Trust and Conflict within Knowledge-Intensive Environments:
The Case of Virtual Inter-Organizational Arrangements

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ABSTRACT

Trust and conflict are inherent characteristics of any organizational arrangement and central for knowledge sharing; yet they have received limited attention in the knowledge management literature. In this paper, we undertake an investigation of both trust and conflict within the context of virtual inter-organizational arrangements, which represent linkages for value-laden shared knowledge. The paper proposes that knowledge sharing is positively related to inter-organizational arrangements so long as the parties exhibit a trust type that permits conflict to be heard, considered and resolved. In so doing, the study argues that a dialectical relationship exists between trust and conflict as they have the potential to affect one another and hence magnify the distinct influences each brings to bear on knowledge sharing in inter-organizational arrangements. This paper explores the dynamics of the different forms of trust and conflict within three different models of virtual inter-organizational arrangements. The implications of these linkages are discussed and strategies generated.

INTRODUCTION

Today's complex, competitive and dynamic business environment necessitates adaptive, flexible and responsive organizations. Accordingly, organizations are often compelled to form alliances with other organizations to survive and prosper. An expected outcome of such inter-organizational arrangements is the increased access to a wider pool of resources and in particular that of knowledge. These knowledge-intensive inter-organizational arrangements have received overwhelming attention in the recent management and organizational literature. Yet often overlooked is the fact that this fertile mechanism for nurturing knowledge sharing and knowledge creation can become sterile and even pathological, when trust between collaborators is lacking and conflict is poorly managed. Whilst trust and conflict are fundamental considerations for effective knowledge-intensive inter-organizational arrangements, in particular those of a virtual nature, both bodies of literature have largely evolved independently of one another.

This paper addresses this gap and takes a focus on different forms of virtual inter-organizational arrangements. The paper begins with the argument that trust and conflict are both key characteristics of virtual inter-organizational arrangements. It then reviews the literature on conflict and trust and identifies their main types and forms. Following from this,

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it takes a focus on specific though diverse structural forms of virtual inter-organizations and develops a framework identifying the different forms of trust and conflict associated with each of these arrangements. The framework is used to develop strategies for generating trust and also aid in minimising dysfunctional conflict.

VIRTUAL INTER-ORGANIZATIONAL ARRANGEMENTS

Virtual inter-organizational arrangements are defined as a network organization consisting of independent enterprises (organizations, groups, individuals) that come together swiftly to explore a business and/or market opportunity (Kasper-Fuehrer and Ashkanasy, 1998). Such inter-organizational arrangements often result from the convergence of two trends: firstly, technological advancements, which revolutionize communication between firms by establishing linkages for value-laden shared knowledge and secondly, the growing recognition of the importance of knowledge and innovation for networked organizations (Scott, 2000). Thus, these organizations can add value to business activities by managing knowledge and developing core competencies outside the organization, and between the organization and its strategic partners (Zigurs and Qureshi, 2000).

The definition above implies that collaboration is a key requirement for this form of organizations. Partners are expected when they enter into an alliance to share their skills, expertise and competencies in order to achieve a shared purpose and a jointly managed common task. Such partnerships therefore rely on trust, which often needs to evolve swiftly due to tight deadlines. Indeed, trust has been found to be positively related to the performance of inter-organizational partnerships (Aulakh, et al 1996). When trust prevails, partners are more confident in being open with each other, knowing that information and ideas shared will be used for the benefit and advancement of the partnership. Moreover, with trust, conflict and differences are used constructively to share knowledge and generate new ideas. Open debate is the medium through which opposing views, assumptions and constraints are examined, valued and reconstituted towards creative solutions responsive to several points of view (Sockalingam and Doswell, 1997). Accordingly, Tjosvold (1997) notes that: "Conflict when well managed, breathes life and energy into our relationships and strengthens our interdependence and makes us more innovative and productive" (p.23). But when conflict is poorly managed or avoided, people remain aloof, sceptical and angry, and become rigid, fixated and ambivalent (Sockalingam, 2000). Further, trust disintegrates and may be replaced by mistrust with negative implications on the performance and survival of the alliance.

Accordingly, the main proposition of the paper is that ***knowledge sharing is positively related to inter-organizational arrangements so long as the parties exhibit a trust type that permits the conflict to be heard, considered and effectively resolved***.

TRUST AND CONFLICT

Trust "is at the heart of knowledge exchange" (Davenport and Prusak, 1998: 35) and is "the gateway to successful relationships" (Wilson and Jantrania, 1993: 5). Several researchers have found that trust is a 'need to have' quality in business interactions (Davidow and Malone, 1992; Kramer and Tyler, 1996; Mayer et al, 1995) and teamwork activities (Panteli and Dibben, 2000). Accordingly, high levels of trust are key to effective communication (Dodgson, 1993) as trust facilitates challenge, debate, learning and innovation, and "improves the quality of dialogue and discussions … [which,] facilitates the sharing of … knowledge" (Ichijo et al, 2000, p200), and committed relationships (ibid).

In inter-organizational arrangements, trust is positively related to conflict resolution (Twomey, 1975), and further facilitates harnessing the manifold benefits of conflict - the "spark" that ignites valuable innovation (Pascale, 1994). Accordingly, if conflict is poorly managed and trust is lacking, problems develop and fester, morale and motivation are threatened, communication is impaired, and knowledge sharing is limited whilst the potential for innovation is lost or considerably compromised. We return to this view after discussing the concept of conflict.

Conflict and its forms

Conflict is defined as "an expressed struggle between at least two interdependent parties who perceive incompatible goals, scarce rewards, and interference from the other party in achieving their goals" (Hocker and Wilmot, 1991). Conflict may be related to power differentials, to competition over scarce resources, to tendencies to differentiate rather than converge, to negative interdependence between work units, to ambiguity over responsibility or jurisdiction, or to denial of one's self-image or characteristic identifications including values and sensitivities (Deutsch, 1969).

For well over a decade, genuine interest in the study of organizational conflict has developed. Researchers have made significant strides in understanding and describing the mechanics of the organizational conflict phenomenon. What sets these studies apart from earlier studies are 1) the ethos that conflict is a phenomenon omnipresent in organizational life and simply inevitable; it is the nature of complex organizations and central to what an organization is, and 2) the underlying notion that conflict is a twin edged sword with the potential to be both

functional and dysfunctional (Sockalingam, 2000). Thus, the emergent view of conflict is that it is both an enemy and a friend on the "perpetual expedition to organizational efficiency and effectiveness" (Van de Vliert, et al. 1997).

The organizational conflict literature has identified three main forms of conflict: relationship conflict or affective conflict, cognitive or task conflict and process conflict.

Relationship conflict tends to be emotional, and focused on interpersonal incompatibilities or disputes (Brehmer, 1976; Cosier and Rose, 1977) which typically provokes hostility, distrust, cynicism, apathy and other negative emotions (Jehn, 1994; Amason et al, 1995; Eisenhardt et al, 1997). It has been found that relationship conflict has negative implications on team and organizational functioning; it promotes inefficiency and ineffectiveness (Argyris, 1962); it can lead to a loss of perspective regarding the task (Kelley, 1979), tends to inhibit individuals' cognitive functioning in assessing new information provided by team members (Pelled, 1995) and processing complex information (Staw et al, 1981), encourages stereotype listening (e.g. "There goes techie again") and induces the freezing out of iconoclasts from important discussions (Pascale, 1999). Moreover, Amason et al (1995) found that relationship conflict diminished decision creativity and quality, eroded team unity and commitment, and curtailed decision acceptance and support.

Cognitive conflict is generally task orientated and focused on judgmental differences on the best solution to achieve organization objectives (Amason, 1996; Jehn, 1995; Brehmer, 1976; Cosier and Rose, 1977).   It is a condition in which individuals disagree about task issues including, goals, key decision areas, procedures, and the appropriate choice for action (Pelled et al, 1999). Based on empirical research, Pelled et al (1999) suggest that functional background diversity is the key source for cognitive conflict and has the greatest potential to influence performance. They note that individuals tend to draw on belief structures based on functional background differences when addressing work place issues. Research shows that cognitive conflict elicits divergent thinking, which facilitates multiple perspectives being brought to bear on decision making and the consideration of diverse aspects of the issue under debate (Nemeth and Kwan, 1987; Nemeth et al, 1990; De Dreu and De Vries, 1993; Nemeth, 1995). Thus, it is argued that well managed cognitive conflict can arouse critical, focused, creative, and investigative (Amason et al, 1995; Amason, 1996) interaction, through frank communication of varied perspectives, open discussion and challenge of viewpoints and traditional paradigms, without threat, anger, resentment or retribution (Amason et al, 1995). Accordingly, cognitive conflict when well managed leads to better scanning of the

environment, greater flexibility and higher responsiveness to external change (Nemeth and Staw, 1989).

Process conflict, the most recently identified form of conflict concerns an "awareness of controversies about aspects of how task accomplishment will proceed" (Jehn and Mannix, 2001: 239). This form of conflict arises from differences of opinion regarding responsibilities and resource delegation. Unlike cognitive conflict, process conflict tends to be associated with decreased productivity through ineffective task performance (Jehn et al (1999), and dissatisfaction that can promote a desire amongst members to abandon the team (Jehn and Mannix, 2001).

Despite clear theoretical distinctions between the three common forms of conflict, in practice there is a strong inter-relationship between each form. Cognitive conflicts may be taken personally and thus generate relationship conflict, or conversely, relationship conflict may prompt individuals to criticise each other's ideas (Amason 1996; Pelled et al, 1999). Further, Jehn and Mannix (2001) found that process conflicts interfere with task issues resulting in misdirected focus on irrelevant discussions such as members' ability. Accordingly, whilst cognitive conflict promotes creativity and innovation, relationship and process conflict when not properly managed can weaken inter-organizational alliances, curtail open sharing of knowledge, distort debate and thus undermine success.

Trust and its forms

Trust has been defined as a state of a positive, confident though subjective (Baba, 1999) expectation regarding the behaviour of somebody or something in a situation which entails risk to the trusting party (Cook and Wall, 1980; Currall and Judge, 1995). Individuals must often act under uncertainty and ambiguous and incomplete information (Luthans, 1992). This introduces the perceived risk and thus the requirement for trust. The latter is a particularly valuable function in virtual settings. Trust allows for cooperation without the direct operation of control which has been common practice in traditionally structured organizations and which is not only practicable but counterproductive in virtual forms of organizations.

Various forms of trust have been identified in the literature. The tendency of an individual to trust, e.g. due to faith in humanity (McKnight et al, 1998) is widely known as dispositional trust. Although individuals may have a natural tendency to trust others, they may not do so in certain situations and under different circumstances (Dibben, 2000). Trust in such cases, becomes dependent on the situational cues that modify the expression of generalised tendencies to trust and is labelled as situational trust (Worchel, 1979). Jones and George

(1998) identify two other types of trust: conditional and unconditional trust (in Newell and Swan, 2000). Conditional trust is commonly found at the initial stages of relationships when there are no obvious grounds for distrust. Given its provisional nature, conditional trust is fragile. However, as relationships mature and familiarity increases, conditional trust can transform into the more enduring unconditional trust. Unconditional trust is considered to be more supportive of synergistic relationships that are essential for superior performances (Newell and Swan, 2000) as it stems from firsthand knowledge and experience of, and confidence in, the other party.

With particular reference to temporary organizational arrangements, Meyerson et al (1996) present the concept of swift trust, which may flourish even though the traditional antecedents seem to be missing. They suggest that swift trust could be strong and 'resilient' enough to survive the life of the temporary group since it centres around the competent and faithful enactment of clear roles and members' associated duties. This type of trust presumes that roles are clear and that each member has a good understanding of others' roles and responsibilities. Furthermore, in order to cope with uncertainty, this type of trust falls back on predispositions, categorical assumptions and theories, which are independent of the object of perception. Meyerson et al (1996) propose that in temporary teams, members tend to relate with each other based on roles rather than individuals and as such, swift trust is founded more on professionalism rather than character. "This potentially 'cool' form of trust places less emphasis on feeling and commitment and more on action and cognition" (Huemer et al, 2000: 135). Jarvenpaa and Leidner (1998) found evidence of swift trust in their study of global virtual teams, and note that this trust is very fragile and temporal, and is further dependent upon the communication behaviour of team members. Regardless of the initial levels of trust, their research found that only 14% of teams saw an improvement in the levels of trust over time.

Following Boon and Holmes (1991) and Shapiro et al (1992), Lewicki and Buncker (1995, 1996) argue that trust dynamics are different at each stage of a relationship, professional or romantic. They highlight that "this is a fundamentally different perspective on trust from the view that the essence of trust cannot be captured by a single, 'static' definition of its key elements and attributes. Trust is viewed as a dynamic phenomenon that takes on a different character in the early, developing, and 'mature' stages of a relationship" (1996: 118). According to this view, trust changes with the passage of time as individuals begin to feel more comfortable with one another and develop improved awareness of others' integrity and competence over time (ibid). Based on this argument, Lewicki and Bunker suggested three types of trust, each corresponding to a different stage of a relationship: Calculus-Based Trust,

Knowledge-Based Trust and Identification-Based Trust which are "linked in a sequential iteration in which the achievement of trust at one level enables the development of trust at the next level".

Figure 1: The Stages of Trust Development (Lewicki and Bucker,1996, p.124)

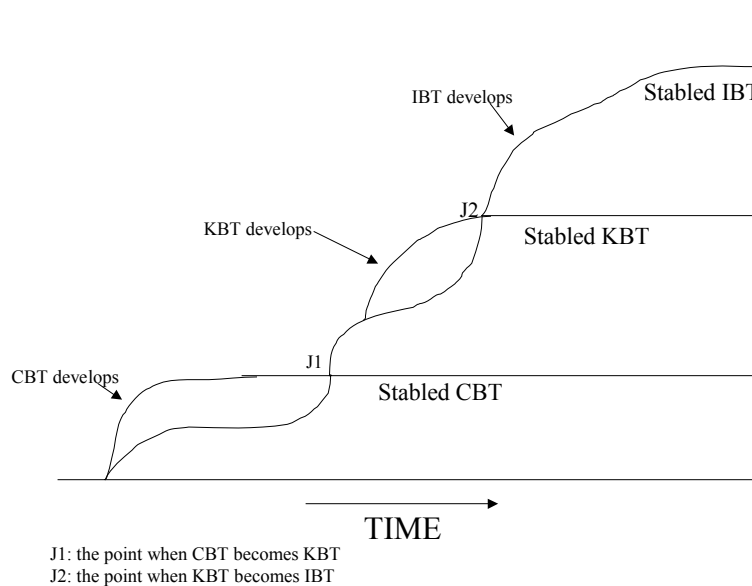J1: the point when CBT becomes KBT
J2: the point when KBT becomes IBT

Figure 1 depicts the model of trust types as presented by Lewicki and Bucker (1996). They propose that understanding how trust develops can help better understand how relationships change and evolve over time. The movement from one type of trust to another begins at point J (J1 and J2) in the figure. However they caution that this movement may not develop smoothly, and further some relationships may not progress beyond the initial stage of the relationship.

Calculus-based trust **(CBT)** is the type of trust that is grounded in the rewards to be derived from pursuing and preserving the relationship or in the fear of punishment for violating trust within the relationship. This trust can arise when untrustworthy behaviour by a partner can lead to costly sanctions that exceed any potential benefits that opportunistic behaviour may provide. Potential sanctions in professional relationships may include the loss of repeat business or of reputation.

Knowledge-based trust **(KBT)** relies on information about involved parties, The assumption is that the more information one has about others, the more able one is to predict their actions. Such information is collected over time, largely through the interaction between parties:

"Regular communication puts a party in constant contact with the other, exchanging information about wants, preferences, and approaches to problems. Without regular communication, one can 'lose touch' with the other – not only emotionally but in the ability to think alike and predict the reactions of the other" (p.121). Lewicki and Bucker (1996) propose that, "the parties may not move part CBT if: a) the relationship does not necessitate more than 'business' or 'arms-length' transactions, b) the interdependence between the parties is heavily bounded and regulated, c) the parties have already gained enough information about each other to be aware that any further gathering is unnecessary [...] or d) one or more violations of CBT have occurred" (p.124/5).

Identification-based trust **(IBT)** is the type of trust that is characterised by mutual understanding among all parties to the point that each can effectively act for the other. In this case, "the other can be confident that his or her interests will be fully protected and that no surveillance or monitoring of the actor is necessary" (ibid, p.122). In other words, identification based trust is generated by shaping and moulding identities in ways that increase identification between the parties (Maguire et al, 2001).

Though this model of trust development has been popular in the traditional organizational literature, its relevance has not been explored in the virtual organizational literature, mainly because this literature has so far concentrated on temporary organizational arrangements, an environment with no history and no future. We believe however that this model is relevant to the case of virtual inter-organizational arrangements that we present here.

Virtual alliances can take numerous forms and structures, with some being more permanent, interactive, knowledge-intensive or more complex than others. For the purpose of this paper we use three models of virtual inter-organizational arrangements developed by Burn et al (2002), star-alliance, value-alliance and co-alliance. The star alliance model is typified by one dominant player collaborating with other peripheral organizations. The value-alliance model refers to an alliance between a core organization and others that deliver interrelated products and services within the industry value chain. Finally, the co-alliance model is described as a collective of organizations that make equal contribution of resources, competencies, and knowledge to the alliance.

Even though these models may not be permanent, they do have some continuity in their operations. Indeed, as these present different partnerships of independent enterprises, partners are not expected to collaborate on a continuous basis, but rather to come together when the need arises, for specific projects and then disassemble. This implies that the trust experienced

among parties is not just swift, but has opportunities to develop or diminish depending on the interactions that have taken place between the partners during the various stages of their relationship, including experiences with the handling of specific projects. The different characteristics and power dynamics of each of these would require different interactions which in turn will have an influence on trust development and conflict propensity.

The following section begins by examining the propensity of conflict at different stages of trust development within the general context of virtual alliances. This in turn will be used to explore trust and conflict within the three specific contexts identified earlier.

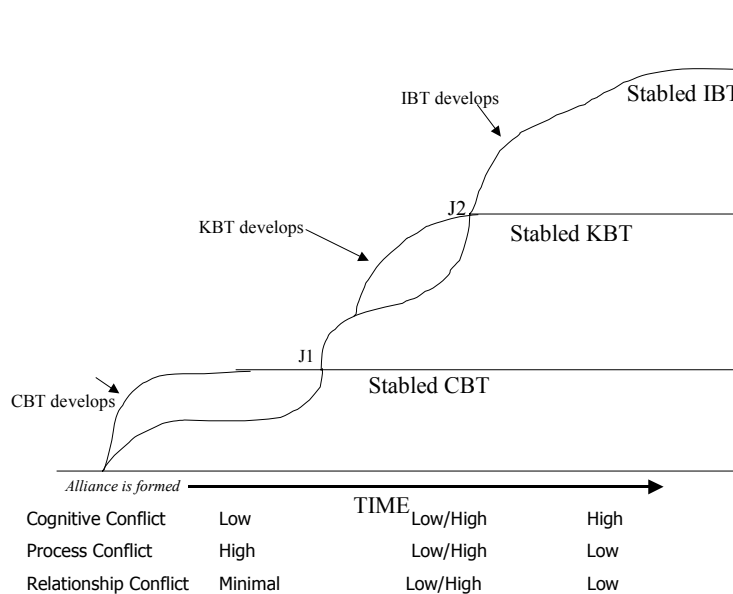### VIRTUAL INTER-ORGANIZATIONAL ARRANGEMENTS: TRUST & CONFLICT

At the initial stage of a virtual inter-organizational alliance, given the limited and even lack of familiarity between members and the professional makeup of the alliance, trust will tend to take the form of CBT as a result of the rewards of being trusting (e.g. increased sales and reputation). Also, at this initial stage the propensity for relationship conflict would be minimal as individuals have little experience and knowledge of their counterparts, and further have come together based on their expertise for collaboration leading to mutual benefit (Sochalingam and Panteli, 2001). The propensity for cognitive conflict at this stage tends to be low as the opportunity for strong differences in opinion, and concentrated debate is comparatively limited. At this stage partners tend to be cautious in the manner in which they present themselves, in establishing relationships with fellow partners, and their position within the alliance. Nevertheless, the propensity for process conflict tends to be high at this stage (Jehn and Mannix, 2001) as the prime concern amongst partners is establishing clear guidelines for operation including partners' responsibilities, resource availability and delegation, work norms, timescales and processes to be adopted. It is therefore expected that all parties will naturally seek comfort from additional information by attempting to glean some understanding of the new situation. How CBT and process conflict are managed at the early stage can affect the dynamics of both trust and conflict in subsequent stages as process conflict can be dysfunctional.

As the alliance progresses onto addressing the actual task element of the project, the propensity for cognitive conflict increases, in particular in situations involving non-routine, unstructured projects and the need to articulate tacit knowledge; as in the co-alliance case that we will see later. If the conflict is well managed, it can enable the partners to learn from the varied viewpoints and knowledge shared, develop new insights, and leverage knowledge to create new knowledge (Sockalingam, 2000).

If the initial process conflict and the subsequent cognitive conflict are poorly managed, they can trigger or escalate the propensity for relationship conflict, and thus compromise trust further. Once relationship conflict sets in, it can cause division and hostility amongst parties, apathy and disinterest in discussions and also threaten the fragile CBT.

The manner in which conflict is recognised and managed can influence not only the effectiveness of the alliance but also its survival. If the different forms of conflict are not appropriately identified or are poorly managed, learning and knowledge sharing will be curtailed, thus undermining the effectiveness and propensity of the alliance to achieve its goals. The lack of success in turn may curtail future projects between members of the existing alliance and discourage the formation of new alliances with new partners. In contrast, when conflict is well identified and appropriately managed, it can lead to more open sharing of knowledge, which can lead to the creation of new value-adding knowledge and innovative solutions, through the integration of existing individual sets of knowledge. This in turn can contribute to the development of trust not only from CBT to KBT, but also to IBT as the enriching experience and the increased propensity for genuine success serves to enhance motivation and commitment to the alliance, and strengthen individual relationships and the alliance as a whole. Within such alliances there is an implicit realisation that alliance success is synonymous with each individual party's success. Figure 2 depicts the propensity of conflict that may arise at different stages of trust development.

Figure2: Conflict Propensity and Trust Development in Virtual Alliances – A generic model

Cognitive Conflict	Low	Low/High	High
Process Conflict	High	Low/High	Low
Relationship Conflict	Minimal	Low/High	Low

Having identified the interrelationship between trust and conflict it remains to examine these within the context of specific inter-organizational arrangements. Depending on the nature of these alliances, appropriate strategies will be identified and adopted in order to enable the further development of trust.

Trust and Conflict in the Star-alliance model

The star alliance consists of a core surrounded by various satellite partners who are only called upon to play a role in the virtual organization when a need arises. The satellites rely on the core as the dominant party for leadership. Accordingly, the core has the responsibility to allocate and direct work to its satellites. It is this central and dominant member who decides which partner supplies what resource, depending on project and client requirements. Thus, the power differential in this model is distinct and is linked to task allocation, process specification and information distribution. Depending on the performance and contribution of individual satellite partners, the core player has the power to decide whether or not to reward them with further projects. As such, some partners may develop a closer and stronger relationship with the dominant party than others. Where others perceive preference towards some satellites as inequitable and unfair, there is a potential for relationship conflict to develop between satellites, and between satellites and the core player. If relationship conflict creeps into the alliance, it can threaten the effectiveness and success of the alliance as a whole.

Following our earlier discussion, CBT is the most likely form of trust where the mechanisms for developing this trust are formal and clear (i.e. rewards and punishments). Core partners seeking to generate and stabilise this form of trust within the star-alliance model need to ensure clarity of roles and provide sufficient information and codified knowledge for each task that is allocated. Accordingly, the core partner plays a critical role. If the core partner withholds, or is perceived to be withholding information, the development of KBT will be compromised and even a stabled CBT will be questioned and its positive effect in minimising relationship conflict may diminish.

Trust and Conflict in the Value-alliance Model

The value-alliance models are networks that comprise a range of interrelated products and services that are based on an industry value chain. This model is a reinvention of the traditional value-chain so as to permit an efficient, demand-pull operation that results in increased customer satisfaction. Unlike, the previous model, all parties in the value-alliance model are needed for the completion of the value chain and thus are expected to make a contribution in all the projects undertaken by the alliance. As with the star-alliance model,

there is a central player whose role is to disseminate codified information and explicit knowledge from clients to associated partners. The central player needs to ensure that there is not just clarity of each individual's role and contribution, but also an understanding of the entire process. If the central player is effective in nurturing clear shared understanding of each partner's role in, and contribution to, projects undertaken by the alliance, the propensity for the dysfunctional process conflict can be minimised. Further, given the opportunity for mutual benefit, the effective management of cognitive conflict can also minimise the potential for relationship conflict and strengthen the effectiveness and success of the alliance as a whole.

The features that characterise this model, i.e. involvement of all parties in the value-chain, would enable the development of a stabled CBT which will be sufficient for the success of this alliance. Furthermore, this model provides more opportunities for the development of KBT than the star-alliance model. This idea of trust emerging as knowledge-based follows the premise that through ongoing interaction with all partners, firms learn about each other and develop trust around norms of interactions between themselves.

Trust and Conflict in the Co-alliance Model

The co-alliance structure relies on the notion of shared partnerships with each partner bringing different expertise and making equal contribution to the alliance. This form is quite distinct from the previous forms in the following ways: there is no dominant party; all parties are equal, knowledge sharing needs to be multidirectional (i.e. to be exchanged among all parties involved), tacit knowledge and not just explicit (codified) knowledge needs to be shared as the creation of new knowledge is vital.

Shared commitment is therefore vital for the co-alliance to succeed. As there is no dominant party in this arrangement, all parties are expected to take an active role in creating, maintaining and promoting the virtual organization. Further, all parties are mutually dependent on one another given the different skills and competencies each brings to the alliance. As such the propensity for cognitive conflict tends to be high in the co-alliance model. The effective management of cognitive conflict is critical as genuine involvement in discussions elicits a sense of self-affirmation and accomplishment that leaves people feeling more integrated, adjusted and competent (Weider-Hatfield and Hatfield, 1996; Tjosvold, 1997), which is key for new knowledge creation.

In order for this model of virtual organization to succeed, parties need to accept the process that characterises this alliance (i.e. equal commitment and contribution by all), and thus move

quickly to the second stage of the relationship and acquire a sufficient knowledge base of each other. If this is done effectively, the group will successfully and quickly move from CBT to KBT. Clearly, due to the high level of commitment and active participation required by all parties this alliance will work better if the parties have some prior knowledge and experience of each other.

Co-alliance models may also reach the level of IBT, the stage where each party acts like the other, represents the interests of the 'whole' and have the interest and skills to represent each other individually and collectively. The degree of continuity of this partnership as well as the level and frequency of interaction among all parties concerned will determine whether KBT can develop to IBT. The following section discusses specifically this issue taking into account the challenges involved in generating trust in virtual, computer-mediated environments.

Generating IBT in the Virtual Co-alliance Environment

This section builds on the premise that not all types of virtual inter-organizational arrangements are equally knowledge-intensive. The co-alliance model is more knowledge-intensive than other models due to the nature of its goals that makes the sharing of tacit knowledge vital for the success of the virtual organization. This is therefore the most likely form to develop IBT. To address the question of how IBT can be generated in the virtual, computer-mediated environment, two issues are identified as important: a) familiarity with all partners and b) co-alliance's identity.

a) Familiarity with Partners: information and communication technologies with collaborative potentials are increasingly used in organizations to enable their members and partners to communicate and co-ordinate their actions with great speed and effectiveness and therefore 'potentially offer many of the same advantages as trust' (Baba, 1999). Despite their collaborative potentials, access to technology alone is not sufficient to encourage and sustain collaboration (Baba, 1999; Handy, 1995; Panteli and Dawson, 2001). Technology is not an antecedent to effective trusting relations. "…You may receive many emails, voice mails, and phone calls, but you are missing significant amounts of data that would normally be available to you in face-to-face working relationships" (Platt, 1999:41). Face-to-face communication is the preferred means of communication at the start and end of each work process as it is valuable for establishing real shared understanding of task requirements and joint achievements. Computer-mediated communication, on the other hand, for are more suited to the middle period when the task context is well established (Zack, 1993). Even videoconferencing systems which have the capability for face-to-face though distant (and video-mediated) communication have been found to be more suitable for structured and

presentation-style meetings, where participants know each other well, rather than for creative, and innovative meetings where trust and rapport are yet to be established (Panteli and Dawson, 2001). Video-conferencing systems could of-course effectively to share information resources in the star-alliance and value-alliance models.

It seems therefore that if communication is restricted to just computer-mediated, the potential for the development of IBT will be limited in virtual settings. Handy (1995) concurs that for trust to develop in virtual environments, there is a need for regular face-to-face communication. Accordingly, a combination of face-to-face and computer-mediated communication is vital to enable parties to increase familiarity with each other not only for enhancing their knowledge base, but also for harnessing opportunities for building a mutual understanding of each other and the organizations that they represent.

b) Identity: Due to the nature of the co-alliance model and mainly the lack of a central player, trust relationships need to be jointly developed by all parties involved, constituting a type of trust relationship that is mutually negotiated, enacted, reinforced and even renegotiated. This conceptualisation of trust is based on the situated identity theory (Alexander and Lauderdale, 1977), which argues that parties perform a recognised action in a socially defined setting. This action, however, is neither predetermined nor is it random. It is rather 'an emergent property of moment-by-moment interactions between actors, and between actors and the environment of their action" (Suchman, 1987:179). IBT emerges within such situated identities and develops through regular interaction between parties, and is sustained through (re)negotiations.

Accordingly, IBT in a co-alliance virtual environment will not be based on a shared collective identity as Shapiro et al (1992) and Lewicki and Buncker (1996) argued, nor will it be merely based on a complementary and mutual understanding among the parties that their identities are different as Maguire et al found (2001), but rather on an identity that is situated. Alexander and Lauderdale (1977: 225) note that: "… [partners] who confront a choice situation constitute the situated identities that would result from their choice of each among several alternatives. Then, they decide what to do or what they expect another person to do, based upon their knowing what kind of person they are or the other is (or would want to become) in situated identity terms". This situated identity will act as a prerequisite for social conduct (ibid) and in turn will help in building and maintaining an interactive social situation every time the parties get together and will last throughout the duration of the virtual alliance.

Table 1 summarises the main findings of our discussion, identifying the links between all three virtual models and different types of trust and conflict. Further, the key factors and resources needed to generate trust and manage conflict are presented.

Table 1: Trust and Conflict in Virtual Alliances

	Star-Alliance	Value-Alliance	Co-alliance
Description	Dominant party for task allocation	Dominant Party for Coordination	Equal commitment of all parties
Conflict Propensity [after initial stage]			
- **Cognitive**	Low	Low	High
- **Process**	High	Low/High	Low
- **Relationship**	High	Low/High	Low
Type of Knowledge exchanged	Codified, Explicit	Codified, Explicit	Tacit
Type of Likely Trust	CBT	CBT to KBT	[CBT], KBT to IBT
Key Player in Trust Development	Core Partner	Core Partner	All Partners
Key factors needed to generate Trust	Comprehension of Roles	Comprehension of Process (i.e. value-chain system)	Familiarity with all Partners; Situated Identity
Key resources needed to develop trust and manage conflict	Information Resources (e.g. data on specific tasks)	Information Resources and some discursive resources with key partners	Discursive resources (access to and voice in key discussions)

CONCLUSION

This paper has argued that the increasing emergence of new forms of virtual organizing for knowledge sharing and innovation require a careful repositioning of trust types in this field of research. Following from this, the main proposition of this paper is that knowledge sharing is positively related to inter-organizational arrangements so long as the parties exhibit a trust type that permits the conflict to be heard, considered and resolved.

Using Lewicki and Buncker's trust model, it is possible to identify and map the propensity of different forms of conflict at different stages of trust development in the case of virtual alliances. In exploring these connections, several contributions are made: First, we have developed a framework for understanding how different forms of conflict and their propensity relate to different types of trust within the context of virtual organizations. Secondly, we identify strategies for generating trust and managing conflict for different models of virtual inter-organizational arrangements. These can be used by those enterprises that are interested in exploring such emergent forms for organizing their operations. Thirdly, the study sensitises researchers to the complex dynamics of virtual organizational arrangements. The focus on the various forms of virtual inter-organizational alliances has enabled consideration of the power dynamics in which trust relations are embedded, which in turn has implications for the way trust is developed and conflict is managed. We posit that power dynamics when acknowledged can be used to build those conditions that encourage the further development of trust. When there is no central player in the alliance the generation of trust becomes a responsibility of all parties involved as it is the case with the co-alliance model.

It is readily acknowledged that what has been attempted here is only an exploration of contingencies to provide a better understanding of trust and conflict within the knowledge-intensive virtual environment. Further research is required to merit the conceptual and empirical work that is lagging in the existing literature.

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