBT, KBT, and IBT building processes. Institutional-based trust, dispositional-trust, identification with the members and the VO, and trustworthiness of the trustor are the antecedents of trust identified in the literature, which are the focus of the variance approach. However, with a process-based approach, we do not focus on identifying such precursors of trust or on predicting the level of trust with these identified precursors. Rather, we aim to understand the processes through which such identified antecedents could lead to trust and to understand the state of change over time, namely how undesired levels of antecedents or trust can be changed to the desired levels over time. In this section, we discuss the proposed framework in detail by reviewing the current literature and identifying the events, processes, and activities that are necessary to build and maintain trust in virtual organizations.

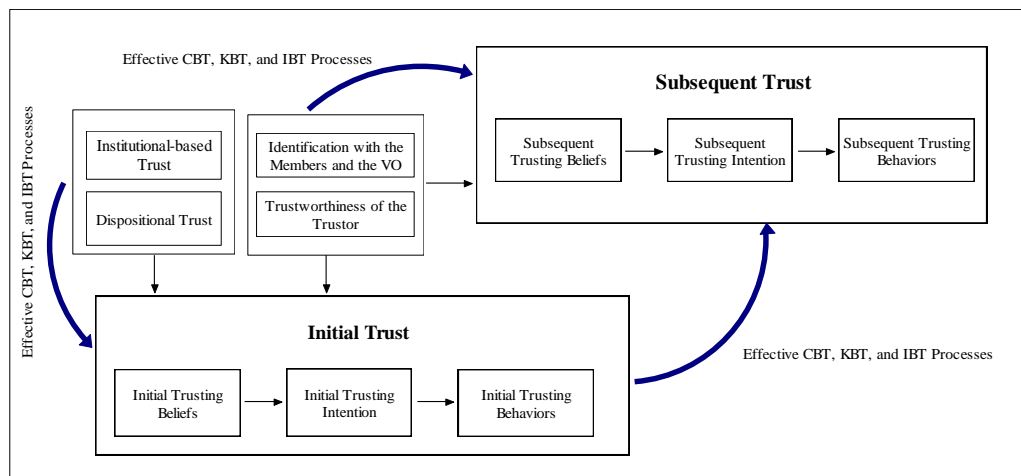


Figure 3: A Conceptual Framework for Understanding Trust Development in VOs

The Distinction between Initial Trust and Subsequent Trust

Traditional models of trust such as the one proposed by Lewicki and Bunker (1995, 1996) have suggested that trust tends to develop gradually through direct personal interactions and communication over a long period of time. Provided that Lewicki and Bunker’s model is able to be applied verbatim to the VO domain, the level of trust among members should be low at the early stage of a virtual working relationship because members of a VO often have little or no prior working history with one another and may never have had any face-to-face interaction. Nevertheless, recent studies have shown that high levels of trust exist in virtual work relationships at the onset even before members have had a chance to be involved in high levels of interaction (Iacono and Weisband, 1997; Jarvenpaa, Knoll, and Leidner, 1998; Jarvenpaa and Leidner, 1999; Jarvenpaa, Shaw, and Staples, 2004). This contradiction with traditional models of trust development indicates that studying *initial trust* is important because its formation may require an explanation beyond what the traditional trust models tend to provide. Hence, in our framework we distinguish initial trust from *subsequent trust* (see Figure 3). Our concept of initial trust is similar to the one developed by McKnight, Cummings, and Chervany (1998) and is defined as trust developed in the initial phases of a VO when members have not started work

and transactional relationships. Subsequent trust refers to trust developed after members’ involvement with work or transactional relationships. In the development of our propositions, we discuss process and events that are important for trust development at both the initial and subsequent phases of a VO.

Propositions

The distinction between CBT, KBT, and IBT has offered an insightful and important conceptual framework to trust building in general and this distinction is also critical for studying trust building in virtual organizations. In recent work, Panteli and Sockalingam (2005) advocate that Lewicki and Bunker’s model be extended to virtual alliances. Panteli and Sockalingam’s Trust and Conflict Model is primarily derived from Lewicki and Bunker’s (1996) model. In their model they also distinguish between CBT, KBT, and IBT. Work done by Jarvenpaa, Knoll, and Leidner (1998) in which they explored the antecedents of trust in global virtual team settings revealed that these three major categories of trust may be present in virtual work place. Although they did not explicitly categorize trust into CBT, KBT, and IBT, their analysis implicitly indicates the presence of these three types of trust in high-trust teams. They point out that high-trust teams deal with “free-riders” and those who do not adhere to the norms more decisively (source of CBT), discuss the goal of the assignments and their personal goals to a

greater extent (source of mutually accepted goals and IBT), and engage in frequent communication to reduce uncertainty in the global context (source of KBT). The presence of these three types of trust in VOs indicates the relevance of this classification scheme to the current study. Further, this categorization allows for the identification of activities, strategies, and processes that are necessary in order to strengthen each subtype of trust, which in turn will provide VO organizers with more comprehensive guidelines on how to implement trust building strategies.

Nevertheless, Lewicki and Bunker's model should be extended to a virtual work environment with great caution. They propose that trust develops and evolves slowly over time from a lower level (CBT) to a higher level (KBT) and then to the highest level (IBT). This developmental trust evolution model may not hold true in the VO setting since it does not take into consideration characteristics that are inherited in VOs: the often short and finite life-span and the virtual context of VOs. To some degree, trust building in VOs may share similar traits with trust building in temporary groups as argued by Meyerson, Weick, and Kramer (1996). In both cases, the temporary nature of such organizations imposes time pressure on members, leading to swift trust creation in both cases.

Although not directly related to VOs, the concept of Swift Trust, proposed by Meyerson, Weick, and Kramer (1996), offers insight into the trust building process in temporary groups or organizations. Meyerson, Weick, and Kramer (1996) find that trust building in temporary organizations has some unique properties. They argue that individuals in temporary groups are under time constraints and pressure. They have little time to build relationships and develop trust expectations based on first hand information. Hence, they tend to fall back on their predispositions and category-driven assumptions and judgments to reduce uncertainty and increase the speed of trust development. As will be discussed in subsequent sections, people with a predisposition to trust are inclined to extend trust more readily than people who do not. Category-driven assumptions and judgments

tend to induce cultural cues, and occupational- and identity-based stereotype (Meyerson, Weick, and Kramer 1996). For instance, when their computer breaks down, people tend to go to computer technicians for help because their category-driven (occupational-driven in this case) assumptions make them believe that computer technicians are more trustworthy when it comes to addressing this problem than people of other occupations. By falling back on these heuristic trust-building mechanisms such as category-driven assumptions, trust in temporary systems can be established fairly swiftly, particularly when people's roles and responsibilities can be defined clearly. They suggest that swift trust, which is based on trust in each member's "competent and faithful enactment of clearly defined roles and responsibilities", deemphasizes feeling, commitment, and exchange, emphasizes action and heavy absorption in task, and is strong and "thick" enough to survive the duration of a temporary group. While VOs are not identical to temporary groups, theoretically, trust could also develop in a swifter manner in VOs than in traditional organizations because VOs too are temporary in nature. Additionally, some empirical studies have shown that high levels of trust exist in virtual work relationships at the onset before members have even had a chance to be involved in high levels of interaction (Iacono and Weisband, 1997; Jarvenpaa, Knoll, and Leidner, 1998; Jarvenpaa and Leidner, 1999; Jarvenpaa, Shaw, and Staples, 2004). For example, based on their study on seventy five global virtual teams, Jarvenpaa and Leidner (1998, 1999) found that swift trust is present in high trust teams.

As a result, we believe that trust building processes may not follow a slow evolutionary path proposed by Lewicki and Bunker (1995, 1996). High levels of trust can be achieved in a swift manner at the initial phase of a VO. This idea is similar to the theory of swift trust in temporary groups. But as will be pointed out in later paragraphs, the fundamental differences between VOs and temporary groups have rendered the formation of swift trust in virtual teams much more complicated than in temporary groups. Thus, we use the term *Initial Trust* rather than Swift

Trust in order to distinguish between the two. This leads to the first proposition:

Proposition I: Initial trust (as presented by initial trusting beliefs, initial trusting intention, and initial trusting behaviors) can be swiftly established at the initial stage of a VO's existence.

Additionally, imposed time pressure makes it difficult for members to engage in social or interpersonal interaction and exchange. This ultimately means that trust building must be more task and action oriented. Several studies have found evidence of task and action-oriented trust building in VO settings (Iacono and Weisband 1997; Jarvenpaa, Knoll, and Leidner 1998, Jarvenpaa and Leidner 1999). Iacono and Weisband (1997) indicate that high performing teams demonstrate high levels of action. Jarvenpaa and Leidner (1999) find that action strengthens trust in a self-fulfilling fashion such that action will maintain members' confidence that the team is able to manage the uncertainty, risk, and points of vulnerability. So our second proposition is therefore:

Proposition II: Trust building and development in VOs is more task and action oriented than in traditional organizations.

Another direct effect of the relatively short and finite life span of VOs on the trust building process is that they do not have the luxury of allowing trust to evolve sequentially over time from the lowest level (CBT) to a higher level (KBT) and then to the highest level (IBT). This temporary nature necessitates not only swift trust building but also the concurrent development of CBT, KBT, and IBT in VOs. When activities (such as negotiation of contracts and rewarding systems) are conducted to facilitate the establishment of CBT, some team members may already be engaged in activities that strengthen KBT (such as team building exercises and initial interaction through ICT) and IBT (such as goal-setting activities and design of a mutual logo). In other words, multiple activities that are intended to achieve different types of trust usually occur concurrently rather than sequentially in the VO setting to reduce time used for trust building,

which in turn results in possible concurrent rather than sequential stage-wise achievement of CBT, KBT, and IBT.

In their study of global virtual teams, Jarvenpaa and Leidner (1998) noted that teams which engaged in team-building exercises prior to an actual task, had a positive effect on the knowledge or perceptions of other members' integrity, ability, and benevolence (source of KBT). Additionally, they pointed out that high trust teams already exhibited knowledge of their task objective and discussed their personal goals even during the early team-building exercises. As previously noted, the discussion of task objectives and personal goals helps create mutually accepted goals among the team members, which will in turn help build IBT. In this case, activities that may lead to KBT and IBT were conducted concurrently in high trust teams because there was no time for IBT to wait until KBT was built.

Related to this is a case study by Malhotra, Majchrzak, Carman, and Lott (2001) on SLICE, a virtual cross-value-chain collaborative creative team jointly formed by Boeing-Rocketdyne, Raytheon, and MacNeal-Schwendler, which has shed some light on the manner in which trust develops in virtual environments. The authors identified an umbrella agreement preceding the creation of the SLICE team, as a contributing factor to effective trust building and the team's eventual success. Specifically, this umbrella agreement specified the participation level (allocation of responsibilities, management of risk, allocation of intellectual property and liability, protection of company confidential information) and served as a legal framework and a foundation for CBT building in SLICE. However, what was not directly stated but can be inferred from this case study is that activities that lead to KBT and IBT were conducted concurrently with the discussion and drafting of the umbrella agreement. Senior managers, contract managers, and program managers from the three companies had a series of meetings to discuss and "identify the complementary skills that each partner company could bring... and the compelling business reasons for each company to share their resources and the skills and knowledge of their employees..." prior to

the formation of the SLICE team. The discussions on each partner's complementary skills enabled the three companies to gain better understandings of each other's professional competencies. The interaction during the meetings also improved their general knowledge about each other. The improved knowledge and understanding in turn enhanced KBT. On the other hand, "the compelling business reasons" mentioned above rendered the three partners fully aware of the necessity of relying on each other and the necessity and urgency of creating mutually accepted business objectives and goals. As will be shown in our discussion of IBT building processes, creation of mutual business objectives and goals are important IBT strategies.

Hence, if the case of the SLICE team is analyzed from the trust building perspective, CBT, KBT, and IBT can be achieved concurrently in VOs. Jarvenpaa and Leidner's study also appears to support this argument. Thus, we propose:

Proposition III: CBT, KBT, and IBT can be achieved concurrently rather than sequentially in VOs.

Although previous research has found evidence of swift trust in VOs, notably, arguments suggested by Meyerson, Weick, and Kramer (1996) for temporary groups do not fully apply to the virtual environment. Two fundamental differences exist between VOs and the temporary group context on which Meyerson, Weick, and Kramer (1996) build their theory of swift trust. First, Meyerson, Weick, and Kramer presume that members of temporary groups have periodic face-to-face meetings and are accountable to a single individual. In contrast, VO members typically remain geographically dispersed and report to different individuals. Second, Meyerson, Weick, and Kramer assume that temporary groups are assembled based on their clearly defined roles whereas in VOs, members are assembled based on differences in their competencies and knowledge (Jarvenpaa and Leidner 1999). The implication of these two fundamental differences is obvious: the theory of swift trust may not hold completely true in VOs.

The formation of swift initial trust in the VO setting is much more complicated than the swift trust formation in temporary groups described by Meyerson, Weick, and Kramer (1996). In temporary groups, people have little time to build relationships and develop trust expectations based on first hand information. As a result, instead of developing trust, members import trust from other more familiar settings such as trust in the competent and faithful enactment of a clear role by individual members. In temporary teams, less emphasis is placed on feelings, commitment, and exchange and more emphasis is put on action and absorption in the task. It is assumed that individuals of temporary groups usually belong to closely knit social and professional networks. They must competently and faithfully perform their roles and responsibilities. If not, their poor performance will be noted and known within their close social and professional groups. The consequences of poor performance are often severe and may damage an individual's reputation. Furthermore, the individual to whom every member in the temporary group reports, referred to by Meyerson, Weick and Kramer (1996) as a "contractor", also plays a vital role in the formation of swift trust in temporary systems. If members trust the contractor, they tend to trust each other because he or she has selected them. The contractor articulates the shared goal of the team and everybody strives to achieve the goal.

But in VOs, the effect of reputation and professional networks is much weaker for the following reasons. First, members are from more dispersed geographical locations, their reputation may not quickly diffuse, and hence they are less threatened by the reputation effect. For example, many online shopping or auction sites such as half.com and eBay.com offer peer-rating services in order to ensure that participating members act in a trustworthy manner. Nevertheless, such mechanisms may not necessarily be effective as one can always create a new account should the old account be rated poorly. Second, the professional groups that members belong to are less clearly defined and less closely bound, which in turn weakens the effect of professional networks (Jarvenpaa and Leidner's 1999). Also, members are not

accountable to one individual as in temporary groups (Piccoli and Ives 2003). Different groups of management or individuals that VO members report to may have differing objectives and goals. Hence, it is more complicated to set shared goals in these organizations than in the temporary groups.

Prior research has found that trust develops differently in VOs compared to temporary groups due to their above mentioned differences. Consistent with Gersick and Hackman's (1990) research on group development, Jarvenpaa and Leidner's study (1999) on global virtual teams found that members created trust instead of transporting or importing trust from other more familiar contexts as is the case for temporary groups. Also, unlike Meyerson, Weick, and Kramer's theory of swift trust which discounts feelings, commitment, member-support, and group well-being as unnecessary, researchers have found that in the context of VOs, members must devote time for group commitment, group support, and group well-being to cope with complex tasks, technological uncertainties, and conflict resolution (Jarvenpaa and Leidner 1999; McGrath 1991).

In summary, it is evident from the literature that clearly defined roles, the effect of reputation and professional networks, and category-driven assumptions and judgment, in VOs, are insufficient to import swift trust. Compared to temporary groups, VO members create initial trust by utilizing a more comprehensive set of mechanism and strategies which facilitate the building of all three types of trust (CBT, KBT, and IBT). This leads to the fourth proposition:

Proposition IV: The effect of reputation and professional networks and category-driven assumptions is insufficient to build initial trust in VOs.

The fundamental differences between VOs and temporary groups have rendered initial trust building in VOs more complicated. As researchers have indicated, members of a VO create trust instead of transporting or importing trust from other more familiar contexts as is the case for temporary groups (Jarvenpaa and Leidner, 1999). In order to facilitate the creation rather than the

importation of initial trust, effective IBT, KBT, and CBT building processes are necessary.

We argue that initial trust can be established swiftly in a virtual work environment, provided that effective processes and mechanisms are in place. Nevertheless, trust development is not an easy task due to the dispersed nature of VOs and obstacles in communication. Therefore, we identify through reviewing the current literature activities, mechanisms, processes, and events that are considered critical for the formation of initial trust and categorize these activities based on Lewicki and Bunker's classification scheme into the CBT, KBT, and IBT building processes.

Although we adopt a process approach and focus on identifying relevant activities, events, and processes that are necessary for the establishment of trust in VOs, we believe that a variance approach is equally important. These two approaches complement each other and together they provide a more complete picture of the manner in which trust develops in VOs. Hence, in addition to identifying CBT, KBT, and IBT processes, we relate our process-based framework to the trust antecedents identified in the variance-oriented studies by discussing how these three processes may help establish desired levels of antecedents, which in turn will lead to high levels of trust.

Effective CBT-Building Process

Central to CBT is the fear of punishment for violating trust in a relationship and the rewards for pursuing and preserving trust in a relationship. Therefore, CBT trust building activities and strategies involve the establishment of control mechanisms and safeguards that encourage trusting behavior and deter the violation of trust. However, effectively employing CBT activities and strategies in VOs is a challenging undertaking due to the lack of formalized control mechanisms and a legal framework within the virtual context. VO members need to seek substitute methods that work in the virtual context. Several mechanisms have been identified in the literature as important to assist VOs in achieving and sustaining CBT. These include having a clear and effective reward

system, well-defined relational contracts, reputation management (i.e., recording and distributing individuals' reputations for the purpose of monitoring and sanctioning), and a credible punishment or sanction system. Processes that aim to achieve individual reputation management, membership management, and credible sanctions or sanction threats against undesirable behaviors are also important CBT strategies because prior research has documented the effectiveness of these social-control and self-control mechanisms in Open Source Software Project groups, which are essentially a type of virtual organization (Gallivan 2001; Markus, Manville and Agres 2000). Other effective CBT strategies include the establishment of clearly articulated and well-communicated relational contracts and agreements which clarify terms relating to allocation of responsibilities, management of risk, allocation of intellectual property and liability, protection of company confidential information, the quality and functionality of products and services, deadlines, potential liabilities, profits and resource allocation. Such contracts and agreements provide a guideline and a substitute for an absent legal framework in VOs (Fuehrer and Ashkanasy 2001) and may serve to guard against undesired behaviors, reduce misperceptions, and increase shared expectations, and thus facilitate the development of trust (Handy 1995).

Effective CBT-Building Process to Enhance Institutional-based Trust and Initial Trust

Institutional-based trust has been identified as an important antecedent of trust and it involves one's belief that the necessary impersonal structures which allow individuals to act in anticipation of a successful future endeavor are in place (McKnight, Cummings, and Chervany, 1998). Two dimensions have been suggested in the literature for institutional-based trust: situational normality and structure assurance. Effective CBT building processes and activities have the potential to establish high levels of institutional-based trust, which will in turn lead to trusting beliefs, intentions, and behaviors. Specifically, CBT processes enhance structure assurance. Structural assurance involves one's belief that contextual safeguards such as

contracts, regulations, guarantees are in place (McKnight, Cummings, and Chervany, 1998).

As previously discussed, successful CBT-building activities and processes involve the development of effective reward systems, well-defined relational contracts, reputation management, and credible punishment and sanction systems. These mechanisms provide the necessary structure assurance to enable VO members to feel confident about their expectation of the trustee's future behavior. Such safeguards could mitigate the perceived risk in forming trusting intention and make the trustor feel confident that the trustee will make every effort to fulfill their responsibility (Baier, 1986). Institutional-based trust has been indicated as an important precursor of trust, particularly at the early juncture of a VO when members have little or no direct information about the trustee. In this sense, the trustors transfer their trusting beliefs about the institution's safeguard structure into trusting beliefs about the trustee. By providing the necessary structural assurance to the members, CBT-building processes and activities can be effectively employed to facilitate the development of initial trust in a VO.

Effective KBT-Building Process

Regular communication fosters and strengthens KBT. Yet VO members are constrained by the lack of shared working history and the limitation of ICT in information exchange about each other. Research has reported that one major constraint in ICT lies in its lack of nonverbal and emotional cues (Takeuchi and Nagao 1993; Walther and Tidwell 1995). A number of studies have suggested that face-to-face communication is still the most effective means of fostering trust (Nohria and Eccles 1992; Grundy 1998). Hence, it is imperative that VO members seek innovative mechanisms that can compensate for the limitations of ICT and foster the establishment of KBT. For instance, in an attempt to mitigate the problems associated with non-face-to-face communication and interaction, video and audio conferencing technologies may be employed. Facial displays may also be incorporated in chat sessions. Prior research has found that facial displays tend to enhance

subsequent interaction (Takeuchi and Nagao 1993) and can hence foster trust building. Other mechanisms that have been identified as effective in facilitating the achievement of KBT include screening and choosing partners carefully and wisely, (Bhattacharya and Devinney 1998), trust-building exercises designed to encourage the exchange of information concerning members' abilities, motivations, and work habits (Jarvenpaa, Knoll, and Leidner 1998), communication of other members' trustworthiness (Fuehrer and Ashkanasy 2001), and creation of boundary role persons who provide the linking mechanism across organizational boundaries.

Effective KBT-Building Process to Enhance Institutional-based Trust and Perceived Trustworthiness of the Trustee

In addition to structure assurance, situational normality is another dimension of institutional-based trust. Situational normality simply means that one believes that success is likely because everything appears to be in proper order (Baier, 1986; Lewis and Weigert, 1985). For example, in an electronic-market like e-Bay (a type of VO), many individuals come together to sell various items. A potential buyer who comes to bid on one specific seller's item would expect an online setting conducive to customer service that is reflected in the website's professional appearance, seller online support features, and the safe and user-friendly transaction handling procedures. The buyer's belief that the situation is normal helps build trust because he or she believes that the institution in the situation (e.g., the electronic-market) reflects the actions of the people involved (e.g., the seller).

KBT-building activities and strategies rely on information relating to the trustworthiness of the involved parties. Hence, effective KBT-building activities and mechanisms need to be in place to convey and highlight the sense of situational normality and the trustworthiness of the institution to VO members. For instance, it is critical that online companies successfully communicate their trustworthiness by making known their privacy protection policies, their secure transaction handling technologies and procedures, their easy-to-access customer service, and their

convenient dispute resolution mechanisms. By creating the sense of situational normality, these KBT-building activities facilitate initial trust development among VO members because researchers have found that trustors tend to transfer their trust of the institution (in this case the VO) to the trust of the members participating in the institution (Doney & Cannon, 1997).

KBT processes and activities can be used to communicate not only the trustworthiness of the VO, but also the trustworthiness of the members. At the early stage of a VO relationship, trustors may not have time or have the opportunity to collect first-hand information to form their evaluation of the trustee's trustworthiness. Under this situation, KBT processes can aim to provide second-hand information provided by other trusted sources to convey the trustworthiness of the trustee. A number of studies have discussed the pattern that trust can be gained using a trusted third party's endorsement that the trustee is trustworthy or can be transferred from one trusted "proof source" to the trustee with which the trustor has little experience with (Milliman & Fugate, 1988).

Effective IBT-Building Processes to Enhance Organizational Identification

Developing strong organizational identification and a common business understanding are essential goals of IBT-building activities (Dutton and Dukerich 1994; Shapiro Sheppard, and Cheraskin 1992). Organizational identification refers to the social, psychological, and cognitive tie binding organizations and members (Dutton and Dukerich 1994; Turner 1987). Common business understanding is a concept somewhat similar to organizational identity. The latter however, is a more dynamic concept because organizational identity changes with the prevailing environment (Gioia 2000). Within the context of VOs, common business understanding is defined as "a transient understanding between network partners as to what they stand for, about the nature of the business transactions that they engage in, and about the outcomes that they expect—their 'vision' (Fuehrer and Ashkanasy 2001)."

Social scientists have suggested that strong organizational identification is an essential antecedent of trust since it contributes to a willingness to cooperate (Dutton and Dukerich 1994). Collective identity has also been found to strengthen trust in the VO setting. Recently, an increasing number of studies have investigated the antecedents and consequences of trust in open source software (OSS) development teams. OSS developers and users are typically geographically distributed; they use telecommunications tools such as the internet and email to communicate and collaborate; and they can join or leave the team at any time depending on their interest in the project. These characteristics qualify OSS teams as types of virtual organizations. Researchers in this field find that team members' compliance to OSS ideology augments trust among the members (Stewart and Gosain, 2006). In the social sciences, acceptance of an organization's ideology has been identified as an indicator of the strength of collective identity (Ashmore, Deaux, and McLaughlin-Volpe, 2004).

Nevertheless, effective IBT building is a challenging undertaking in VOs because many factors which have been thought to cultivate IBT tend to be absent within the context of VOs. These factors include shared name or legal status, dress code, shared language, proximity, shared organization charts, and shared working history. However, creative activities and mechanisms that are outside the domain of conventional organizations can still be employed to achieve IBT in VOs. For instance, VOs can develop a shared intranet, a shared virtual working space, a shared organization handbook, a shared vision, and shared ideologies and utilize ICTs such as chat rooms, video conferencing, and listservs to create strong organizational identification.

As previously indicated, trust building is more complicated in VOs than in temporary groups. Unlike in temporary groups where members import trust from other familiar settings, members of a VO have to create initial trust through the employment of the afore-discussed effective CBT, KBT, and IBT processes. VOs may take differing forms and exist for various purposes. Depending on the

type of VO and the level of risk and uncertainty involved, the trust-building processes may vary. Some VOs need all three processes to be in place while others may only need one or two. Thus we obtain:

Proposition V: Effective IBT, KBT, and/or CBT processes are necessary for initial trust to be established at the initial stage of a VO's existence.

Another effect of the two fundamental differences between VOs and temporary groups is related to the fragility and resilience of initial swift trust. Meyerson, Weick, and Kramer (1996) suggest that swift trust is "thick" and resilient enough to survive the duration of temporary groups. However, we believe that various factors in VOs such as obstacles to periodic face-to-face communication, uncertainty or lack of clarity with information communication technologies, and the inability to simultaneously attend to local work demands and requests from distant workmates can all make initial swift trust very fragile and induce a decline in trust. Hence, sustaining trust in VOs is further dependent on subsequent trust building endeavors. Previous empirical studies offer support to our argument. For instance, Jarvenpaa, Knoll, and Leidner (1998) identified frequent communication and substantive feedback as key success factors for high trust teams. In another study on global virtual teams, Jarvenpaa and Leidner (1999) found that swift trust is fragile and is further dependent upon the communication pattern of team members. Unpredictable communication, lack of substantive and timely response, lack of individual initiative, and negative leadership were observed to be prevalent in teams that began with high trust but finished with low trust. Piccoli and Ives (2003) conducted an empirical study on 51 VOs to investigate the manner in which trust deteriorated in virtual environments. Their study revealed that trust tends to decline in VOs where members knowingly fail to follow through on an obligation or incongruence exists in their perception of what each other's obligations are. This leads to the following proposition:

Proposition VI: Initial trust is not resilient enough to persist throughout the duration

of a VO's lifespan without subsequent IBT, KBT, and CBT building processes.

Effective CBT, KBT, and IBT Processes at the Subsequent Stage of a VO. Although effective CBT, KBT and IBT processes are necessary for both the initial and subsequent trust in a VO relationship, activities and strategies that constitute these processes may vary depending on the stage of the relationship. For example, at the early stage of a VO relationship, CBT processes primarily involve the establishment of effective rewarding systems and relational contract arrangements and KBT processes focus on facilitating the communication of second-hand information regarding the trustee's trustworthiness. But at the subsequent phase of a VO when members have started working together, CBT processes may entail more activities such as monitoring of the relationship and the credible enactment of the terms specified in the rewarding and contract arrangements. KBT processes will focus more on facilitating direct interaction and first-hand information to communicate the trustworthiness and behavior predictability of the trustee. Therefore, VO managers need to dynamically evaluate their specific situations to determine what activities and mechanism to employ in the three trust building processes.

Dispositional Trust. In many cases, VO managers have little control over dispositional trust through employment of trust building strategies. Therefore, we did not provide any discussion on how CBT, KBT, or IBT processes could influence this construct. Nevertheless, we include this construct in our framework because dispositional trust could function as a stable factor, influencing the likelihood that a person will trust other people across situations. Some researchers have advocated for the inclusion of this construct in conceptual and empirical investigations as either an antecedent or moderator of trust in both online and offline settings (Grabner-Kräuter and Kaluscha, 2003; Mayer, Davis, and Schoorman, 1995). Dispositional trust has been defined by Rotter (1967, 1980) as a faith in human nature deriving from past experience that other individuals or groups are basically honest and can be relied on. To some extent, dispositional trust encompasses personality

orientation or traits. Certain individuals who possess traits to trust are inclined to extend trust more readily than those without those traits. When people do not know each other well and no other situational information is available, dispositional trust plays a prominent role for making judgments of whether or not to trust (Johnson-George, and Swap 1982; Rotter 1980; Mayer, Davis, and Schoorman, 1995). In VOs, members usually do not have a shared culture or shared working experience. In other words, it is highly likely that members do not know each other well, particularly during the early juncture of its existence. Therefore, initially, members will fall back on their traits/disposition to make trust judgments. Empirical research provides further support that this construct is an important precursor of trust in virtual environment (Gefen, Karahana, and Straub, 2003; Lee and Turban, 2001; Javanpaa and Leidner, 1998, 1999).

Empirical Indicators

Although the primary goal of this study is to develop a process framework of trust development and maintenance in VOs, we have also identified some candidate indicators for each construct or process. As we do not focus on the antecedents of trust, we refer readers to the references for the measurement of these antecedents. In this section, we only discuss some sample empirical indicators for trust (represented by trusting beliefs, trusting intention, and trusting behaviors) and three trust building processes. Table 2 summarizes the candidate indicators for each construct and process. It is important to note from the outset that this list is not exhaustive, rather indicative of the types of perceptions, behaviors, and events that can be examined for evidence. Further, researchers need to adapt these indicators to suit the context and purpose of their research. For example, perceived trustworthiness has been noted as a multidimensional construct and researchers have suggested three dimensions of trustworthiness that parsimoniously capture the key aspects of this construct: perceived competence, perceived benevolence, and perceived integrity (Mayer, Davis, and Schoorman, 1995). However, the dimension that best captures the perceived trustworthiness differs from situation to situation. In an online

shopping context, the perceived integrity and competence of the sellers are vital because these perceptions indicate that the trustor's belief that the sellers will ship the ordered item on time and as described. But benevolence may not be as vital because the trustor may not care whether the seller's good service is driven by the motivation to make money or by their benevolence. But in a virtual product development team, members' benevolence could be as important as their competence and integrity because benevolence ensures mutual benefits and mutual growth. Therefore, in a particular situation, some indicators and dimensions of a construct might be more natural and proper than others. Because it is infeasible to develop a complete list of all empirical indicators that are manifestations of the constructs and processes, the selected indicators only serve as guidance and

researchers need to adapt them to suit their particular research contexts and purposes.

The proposed process framework can be viewed as a framework to provide useful guidance for VO managers. Drawing on Lewicki and Bunker's classification scheme, the framework identifies processes that promote both instrumentally and non-instrumentally motivated trust. By adopting a process approach, we document relevant activities, events, and mechanisms that are necessary for developing and sustaining trust in VOs. While the variance approach improves VO managers' understanding of what antecedents would lead to a high level of trust, a process approach facilitates managerial intervention by informing the managers of how desired levels of antecedents and trust are achieved.

Table 2. Sample Empirical Indicators

Constructs/Processes	Sample Empirical Indicators
Trusting Beliefs	<ul style="list-style-type: none"> • The trustee keeps promises and commitments. • The trustee keeps my best interests in mind. • The trustee cares for me. • The trustee is honest. • The trustee is capable of delivering high quality service/products on time.
Trusting Intention	<ul style="list-style-type: none"> • Intends to provide open and honest information to the trustee. • Intends to enter a transaction relationship with the trustee. • Intends to purchase the item(s) from the seller (in an online context). • Intends to cooperate with the trustee on the tasks and transactions.
Trusting Behavior	<ul style="list-style-type: none"> • Provides open and honest information to the trustee. • Enters into a transaction relationship with the trustee. • Purchases the item(s) from the seller (in an online context). • Cooperates with the trustee on the tasks and transactions.
Effective CBT-Building Process	<ul style="list-style-type: none"> • Establishes a clear and effective reward system • Establishes an effective reputation management system • Ensures credible punishment and sanction system • Develops well-defined relational contracts
Effective KBT-Building Process	<ul style="list-style-type: none"> • Carefully screens partners • Involved in high levels of interactivity with members through ICT • Builds effective mechanisms to communicate the trustworthiness of members • Creates boundary role persons • Conducts trust building exercises
Effective IBT-Building Process	<ul style="list-style-type: none"> • Sets shared goals • Creates joint products • Creates a shared value and ideology • Creates a shared virtual work space

CONCLUDING REMARKS

This paper has revealed that a process approach is necessary to examine trust development in VOs because it would provide additional insights on the manner in which trust develops in VOs. To address this need, a process framework of trust development in VOs is presented based on various streams of literature. The contributions of the framework include: 1) it fills a void in the literature on trust building in VOs; 2) it better captures the trust development process in virtual environments because it takes into account the differences among traditional organizations, VOs, and temporary groups; 3) it provides

guidelines on how to implement trust building and maintenance activities and strategies in a virtual setting.

Despite the contributions of the proposed framework, several directions for future research remain. For instance, it would be helpful to conduct empirical studies to test the effectiveness of this framework. It may also be worthwhile to investigate in greater detail how to develop each specific type of trust in virtual organizations. On the whole, this study is only a beginning. More extensive research needs to be conducted to facilitate the understanding of trust development in VOs.

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