Trust and identification in the virtual team: Exploring the bases of trust and the processes of intra-group identification

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ABSTRACT

The trend for virtual projects follows recent rapid developments in communication technologies. This thesis examines whether distributed workers in temporary teams have the opportunity or inclination to redefine themselves in terms of their team memberships, and how such identification and trust processes might alleviate potential intra-group tensions and promote tolerance and cooperation. It asks the question: "Is there a climate for shared perceptions, group cohesion, solidarity and trust in the virtual team?" To address this, a conceptual framework is drawn from social psychology theories and existing empirical research on groups, linking concepts of self, trust, climate and group cohesion. It employs a two-stage mixed-methods research design. A survey of IT/IS project professionals accessed through the Association for Project Management produced 226 completed questionnaires. The data was used for the study's inferential statistics. Three distinct companies were identified from the survey responses for the second qualitative phase using a systematic sampling approach.

This project contributes to the literature and theory by proposing that virtual team members' willingness to form relational links, the way they make sense of their work environment and their views of their own contribution and other team colleagues' behaviour are related. It also extends current methodological approaches in the study of virtual teams. The survey-then-interview design overcomes the lack of specific and predefined measures of trust and identity in virtual team working by allowing the researcher to draw on extant literatures for instrument development, theory testing and in-depth probing for additional insights. Structural equation modelling enabled the researcher to study the whole relational phenomenon and to derive a structural model whose factors provided the themes and constructs for qualitative analysis. Critically, this study has demonstrated that although trust starts at the interpersonal level, collective trust and identification are possible even for teams with limited face-to-face interactions.

Other key survey findings suggest that (1) trust is instrumental and predicated on self-preservation through collective project delivery, (2) project demands and experiential
learning influence members’ attitudes on perceived trust enablers, moderating work preference and willingness to trust, (3) team climate acts as a sensing mechanism for evaluation of personal contribution. Its structural mechanisms (such as rules, policies, and protocols) provide the clarity for continued cooperative performance and (4) solidarity identity remains important for commitment and performance evaluations. The interview data supported the survey findings but also provided insights into the effects of power and status, inter- and intra- group dissonance, the ascendancy of personal risk over project risk and personal ownership of standards.

As virtual projects are likely to become more popular with new technologies, the study’s findings on the complexities of within-team relationships will help organisations and their management devise strategies for encouraging team identity and trust for concerted project performance.
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PREFACE

"How can you even consider trust in today's workplace?"
"Why not simply pay people to support increased performance improvement?"


I embarked on this journey nearly four years ago for self-actualisation reasons, having spent many years working in industry busily 'doing' things and moving from project to project with little time or opportunity for reflection. My interest in the virtual project team\(^1\) stems from my working experience in the engineering and clinical research industries, which has grown over time as I observe its increasing adoption across a variety of industries. New and emergent digital computing and communication technologies have given rise to novel organisational structures designed to take advantage of the increased organisational memory and connectivity (Miles and Snow 2000; Mowshowitz 1997). Many companies now regularly deploy their staff to work on virtual projects involving multiple team members across locations, departmental functions and organisational boundaries (Grenier and Metes 1995; Lurey and Raisinghani 2001; Warkentin et al 1999). Latterly, virtual teams using technology as a primary enabler have been identified as amongst the key imperatives of modern businesses (Powell et al, 2004). As it cannot be assumed that existing theories on conventional groups are generalisable to the modern team structures, research interest and momentum have also gathered pace. A cursory search for the terms 'virtual teams', 'distributed teams' and 'dispersed teams' in the online databases, Business Source Premier and the Psychology and Behavioural Sciences Collection produced 378 articles (September 2006). My first challenge was deciding on a topic within this context that would keep me focused for an extended period and importantly, one that would contribute to our understanding of relations in modern teams.

Arrow et al (2000) rightly noted that work group research on both sides of the Atlantic is often hypothetico-deductive, focusing on a limited range of variables and paying little attention to the interaction of groups in their embedding environments.

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\(^1\) The virtual project team is defined in Chapter Two, Section 2.1. For the purpose of this thesis, the words 'virtual', 'distributed' and 'dispersed' are used interchangeably.
As with other writers such as Ahuja (2000) and Rennecker (2002), they also observed that studies examine mainly inter- rather than intra-group relations. The people effect on project outcomes is demonstrated in Lechler’s study of 257 successful and 191 unsuccessful projects (1997; cited by Kerzner 2001). Key factors found are the project team, project leadership and top management support rather than the technocratic process of project management. Perhaps in response to this, the importance of group identity, members’ attributions and trust have emerged recently as key variables in the functioning of modern task groups, now more commonly termed as teams (e.g. Cabrera 2002; Early and Laubach 2001; Mortensen and Hinds 2001).

Accordingly, the starting point for this thesis is an acceptance of the premise that as projects are managed and performed by people, member-member and member-collective relations are critical factors for success. As such, the study’s objective of developing an understanding of how a transient and variable ‘society’ of distributed workers, loosely organised as a team might work together to perform allocated tasks should further our appreciation of members’ motivations for cooperation and performance. Following the embedded context argument it seeks to model the complex phenomenon of people and relations within the virtual team. It responds to Roderick Kramer’s (2001) call to examine the bases of trust within organisations and his identity-based trust proposition that individual identification and shared awareness of their membership in an organisation (or for this project, a task-oriented work team) fosters a form of presumptive trust in other members. His question “On what basis can or do individuals predicate trust in other organisational members?” (p168) is especially appropriate in the distributed environment where members have a reduced opportunity to engage in repeated exchanges that can facilitate shared perceptions and trust formation as in more social, co-proximate settings. However, while Kramer’s ‘presumptive trust’ is similar to the concept of ‘swift trust’ (Meyerson et al 1996) in that both serve as a catalyst for action based on the assumption of best intentions, this thesis argues that the basis for that initial trust and its transition to the wider virtual collective including the mechanism with which this is achieved should be investigated.

In any organisation there is a kind of atmosphere or climate that is felt by the members and which influences their perceptions and attitudes to others in that
environment (e.g. Litwin and Stringer 1968; Joyce and Slocum 1982; Payne 1971; Schneider 1983). Climate’s structural elements act as vital reference points for people to validate their own and fellow members’ opinions, abilities and behaviours. As the literature suggests that a positive team climate can help members define their group-boundary and engender cognitive and affective in-group/out-group evaluations, it is possible that in virtual teams, climate’s role is as an important sense-making mechanism, through which members can feel that they belong, identify with the stereotypical and normative perceptions of other relevant colleagues and gauge the extent of group solidarity and cohesion.

According to Pratt (2001) the shared subjective structures through social categorisation become the salient context for self-regulation and action. While accepting the hypothesis that when the climate is perceived as enabling, the resultant identification is the basis for mutual trust and cooperation, this thesis further proposes the need to establish whether in temporary and temporal projects, individuals have the opportunity or inclination to redefine themselves in terms of their team memberships.

Therefore, referring to the dispersed project environment and extending on Kramer’s question on the foundations of trust, this thesis asks the question, “Is there a climate for shared perceptions, group cohesion, solidarity and trust in the virtual team?” To address this, a conceptual framework (Chapter Three) is drawn from social psychology theories and empirical research on groups, linking numerous related concepts and constructs (such as self-concept, social identity, social categorisation, group socialisation and generalised trust) with group processes (such as the effects of task interdependence and shared fate, superordinate goals, group norms, group cohesion, group identity and performance). As there is only limited research on the practice of virtual teeming, the aim of this thesis is to model trust and identity processes within the modern team. However, as trust is an intangible emotion or psychological state, determining its existence and potency cannot be done through direct questioning or using laboratory criteria. Similarly, identity, cohesion and solidarity are cognitive constructs that are equally difficult to operationalise. Further, to avoid Tajfel’s (1972) concern that theory and research are being derived from experiments done in isolation of reality this project adopts a mixed-methods research
design to capture the psychological realities of virtual team members in their social and cultural contexts.

In Chapter One I discuss the effects of new technologies on business work practices and the prevalence of virtual teams. A more detailed explanation of the research problem, the scope and significance of the study is also presented. It ends with a map of the thesis chapters.
CHAPTER ONE

1. Changing work practices

One outcome of the 21st century ‘wired-up’ world is the scale economy of global research and marketing of world products and their components. This has produced a generation of giant brands exemplified by companies such as SAP, Oracle, Microsoft, Vodaphone, Hewlett-Packard, Sun Microsystems and Veritas. Their products among others are moving enterprise systems away from traditional hard-wired technologies towards emerging mobile Internet Protocol (IP) networks that offer the benefits of converged voice, data, video and email. These new ‘presence’ technologies greatly enhance the ability of organisations and their workers to be connected 24/7, across various geographical distances and time zones, and crucially, to be able to communicate while on the move.

The growth of away-from-the-office remote working was already in motion with earlier landline technologies. In 1997, Brocklehurst observed a growing tendency for homeworking. Highly-skilled employees were beginning to work from home all or part of their time using telephone and other communication technologies to keep in touch with their colleagues. These well-paid workers enjoyed a high degree of self-governance, yet remaining very much a part of the firm. The homeworking formula soon expanded into teleworking or telecommuting, which is defined as work performed away from the corporate office at a local setting or while on the move, with interactions conducted through some form of electronic network (Clear and Lee-Kelley 2005). As home- and tele-working become more accepted practices, they are extended through outsourcing to include individuals who are not employed directly by the company but hired as free-lance contractors or consultants on specific projects. These ‘pseudo-employees’ (contractors or employees from a partnering firm seconded to the project for the duration) provide the vital resources and skills to companies looking to reduce and manage their fixed costs (Davenport and Pearlson 1998; Dickerson 1998; Oates 1998).
Prior to the wide-spread use of information communications technology (ICT), shared database or groupware, and now, mobile/wireless technology, complex project participation or cross-boundary collaborations would have required the participants to work in close proximity. The novelty in modern shared projects is not the removal of the need for co-location (which has been gradually happening); it is the ability to maintain a constant and instantaneous co-presence using the new generation of computing and communication technologies, and increasingly, without the need to be hard-wired and stationary. This networked project environment is the modern basis for Lipnack and Stamps' (1997) early conception of the 'virtual team', or to continue with the location metaphor, one which Townsend et al (1998) had named the 'virtual workplace'.

In turn, these virtual workplaces or virtual teams have spearheaded a new genre of technology solution providers who are keen to defray the cost of international telephone costs, emails, faxes and the big ticket item of international travel, through their offerings of project collaboration software. A quick search by the researcher on the Internet produced 241 different web-based project-management software packages designed specifically to support distributed projects (www.web-based-software.com). The espoused benefits of these web-based project management systems include real-time services; rapid deployment and accessibility; a flexible and highly intuitive work environment requiring only minimal training for the project participants; a fully functional document and information storage and management system with an audit trail of access and transactions; configurable processes to allow workflow allocations and monitoring; fully integrated project management tools such as planning, risk, issue and change management; as well as team calendar and project inbox for scheduling team meetings and information alerts.

A circular movement has evolved - as distributed collaborative business practices become more popular through the increased connectivity of modern technology, yet faster and more powerful technologies are developed to support them. This growing ability to integrate work flows and processes across value adding functions or departments and between partners extends the concept of remote working and partnering well beyond the early home-working and teleworking models; and along with it, unique challenges not previously faced by conventional co-located teams.
1.1 Virtual working prevalence

An estimate in 1996 was that there were at least 8.4 million workers in dispersed projects in America alone (Caldwell and Gambon 1996; Henry and Hartzler 1997). The anticipation was that this figure would exceed 30 million by the year 2000. By 1999 Work Week (cited by Wiesenfeld et al, 2001) reported the US total at nearer 18 million; doubling the 1996 estimate. In the same year, deLisser (1999) calculated that more than half of companies employing over 5,000 employees were using virtual teams. The rising prevalence is supported by a Gartner’s research (in Soloman 2001) which predicted the involvement of over 137 million workers in some form of remote electronic work by 2003 and that by 2010, employees will spend 30 percent of their time working own their own, five percent in the same place and at the same time, 25 percent in a different place and same time and 40 percent in a different place and different time. More recently, Kanawattanachai and Yoo (2002) suggested that over 60 percent of professional employees already work in virtual teams. Kirkman et al (2002) reported that two out of three Fortune 500 companies already employ telecommuters and that 19 million people work from home online or from another location in the US.

The trend appears to be continuing. A recent study in Germany found 20 percent of the 376 business managers surveyed to be working predominantly as a member of a virtual team, and up to 40 percent of the remaining participants had at least some experience of virtual team participation (Hertel et al 2005). In the UK, British Telecom alone has over 10,000 dispersed project workers who do not ‘have an allocated office....[and] are located all over the UK’ (BT interview, 22 March 2004).

IBM regularly uses virtual teams; one of them was a time-constrained project requiring the participation of experts based in Australia, Scotland and the US (Gray and Larson 2003). Members in Australia and Scotland were able to address issues generated in the US often providing solutions by the beginning of business the next day. Another example is Nortal who is encouraging employees to operate more flexibly with respect to communicating and connecting with other colleagues across time zones. Annually, this saves the company $22 million in real estate costs and $18 million in phone charges for workers who use VoIP instead. Along with reported
savings, productivity has risen by 15 percent. Presently, over 65 percent of its workforce is involved in virtual projects (Cummings 2005). In 2004, Bellwether won an e-commerce award for best use of teleworking. It also operates virtual teams to bring about cost savings, cut travel time and enable the recruitment of a wider range of people with the relevant skills (IEE, 2004). Other current examples include Eli Lilly & Co. where a 15-strong team work from three sites with email cited as the medium for even complex communication (Axtell 2004) and GlaxoSmithKline which already has a large, dispersed workforce structured as virtual teams operating Groupware tools (GrooveNetworks 2005).

1.2 The research problem

As work-group association becomes more transient and direct supervision is reduced with greater distributed working, voices of concern are raised on possible supervision, human resource and operational difficulties, including questions on its value as an alternative to the conventional team. For example, while Handy (1995) doubts that virtual teams can function effectively in the absence of face-to-face interactions, Keenan and Ante (2002) report that virtual team members struggle to cope with the increasing amount of technology and having to deal with colleagues from different cultures. Other writers such as Kraut et al (1999) and Kerber and Buono (2004) echo these concerns adding that while electronic networks have made it easier for virtual connections, personal linkages remain crucial to mitigate any perceived negative consequences. The impact of the lack of social presence and context inherent to face-to-face environments on trust development within the team is also highlighted by Jarvenpaa et al (1998). Others question the effectiveness of artificial communication media as replacements for face-to-face meetings and their affect on creativity, morale and decision-making quality (e.g. Hightower and Sayeed 1996; Warkentin et al 1997). There is, as yet, no definitive evidence of the synergy-bonus or value creation anticipated by Conway and Forrester (1997). Feedback from communications company AT&T reflect some of the downsides of remote working; namely the lack of direct supervision and the challenge of keeping the remote worker as an integral part of the office team (Johnson 1997).

These reservations suggest that virtual team working presents challenges that are different from that faced by conventional co-located teams. The underlying question
seems to be the continued acceptability of existing managerial logics for these new virtual projects. For example, the well-known ‘management-by-walking-about’ technique pioneered by Hewlett Packard had worked well for managers to get closer to their workers. It is no longer practical or cost effective in distributed teams. Similarly, the importance of autonomy in permanent work groups on performance (Cohen and Bailey 1997) may be less critical in a matrix-based virtual project where greater individual autonomy is the product of reduced direct supervision. Indeed the language used in contemporary management literature is anchored largely on empowerment and commitment as organizations are obliged through increasing global connections to delegate control to project groups and teams, making them more self-managing (e.g. Argyris 1998; Clutterbuck 1994; Kirkman et al 2004; Zimmerman 1995).

Concerns include the problems of managing people at a distance, changing psychological contracts as people move from job to job or between teams, and issues of trust and commitment. Another popular research topic is the challenge of temporal coordination on conflict resolution (e.g. Cramton 2001; Montoya-Weiss et al 2001). However, despite the apparent growing research interest in virtual teams, many of the management, motivational and operations problems associated with virtual teaming itself have yet to be studied and understood as distanced teaming may be a barrier to the development of the shared values that are characteristic of high trust co-located teams. Accordingly, this thesis examines the identification and trust processes within virtual work teams to establish whether the virtual project structure can provide an environment that is conducive for team members to classify themselves as actually belonging to a distinct collective. The following sections detail the foundations of the research problem for this study.

1.2.1 Decreasing homogeneity
The three-prong foci of group research identified by McGrath (1997) as systems for (1) influencing members, (2) patterning interaction, and (3) performing tasks, suggest groups are vehicles for social identification, reiterating the assumption that dynamic interactions among members shape their views and attitudes, and ultimately their behaviour and performance. Identification in the conventional sense implies a degree of belonging, loyalty and shared characteristics exampled by common cultural,
education, demographic, attitudinal and organisational variables, but this similarity-based conception of group identity may not be applicable for the virtual team since members are likely to work with people who are not their immediate work colleagues or social acquaintances and whose unique personal histories and differing language proficiencies may result in differences in rules of social engagement and dialogue - thus possibly increasing the opportunity for misunderstanding and conflict, and reducing the exposure necessary for developing shared schemas and values.

The fact that team membership grows and shrinks at various stages of the virtual project life cycle means that virtual teams exhibit little of the permanency characteristic of discrete face-to-face teams. In addition, as companies struggle to control costs while accessing high-level skills and know-how, new operational strategies of outsourcing, insourcing and off-shoring have also become popular solutions to bridge resource and skills gaps. Hence the modern project team is likely to include employees as well as temporary and independent contributors. Team members faced with multiple dimensional relationships will, arguably, have varying levels of commitments. Another growing expectation by project sponsors is professionally accredited project members. For example in response, BT now actively encourages its project staff to acquire professional membership of the Association for Project Management. Individuals may experience commitment to the organisation or various sub-system(s) as well as commitment to certain professional values arising from their own socio-educational or professional background. Conflict of commitments can easily occur. The changing team structure and numerous temporary relations can impact on the way individuals perceive their teams and the degree of cooperation they are willing to give especially in the event of a conflict between their organisational functions, professional ideals and personal goals. The lack of permanency and increased variability underlines the need by this study to understand the processes that can alleviate intra-group tensions and promote greater tolerance.

1.2.2 Changing power relationships

Drucker (1994) and Makin et al (2000) predicted increasing specialisation and evolving employer-employee power relationships emphasising self-leadership and devolution of power down the hierarchy. It might be argued that in the face of rising pressure for improved productivity and cost-containment, this self empowerment is in
reality a way of keeping competencies fresh at the expense of the individual worker. While many companies have established staff development programmes, it is likely that others are reliant on the initiative of their workers to keep pace with technological advances. Pfeffer’s (1992) perspective of power as an individual property applies in that individual actors are increasingly recruited for their personal knowledge, over which they control the speed and degree of access. In effect, while demand for their particular expert knowledge continues, individuals are ‘master and commander’ of their own destinies. It is questionable if Whyte’s (1956) original vision of the grey, impassive ‘organisation man’ still persists since Giddens’ (1984) ‘dialectic of control and choice’ states that even actors with the least resource capabilities can elect to withhold their participation.

The calibre of virtual project membership tends to consist of highly qualified and experienced individuals who are entrusted to work under their own volition and with little direct supervision. Moreover, modern project complexity requires participation from a range of professionals with high levels of expertise and who are responsible for different stages of the project life cycle. It follows that the manager is no longer able to assert his will over his subordinates based upon his own expert power or relative proximity. As such, the range of freedom for actors now depends on the superiority of their own competency and skills and their access to tangible resources such as capital, equipment and human resources. As society and businesses adopt higher levels of division of labour and specialisation, this ability to exercise personal choice and self-management is likely to become stronger and possibly making the question of ‘what is in it for me?’ paramount for voluntary cooperation.

Another consequence of high connectivity, automation and new virtual structures is changing patterns of employment. Will these developments lead to reduced civic mindedness and increased opportunism? Is it still reasonable to expect collective behaviour to emerge? If, as Kerr (1983) and Sheppard (1993) suggest, group productivity can be affected as individuals pursue their self-interests (say, ignoring work protocols or standards, not sharing information, not meeting deadlines etc) over the common good, the need for coordination and motivation may become more acute in teams that are dispersed than co-located teams. The shift in power-balance between individuals and corporations prompts the need for organisations to locate mechanisms
that will control or moderate possible opportunistic or selfish behaviour, particularly in relation to how virtual members would use and interpret organisational rules and procedures, communication systems and knowledge sharing, manipulate leader-member relations and affect resource distribution.

1.3.3 Trust's role in the virtual team

Jones and George (1998) argue that trust is critical for cooperative behaviour among individuals. Even within the organisational economics literature, trust is viewed as a ‘soft’ but powerful governance mechanism to reduce opportunistic behaviour and transaction costs of exchange (Williamson 1983; Arrow 1974; John 1984). The lack of verbal and non-verbal cues of virtual teams underpins Woolgar’s (2002:2) concern about: “…the nature of the ‘social glue’ that holds societies together…..” What is the social glue that will hold this modern organisational form? When writing on team climate and performance, Moran and Volkwein (1992) suggest that trust and commitment are among the key dimensions for team cohesiveness, arguing that actors’ commitment to the common goals reflect their perception of one-ness with or belonging to the collective.

Evidence from the general management literature indicates a growing volume of theoretical propositions and empirical findings on virtual organizations, self-directed teams, dispersed teams, outsourcing and use of sub-contractors, temporary employee contracts and market-oriented inter-firm collaborations (e.g. Balkema and Molleman 1999; Jarvenpaa and Leidner 1999; Kasper-Fuehrer and Ashkanasy 2001 etc ). There is also general agreement on the importance of communication and relationship rather than focusing on a collection of roles for performance. But decreasing direct supervision in the virtual team and changing employment relationships requires an understanding of the balancing moderators between self-interest and trustworthy behaviour.

The popular goal model of why organisations exist assumes consensual actions and values (Schein, quoted in Mullins 1985:2). The assumption that alignment of organisational goals with individual desires and emotions will suffice to encourage performance ignores the practical discrepancy between operational policies and individual actions in practice (Perrow 1961). Although writers such as Quinn et al
(1996) postulate that successful leveraging of the potentials of knowledge workers requires shared interest, common values and enjoying mutually satisfying solutions, they have not explained how this can be achieved in practice. More importantly, the focus on the deep-seated bonding between actors fails to acknowledge the temporal and temporary effects of modern projects.

Following the above arguments, a virtual team is doomed to fail from the outset unless there is a readiness (deliberate, morally or instinctively) to assume good organisational citizenship behaviour. The loose and decentralised nature of the virtual team exposes individuals and the team itself to additional risk, uncertainty and possible conflict. Davenport et al (1992) and Davenport (1994) noted that just because the mechanism for information exchange is available it does not mean people will use it. Issues of role clarity, workload distribution and perceived fairness of decisions and interpersonal treatment can affect a team member’s perception of trust and tolerance by and towards other team members. In fact Siegel et al (1986) opine that the current vogue for electronically supported communication may lead to a modern form of the de-individuated behaviours first identified by Zimbardo (1969). The emotion and tone of group communications can quickly degenerate away from accepted standards of cordiality, creating an atmosphere ill suited for trust building. An example is the phenomenon of ‘flaming’ where inappropriate or offensive language and signs or symbols might be used. An absence of mutual empathy from little to no day-to-day shared experiences can intensify any ill feeling leading to a low trust team climate. If the assumption of a shared sense of familiarity based on shared evaluations in traditional groups is challenged by distance, increased role segmentation and complexity in modern projects, it is important that we examine the components of a team climate that is conducive for member performance and one that supports trust maintenance between virtual team members.

However, as with the old adage of ‘beauty is in the eye of the beholder’, trust is an intangible concept and assessment of its presence or absence is subjective. Trust is demonstrated when the occasion arises by behaviour or action that is perceived as potentially beneficial or harmful to the recipient. Taking such a social cognitive approach, this project seeks to understand the psychological structuring of group life in the face of the apparent barriers for social interaction and identification and to
establish the cognitive constructs that allow disparate team members to relate and perform over a time-space divide. In line with the query of continued applicability of existing managerial logics and the suitability of the virtual context for group identification and solidarity, the thesis’ object is to address the key research question, ‘Is there a climate for shared perceptions, group cohesion, solidarity and trust in the virtual team?’ through the following supplementary questions:

1. Is virtual teaming a problem (conceptually or practically) for project members?
2. Do virtual members have the time, the inclination or opportunity to redefine or adjust their self-identity towards the group norms?
3. Does working virtually affect the way individuals evaluate their own and others’ performance/behaviour?

1.3 The significance of this research
Although many researchers have since responded to DeSanctis and Monge’s (1999) challenge to study the effects of virtual working, there is room for further research especially in the practice and process of virtual teaming and their impact on self-concept and group identity. Of particular interest and relevance to this thesis are: (1) Wiesenfeld et al’s (1999) research on the question of whether the distance and dispersion of virtual working would weaken the relationship between virtual employees and their organisations; particularly when inter-member experiences within the team and their impact on members’ view of their own and others’ contributions have yet to be investigated, and (2) many of the research questions for Jarvenpaa and Leidner’s (1999) case-based research of virtual team effects are also pertinent for this project, such as whether trust exists in virtual teams; its basis and antecedents; its development and decline and whether traditional conceptualisations of trust are still relevant in the virtual context. Equally relevant are questions of why some groups seem more able than others to resolve problems and conflicts early on in their life cycles, and the importance and most effective ways communicating in a virtual team. They have also advised exploring issues of member diversity. As ‘gaps’ remain in our empirical understanding of virtual teams, investigating whether team members having to rely on computing and communication technologies for project
performance are affected in the way they perceive and relate to their fellow workers, will have theoretical and practical significance.

1.3.1 Theoretical knowledge

Group actions are “possible only when each participant has a representation that includes the actions of others and their relations” (Asch 1952/1987: 251), and any attempt to theorise the person and context as separate entities can only produce a partial understanding of the whole relationship. Yet, the lack of co-proximity and team transience may be so fundamental that they leave little room for the concepts of group identity and in-group behaviour which are rooted in theories of social identity, self-categorisation and social comparison (Tajfel 1972, 1974, 1975; Turner et al, 1987). More instrumental-utilitarian social exchange theories (Blau 1964; Homans 1964; Thibaut and Kelley 1959) may assume greater relevance. If this is the new ‘order’ the question to be addressed are: Will virtual teams with their temporal settings and output orientations fit existing team development models? And can understanding of the socio-psychical domains of individual team members increase our knowledge and understanding of virtual team working?

McGrath et al (2000) had already raised their concerns about traditional research on small groups having the tendency to focus on the group as a distinct level of analysis. They suggested that groups function as complex systems, adapting to individuals’ past and their mutually created history as they progress. Since the biological foundation of self-interest is underlined by self-preservation and self-enhancement and is served through the ways actors sense and construct relationships with their group and evaluate their behaviours, it is conceivable that the complexity of the virtual team structure, composition, varied histories and at-distance negotiations can undermine peoples’ subjective self-belief and increase self-centred tendencies. Presumably it is harder to assimilate oneself into the in-group prototype if there is too much variability for any context-dependent features of group membership to function as prototypical categories. Hence the emergence of the ‘self’ through social reconstruction and internalisation of ‘intelligent habits through education’ (Musolf 2001:281) forms the epistemological foundation for this thesis. Ultimately, this research should inform current understanding of group relationships under modern technology–focused conditions.
This project assumes Jonathan Turner’s (1988) argument that any conceptualisation of structure and social systems should begin with an understanding of social interaction and accordingly, it adopts the human relations approach of viewing the ‘work organisation’ as a ‘social organisation’ to examine the socio-psychological aspects of those who work in this new decentralised virtual setting. It seeks to establish a theory on the frame of reference (the ‘climate’) for team congruity between individuals and the system’s practices and procedures. The extant literatures on trust and climate currently form two distinct research pools and there is as yet no discernable evidence of any attempt to study the relationship between trust and climate, or together with self-concept, as constructs that determine and moderate individual perceptions and behaviour. Learning derived from this study will add to the current body of knowledge on groups and teams.

1.3.2 Applied knowledge

The imperative of staying competitive and having the ability to do business globally is likely to force firms to continue with virtual organisational structures. Hence, interest in virtual team working has been growing. But empirical research is still in its infancy; some recent examples of virtual team research are Warkentin and Beranek’s (1999) study on training to improve virtual team communication and a few longitudinal case studies on the in situ work practices of virtual teams in their respective local work contexts (e.g. Majchrzak and Borys 1998; Cramton 2001). Although there have been some research into the effects of group potency with its root in organisational identification, and represented by the collective belief that a group can be effective, little is known about its antecedents particularly in the domain of virtual teams (Lester et al 2002). Certainly, despite the economic potential of team working, studies on conventional work team effectiveness have so far been inconclusive (Lawler, 1992) notwithstanding a rush of interest on the antecedents of team productivity (e.g. Campion et al 1993; 1996).

Researching the literature has led this researcher to conclude that the social and psychological ramifications for individuals working across the virtual divide are not well researched, hence the motivation for this study. Robert Putnam’s (1995:664-665) idea of ‘social capital’ drawn from the new ‘features of social life’ in which norms
and trust are two key ingredients in the creation of shared objectives implies that an alternative venue might be required for the creation of social capital in virtual teams. Virtual team working adds to the cultural diversity by the need to work cooperatively remotely, and having to rely on a technological platform to communicate and coordinate activities. While accepting that collaborative technology such as Groupware is 'here to stay' (Yen et al 1999:70), and there is some empirical evidence of the efficacy of the use of groupware, networks and e-mail in creating and supporting e-communities, it is questionable whether the limitations of the technologies create more disadvantages than advantages for group identity, such as the potential for misunderstanding in asynchronous e-mail. More specifically, if lack of co-location where people can communicate and interpret meanings through multiple modes such as paraverbal (e.g. tone of voice, inflection, and voice volume) and non-verbal cues (e.g. eye movement, facial expression, gestures and body language) limits the building of shared history and the willingness to cooperate, then there is definitely a need to investigate how and why certain distantiated teams do work. The study's findings will inform business practice on individual motivation on virtual team working.

1.4 The scope of the research
The focal interest of this research is trust and identification as mechanisms for transactional governance in the virtual team. A review of the salient literatures in Chapter Two has shown that trust is fundamental to peoples' willingness to cooperate and not to act opportunistically. Trust appears also to be the key to organisational commitment, group identification and climate. Taking this as a starting point, the study focuses on the socio-psychological aspects of those who work and interact with others in decentralised settings. In particular, it aims to understand the role of trust as a precursor to action and a conditioner of virtual members' (a) perception of the intentions and behaviours of his 'absent' team mates and (b) willingness to interact and work with them.

As there appears not to be any pre-validated trust instrument that is suitable for the current research context, the survey questionnaire for this project was drawn from an extensive (although not exhaustive) review of the relevant literature and qualitative input from industry specialists with experience of virtual team working. The target
population consisted of knowledge workers engaged primarily in IT development, upgrade and migration projects. The survey was followed by face-to-face interviews from a judgement sample consisting of three diverse cases; namely a virtual team involved in an exclusive outsourcing partnership based between the UK and India; a virtual team consisting of directly employed personnel who are located all over the British Isles, and a virtual team involving a collection of workers drawn from a group of collaborating business units within a large corporation.

By focusing on the micro level of reality to understand the way individuals perceive their surroundings and interpret other members' intentions and actions, we can conceptualise the enabling aspects of social intercourse and cooperative working. This is congruent with current research interests in the softer normative Human Resource Management (HRM) implications of changing organisational structures on employment relationships and the long-standing workgroup study findings of Trist and Bamforth (1951) showing that greater care should be given to the socio-psychological needs of workers for higher commitment, which, in terms of the psychological contract, is an outcome of the perceived trustworthiness of one's organisational contacts (Rousseau 1990, 1995). Finally, while this research will not track team effectiveness in economic terms, qualitative indicators for success will be used to map trust's perceived role in team outcomes.

1.5 Research structure

It is anticipated that the findings from the questionnaire will provide an initial understanding of the factors influencing team identity, cohesion and trust. The interview data will be used to embellish on the prior findings by providing further insights to the themes in the questionnaire, and leading to the formulation of a theoretical model capable of further testing. This chapter (One) provides an outline of the background and problem for research and its significance in furthering theoretical and business knowledge. Chapter Two consists of a thorough review of the salient literatures, sectioned into three parts: part one begins by examining the literature on virtual teams, ending with a working definition of the virtual team. Part two reviews the trust literature, drawing from a mix of psychological, sociological, socio-psychological, economics and management disciplines. Part three discusses the difference between climate and culture and the relevance of climate as a cognitive
construct for this thesis. Chapter Three presents the thesis’ theory of trust and identity in the virtual team. Chapter Four explains the project’s philosophical and epistemological assumptions and the research methods used. Chapter Five reports the statistical findings and observations from the first stage of the research process, ending with the full structural model. Chapter Six discusses the findings and the model in relation to the literature. In Chapter Seven, the thematic evidence from the cases is presented. Methodological limitations are reported and discussed separately for each of the two data-collection phases in Chapters Six and Seven. In the final chapter (Chapter Eight) the quantitative and qualitative findings are compared and contrasted, and additional insights are drawn and an amended research model is presented. The thesis concludes with an overview of the project’s findings, their implications and possible solutions for management and a call for further research. Figure 1.1 below shows a map of the thesis chapters.

Figure 1-1: A map of the thesis

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<th>Chapter One</th>
<th>Overview, research problem, purpose and scope</th>
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<td>Trust</td>
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<td>Chapter Three</td>
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<tr>
<td>Part 1</td>
<td>Epistemology and research design</td>
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<tr>
<td>Part 2</td>
<td>The research process: Phase 1, survey; pilots 1 and 2</td>
</tr>
<tr>
<td>Part 3</td>
<td>The research process: Phase 2, interviews</td>
</tr>
<tr>
<td>Chapter Five</td>
<td>Model development and reporting the findings</td>
</tr>
<tr>
<td>Chapter Six</td>
<td>Discussion of survey results and limitations</td>
</tr>
<tr>
<td>Chapter Seven</td>
<td>Presentation and discussion of the thematic evidence from the cases and limitations.</td>
</tr>
<tr>
<td>Chapter Eight</td>
<td>Conclusions from summary findings, amended model, managerial and organizational learning, future research recommendations.</td>
</tr>
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CHAPTER TWO

LITERATURE REVIEW (PART ONE)

"People do not just get together; they get together to do something"

2. Introduction

There appears not to be a pre-validated instrument that is suitable for the stated aims of this thesis. Although there are existing measures of interpersonal trust and trustworthiness perceptions by eminent researchers such as McAllister (1995) and Mayer et al (1999), they were designed for conventional face-to-face interactions, measuring trust as generalised characteristics (e.g. ability, benevolence, integrity etc. or affect-based trust versus cognition-based trust) and therefore, not appropriate for the virtual team setting. Accordingly, this chapter presents a review of the salient literatures from which the study's questionnaire was derived and piloted. The structure of this three-part literature review follows the following extract from Figure 1.1 in Chapter One.

<table>
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<tr>
<th>Chapter Two</th>
<th>Literature review</th>
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<tr>
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<td>Defining the virtual team</td>
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<tr>
<td>Part 2</td>
<td>Trust</td>
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<tr>
<td>Part 3</td>
<td>Climate</td>
</tr>
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</table>

It begins with an evaluation of the group and team literatures to derive a working definition of the virtual team for this project. The definition scopes the boundaries of the thesis and frames the sampling of the case studies. Part Two reviews the trust literature: namely, its definition, antecedents, constitution, composition, its importance to the individual and as a mechanism for managing relationships. Part Three reviews the literature on organisational climate and team atmospherics. It discusses whether the virtual project design can provide an environment that is conducive for individuals to identify themselves as really belonging to a distinct collective.
2.1 Groups, teams and virtual teams

Groups are two or more individuals who have some interdependence or relationship, and whose interactions can influence one another (Forsythe 1999; Paulus 1989). Assuming Turner’s (1982:15) more subjective conception, a group exists when “two or more individuals.....perceive themselves to be members of the same social category”. Dunbar (1993) on the other hand, supports McGrath’s (1984) argument for the need for extended interactions. A group is a collection of individuals whose dealings with one another over time, have led them to develop personal relationships with one another. Small groups of twenty of less will have some formal or implicit social structure, usually in the form of status and role relationships that are subject to power and status differences (Sherif and Sherif 1969). Larger groups are more susceptible to misbehaviour and require greater efforts to control ((Latané 1981; Lawler 1992). Akin to the need for distinctiveness (Brewer 1993), the status as a group needs to be recognised and accepted by others (Brown 2000).

Teams share similar characteristics as groups but would have been formed for some specific purpose or task. Members work together for a common goal in an organised structure (Cohen and Bailey 1997; Hackman 1987). As such, team members are chosen for their task relevant knowledge and to perform their tasks, they will have access to more than one information source and each member will have a defined set of responsibilities. The distinction between a social group and a work team appears to be one of salience. For the social group, salience is anchored on individual characteristics and their acceptability by others within the collective (Moreland et al 1996). For the work team, ‘fit’ is based on individual competences and anticipated contribution to the group or project outcomes. Personal characteristics can become salient for the work team if they are relevant to the project or lend meaning to their experiences (Oakes 1987).

A virtual or distributed team is a modern team structure. At its most basic, it is defined as “groups of people engaged in a common task or goal communicating through electronic means” (Warkentin and Bernaek 1999:271). The Microsoft Encarta Dictionary (2002) identifies the lack of co-location as the main feature of a virtual team. Townsend et al (1998:18) are more specific, defining the virtual team as a group of “geographically and/or organizationally dispersed co-workers that are assembled
using a combination of telecommunications and information technologies to accomplish an organizational task. Virtual teams rarely, if ever, meet in a face-to-face setting". Lipnack and Stamps's (2000:18) definition view the virtual team as a group of people who use technology to work interdependently with a shared purpose across space, time, and organisational boundaries. With new technologies such as wireless networks and ubiquitous computing, mobility becomes another feature of the virtual team.

Despite the assumption of physical dispersion of virtual team workers, there are levels of 'virtual-ness' in terms of spatial distance, time, cultural diversity, temporality, and mode of interaction. For example, Klein and Miller (1999) in their research of distributed planning teams have found that co-location may be a limited feature. They prefer to view virtual teams as distributed by "authority, responsibility, location, capacity for direct communications, task knowledge and expertise" (p208). Similarly, Hutchinson's (1999) definitions of three types of virtual teams (intra-organisational teams, inter-organisational teams, and inter-organisational distributed teams) suggest varying levels of virtual working and relationships. More recently Millward and Kyriakidou (2004) propose that the virtual team is more a mental representation than a sociological entity with presence and form.

Globalisation's effect on business propensity for flatter structures drives the increasing adoption of the virtual team (Dubé and Paré, 2001; Montoya-Weiss et al, 2001). The various conceptions indicate its suitability for specific, short-term projects that are carried out by different people from across functional or organisational lines as well as geographical boundaries. Flexibility is its key asset but the anticipated ability of members to contribute and acquire diverse knowledge and expertise quickly and willingly requires mutual trust (Jarvenpaa et al 1998; Jarvenpaa and Leidner 1999). Knowledge transfer and cooperation in the virtual team also require an appropriate communication structure, a level of technological competence by the team members and their willingness to communicate and collaborate with people that they seldom meet and may have had no prior shared experiences.
2.1.1 Virtual team characteristics and typologies

An early attempt at defining characteristics of the virtual team was made by Henry and Hartzler (1998, cited by Gould, D. 2004):

- Members are mutually accountable for team results.
- Members are dispersed geographically, including nationally or internationally.
- Members work apart more than in the same location.
- The team solves problems and makes decisions jointly.
- The team usually has fewer than 20 members.

Bal and Gundry (1999: 12) were more specific in the way they viewed the virtual team. Unlike their predecessors where occasions for co-proximate working would be expected, and there was no reference to the team’s temporary nature or reliance on technology for communication and coordination, Bal and Gundry offered their own criteria for a virtual team:

- Geographically dispersed
- Single purpose
- Use Internet enabled collaboration technologies
- Not permanent
- Members responsible for problem-solving
- Members sharing responsibility for achieving objectives
- Typically small teams

A year on, Bal and Teo (2000) (Figure 2.1 below) presented a more refined set of characteristics, having synthesised other writers’ models. It is possible that Bal had observed growing use of the virtual team structure for cross-functional and inter-organisation joint-venture projects, and in his joint submission with Teo, cross-boundary collaboration was included as one of the four common criteria. Presumably the assumption by Bal and Teo that team members are knowledge workers is a reflection of the greater likelihood of virtual teams being deployed for projects that involve members who possess important knowledge and know-how for project success. Another interesting departure of Bal and Teo’s list from the 1999
characteristics is the inclusion of joint problem-solving and decision making by team members. This would imply that distance, time or organisational differences can be overcome through technology-use; thereby providing members the ability to replicate conventional work group processes.

Figure 2-1: Bal and Teo’s (2000) table of characteristics of virtual teams

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Descriptions</th>
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<tbody>
<tr>
<td>Four common criteria</td>
<td>Geographically dispersed</td>
</tr>
<tr>
<td></td>
<td>Driven by common purpose</td>
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<tr>
<td></td>
<td>Enabled by communication technologies</td>
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<tr>
<td></td>
<td>Involved in cross-boundary collaboration</td>
</tr>
<tr>
<td>Other Characteristics</td>
<td>It is not a permanent team</td>
</tr>
<tr>
<td></td>
<td>Members solve problems and make decisions jointly and are mutually accountable for team results</td>
</tr>
<tr>
<td></td>
<td>Small team size</td>
</tr>
<tr>
<td></td>
<td>Inconsistent membership</td>
</tr>
<tr>
<td></td>
<td>Team members are knowledge workers</td>
</tr>
</tbody>
</table>

Source: Bal and Teo (2000, p. 348)

Hinds and Bailey (2000) on the other hand, prefer to be less categorical and simply define two basic types of virtual teams: geographically virtual teams and temporally virtual teams. The first are teams whose members are not physically co-located and the second are teams that span time zones. Other writers approach the virtual team concept through the personal attributes of the team members. For example, Fisher and Fisher (1997) point to the seven competences of virtual team members: a desire to improve personal knowledge, specific technical skills, a team-working approach and a strong problem solving and decision making capability. Likewise, in addition to their virtual team types, Duarte and Snyder (1999) have also identified six competencies: project management, networking, and appropriate use of technology, self-management, cultural and interpersonal awareness. There appears to be some consensus that virtual teams possess a set of attributes, primarily centred around leadership, technology, geography (physical and temporal), boundary spanning,
communication, life cycles and team roles (e.g. Chinowsky and Rojas, 2003; Hunt, 2000; Kozlowski, 2002; Martins, 2004; Brock, 2004); although latterly, Palmer and Speier (2005) referred to the range of involvement by members, the membership of the group, organisational mission and length of projects. Therefore, the extent to which the two classical assumptions of how human characteristics can combine to affect group outcome may be attenuated by the distributed work patterns, comes into focus - whether the individual effects on a group are additive, affecting every member he/she comes into contact in a similar way, or whether the effects of individuals on their fellow members are more organismic, less predictable, and ‘chemistry’ dependent. This in turn suggests that unless and until we understand the individuals composing these teams, we will not understand the mechanisms for identification and trust formation and transformation.

2.1.2 A working definition of the virtual team
From the above discussion of the various reasons for and characteristics of the virtual team, a working definition for this thesis is presented below:

A virtual team is a work group that is constituted for the achievement of a specific set of organisational goals and outputs. Comprising of a mix of employees, contractors and/or organisational partners, interactions are conducted mainly via some form of computing and communication technology. The membership structure is fluid with members joining and leaving as and when their contributions are required or completed. While members tend to work from their own regional settings, not all members are physically distributed all the time.

This definition was used to help the researcher define and select virtual team workers for survey and interview. It was included in the questionnaire as a ‘drop-down’ definition label, attached to a filter question which asked the respondent to identify the project (whether conventional or virtual) that occupied most of his/her time at the time of the survey. Respondents were able to click on each team type for clarification. There is no assumption in this definition of members’ attitudes or personal attributes, problem-solving or decision-making processes. As the focus of the thesis is on the perceptual attitudes and behaviours of team members when working in this modern
setting they, and actual work practices such as problem-solving and decision-making, should be gleaned from the data rather than assumed.

2.1.3 The problem of virtual teaming for social bonding

"You cannot build network organizations on electronic networks alone... If so... we will probably need an entirely sociology of organizations"


Chapter One cites evidence of the growing adoption of the virtual project team and poses the question of the continued acceptability of existing managerial logics. It also highlights the discernible shift from researching the group to researching the co-located team and that of late, the virtual or distributed team has taken centre stage. In line with the aims of this thesis, the focus of this literature review chapter is on the relational implications of the practice of virtual working.

It is plausible that the social setting of cyberspace and the new image, voice and text features offered by digitalised technology can provide the social occasion for interactions. This kind of dematerialised exchange provides a presence that allows performative transactions to take place. The specific challenges and their effects on creativity, morale and performance quality highlighted in Chapter One stem from the added dimensions of temporary and changing structures. Problems arising from reduced direct supervision and coordination, increased diversity within the team, shifting power-relationships, and frequent at-distance working under time-limited conditions are possible barriers to generalised bonding. Inappropriate language use can encourage abuse of the digitalised media and create obstacles for governance, trust and commitments. Any one or a combination of these can complicate matters, especially when technology fails to deliver the anticipated functionality, connectivity, capacity or accessibility.

Physical proximity encourages frequent communication and the development of closer and more positive relationships, and their continued presence increases feelings of familiarity and mutual affections (Athanasiou and Yoshioka, 1973; Festinger et al,
1950; Zajonc, 1980). So while teams can co-locate all the information they need in a virtual proximity and work concurrently across space and time, Brown’s (2000: xv) suggestion that “human beings are group beings” implies that the loss of physical immediacy and missing verbal and non-verbal cues can limit individual perception of belonging. The importance of the emotional drivers and attribution processes that motivate people to truly engage with one another at work is well supported by empirical explorations into social influences from both sides of the Atlantic, and is aptly reflected by the often cited anecdotal statements of multinational CEOs such as Jack Welch (GE) and Percy Barnevik (ABB): organizations cannot succeed if their people were to withhold their cooperation and effort.

The argument that modern, flatter network-based structures require cooperative teamwork rather than reliance on hard rules and job descriptions seems logical (DiMaggio 2001; Fligstein 1990) but as people become less involved with the centre, enjoying a higher degree of control over their own work-flows, there is a possibility of losing touch and forgetting that the interactant across the electronic workspace is in fact, a human being. Absence does not always make the heart fonder. Indeed, mutual awareness is likely to decrease within distanced teams (Dourish and Belloti, 1992; Fussell et al, 1998). For the virtual team knowledge and information exchanges are still required for performance, albeit via computer-mediated platforms. The generally asynchronous and one-to one nature of these cyber-interactions tends to be more rule-based than face-to-face, open discussions. As such, protocols may become the currency of exchange rather than the cooperation anticipated by DiMaggio and Fligstein. Besides, shared fate through the project is not synonymous with common cultural interests and values. The removal of open-ended, face-to-face social negotiations makes it difficult to assume shared values and invokes a different image of group involvement and solidarity.

Sharing the same physical space can generate positive feelings. In the conventional office, group life is typified by people exchanging knowledge, work concerns and new ideas. They also share gossip, intrigue, innuendoes and conflict. Over time, these exchanges give rise to a feeling of camaraderie or esprit de corps amongst the group members. How well people perceive they are getting on with one another is an important feature of social life. Cramton (2001) found that because virtual team
members lack direct information on the contexts within which one another is working, they are more likely to make dispositional rather than situational attributions concerning the actions of their distant partners. Given the life-cycles of virtual groups, it is likely that the meaning and feelings of work and relationships can only reflect values of limited generality and longevity. Hence, it is understandable that the existence and identity of the virtual team may be seen as more in the mind (as a psychological team) than as a sociological entity with presence and form (Millward and Kyriakidou, 2004).

While Giddens (2001) postulates that trust is necessary to maintain relationships in modern online settings and Handy (2001:60) concurs adding that “even Adam Smith argued that the market depended on sympathy. Erode that sympathy and you risk destroying the basis of trust on which the dealings of the market ultimately depend”, neither has offered any explanation of the trust and identification processes within time-limited, output-oriented work teams. If the lack of proximity and reliance on artificial media for communication limit social bonding and shared values, Beck’s (1999:12) question of “How can a secular society exposed to the rigours of a global market, based on institutionalized individualization amidst a global communications explosion, also foster a sense of belonging, trust and cohesion?” is also pertinent. These two divergent views provide the impetus for this thesis to examine the basis and extent of trust and identity in modern temporary virtual teams.
CHAPTER TWO
LITERATURE REVIEW (PART TWO)

2.2 Trust

Despite growing professional and academic interest in the construct, a universal
definition of trust has yet to be agreed, and the difficulty of conceptualising trust is
aptly explained by Porter et al (1975):

Trust tends to be somewhat like a combination of the weather and motherhood. It is
often talked about and it is widely assumed to be good for organizations, but when it
comes to specifying just what it means in an organizational context, vagueness creeps
in. (p497).

Trust is derived from the German word ‘trost’ meaning comfort, which suggests that
trust can preserve, if not elevate, one’s sense of ease and well-being. The Oxford
Dictionary (1964:1397) defines trust as a “firm belief in the honesty, veracity, justice,
strength etc., of a person or thing” (noun) and to “place trust in, believe in, rely on the
character or behaviour of” (verb). However, these relate only to willingness and/or the
act of trusting someone or something, and do not really indicate how or why trust is
engendered or its consequences.

2.2.1 Foundations of trust

As a concept, trust has been the subject of increasing interest for scholars from
different disciplines such as social psychology, sociology, economics, organizational
behaviour, strategic management, international business and political science (see
Barber 1983; Bromiley and Cummings 1995; Carnevale 1995; Currall and Judge,
1995; Dasgupta 1988b; Hosmer 1995, Kramer and Tyler 1996; Lewicki and Bunker
1995a; Lewis and Weigert, 1985; McAllister, 1995; Mishra 1996; Rotter 1971; Sitkin
and Roth 1993; Williamson, 1993; Zaheer and Ventrakaman, 1995). The literatures in
the various disciplines are awash with collections of ideas and definitions including
numerous articles proffering various classifications or typologies of trust. The
attempts to categorise forms of trust assume that trust has fixed properties and is
static, but studies have found trust to be dynamic, and role and context specific (e.g.
Kanawattanachai and Yoo, 2002; Luo, 2002; Seligman, 1997); leading Bachmann
(2001) to question the usefulness of trust classifications. Following O’Hara’s (2004) argument that writers’ efforts to scope trust too tightly are unhelpful for such a multifaceted, complex phenomenon and that it is more fruitful to focus on the trust process in its embedded context, this thesis discusses trust specifically in the virtual team context.

2.2.2 Trust in modern project teams

Despite the lack of consensus on its definition or origin, there is agreement that trust is an important relational construct in an increasingly opaque society of ‘strangers’ since it is both an outcome and a precursor of cooperation. This has led Gandori and Soda (1995:2) to postulate that trust is “one of the most frequently mentioned concepts in connection with inter-firm cooperative relations”. As the virtual team is in effect an intra- and inter-firm cooperative effort, the importance of trust as a strategy for dealing with the uncertain and uncontrollable when building and maintaining cross-function/cross-boundary relations becomes relevant.

Indeed, changing social and market conditions mean that Luhmann’s (1979:33) argument for ‘familiarity of the trustee’ and Hardin’s (1993:510) reference to ‘thick relationships’ are no longer adequate in explaining the pre-requisites of modern project cooperation. Familiarity and visibility are increasingly replaced by abstract systems, necessitating a distinction between trust and confidence: while trust is an emotional state between people, confidence is a cognitive comfort or reliance on objects, systems or outcomes. Faced with increasing variability in team life and multiple relationships and roles, individuals have to trust and be confident about the unknowable around them. This is true of individuals having to work on a portfolio of projects. It involves someone taking a chance with another despite not knowing for sure the latter’s competence, character or intentions. Whatever the motivation, it points to a kind of unconditional solidarity as characterised by Eisenhardt’s (1989:34) ‘pure’ or ‘pristine’ trust and Gambetta’s (1988:213) ‘trusting trust’, or even, Kramer’s (2001:168) ‘presumptive trust’.

Seligman’s (1997) proposition that the decreasing emphasis on community in modernity has resulted in a personalised trust that is subject to and predicated on the extent of role negotiability ignores individual perspectives, beliefs and
professionalism. Following Putnam's (1995, 2001) social capital argument and Giddens' (1991) conceptualisation of our ontological need for security, the loss of a sense of the collective whole may be replaced by a trust that is developed and articulated as bonds of friendship or comradeship - that is, from organisational social capital to an interpersonal social capital. In the modern project environment, it is possible that trust gives the individual power over self, allowing members to be self-reliant and self-contained and importantly, to trust oneself. If that is the case, trust allows individuals to be comfortable with their own and their colleagues’ professional ability and the expectation that each will carry out his/her allocated task(s) without the need for direct supervision. It brackets any misgivings about the supporting abstract systems, enabling individuals to use these systems to carry out their day-to-day activities. It cushions people from their anxiety about the possible effects of changes within and surrounding their work environment. At the same time, the new internalised sense of honour and confidence should foster individualised reliability or predictability towards the institution, fellow citizens and team colleagues.

Of importance to this thesis is that modern trust appears to be based on individual attributes, agency and consciousness (Seligman, 1997), making central member-member interpersonal trust and identification. Further Silver (1997) indicated that confidence in one another’s trustworthiness is iterative and built through reflexive mutual control. This suggests that it is possible to develop bonds between individuals within a distributed team, but the question remains as to the possibility of a group-based trust. A hypothesis by this thesis is that despite decreasing situated and historical homogeneity, a level of sharedness is possible, not necessarily in values or ethos, rather as a mutual focus on the project mission and project delivery and as an unspoken generalised expectation of members’ goodwill and behaviour. At this point, there is still a fundamental ambiguity on how this interpersonal solidarity becomes team-wide.

2.2.3 Researching trust in the virtual team
The sequencing of modern communications technology means that it is often one person communicating electronically with another individual or with a small number of other individuals. Exchanges may not be in real-time, making something urgent even more critical by the time a return communication is received. In this setting, it is
conceivable that trust emanates from the self (at the individual level) as that unit act of reaching out to distant colleagues in order to start social and performative exchanges. From this interactionist perspective, trust in the virtual team is the moral bond or mutual promise between individuals, or small groups of individuals. Debate on the person-situation or agency-structure argument leads to an important question: In the virtual team setting, is trust offered as a rational decision based on certain ‘trust ratings’ or is it a trait propensity?

Another debate centres on consistency in personal attitudes and attributions. For example, Moscovici (1981) argues that human ideologies, produced by communication, initiate new conditions of social life which in turn, produces new types of social behaviour. This social reflection and learning view is counter to the consistency proposition that trust is a deep-seated, dependence-need or basic belief that is stable, enduring and pivotal in identity formation. For proponents of the consistency perspective, its function is one of stability orientation, prediction and guidance of behaviour. An example is Heider’s (1958) balance theory which postulates that how an individual behaves towards his neighbour is a direct outcome of his interpretation of the neighbour’s behaviour. This, in turn, influences the neighbour’s behaviour towards him. Social psychologists such as Tajfel and Turner accept that dispositions shape behaviour, but argue social contexts and their meanings are constructed and modified through extended social interaction. The controversy over the consistency of behaviour from personality traits under different situations and over time has prompted this thesis to query whether trust is indeed a personality trait and does it evolve and change with the dynamic exchange of personality and the environment.

Although Luhmann (1988) suggests that trust is voluntary and cannot be demanded, another emergent research issue is whether people are knowing-agents who can decide whom to trust, when to trust and under what circumstances. The conceptualisation of trust as an emotional state or a belief does not explain the act of trusting. If trust is an impulse derived from the cultural milieu surrounding an actor and internalised over time as part of his/her personality to influence decisions and actions, its leaves unanswered the question of individual agential ability. Although structures and systems may act as enablers or constraints in the routinisation of work
and life, it is the practice of agency in whether trust is engendered and returned (or not). Presumably in the virtual context, one member offers his trust to another who acts to accept or reject that trust. If accepted, a bond is created in which each promises the other (expressly or implicitly) not to act opportunistically and can reasonably expect each other not to renege on the pledge. Adherence would serve as the foundation for further cooperation. The dynamics of how this trust-based cooperation actually plays out when working together remotely on complex tasks needs to be examined.

Social psychologists such as Johnson-George and Swap (1982); Robinson and Rousseau (1994) and Zaheer et al. (1998) view trust as between individuals, and that it underpins mutual cooperation. It is people who trust, rather than the organization itself and it is this interpersonal trust that shapes micro-organizational behaviour. Following this argument, any attempt to attribute individual motivations and behaviours to the organization is a cross-level fallacy. Hence researchers of transaction cost economics (Williamson 1983; 1993) and other mathematically driven economic approaches such as game theory (Axelrod 1984) and to a large extent, agency theory (Jensen and Meckling 1976; Bairman 1982; Eisenhardt 1989) may be culpable of oversimplifying what is a complex social process; especially when the need to manage suspicions and difficult relations is likely to increase with the current trend toward transnational activities. Working as part of a virtual team in whatever capacity, increases the feeling of vulnerability faced with structural and relational challenges, making the interpersonal trust central to any collaborative venture.

Smith et al. (1995:15) when reflecting the shifting interest from personal to organizational trust relationships, proposed a challenging research agenda in “the study of trust and its impact on cooperative relationships at all levels”. This is unlikely since human cognitive boundary acts as a constraint on the possibility of reconciling the extant incongruities that exist among trust constructs (Bigley and Pearce, 1998). Attempting to do so is likely to result in establishing a ‘global attitude’ of the trust concept (Butler, 1991:647) or furnishing yet more trust typologies which are merely ideal states. Others have focused on trust benefits and trust outcomes in a variety of contexts. For example, Kim and Mauborgne’s (1993) study has revealed that trust increases the commitment of foreign subsidiary managers and Ring and Van
de Ven (1994) have found that trust promotes inter-organizational cooperation while McAllister’s study (1995) indicates that trust can improve individual performance, and Zaheer et al (1998) have found that trust reduces conflict. The growing practice of using projects to bring about change and to achieve organisational objectives means the social connections between individuals and between individuals and organisations are increasingly tasks focused and brief. Although research interest into the social context within which individuals behave is growing (Kramer and Tyler, 1996: 2), only scant interest is shown on how trust transforms from a personal property to a group-wide attribute under such transient conditions.

Another unresolved difficulty is relating personal trust directly to organizational performance. Zand’s study (1972) which concluded that high-trust groups perform better than low trust groups is supported by Morgan and Hunt’s (1994) finding that high trust work relationships increase commitment to the organisation, reduce conflict and improve staff retention. But Luo (2002) argues that the link between trust and performance is dependent on other situational factors such as age of the partnership and level of interdependency. Kanawattanachai and Yoo (2002) in their study of trust in low and high performing teams also found that trust is situation specific and dynamic. Of importance to this thesis is the criticism by others (e.g. Gulati 1995; Ouchi 1980) that the proposed link between trust and performance does not successfully explain the transfer of individual-level trust to organizational decisions and actions especially in terms of the diametrically opposing forces of power and trust.

Furthermore, trust’s nebulous and intangible nature makes it difficult to measure quantitatively and its success as a governance or social lubricating tool, or its impact on performance, is likely to be limited to personal perceptual assessment and attitude. The epistemological gap of the future being ‘unknowable’ (Barbalet, 1996:82), the realisation that trust allows us, as individuals, to take that leap of faith, and that the trust process is between people, suggest the individual as the unit of analysis when researching trust within the virtual team. That still leaves as a challenge for this project, a methodology design that will adequately capture the complex nature of everyday working interactions between virtual team members. Adopting a traditionalist positivistic approach to study trust will probably only tell us the ‘what’.

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but is unlikely to produce the ‘why’ and ‘how’ answers to trust formation and maintenance in virtual relationships. As a universal conceptualisation of trust is unlikely to produce a balanced theoretical and empirically viable research, the remainder of this literature review chapter assumes a logical, step-by-step approach to examining the construct. It starts by taking the sociology and psychology writers’ lead in examining the origins of trust within people and the antecedents of trust between people before going on to discuss the possible transformation of that interpersonal trust into a team characteristic.

Sections 2.2.4 (trust within people), 2.26 (trust between people) and 2.27 (trust within the team) each begins with a diagram depicting the key assumptions for that trust category, the underlying theories and the identity associated with the trust assumptions. They provide a ‘road-map’ to guide my discussion of the vast literature on trust by focusing on the three key social identities of trust: the self, the dyad and the collective. Section 2.25 is a review of the self-identity literature.

2.2.4 Trust within people

"The thing on the blind side of the heart..."

G. K. Chesterton (1874-1936) in "The Ballad of the White Horse"

![Diagram](image)

O’Brien (2001) proposes that the lack of trust is depicted as “a kind of fear” of the unexpected or unplanned. Citing the Chief Executives of 3M, Hewlett-Packard, SAS and IBM Research as firm believers, she argues that self-trust and self-respect are crucial building blocks for “intrinsic motivations or self-driven and sustaining commitment” (p5). This view suggests that trust is an emotion, a feeling, or attitude that emanates from within the essence of a person and is a function of a sense of personal worth. When contextualised to the virtual team, it could be said that team
composition variability, shifting relationships and lack of face-to-face contact can induce a heightened sense of the unknown. Following that line, a certain level of inherent self-belief is necessary to motivate an individual to begin and to continue interacting in the virtual environment.

It is possible that there is a biological basis for the difference in self-trust between people as humans are born with certain characteristic patterns of emotional response or temperament. Giddens (1991) in his analysis of modernity and self-identity refers to our ontological need for personal safety and security. Unlike Fukuyama (1995) who has identified trust as a pre-existing component of society, Giddens sees trust as pre-existing in an individual. It is a part of the personality of an individual and acts as a comfort blanket or protective cocoon to shield or bracket people from the harsh realities of everyday life. Trust is essential for sense-making and for social interaction beyond one’s immediate comfort zone. As a function of the self, trust is the cog that turns the wheel. It allows affective and cognitive interpretations and actions. Although divergent on the origins of trust, both Fukuyama and Giddens agree that because societies are so full of risks and dangers nowadays social exchange can only take place a form of basic trust (as coined by Winnicott, 1975) which stems not from deliberate or cognitive decision but from an emotional, tacit acceptance or faith in the one’s own judgement and ability to overcome adversity (one’s belief system). This may be illustrated with people moving to new towns, new jobs, crossing the road or buying produce from a grocer. The act is deliberate but the willingness to undertake an adventure or new scenario is based on the non-conscious psychological state of trust in oneself and in one’s environment.

Reliance as a trust product is grounded in the assumed consistency and integrity of others. That is, individuals have a certain disposition to estimate, expect or predict the trustworthiness of others. This is supported by Dasgupta’s (1988b) view on trust as a generalised expectation of another party that is not necessarily founded on actual observation or experience. Trust as a preconscious state allows social exchange and relationships (Zucker, 1986). But trust can be betrayed. The possibility of trust erosion (or further trust building) through experiential learning is at odds with the ontological or sociological approaches to trust. Intrinsic trust disposition contradicts Bandura (1978) theory of social learning and personality development which sees all
aspects of personality as learned. Trust as a learned behaviour is described by Hardin (1993:524) as a “by-product of fortunate experience”. The social learning perspective sees trust as an instinctive disposition that is subject to episodic reinforcement or diminution. It assumes a knowledgeable agent who is reflexive and conscious of his/her decisions and actions. An example is Meyerson et al’s (1996) concept of a swift, depersonalised trust which is founded on Brewer’s (1981) and Goodman and Goodman’s (1972) observations of social groups and temporary groups. A similar example is Kramer’s presumptive trust which argues that in organisations that are salient, members identify with the organisation and through this identification they are able to trust one another even if the opportunity to test this assumption is not available. Although not addressed by Meyerson et al, it is likely that immediate relational links are only possible given a pre-existing willingness (as opposed to an ontological need) to trust. Additional cues such as paper qualification, experience and references can serve as supportive props for post-decision justification.

To view trust as an individual disposition is to accept that there is a real self (see Baumeister, 1998; Sedikides and Brewer, 2001; Tesser, 2001) which is composed of a set of properties and processes, each of which can be conceptually defined and empirically indexed. In other words, a person’s trust propensity is a manifestation of the self in a social context, and trust levels are correlated with the motivational and affective aspects of that self. Although learning from experience can moderate one’s readiness to trust, unrealistic optimism (Reagan-Cirincione, 1994) can delay or block any learning adjustment. Alternatively, people’s self-serving bias (Campbell and Sedikides, 1999; Zuckerman, 1979) can affect their willingness to attribute positive outcomes to others and therefore, in a team situation, may prevent cooperation, encourage attribution error and prevent development of shared evaluations.

Self-efficacy theory postulates that a person’s sense of his own effectiveness affects his actual performance. If an actor has confidence in himself and his partners, then cooperation and performance can take place. This self-confidence or trust in one’s own capabilities is a latent tendency that has long been used by writers such as Allport (1955) as a hypothetical construct to explain and predict regularities in behaviour. However, it does not necessarily imply that a person will exhibit trait-relevant behaviour in all situations. Of particular interest to this thesis is whether the
conditions of virtual working and communication are the situations that facilitate the manifestation of latent dispositional trust.

Conversely, reciprocal determinism can shift the social learning construct from a passive to an active process. With this approach, although individuals are affected by their environments and learn behaviours from their environments, they are also able to exercise choice and to exert control over their environment. When related to Giddens' self, reciprocal determinism is the linking pin for the development of a self-identity that has as its basis a certain level of self-esteem and self-discipline, with which to deal with the external uncertainties of day-to-day social life. This is the basis for professional identity and as a catalyst for an actor to start building on that competency.

Self efficacy theory and reciprocal determinism provide important theoretical support for Giddens' concept of the self. Although focus on the individual is very much a Western philosophy, Giddens' constructionist self postulates against a pre-determined teleological principle of the stable final form or end state. The process of social construction and human action cannot be merely a repetition or reproduction without the ability to transform, since the future is not necessarily knowable and unintended consequences (through human action) can cause things to change and are in turn affected by the course of events. Against an unknowable future, Giddens' (1991) 'reflexive project' of trust and self-identity to cope with uncertain events would seem a logical assumption (p32-33).

The situational view argues that personality trait is entirely contextual and can be consistent only in the same situation (Mischel, 1968; Mischel and Peake, 1982). In the terms of this modern interactionist approach, trust is still part of a person's belief system, but does not merely exist. It is derived from the individual's early-life experiences and the strength of its impact on individual action is a function of the situational novelty that a person is facing (Rotter, 1967, 1971, 1980). That is, the greater the uncertainty of a situation, the more an individual will rely on his trusting disposition. Longitudinal and experimental studies have found the use of this manner of coping strategy to be linked to self-esteem or self-belief (Sedikides and Gregg, 2003). As the situation becomes more familiar, personal knowledge is accumulated.
and gradually becomes the primary driver for decision-making and a code for acceptable behaviour. This selective reinforcement is an extension of the social learning approach in which internal variables regulating the interpretation of one's external environment are mediated by the situational stimuli. Unlike Giddens' routine reflexive monitoring, it assumes a lack of free will since people are controlled by situations – as in those who find themselves having to work in a distributed way.

Behavioural decision theorists such as Axelrod (1984), Coleman (1990) and Gambetta (1988) ignore personality traits entirely. They prefer to focus on immediate situational factors and argue that a social actor will act rationally. An actor will attempt to calculate the potential benefits or losses which might result in his/her decision to trust or not to trust another social actor before actually investing in a relationship. This presupposes the ability to quantify the propensity to betray and the extent of potential benefits or losses. The argument that our beliefs, desires and rational appraisal of our environment ‘cause’ us to act in certain ways is supported by Keat and Urry, (1975:156) - although they concede that it is possible to have conflicting desires and to act against our belief systems. The notion of consistency helps us organise our perceptions of others, allowing us to make certain behaviour-outcome assumptions. A person who finds his/her trust continually thwarted may still continue to cooperate with those responsible if his/her desire to belong or to keep his/her job is strong. It is possible that he/she will attempt to devise some form of defensive or coping mechanism and will fall back on his/her self-belief and block actively, any feeling of being let down.

In applied terms Cassell (1993:14) associates this emotional state with the need of managers to maintain low or manageable levels of anxiety through the enactment of rules and procedures to routinise activities standardise forms of contact, and possibly the manner and content of communication. The need for the familiar and the predictable may be so strong that actors are willing to accept negative or unpleasant aspects of life to avoid uncertainty. In the context of the virtual team, this may explain the apparent acceptance of the uncertainty accompanying changing social contracts and decentralised, virtual structures, not because people perceive or recognise this new way of working as beneficial but because over time, the novel practice of distributed working becomes the norm or routine, thereby transforming it into a
secure platform for social exchanges. Using Giddens’ definition of anxiety and fear (anxiety is a generalised emotional condition and fear is relevant to a specific context) it is further possible to explain an individual’s acceptance of distributed working. While an actor may be anxious about the novelty of a situation, his greater fear of loss (e.g. losing one’s place in society, or as a valued member of an organization or one’s livelihood, or simply losing his job) is likely to increase his effort to protect self well-being by cooperating.

The above review of trust within individuals indicates that notwithstanding its foundation, trust is derived first from the individual and extended to relevant others to enable social exchange with a view to achieving some personal goal/s or to protect against possible risk to the self. Previous history or knowledge of the trust subject does not need to be present. Trait proponents suggest that trust disposition underpins a person’s willingness to trust another while social learning authors argue for trust’s reinforcement (or reduction) through experience. These two perspectives distinguish themselves from yet other writers who argue that prior experience is a pre-requisite for trust formation.

### 2.2.5 Self identity

Dispositional trust has been associated with the motivational and affective aspects of self. O’Brien (2001), for example, cites self-respect and self-trust as foundations for the willingness to commit to any relationship. However its importance in the trust process is underplayed and not well explained in the literature. Hence, before moving on to discuss interpersonal trust, this section considers the premise of self-concept and attitude formation.

Allport (1955) viewed self-concept as encompassing all aspects of one’s personality that gives an actor a unified sense of self. To Rosenberg (1979) self-concept is “the totality of the individual’s thoughts and feelings having reference to himself as an object” (p7). Jahoda (1958) cited self-respect, self-confidence, self-reliance and self-acceptance as vital components of a healthy mental attitude towards oneself. Hence, self-concept represents abstract attributes which allow a person to tolerate and overcome anxiety without disintegration. More recently, the conceptualisation of self as three representations has become an important topic in social and personality
psychology: the individual self, the relational self and the collective self (Brewer and Gardner, 1996). At the individual level, persons seek self-definition by differentiating from others, and this desire affirms, protects and enhances a person psychologically. The relational self is achieved by assimilating with significant others through personalised bonds. Relationship management is the protection or enhancement of the significant other. The collective self is derived from impersonal bonds with others in a social group. This common identification allows inter-group comparison processes to satisfy the motive to protect or enhance the in-group; a process of maximising intra-category similarity and inter-category differences (Hogg et al, 1995; Turner et al, 1987; Turner et al, 1994). Although the need to belong is a natural human emotion, making the interpersonal self important, Sedikides and Brewer's (2001) thesis of self-reference (where the individual self is primary) would argue that the urge is for ultimate self-enhancement and self-protection. Thus interpersonal relationships with significant others are formed to benefit and protect the personal self. Positive identification with the in-group encourages positive evaluation of that group membership and increases members' commitment and support for one another (Hogg and Terry, 2001). This is in line with the earlier discussion on basic trust in which individual trust propensity driven by an ontological need for personal safety and security, allows initial action and reflexive reinforcement underscores future attitudes and willingness to trust.

People with a strong sense of self can devise coping or adaptive mechanisms to handle uncertainty. In line with this conception of the self are Maslow's (1954) self-actualisation and autonomy hypotheses. Individuals constantly strive to fulfil their potential and to maintain control over their own destiny. Individuals need to feel good about themselves before being able to reach out to others (Erickson, 1968). Aron and Aron (1986) argue that when the other is included in the self through self-expansion, this person becomes part of the personal self and depending on the strength of absorption, can be so fused with the personal self that it would be difficult to tell one from the other. This indicates a trust that is transformed from a unidirectional, basic trust (offering the 'olive branch') to a strong bidirectional, dyadic trust where trust has begotten trust. Aron and McLaughlin-Volpe (2001) further suggest that people in close relationships have a more relational self as opposed to those who are not. While the initial motivation for social exchange may be self-interest, the process of inclusion
spontaneously activates the 'altruistic' orientation of mutual gain (Cialdini et al, 1997). When this occurs, the need to protect and defend is extended from the self to the close others; moving from the 'I' to the 'we'. Thus identification with the team, whether as a psychological or social group, is a progressive inclusion of the in-group or a sub-set of the team or the team itself. This leads to a motivation to cooperate and benefit others in that group along with one self, reducing opportunistic tendencies and moving towards a shared ownership of the group's fate. The implication for members in distributed projects is the extent to which the modern team structures can support group identification and emergence of the collective self.

Social learning is important for self-concept since in order for another's behaviour to become a part of one's experience, it entails perception, interpretation and internalisation. The continuity of memories when triangulated with current events and observations, help actors maintain their self-identity and to make sense of their environment. Ultimately, the self is a product of interpersonal influences. Self-identity (how I see myself) and meta-identity (how I suppose others see me) are abstract cognitions that are fundamental to human existence (Laing et al, 1996), and they enable any two actors to orientate themselves with the other, using schemas or experience. It need not be direct experience; it could easily be a projection of one's own experience of an episode, a situation, or another person. Alternatively, projection could be not about the other's experience of me, but my experience of how I experience him/her and interpreted in terms of my own inner world – what Laing et al (1996:17) have named as one's 'phantasy system'. This form of attribution has little to do with the 'reality' of interpersonal systems, but is based on individuals' hidden value systems and expectations based on these systems. This can account for conflicting team climate perceptions or trust evaluations of fellow team members sharing the same working environment. This projected reality assumption along with the social identity perspective are used by this thesis to explain the link between social categorisation, self-conception and group behaviour.
2.2.6 Trust between people

"And trust me not at all or all in all"

Lord Tennyson (1809-1992): Idylls of the King 'Merlin and Vivien' (1959:396)

Social interactions, pledge of reliability, knowledgeable actors

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Social learning, representation, reinforcement, social exchange

→

Dyad

Trust assumptions

Theory

Identity

The various perspectives on the foundations of trust discussed earlier provide little indication as to what is really meant by “I trust you”. The statement may be either the product of cognitive evaluation or a personal or affective inclination. Initially it will involve at least two parties. Understanding the transformation of an individually constituted trust to an interpersonal relational trust requires the factors underpinning the formation of relationships, in particular for this thesis, work or task relationships. Social cognition, an area of social psychology that is concerned with how people think about other people or groups of people (e.g. writers such as Asch, Heider, Lewin and Sherif) offers various theories with which to explain or unravel the rules of trust-engagement between parties.

Some writers such as Rotter (1967, 1971, 1980) view interpersonal trust as anchored on the pledge of reliability given by an individual or social group to another individual or group, but the form or substance of this trust is not entirely clear. Presumably implied reliability is derived from interpretative means such as contextual cues (e.g. status, gestures), past relations or even through word-of-mouth. However, the cause and nature of any articulated trust (verbal or written) would need to be situated in a specific context at least linguistically, since the phrase “I trust you” can mean different things to different people, and along with this difference, elicit varying expectations and responses.
There are divergent views of whether direct prior experience is necessary or learned knowledge from other similar encounters will suffice for interpersonal trust formation and maintenance. Virtual teams, by their nature, band and disband as projects are formed and completed, so group associations can be brief. On a large project, many if not most of the team members may not have met the other members of the team; nor are they likely to meet face-to-face if the project is internationally based and activities are performed via computer-mediated communication (CMC) systems. Each individual is also likely to be involved in more than one project at any one time which means that team members have to manage overlapping and changing roles and relationships; thus begging the question: How does one formulate views of another if he does not already know that person; or indeed, have the time and opportunity to get to know that person?

The main difference between animals and human beings is the latter’s capacity for self-consciousness and reflection or social learning - although some would see this as a human tendency to take mental short cuts by processing the social world through the process of stereotyping (mentally placing people in pre-existing categories). This ‘typification’ is a process which we use to build our taken-for-granted stock of common sense or knowledge about the social world and the people in it (Alfred Schutz, 1972). Typification enables presumptive or swift trust to be applied in new or strange situations to people or colleagues whom we might not have dealt with before. We accept them as trustworthy by virtue of the fact that they are of a certain type or possess certain qualities or professional skills. Schutz’s typification (as an extension of Moscovici’s (1981) theory of social representation) does not require previous direct experience. This is an important factor for trust formation between people who have not previously met or who meet rarely. General evaluations may be made based on our existing stocks of knowledge about the type of person that someone is likely to be. Although the knowledge pool is an outcome of social learning, over time, social representation decisions need not be the direct objectification of the present actor(s).

Although an individual’s trust propensity supported by the process of typification or stereotyping allows him to reach out to another, the potency of that trust is relative to the motive(s) of the trustor when deciding (instinctively or deliberately) to place his trust on another person or his confidence in a system or thing. The link between
motive and early trust is fundamental to the formation of social bonds and it is through reflexive monitoring that learning is possible for trust adjustment (Giddens, 1991).

The various views on the process of social representations also offer a plausible explanation of the conception of trust and knowledge in the absence of physical face-to-face cues which are considered necessary for traditional social attribution. It may be one, or both, of two possibilities: (a) through mental programming - the speedy categorising of one’s distant team-mates using the schema process of stereotyping or typification and/or (b) through the primacy-recency effect of information presented about someone (e.g. a curriculum vitae; a press release) as a first impression. By inference, the trust experienced between two members of a virtual team is likely to be a form of swift trust or presumed trust which is depersonalised and fleeting. It is likely to be inferior to the affective bond formed by members of a traditional team who are working in close proximity.

International or multi-partnered virtual teams are expected to engage and work progressively towards the team objectives from day one. To overcome this, some industries (e.g. clinical research) operate a central repository of all the academic qualifications, achievements and specialisms for each member of staff which is accessible to clients, sponsors and other team members. This enables a paper-based ‘first impression’ or judgement of the apparent competences and suitability of those who are tasked to perform certain roles. Once accepted, the actors are entrusted with bringing about a successful outcome of the project. The presence of basic or natural trust means that these temporary systems can very quickly “exhibit behavior that presupposes trust” (Meyerson et al, 1996:267). It is plausible that Meyerson et al’s swift trust is based on an assumption that as part of selection, individuals joining a team would have already been through and passed some kind of screening process for suitability, competency and reliability. What matters then is the experiential learning through social interactions. If the experience of social interactions between the team members is largely positive, then the basic trust is likely to assume a more robust constitution via the reinforcement effect. Should this be the case and if there is a possibility that this initial attribution-based interpersonal trust is then developed into a generalised state through further social interaction, it will be a comforting knowledge
for managers putting together a virtual team as members are expected to ‘hit the road running’.

Using Mead’s (1938) processual explanation of communication, it is also possible to appreciate this transformation from basic to cognitive, and possibly to mutual affective trust behaviour, not just from the act of interaction but through interpretive processes. Patterns emerge and become recognisable as people engage one another in social interaction. In the interactionist view, these patterns also change with each interaction as their construction of reality and events would have altered with different time space or situational context, thus underlining the view that interpersonal trust is situational and experientially oriented. This continuous process of renewal and extension of images and meanings is the basis of our common-sense that is understood by most members of a society, organisation or group. Presumably, Heider’s balance theory where peoples’ attitudes toward (sentiment relations) and connections to (unit relations) other people, objects, ideas or events based on the principle of looking for a good perceptual fit, may be linked with the social learning process to explain any convergence in overall impressions and changing nature of relationships. The on-going interactions between virtual team members will help reinforce or adjust the interpersonal trust process as each in the group does “his best to manage the impressions that he makes on others” (Benton and Craib, 2001:87) to achieve his own desires or goals.

Trust is domain specific, e.g. an individual may be trusted to do analytic tasks related to his technical area but may not be trusted to initiate contact with an important customer (Hardin, 1993; Zand, 1972). Further, a person may have various levels of trust for another person for different situations or anticipated outcomes based on perceived risks. Hence Baier’s (1986: 236) challenge that there is a need to provide an answer not so much on whom to trust but “What do you trust to them?” further highlights the complexity of interpersonal trust.

Those who are inclined to previous knowledge would argue for a distinction between an individual’s propensity to trust and the relational trust arising between the counterparts in the dyad. They prefer to describe dyadic trust in terms of ‘cooperation’ (Bateson 1988, Gambetta 1988), ‘confidence’ (Cook and Wall 1980, Coleman 1990)
and ‘dependability’ or ‘predictability’ (Rotter 1967, Gabarro 1978, Lewis and Weigert 1985, Dasgupta 1988a, Gambetta, 1988, Good 1988). These trust attributes are derived from previous interactions between exchange partners. The indication is that while basic trust need not be conditional on prior experience and has the ability to enable initial cooperative action, reciprocal interpersonal trust requires experiential social praxis. This can present a problem with the virtual team as team participation is on a need or task basis and opportunity to get to know others in the team is limited to the task duration.

Explanation of the mechanisms for transformation in the virtual context from first trust into interpersonal trust may be found in the theories emanating from the field of socio-psychology with its social cognition perspectives. People as ‘thinking organisms’ as opposed to mere emotional or mindless organisms offer a useful platform from which to understand the complexities of individual perceptions and interpersonal relationships over time. As such, Moscovici (1982) and Zajonc (1980) are among the proponents to argue against social cognition isolated as an individual’s attitude about a social object. Instead, they posit a link between people and the social object. This implies a feeling of empathy between trustor and trustee from the word ‘go’ (i.e. the trustor and trustee must exhibit a degree of self-belief and confident expectation of the goodwill of the other) and it is through reflexive monitoring of actual behaviours and interactions that provide the data for making inferences about others’ future intentions. An interesting question is whether social cognition from physical characteristics is affected by the artificial presence of another when using video-conferencing technology rather than from direct face-to-face encounters.

Homans (1964) suggests that before entering into any relationship, individuals would weigh up the past, present and possible future rewards and costs. This social exchange approach is an economic model. Its basic assumption is that actors will behave in ways that will maximise their own utility (even if at the expense of others), although Dwyer (2000) proposes that only relationships that are mutually beneficial at the lowest cost, can survive. Given the utility assumption, trust does not sit well with economic principles. Here, trust is considered only as part of a calculated process to pool resources and share risks for economic gain. The term ‘I trust you’ in this instance as a statement by self-interested agents will hold true only as long as there is
some future discernable return and as a virtual team is a goal-specific unit tasked with producing some economically beneficial outcome, it is not impossible that individualism could prevail over the common good and trust and in this context, is given only as an exchange for good citizenship by the other.

Trust’s importance for relationships is recognised by even those in the logic-based field of artificial intelligence; although their tendency is to present trust as a mathematical model. As trust is an intangible and intrinsic dimension described by terms such as: a faith, a feeling, an instinctive need, an emotional state, a feature of personality, a willingness to be vulnerable), the usefulness of measuring and promoting this construct as a generalise attribute through deterministic probability models is questionable unless supported by a more qualitative understanding of the underlying motives.

2.2.7 Trust within the team

“To betray, you must first belong”

This section continues with the question raised in Chapter One on whether virtual projects can provide an environment that is conducive for intra-member classification as a collective. Although management may try and lay down procedures and processes to get people to start identifying and engaging with one another quickly, it is the internal ‘conditions’ of receptiveness that will determine social engagement. One party or both has/have to decide to favour the other who is presumed not to act opportunistically. But trust as a concept, cannot be easily measured in its own right and has to be captured via indicator variables - the challenge for this thesis is how to
know when trust is operating within the virtual team and whether this trust is truly a collective property. The conundrum facing this project is the classical ‘chicken or egg’ question of whether trust is an antecedent of commitment and performance or an outcome.

To culture researchers, the transference from the individual to the collective is reminiscent of the neo-Kantian assumption that knowledge in social science is based on the shared culture of a community. Yet a central theme from literature discussion so far is the question of the development of ‘sharedness’ between virtual team members. Although conceptually credible, there is a real methodological difficulty in assessing how social constructs such as group trust or virtual community identity is derived, manifested and transferred. This has led to the reviving interest by social psychologists to understand how individuals are bound into groups (Hogg, 1992; Markovsky and Lawler, 1994). There is as yet no conclusive evidence or agreement on this process. For example, Zaheer et al (1998:143) while acknowledging that “trust has its basis in individuals” extends this person-to-person trust to inter-organizational trust by defining it as the extent to which individuals in an organization collectively experience trust toward another organization. This assumes that the aggregated individual perceptions and attitudes are representative of the group at large. Likewise Costa et al (2001) view trust within work teams as the extent to which team members trust one another and that there is a correlation between trust and team stress and commitment. They too derive team scores by aggregating individual responses and comparing between teams using the aggregated means.

Another approach to collective disposition has its basis in examining the impact of institutional structures and processes on trust development among strangers. This perspective is grounded in the theory that normative prescriptions, socialisation processes, institutional practices and structural constraints together with network strategies will maintain agency integrity. For example, Shapiro (1987) focuses on the preconditions to economic exchange and the contextual factors necessary for continued relationship. She defines trust as “a social relationship in which principals – for whatever reason or state of mind – invest resources, authority or responsibility in another on their behalf for some uncertain future return” (p.626). These principal-agent relationships are the foundations for individuals, groups or organisations to
bridge markets and geographical distances. Full knowledge or information is not always available and therefore conformance and performance are monitored and controlled through social trust mechanisms. Zucker (1986) concurs. But neither Shapiro nor Zucker has addressed the issue of how such intra-individual processes translate to the team. Xin and Pearce's (1996) examination of individuals working in societies without the modernist institutions found the aggressive use of personal trust relationships to sustain their organisations. Their finding supports the need to establish whether interpersonal relationships within the loose, matrix virtual team structure will suffice as a basis for group performance.

Festinger and his colleagues were amongst the first to develop a formal theory of small group cohesion, explaining how members exert pressure on each other to uphold social norms (Festinger et al, 1950). Cohesion is present when there are mutual positive feelings by members about each other. Other writers such as Bollen and Hoyle (1990) and Sako (1992, 2002) continue to argue for the importance of trust and group cohesion as a basis for group performance. This solidarity arising from a group-based attraction is well acknowledged in the sociology literature. Bollen and Hoyle (1990) posit group cohesion as an affective and cognitive outcome of the human need to belong which, through further interactions can evolve into a willingness to remain part of the group. Group morale on the other hand is more of an affective feeling, being attributable to the feelings of trust toward other members of the group. Hellriegel et al (1999:592) add that group cohesion is “the strength of members’ desires to remain in a group and their commitment to it”, pointing to the importance of mutual attraction. Trust for this approach is the ‘glue’ for social cohesion and group identity. However, while the motivations to stay and conform to group norms are suitably described, the source of the cohesion remains moot.

Exogenous factors seem to play their part in the constitution and maintenance of intra-group trust. For example, writers such as Macauley (1963), Beale and Dugdale (1975) and later Sitkin and Roth (1993), regard legal norms as subsidiary to the trust control mechanism and that legal contract is seen as more likely to be detrimental than conducive to the constitution of trust. Bachmann (2001) disagrees as he sees the two to be compatible and suggests that while individual actors might in the first instance, decide purely on his psychological disposition to invest trust in a relationship, the
existence of commercial remedies can actually lead the actor to engage fully in a trust-based relationship. Using the distinction between confidence and trust, it could be argued that an actor's knowledge that a regulatory framework or contract is in place, gives him the confidence to trust others. In the first instance they can help reduce the risk of betrayal and economic loss down to a level that the trustor finds acceptable, and subsequently they act as a safety net for on-going interactions. Furthermore Bachmann posits that the existence of an integrated framework of institutions can minimise the risk of trust in which common and shared experiences of the players within the net of institutions can orientate the expectations and actions/reactions of these players away from exclusive and opportunistic behaviours for longer-term mutual gains. The proposed reliance of legal contracts and inter-dependency of tasks or roles to create a common fate and increase voluntarism, echoes the call by Miles et al (2000) and Mowshowitz (1994, 1997) for standardisation and protocol to encourage self-governing virtual working. If shared understanding in this context is derived from a convergence of actors’ interpretations of the structural, contractual and procedural aspects of virtual working; it could be argued that the introduction of systems and procedures to regulate behaviour and performance effectively reduces the opportunity for altruistic trust amongst colleagues. Further, the rational-agent hypothesis is possible: that team trust is a collective appreciation of the need to utilise the systems and structure to achieve expected project deliverables, the successful outcome will ultimately preserve and enhance the self and in-group well-being.

The literature on systems theory and organizational and social learning suggests that history, culture or emotion and trust are not major considerations since the assumption is that of homeostasis and stability through error-activated adjustments. Systems are remarkably self-influencing and self-correcting and mental models of players are often resistant to transformative change (Senge, 1990). These perspectives are contrary to the softer notions of reflexive learning and commitment based on socio-cognitive negotiations. Mental models are generally in line with the concept of primacy-recency effect. Having conceived an idea about a person (or persons), the desire for consistency (i.e. the need to protect oneself against uncertainty) means that less attention is given to subsequent information in case the latter is contradictory to the impression already formed – unless it seriously threaten the stability of the whole
system. A bad or good beginning may be reinforced over-time. As with the anecdotal belief that people unite to fight some common enemy or achieve some monumental task, threats to the continuance or persistence of a virtual team during times of conflict or environmental crises might just weather out with trust acting as a defence mechanism to keep anxiety at bay.

Finally, there is a doubt as to the basis of confidence in virtual teams since this faith is unlikely to be on the physical or physiological attributes of the team members. In the dispersed team, confidence is more likely to be based on the output regularity and skill capabilities of the team members (Adami, 1999). In this scenario, it may be a confidence in the structure and system represented by rules, protocols and procedures, rather than in any particular team member’s predilection or specific attributes; an interpretation which has some support from writers such as Miles et al (2000) and Mowshowitz (1997) who are calling for standardisation and behavioural protocols.

2.2.8 Summary
The journey through the trust literature has found that trust is personal and a precursor for action and relations. Trusting someone or being trustworthy is an act or an individualised behaviour which is the outcome of a sense-making process where stimuli are processed by actors and the situation assessed for action or reaction. As it is possible for human beings to act without being necessarily aware or conscious of their choices for action, trust in or of another in the virtual context may be conceived as a rational decision as well as an ontological need. Once this decision is made, an individual’s social and practical orientation to the group is grounded in his confidence of the structural systems and procedures’ ability to maintain stability and harmony between him and members of the group over the geographical and time divides. It is likely that in the context of the virtual team, lack of prior shared histories or personal ties may be overcome in the short-term by self-trust, reliance of structural policies and procedures and the assumption that fellow team members have the requisite skills and knowledge and can be depended upon to perform their roles. Over time, a ‘negotiated’ set of shared perceptions derived from a common fate through the project is possible. This does not mean a fused mindset or shared values and there is likely to be a level of perceptual dissonance between members.
CHAPTER TWO
LITERATURE REVIEW (PART THREE)

2.3 Introduction
Individuals experience their organisations or work-units through their sense-making mechanisms (Schneider, 2000), and Pettigrew (2000) in his forward for the Handbook of Organizational Culture and Climate points to the changing role of the culture and climate constructs; seen now as crucial stepping stones to the appreciation of wider related phenomena - such as the study of trust. This section presents a review of the climate literature for the purpose of understanding the process of an actor’s perception and internalisation of his immediate work context (the climate). It also reviews the different perspectives on the transformation of individual psychological climate to collective or organizational climate and the possible impact of positive or negative climate perceptions on members’ behaviour, commitment and willingness to remain with the organization. Owing to the apparent convergence and inter-changeability of the two concepts of climate and culture, it also discusses their intellectual heritage, philosophies and research methods to explain the use of climate rather than culture for this thesis.

2.3.1 Climate and culture: background
Both climate and culture are viewed as ‘soft’ aspects of an organization that are carried in peoples’ minds, which they would use to relate and interpret their surroundings. Both aim to understand the question of how the organizational context affects the behaviour and performance of the members. Climate’s tradition rests in the fields of industrial and organizational psychology and organizational behaviour, whereas culture with its emphasis on sense-making and social construction, stems from anthropology and sociology. Despite their different ontologies, organizational climate is related to organizational culture as each is linked to the value systems of organizational members.

The term climate was first coined in the late 1930s by Lewin, Lippitt & White (1939) as social climate and social atmosphere. Its research pedigree can be traced back to the work of Kurt Lewin (1951) and to McGregor’s (1960) conceptualisation of the
managerial climate. McGregor’s psychological ‘climate of the relationship’ (p.134) as a possible explanation of the emotionality exhibited between actors in the organisation is of import to this project. Culture only entered the mainstream of organization literature in the late 1970s when Tom Peters (1978) wrote about the importance of symbols, patterns and settings, and when Pettigrew (1979) presented his major work on organizational culture. By then the importance of organizational climate as a key contextual component in providing the conditions for shaping employee attitudes, motivations and actions had already been presented in two major publications by Tagiuri and Litwin (1968) and Litwin and Stringer (1968).

Neither culture nor climate attracted much attention until Peters and Waterman (1982) and Deal and Kennedy (1982) popularised culture as a panacea for organizational ills. This appealed greatly to business practitioners and professionals desperate to keep ahead of the competition. Likewise, in reacting against climate’s predominantly functionalist foundations, culture proponents such as Hofstede (1980), Knights and Willmott (1987), Barley et al (1988) and Sackmann (1991) began to fuel academic interest in organizational culture.

The primary epistemological lens of early culture researchers was based on culture as a phenomenon that is best studied at close range focusing on the unique aspects of particular social situations or contexts. Culture research soon became an established field with further publications by Schein (1992), Ott (1989), Trice and Beyer (1993) and Alvesson (1995) etc. Ashkanasy (2000) suggests that as many researchers find statistics tedious, culture with its anthropological approach and focus on universal meaning, values and norms was able to undermine the excellent scholarship of climate research. The latter was seen as more useful for investigating conditions or dimensions such as lateness, sickness, and turnover. Hence the contention by climate critics is its positivistic methodology and emphasis on the individual and that data are simply aggregated to give organizational-level representations. Criticisms included an accusation that the construct was merely an extension of job satisfaction and its apparent lack of consideration for environmental variations. Examples of early critics were Campbell et al (1970), Guion (1973), Hellriegel and Slocum (1974), James and Jones (1974), Payne & Pugh (1976). The academic debate continued. Reiers and Schneider (1990) argued that climate and culture are reciprocal processes, one causing
the other in an endless cycle. It is only recently that writers such as Moran and Volkwein (1992); Denison (1996) and Schneider (2000) have suggested that the difference between climate and culture is overplayed. They argue that although the two emanate from different scholarly traditions with differing views of ontology, epistemology and methods, they share overlapping interpretations of the same phenomenon and both provide avenues for understanding the ways work organisations are experienced by those who are a part of them.

2.3.2 Climate definition and emergence

Until the advent of culture studies and attempts by authors to integrate climate with other perspectives of organizational studies, the main attention on climate was focused on the dynamics of climate formation and later, its effects on the individual and the organization. The different definitions of climate below reflect the various basic ontological perspectives.

Christie and Merton (1958) in their study of the climate of values in medical schools, noted the existence of a tacit understanding of the expressions, ‘climate’ and ‘atmosphere’ in organizations. Tagiuri and Litwin (1968) and Litwin and Stringer (1968) adopted a structuralist approach in their definition of organizational climate, conceptualising climate to be (1) as a molar, synthetic phenomenon based on an external reality - “phenomenologically external”, (2) residing in the mind of the actor or observer, (3) possessing meaning that is contextual with reference to an external reality, (4) lasting but not as enduring as culture, (6) capable of being shared by several actors, (7) determining, directly and indirectly, the characteristics, conduct, attitudes and expectations of the actors, and (8) having potential behavioural consequences (Tagiuri and Litwin, 1968: 24-25). Halpin and Croft (1967) proposed an analogous link between climate and personality in the sense that people regard organizations as possessing a unique character. This attributed persona, the “psychological atmosphere” (Pritchard and Karasick 1973), came to be viewed as a product of the more basic value systems of the organization (Ashforth 1985; Poole 1985). Ignoring the differing emotions or different ways of sensing and interaction by individual agents, these early objectivist approaches assume that it is the organization structure or the situation (size, the degree of centralisation, specialisation and
formalisation) that gives sense to the climate of the organization to which members respond.

By the 1970s climate studies had changed focus to examine its effects on relational dispositions. Still adopting a causal framework with an assumption of a knowable future, structure is viewed as "the 'deep' logic which gives coherence, meaning and explanation to these relations" (Jackson and Carter, 2000:39). However, voices of dissent began to argue that as it is people who perceive, they are the ones that give meaning to their environment, and they are the ones that influence the character of that environment. In this new mood, climate is more about 'what it feels like to work here', and the traditional structuralist perspective is seen as culpable of an erroneous assumption of universality and possessing a flagrant disregard for variations in human history and changing situated contexts. Human diversity by logic, must impact on the organization itself through actors' perception of and reaction to their organizational surroundings. People define or enact their environment (Weick 1979) and elect to join or leave their work or social settings. This subjective perspective favours peoples' actions and decisions, not structure, as the bases for 'sets' of climates since meanings and values are socially constructed and negotiated interpersonally (Berger and Luckmann, 1966; Weick 1979). Button et al (1996) further propose that individuals' perception of organisation support learning and other contextual aspects influence their goal-orientation.

This gradual shift of climate to a subjective product which is determined by the extent to which the personality disposition and ontological needs of an individual consistently shape his view of the world is critical for this thesis' hypothesis that, as individuals act on their trust dispositions to engage their colleagues, their perceptual interpretations of their colleagues' abilities, intentions and behaviours, as well as the organisation's supporting structures and systems, form the basis for the social climate within that group. That is, from being a dependent variable, group or team climate also assumes the ability to affect behaviour. The suggestion is that a collective identity is possible as people sense or feel that they are a part of an 'in-group' and cooperating with others in that group can produce a shared reality, regardless of physical proximity.
Other writers such as Schneider and Bartlett (1970) and James and James (1989) also began to emphasize the role of individual differences and cognitive schemata, thus conceptualising climate as an individual attribute that is capable of measurement. Climate is no longer a composite only of the physical aspects of organisational life, but an outcome of the patterning of experiential meanings by participating individuals. It is now centred on the effect of the personal properties of the individual actor and his enactment of his surroundings on his behaviour and ultimately, his willingness for continued association with the organization. Humans are no longer seen as merely following rules but can exercise autonomous choice; rational or otherwise. This is consistent with the thesis’ normative model which proposes that how one perceives his team (and therefore his identification with that particular collective) is dependent on a combination of personal willingness to put faith in his team (trusting his fellow team-mates) and his confidence in the organisational structural systems (e.g. protocols of engagement, rules and operational procedures). As interactions take place members get to know one another; and they interpret and react to their colleagues’ ability, acts and reliability. These perceptions form the basis for the social climate within that group and as they move (or not) towards a negotiated consensus of meanings and environmental attributes, the system’s rules and procedures serve to fortify the level of inter-personal and intra-group cooperative atmosphere (Schneider 1975). However, the problem of proximity in the virtual team remains a possible barrier to social enactment and development of a group-based climate.

Until the publication of “On the etiology of climates” by Schneider and Reichers (1983), the importance of group influences in organizational climate study had received little attention. They argue against the distinction between climates as the outgrowth of objective organizational attributes or as subjective individual attributes. Attention is now on how climate emerges through the newcomer socialization process and on the understanding of climates “between groups within the same organization” (p31), rather than just what climate is – or what the organisation has. An individual joining an organization or group faces the daunting task of making sense of and learning the logistics of the organization, the general role of expectations of peers, the tacit norms governing behaviour and appearance, the status and power structures, the reward and communication systems, the organizational policies etc. (Ashforth, 1985).
Morrison's (1993) study has revealed that newcomers actively engage in understanding their new environment during the early months of their joining. Presumably, this is to reduce insecurity and being on the 'outside'. Other studies have also addressed the topic of organizational socialization (e.g. Major et al, 1995; Vanderberg and Self, 1993). Newcomer socialisation is pertinent to the changing membership of a virtual team. Through socialization, a newcomer will establish a "situational identity" (Katz 1980) or social role in which familiarity with the group membership will eventually give rise to similar climate perceptions. Otherwise, his association with the organization or group is likely to be short-lived.

However, Schneider and Reichers appear to be silent on the form (whether face-to-face, bilateral or multilateral) and density (the frequency, content, complexity) of interaction or the required duration of socialization and internalisation for group homogeneity, making it difficult to explain how their model would work for modern virtual teams. Besides, Luhmann's (1988) concept of Vorleistung is about people choosing not to act opportunistically to the detriment of others. In which case, it might be argued that team members' organizational identity may be assumed for the required adaptive 'fit' and not absorbed as part of the person's value or belief system. Thus when using the terms 'shared perceptions' or 'shared values' in climate, they need not be synonymous with that employed in culture studies where 'sharedness' relate to a common or fused set of community conditions. The discussion so far indicates the possibility of rational instrumentality in business relationships. People are only willing to share their work 'space' and knowledge with temporary associates in expectation of some beneficial payoff.

Although Schneider and Reichers acknowledge that a newcomer has an impact on the environment whose processes act to socialise his responses, values and meanings, there is little evidence of attention given to environmental or economic constraints on individual decisions and behaviour in their Attraction-Selection-Attrition (ASA) model. Identified in the trust literature review is the possibility of an individual acting against his natural inclinations - he will not necessarily choose to leave if by leaving the potential loss to his well-being or personal stability is greater than staying.
The apparent explanatory power of the interactionist perspective lies in its potential to conceptually link organizational and individual behavioural phenomena leading many researchers to continue to seek novel ways (e.g. through multi-dimensional approaches) to operationalise and measure climate. For example, Jones and James (1979) derived six dimensions of climate – (1) leadership facilitation and support, (2) workgroup cooperation, friendliness and warmth, (3) conflict and ambiguity, (4) professional and organizational esprit, (5) job challenge, importance and variety and (6) mutual trust. By 1992, Moran and Volkwein had extended the perception dimensions by adding autonomy, trust, cohesiveness, support, recognition, innovation and fairness. Of particular relevance to this thesis is their conclusion that climate is more explicit and measurable in empirical terms such as behavioural and attitudinal characteristics while culture is more implicit and includes perceptions, attitudes and values as well as deep, embedded basic assumptions. Of particular interest to this thesis is whether in the absence of dense and frequent exchanges, virtual team members can feel or experience such a climate, and if yes, whether its components are different from that of a traditional, co-located team. The next section explains the rationale for selecting climate rather than culture for this research.

2.3.3 Climate or culture?

From the literature, it appears that climate and culture are complimentary constructs – both attempt to answer the basic question of how the organizational context relate to the behaviour and performance of the members. Aside from Moran and Volkwein’s (1992) differentiation between climate and culture above, Schein (1988) explains that culture is what an organisation has rather than the more explicit climate which is felt (or experienced). That is, climate addresses the ‘what’ and ‘how’ of organisational systems as seen by individuals, while culture with its deep-seated assumptions, values and beliefs, seeks to explain the ‘why’ in organisational behaviour. Viewed as a form of ‘collective programming’ (Hofstede: 1983:77), culture’s focus is long-termed and community-based as opposed to climate’s individual cognition focus which is more transient and subject to reinterpretation of the perceived stimuli. Differing organizational practices and procedures should produce differing organizational climates.
Research by Verbeke et al (1998) found that while the core concept for climate is centred on characteristics and perceptions, culture has its locus on the learning and sharing of norms and subsequently shaping the way people conduct themselves. Although not directly addressing the culture versus climate issue, Hofstede (1983) pinpoints the key differences between culture and climate when he suggests that culture is about values rather than attitudes, and that the former is about 'desires' while the latter about 'perceptions'. Unlike culture, climate relates less with learned behaviour and more with the perceived impact of 'visible' or 'observable' practices and procedures (the organisational systems) on groups and individuals (Ekvall 1987; Joyce and Slocum 1984; Koys and DeCotiis 1991; Guion 1973; James and Jones 1974). Hence, in climate research, attention is drawn primarily to the subjective perception by members in the organisation of the quasi-objective sets of conditions or dimensions.

Hofstede’s ‘cultural dimensions’ (individualism v collectivism; power distance; uncertainty avoidance and masculinity v. femininity) provide the structure or tradition that reinforces the dominant behavioural patterns of the various nationalities within an organisation and the institutionalised behaviours are in turn, perceived by others internal and/or external to that immediate environment. But the public manifestations of culture such as norms, symbols, language, rituals, myths and taboos can only have been created, understood and accepted over prolonged associations. A strong culture is useful only if it is suitable for coping with the prevailing conditions facing the organisation. As such, the characteristics of the virtual project team may be barriers to strong culture formation.

There is little value in using a time-dependent construct such as culture to measure the congruence of personal and organisational goals in fast-moving time-space distantiated teams faced with a high degree of abstractions (communication and coordinate are conducted electronically with little direct, co-presence exchanges). The project is unlikely to be around long enough for a culture unique to that team to be created – although the team itself can be embedded in a wider and longer standing organisational culture. The transience of these teams makes conventional face-to-face sense-making difficult, and the likelihood of team members, who are culturally, ethnically and historically different, working together for the first time, precludes
culture as a frame of reference for their attitudes and behaviour in this specific context. If anything, they are likely to be more different than similar in their values.

Given the fundamental property of a virtual team is its short-term, object-specific existence the inclination to be assimilated culturally may be reduced or even redundant. Yet, from the observed prevalence of the virtual or distributed team form (Chapter One), there must be something or some basis for group solidarity and cohesion to allow cooperation and concerted performance. This thesis' supposition is that as long as there is an adaptive 'fit' between individual and organisational goals and aspirations, and the possibility of success is high, team members are quite likely to 'get on with it' and worry less about the underlying nuances of social life. Therefore, to the extent that shared values and beliefs are more superficial and are more consciously held, climate conceived through perceptions and meanings is arguably less deeply entrenched than culture, and more suitable for this project. Further, its hypothesised relationships between the self, trust disposition and climate is grounded on climate perception as a function of the individual belief system. As members leave and join the team, they bring with them their trust propensity, their mental representations of the people and the things they trust or distrust, and their interpretive capacity of the current situation. Individuals react to the situational conditions in a manner that is psychologically meaningful to them and the climate identified should reflect the match between current organisational conditions and the values that people hold.

2.3.4 Climate and performance

The relationship between individual perceptual disposition and climate emphasises its role as an intervening variable for performance (Likert, 1967; Schneider and Hall, 1972). Climate-to-outcome relationship has a long tradition and can be traced back to studies by Fleishman (1953) who concluded a link between leadership climate and workers' attitudes. Schneider (1973) found that customer-attrition was related to their negative perceptions of their bank climate. The view that the interaction between climate and personality produces perceptions that implicate behaviour became a topic of interest to researchers. James and Jones (1974) were the first to link climate perception with productivity and turnover. Lawler et al (1974) also established a relationship between climate perceptions and performance, while DeCortiis and
Summers (1987) correlated climate and organisational commitment. Other climate-outcome research include psychological well-being (Cummings and DeCotiis, 1973), absenteeism and turnover (Steel et al., 1990) and dysfunctional job behaviours (workplace violence – Cole et al., 1997; harassment – Culbertson and Rodgers, 1997; theft - Kamp and Brooks, 1991). Kopelman et al (1990) extended on James and Jones’ model by proposing that climate’s impact on individual and organisational performance occurs through its effect on cognitive and affective states.

More recently, the findings by Carr et al (2003) in their meta-analysis of climate and individual work outcomes confirmed climate’s mediating role between the objective characteristics of work environment and subjective individual responses. Hence despite Schneider’s assertion (2000) that climate should be specifically of something (e.g. safety climate), molar climate dimensions can give a broader indication of a variety of individual outcomes (e.g. performance, absenteeism, turnover).

As climate refers to the perceived, subjective effects of the formal or structural systems and informal support and managerial systems on attitudes, beliefs and motivation of people who work in a particular context, its relevance for this thesis is as a predictor of virtual team members’ assessments of their own and their fellow colleagues’ professional behaviour and contribution to team outcomes.

2.3.5 Climate variables

A challenge for this study is the proliferation of climate dimensions and the inconsistency of climate labels’ definitions (Figure 2.2). Recently, Carr et al (2004) used for their study a climate taxonomy comprising of 12 climate dimensions and three higher order facets derived from a synthesis of the literature by Ostroff and her colleagues (Ostrof 1993, Ostroff et al 2003). Their trichotomization of climate perceptions and the 12 dimensions further support the link between personality and climate (Figure 2.3). A point to note is that all the identified climate studies examined their subjects in a conventional context and as this project seeks to examine virtual members’ motivation to trust and identify with their distanced colleagues, the proffered climate dimensions need to be reviewed for their relevance to the modern virtual team.
### Figure 2-2: Examples of various climate dimensions

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>No. of dimensions</th>
<th>Dependent Variable/s</th>
<th>Dimensions descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litwin and Stringer</td>
<td>1968</td>
<td>9</td>
<td>Work motivation and job satisfaction</td>
<td>structure, responsibility, reward, risk, warmth, support, standards, conflict and identity</td>
</tr>
<tr>
<td>Campbell et al</td>
<td>1970</td>
<td>4</td>
<td>Managerial performance</td>
<td>Individual autonomy, degrees of structure imposition, reward orientation, consideration, warmth and support</td>
</tr>
<tr>
<td>Pritchard and Karasick</td>
<td>1973</td>
<td>11</td>
<td>Managerial job performance and job satisfaction</td>
<td>autonomy, conflict versus cooperation, social relations, structure, level of rewards, performance-reward dependency, motivation to achieve, status polarization, flexibility and innovation, decision centralization, and supportiveness</td>
</tr>
<tr>
<td>Jones and James</td>
<td>1979</td>
<td>6</td>
<td>Motivation and job satisfaction</td>
<td>Leadership facilitation and support, workgroup cooperation, friendliness and warmth, conflict and ambiguity, professional and organizational esprit, job challenge, importance and variety, and mutual trust</td>
</tr>
<tr>
<td>Schnake</td>
<td>1983</td>
<td>5</td>
<td>Affective response</td>
<td>Reward orientation, structure, warmth and support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sales volume, extent of technical knowledge and administrative performance</td>
</tr>
</tbody>
</table>
Figure 2-3: Ostroff's (1993, 2003) 3-facets climate taxonomy as used by Carr et al (2004)

<table>
<thead>
<tr>
<th>Climate facets</th>
<th>Dimensions</th>
</tr>
</thead>
</table>
| **Affective facet** — people involvement, interpersonal or social relations | Participation  
Social rewards  
Cooperation |
| **Cognitive facet** — psychological involvement, self-knowledge and development | Growth  
Innovation  
Autonomy  
Intrinsic rewards |
| **Instrumental facet** — Task involvement and work processes | Hierarchy  
Structure  
Extrinsic rewards  
Achievement |

The object of the project management approach is to divide a project into smaller, manageable ‘chunks’ of activities to be performed by relevant specialists who, aided by 21st century technologies, need not be based centrally or together. The networked nature of virtual teams suggest that some facets, such as leadership facilitation, autonomy, decision centralisation, hierarchy and imposed structure are unlikely to be critical climate indicators for this study. Maintaining close supervision and direction is not practicable for dispersed teams and communicating electronically has its limitations for complex, multi-party technical problem-solving. Individual autonomy, localised project-related decision-making and lateral rather than vertical communication are, through practical necessity, default practices for virtual projects. Likewise, technology connectivity rather than leadership is the important facilitator for modern project cooperation.

Further examination of Figures 2.2 and 2.3 identified that some dimensions are consistent across the studies; namely structure, warmth, support, and reward. This
thesis' instrumental social construction epistemology\textsuperscript{2} assumes that as people perceive their work contexts, they attach meanings, assess their enabling or constraining properties, and exercise choice within that socially constructed reality. Therefore, the various levels of institutional structure are experienced and internalised and will affect agency decision and behaviour. Exploratory interviews with senior managers revealed that team members as knowledge workers value self-expression and self-responsibility. They like being trusted to decide their project methodology. An output orientation is also preferred since that allows them the freedom to schedule tasks and work flows to suit their working-style or domestic needs. They take pride in their work and would expect others to produce quality work. In knowledge-based projects, it seems logical that quality is considered an important variable.

Despite the likes of Herzberg arguing that money is not a long-term motivator, this thesis takes the view from the initial discussions, the researcher's own work-based observations and with reference to modern-day living, that the reward package as a whole is an important status indicator. Promotions 'up' the ranks are limited given modern flatter organisation structures and organisations must find a reward system that suitably recognises workers' good performance and allows social comparison with similar others in the field.

As this thesis is interested in the relational dynamics of virtual teams, perceived friendliness and warmth, group identity and managerial support are indicators of affiliation and social identification. Risk and conflict dimensions should be relevant in distributed working since both trust and climate literatures point to increased uncertainty and possible issues of shared identity and value consensus. Accordingly, the chosen climate dimensions for this project's questionnaire are: structure, responsibility, reward, risk, warmth, support, standards, conflict and group identity. Finally, as the chosen dimensions concur with those used by Litwin and Stringer (1968), reference was made to their original instrument with a view to adapting the questions for this study\textsuperscript{3}.

\textsuperscript{2} See Part One of Chapter Four for more explanation of this thesis' ontological and epistemological assumptions.

\textsuperscript{3} Detailed report of the questionnaire design and development for this study is reported in Part Two of Chapter Four.
2.4 Summary

Part three of this literature review chapter explains the different ontological and epistemological approaches of climate and culture and argues for the relevance of climate as an intervening perceptual construct between self-concept, trust, group identity and performance. The link between climate and performance is also discussed at length. Unlike trust, climate’s organizational psychology tradition has yielded numerous tried and tested climate factors, albeit evolved primarily from a conventional co-proximate setting. From the basket of ‘common’ factors, a set of climate dimensions deemed relevant for this study’s research questions and modern distributed context is selected. In the next chapter, I present my thesis on trust and identity formation in the virtual team. Six propositions are proffered.
CHAPTER THREE
A THEORY

3. Introduction
The empirical observations, practical issues and gaps identified in the first two chapters provide the themes for this thesis on the relational dynamics within virtual teams. As existing theories on conventional co-located groups cannot adequately explain these processes, this thesis refers to the organisational psychology and social psychology theories on social identity, self-categorisation, sense-making and contextual salience to examine the identity processes in virtual teams and the extent to which perceptual structures collectively termed the 'team climate' can become a salient context for self-regulation and performance. In this chapter I present my arguments that underpin the conceptual model and research propositions.

3.1 Theory arguments and conceptual model
Earlier literature review has revealed that social and personality psychologists accept that individuals possess characteristic patterns of emotional response or temperament, and trust impulse or disposition is a part of the self and a function of one's psychological make-up. Under conditions of ambiguity and incomplete information, social interaction and cooperation will take place only with a level of self-awareness and a generalised assumption of the other's goodwill and trustworthiness. People attribute motives and competences to their fellow team members either through direct observation or implied interpretation of others' conduct. Along these lines, if trust is viewed consciously or sub-consciously as the enabling option for engagement and task performance as opposed to the potentially adverse consequences of not trusting, then trust may well be the 'tonic' that reduces heightened uncertainty in virtual team working. However, while it is easy to explain that trust within a team is about the extent to which team members relate and trust one another, this trust embeddedness is difficult to operationalise and a challenge to measure. Using a mix of attribution, social leaning, and social identity theories this thesis explores the antecedents of trust and its transition from the dyad to a group-based construct.
Accordingly, this project proposes a theory that:

Trust is first a personal attribute which is offered to enable interaction and action. This interpersonal trust can become an intangible collective asset based upon a complex set of hypothesised relationships involving the work context, self-concept, team identity and cohesion. Ultimately it can influence evaluations by individuals of their own contribution and fellow members’ professional conduct.

Individual attributes and attitudes: This thesis’ social construction epistemology follows Weick’s (1979) subjective argument that actors’ personal attributes and attitudes define the way they assess their environment and their conclusions as to the reliability or dependability of the organisational structural systems and their fellow team members. The project’s assumption that knowledge is inter-relational (between persons, group of persons and the world) means that the experience and consciousness about the relationships within the work group is central to its proposition for the maintenance of a healthy team climate. The thesis’ emphasis on the local context and on the social and linguistic construction of perspective reality supports writers such as Lewicki and Bunker’s (1996) and Shapiro et al’s (1992) arguments that trust is personal and dynamic and can be increased or lowered throughout any given relationship cycle. The difficulty of operationalising latent trust and confirmation of its presence between absent colleagues has already been highlighted in earlier discussions.

Organisational context: Climate, represented by the nine dimensions identified in Part Three of Chapter Two is used by this project as an attributional frame of reference for “...the attainment of some congruity between behaviour and the system’s practices and procedures” (Schneider, 1975: 474-475). That is, team climate constitutes the perceived organisational context for individual and collective conduct and performance. As such, project characteristics of duration, complexity, status and team size and issues of transient membership, diverse work modes, minimal face-to-face contact and reliance on computer-aided communications collectively known as the ‘organisational context’ are conceived or interpreted by team members as either constraining or enabling and a part of the overall climate conditions.
Evaluated outcomes: In the virtual team, relationship preservation management is important, and payoff for non-cooperation and untrustworthy behaviour is likely to be subsidiary to the potential benefit for continued investment in team success. By referring to concepts of group solidarity and group cohesion, this thesis argues that although trust starts between individuals and it is this interpersonal trust that shapes micro-organizational behaviour, it can become a function of the social affinity and commitment felt within the group. This social affinity or solidarity is drawn from Hetcher’s (1987) incentive-driven dependence-based theory of group solidarity. By his definition, solidarity refers to the compliance or commitment to corporate or collective obligations by co-dependent individuals. Group cohesion for this project extents beyond traditional social attraction to include Hogg’s (1992) and Markovsky and Lawler’s (1994) focus on the social structural context in which the group operates, and the intrapsychic cognitive processes of how people think about their groups and fellow members. Cohesion by this extended definition includes the strong mutual bonds of liking and empathy between people and the extent to which people are willing to act as one to serve the group’s best interest. To achieve solidarity and cohesion, trust becomes the mechanism for the acceptance by members of their obligations and a catalyst for their actual compliance. Perceived cohesiveness is measured in this thesis as an individual’s sense of the team or ‘we-ness’ as members consciously or subconsciously suppress their natural self-interested orientation and are motivated to maximise joint or collective interests. Accordingly, solidarity and cohesion for this thesis are states where collective production and social order are indicative of the transition of interpersonal trust to a group property.

The thesis’s theoretical model on trust formation and development within the virtual team is shown in Figure 3-1 below. The research questions following are more detailed extensions of the three posed in Section 1.3.3 of Chapter One and are used to construct the proposed relationships highlighted in Figure 3-1.
3.2 Research questions and propositions

1. Does self-concept enable interpersonal exchanges? Is there a relationship between the self and the way an individual conceives his/her work context? What is its role in the study of trust in the virtual team?

This thesis’ proposed association between self-concept and interpersonal trust refers to the indication of trust in modernity as a personal property which is extended to others to enable social exchange and to create a moral bond between individuals. Self-concept for this study includes the traditional definition of it as an individual’s total personality and sense of self and the more recent categorisation-based notion that it is a set distinctive self-attributes differentiating an individual from others (see Tajfel 1972, Turner, 1982). That is, whilst the individual self is achieved through interpersonal comparison in order to differentiate oneself from others, the relational self relies on assimilating with significant others through personalised bonds or shared characteristics (Brewer and Gardner, 1996). Since personal and social self-conceptualisations are socially constructed and grounded (Hogg, 2001: 131), it is plausible that for the virtual team member, self-concept or self-identity provides the lens with which individuals will make sense of their specific work environment.
Turner's (1988) social categorisation theory differentiates between interpersonal and group processes. It separates the concepts of group attraction and interpersonal or dyadic bonds. Interpersonal social categorisation is based on cognitive schemas or mental representations of specific (non-group determined) characteristics of an individual or his/her relationship with another. The ‘working’ impressions or prototypes underscore actors’ willingness to trust the good intentions and competency of others. The argument that people carry prototypes in their heads as a way of reducing uncertainty and for quicker orientation to their environment, helps explain the process of relationship building by members in a newly constituted virtual team. Using these ‘fuzzy sets’ (Hogg, 2001: 132) of mental categories, individuals can make trust assumptions of others to begin interaction.

**PROPOSITION 1**: The willingness or ability of individuals to form relational links and rely on others is a product of their personality or belief system.

2. *Is team climate possible for a distributed work team with limited physical contact? Does self-concept influence an individual’s view of how well the team is ‘hanging together’? Does interpersonal trust between team members affect the social construction of team climate?*

Interpersonal attraction based on the characteristics of intra-group members and the relationships between individuals cannot be assumed in the modern team context, as group membership stability assumptions are no longer applicable. The question of whether a disparate and changing group of work colleagues can form and maintain any perspective of a team climate needs to be addressed. It may be argued that if self-concept or identity underpins the initial disposition to be vulnerable and reliant on the goodwill of another, the resultant interpersonal trust in turn, influences individual perception of team climate valence. As the climate literature has long since acknowledged the importance of shared perceptions, the transition from dyadic to collective perceptions of ‘how things are around here’ (Reichers and Schneider, 1990:22) may justifiably be engendered as the team perform their tasks and assignments. In taking this approach, this thesis relates to the agency-based perspective of trust as an incentive for anticipated mutual
benefit, and any abuse of that trust is likely to result in a loss to all parties; albeit not necessarily in equal proportions.

PROPOSITION 2: Virtual project members perceive their team as possessing unique climate characteristics.

PROPOSITION 3: Team climate as a mental construction of individuals is underscored by their self-concept and trust dispositions.

3. What indicates the presence of a collective or group-based trust? How is that manifested?

The theoretical model of this thesis is based on the assumption of human agency and choice within a given situation. Hence for virtual teams with little prior history and formed for some expressed purpose or prescribed outcome rather than personal similarity or attraction, group solidarity is evidenced by the production of collective goods or output for mutual advantage. This interdependence of fate is grounded not in homophilly or emotional attachment, but linked to a cohesion based on member's corporate obligations and exit cost. The virtual collective, therefore, is a system of interrelated tasks whereby success is accumulated through 'heedful' joint-action (Asch, 1952; Weick and Roberts, 1993). The thesis also assumes Markovsky and Lawler's (1994) utilitarian approach to solidarity that 'social order is created and maintained because (and only if) interdependence makes cooperation a valued commodity' (p. 115-116). However, throughout the team life-cycle, the influence of social consensus on opinion and norm formation cannot be overlooked.

Within the team or a sub-unit of the team, each member infers that others are encountering similar perceptions as he/she is. Perceived cohesion is high when subjects view the group or the social network as integrated or close (despite the lack of physical proximity), and cooperation and behavioural commitment amongst members are in clear evidence. This does not rule out individual incidents of conflict or behavioural difficulties, but in game theory terms, the alternative is less attractive or beneficial than staying and continuing one's input.
Although it appears only that the positive side of trust emergence is highlighted here, the concept of reciprocity suggests that social ostracism by social groups can be a powerful deterrent. The project management concept of task responsibility also makes accountability far more transparent and difficulties or delays along the critical path can easily be traced back to the individual/s concerned. Therefore, the perceived cohesiveness of the team is not about the extent to which members stick together, but a result of the subjective identification of members with the fate of the team and are willing to contribute to its success. Following this argument, this project theorises that evidence of group solidarity and cohesion are indicative of identification within the virtual team.

PROPOSITION 4: Group identity has salience for the promotion of cohesion and solidarity.

4. Can a positive or negative team climate affect members’ evaluations of their own and others’ professionalism and performance?

Social learning implies the possibility of individuals to improve their choices in given social interactions by referring to past experiences for an increased sense of control. When people feel in control, they are less stressed and panicky and teams perceived to possess enabling climate structures are empowering as they allow individuals control over themselves and their tasks. Therefore, Lawler’s (1992) choice-process theory and his later theory of relational cohesion (Lawler, Thye and Yoon 2000) emphasising the importance of affective emotions for commitment development, support this thesis’ central argument that affection will evolve with extended interaction in an exchange relation or sets of relations that foster a sense of control for the actors. An integrated collective unit can emerge with members exhibiting strong commitment behaviour, which is noticed and appreciated by others in the team. This is evidenced by the willingness to take risk (e.g. to be reliant on others), make sacrifices (e.g. to act without expecting specific return) and behave in a trustworthy manner. The perceived team climate then becomes the mental and emotional frame of reference for evaluating their own and others’ professionalism and behaviour.
**PROPOSITION 5:** A team member's evaluation and affirmation of his/her own contribution and fellow team members' cooperative and professional behaviour towards collective success are influenced by his/her view of how well the team is functioning together.

**PROPOSITION 6:** A team member's self-concept is a useful coping or adaptive mechanism which has an effect on how he/she evaluates and affirms his/her own contribution.

Finally, social learning models indicate that personality and personal attributes are relatively but not absolutely stable, and actors can and often will adapt their behaviour based on prior experiences. It is logical therefore to assume some form of feedback and adjustment on own performance evaluation and perceived professionalism of other members, and between interpersonal trust and intra-group trust (as signified by team cohesiveness). Actors update their beliefs and views of the social world based on their own past experiences and information from observation or word-of-mouth feedback by other players. Lawler and Yoon (1996) and Lawler et al (2000) in their theory of relational cohesion, point out that previous positive experience in dyadic or triadic exchange relations can induce greater contributions of actors in a subsequent joint venture. This is consistent with the intrapsychic cognitive categorisation processes through which people think about themselves and their fellow team members. However, for the purpose of this study, these relationships although important, are unlikely to have an immediate impact on member commitment behaviour owing to the temporary but highly focused and interdependent nature of the virtual team where the payoff for cooperation and project success is likely to outstrip any tendency to abuse the trust given a member. Team cohesiveness and solidarity experiences are likely to feedback but only over time will they cause a re-evaluation of individual propensity to trust. As these changes in trust perceptions and attitudes are likely to be reserved for future social categorisations, it is not possible for this study’s cross-sectional research design to provide further insight. Hence, in testing the plausibility of this study’s research model, they are considered as relationships which cannot be specified and measured readily as bi-directional links.
CHAPTER FOUR
METHODOLOGY

4. Introduction

Denzin and Lincoln (2000) suggest that methodology flows from the nature of the discipline and the particular theoretical perspective. A discipline will select and distil the features from the social world that its specialism is most interested. This implies that the domain assumptions of a discipline will determine its preference for any particular research method. 'Newer' disciplines such as management studies and organisational science are likely to have drawn theoretical and methodological contributions from the 'older' natural sciences and other social sciences. However, even within disciplines, there can be differences in their ontological assumptions. Debates as to which method is better are still ongoing: objective or subjective, explanatory or exploratory, causal or interpretative. There is, however, a growing awareness that such dualistic portrayal does not accurately reflect the reality of human knowledge and social life. Regardless of philosophical roots, it could be argued that all data collection approaches lie along the deductive-inductive continuum (Newman and Benz, 1998; Giddens, 1976). In business and management research there is also the argument that the purpose and context of research locates it along a basic-applied continuum (Saunders et al, 2000). Although using theoretical constructs from sociology, psychology and social psychology, the applied nature of this thesis' research topic comes from its context within business praxis. As such, its research strategy is founded on the understanding that any method(s) used for this project would be capable of criticism by others whose philosophies sit either side of that approach. This three-part chapter (as illustrated by the extract from Figure 1.1 in Chapter One below) explains the thesis' philosophical and epistemological assumptions underlining its research design.

<table>
<thead>
<tr>
<th>Chapter Four Research methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1 Epistemology and research design</td>
</tr>
<tr>
<td>Part 2 The research process: Phase 1, survey; pilots 1 and 2</td>
</tr>
<tr>
<td>Part 3 The research process: Phase 2, interviews</td>
</tr>
</tbody>
</table>
CHAPTER FOUR
METHODOLOGY (PART ONE)

4.1 Epistemological assumptions
The object of the research is to contribute to the body of knowledge about the 'reality' of relationships within a virtual team. The perspective that cognition involves the mind engaging with its environment and evolving with experience, and is "a joint function of what is in the head and what is in the world" (Hosking and Morley, 1991:24) is central to the interpretative hypothesis of this project. Further, Habermas' (1973) postulation of the inseparability of facts and experiences together with Giddens' (1984) suggestion that structure and agency are mutually constituted, underlines this study's adapted relativist position in which the mental construction of external structures have practical effects on people. As actors negotiate their understanding of their social environment and assess their colleagues' intentions, they decide (consciously or sub-consciously) on the course of action for social engagement. The epistemology of agency for this context is anchored on the personal perspective of players: how they perceive their working environments, how they conceive themselves and assess their contributions to their teams; how they view others in the team and their contributions, and the influence of the organisational climate on social identification and cognitive understanding and judgement. This thesis' methodological foundation is therefore based on the supposition that understanding the drivers to cooperate with others in the virtual context requires a relativist rather than positivist epistemic strategy.

Interaction enables a greater awareness of one another, and self-reflection enables a perceptual psychological appraisal of environmental events, objects, processes, rules and structures. Together, they allow an individual to alter his mental representation, but not entirely or constantly as would have the symbolic interactionist, who sees reality as perpetually socially constructed (e.g. Ashforth, 1985; Schneider and Reichers, 1983). Rather, more along the lines suggested by James et al's (1990) differentiation between higher order schemas (HOS) and 'contemporaneous' social constructions. As knowledgeable agents, it is conceivable that trust formation and maintenance in the modern team context may include a mix of reasons or motives
manifested as a combination of instinctive, altruistic and/or deliberate choices and acts.

The social context of temporal and geographical remoteness of virtual team working may be construed as structural constraints for group identity creation. To that extent, this project acknowledges that there is a projected external world which can be, and is often, in conflict with our desires and needs; but only that reality is not necessarily purely objective or subjective and as an entity or structure, it both facilitates and constrains our actions. This reflects the economic reality of many of whom despite their apparent ‘dialectic of control’ (Giddens, 1984), continue to remain in a work environment that may not suit them.

The literature in Chapter Two indicates that trust is first a personal property and to understand the trust process, the unit of analysis is the individual. With its roots in the field of social cognition, trust is constructed as a cognitive category by the perceiver to interpret another individual’s intentions and behaviour. Everyday language and the socially agreed meaning of dispositional labels (such as trust and confidence) will provide the perceptual framework for constructing one’s working or social environment. The climate literature also points to the subjective perception or enactment by an individual of his work environment. Given the multiple levels of societal and organisational life, any collective model will depend on the psychical and organic constitution of the individuals within them. A collective psychological climate emerges when there is convergence of perceptions. James et al (1990) support this argument. For them meaning and sense-making are essentially individual phenomena. Asch (1952/1987) is more specific by suggesting that individuals and groups are both ‘distinct’ and ‘inseparable’, and the only way to understand the group is via the individual interpretative perspectives. The argument that relationship between individuals in the group and the group itself are a whole-part phenomenon in which intersubjectivity of meanings is achieved without the actors being ‘absorbed’ by them is appropriate for this project given the temporary life-cycles of the teams. This leads well into the constructivist perspective of conceptualising trust as a socially defined category, since perceptions are not matters of ‘fact’ but of ‘value’ (Vickers, 1968:122), and as discussed, actors can and do exercise choice in the social process.
Human thought and action make up the reality around them and that reality, when internalised, assumes a structural property that regularises future behaviour (either through habit, disposition or tendency, social praxis, or rules). Humans elect to accept or construct, whether cognitively or emotionally, and whether at the conscious or subconscious level, the reality and structural mechanisms around them. Once constructed, these mechanisms’ role is to preserve a sense of stability and personal well-being. As self-trust and interdependent trust are effectively self-preservation mechanisms, this project’s epistemological orientation is one of instrumental social construction. That is, the social generation of meaning and knowledge by members of the virtual team will be context-bound and laced with personal considerations for protection against the unknown or unknowable.

The project’s ontological leaning is a combination of realist rationality and critical interpretivism, which underlines the instrumental social construction epistemology. By realist rationality I mean that although individuals project themselves as ‘creatures of their situations’ (Hindness, 1988:39), they exercise agency by endeavouring to maximise utility to themselves to prevent personal loss or to preserve ontological security within that situated context. Critical interpretivism points to the selective process of meaning construction and this thesis’ interpretation of the study findings can only be an interpretation of the meanings attached by the study’s participants. Additionally, Craib (1992) suggests that ‘we are positioned’ (p78) and we can only exercise choice within that position; thus implying a structural influence on human decision and action. Hence individuals can be conditioned through training/education/experience and their assessment of a lack of lucrative alternatives, not to act or take a path that might adversely affect their behaviour and well being. Repeated interactions (even if remotely) and internalisation of negotiated meanings and ‘appropriate’ social norms should provide the structural framework or stocks of knowledge with which considered or rational judgement may be exercised.

Adopting an individual level approach has its difficulties in explaining collective behaviour. For modern distributed teams to work there is a mutual or circular dependency that cannot be distinguished – the essence of Asch’s argument of the mutuality of influence and the emergent quality of relational processes. Moreover in the context of the virtual team, it is not clear as yet if at-distance socialisation and the
need to meet stated objectives in a time-limited fashion are in the least conducive for group identification and the formation of group identity. Although relationships estimated at the dyad level when extrapolated to the collective group may not be entirely representative, a holistic or collective level approach is likely to be as problematic since it fails to acknowledge the individual ‘unit act’ of trust giving and to capture the process of social identification through shared fate and experience. Hence, the constructivist mind-set of a pluralistic reality which is “shaped to fit the purposeful acts of the intentional agents” (Schwandt 1994:125) and one that possesses personalities, innate conceptual capabilities and the capacity for reflexivity, learning and communication through gesture, thought and language, appears more in keeping with this project’s context and with the extant literature on individual perception, power and choice. Further explanation supporting the individual unit of analysis is offered in the next section under the sub-heading ‘level and unit of analysis’.

4.1.1 A mixed methods approach

The ramifications of virtual team practice cannot be observed or measured easily in the usual positivistic way; rather the study is dependent on seeking out and understanding the shades of preconceptions, values and emotions of individuals in distributed working. Moreover as our understanding of reasons can only ever be ‘evaluative’ (Benton and Craib, 2001:96), it is not possible for this study to ‘falsify’ attitudes or perceptions in the strict Popper tradition, since beliefs and desires are processes in themselves and are part of a wider interpretive process, not discrete entities which can be isolated for individual examination or measurement (Giddens, 1976, 1984). Similarly Elias (1991) proposes that although people have come to think of an internal world and an external world, “structures of personality and of society evolve in an indissoluble interrelationship” (p45-46). Therefore, a challenge for this project is deciding which research approach to take ‘to find things out’.

The applied context of the study presents challenges that are different from laboratory or experimental designs. The inability to test all possible permutations of human idiosyncrasies, the lack of a ready sampling frame, the simple criterion for defining target participants (e.g., anyone who is actively engaged in distributed project work in a project-based organisation), the need to rely on the agreement of organisations for access to any team, and the continuing goodwill of team members to stay with the
study, highlight the researcher’s lack of ability to influence choice and events. Moreover, the points have already been made about trust and identity not being readily observed or easily quantifiable, and that value presuppositions can influence the language used by study informants to describe their reality.

A review of the research design and methods literature indicated the possibility of a pragmatic approach to accomplish my research aims and to overcome practical issues of access and sampling (Ackroyd and Hughes, 1992; Patton, 2002, Robey, 1996). Adopting too dogmatic a view to research can be counterproductive (Frankfort-Nachmias and Nachmias, 1996). Bryman (1988:5) suggests that the distinction between quantitative and qualitative research may rest on different epistemological assumptions or the technical relevance of data collection approaches to the research questions. Irrespective of epistemological or methodological paradigms, the indication is that a theory is needed to explain the motivations behind the acts; since “our findings on the social world are devoid of meaning ...... without social theory” (May, 1993:23). But while data requires theoretical underpinning, it is itself a repository for theory. It does seem that research is not always purely inductive or deductive; often involving some form of quantitative and interpretative mix.

Howe (1988) suggests that qualitative and quantitative methods can be compatible, since in actively engaging with multiple worldview assumptions, mixed methods research can offer a useful dialectic to examine a given phenomenon from more than perspective. Teddlie and Tashakkori (2003:15) offer three main reasons for the use of mixed methods research, which are relevant to this study: (a) it can answer research questions that the other methodologies cannot; (b) it can provide better (stronger) inferences, and (c) it can provide the opportunity for presenting a greater diversity of divergent views. This project’s mixed-methods research design recognises the pluralism of the context and subjects’ experiences and attitudinal inclinations, and providing there is an overall coherence in the research project, actual structure and process of the research design may be kept flexible to accommodate practical contingencies.

This is not to suggest expediency over integrity. Consideration has to be given to the willingness of participants to engage in a particular mode of data collection. For
example, although the diary technique has been cited as useful in capturing the ‘meaningful processes and structures of personal relationships’ (Miell and Wetherall, 1998:41), and would seem appropriate for the study of trust, initial discussions with managers and potential participants of this project’s first pilot study revealed a definite resistance to keeping any form of diary-log given their busy work schedules. The conclusion for this researcher is that it is unlikely that a one-size-fits-all research methodology would suffice and the optimal discovery and understanding of the project’s subjects’ perceptual attitudes is probably best served by a deductive-inductive research design. Figure 4-1 below shows the structure of this project’s sequential research design. A fuller account of the actual research process is given in the following section.

4.1.2 Project research design

Figure 4-1: A sequential research design

Conceptual model drawn from various salient literatures (Chapter 3, Figure 3-1)

1. Phase one: quantitative (QUAN): Exploratory survey to develop a structural model representing the applied context

2. Phase two: qualitative (QUAL): Three case studies post survey. Series of in-depth interviews to collect individual perceptions and attitudes

3. Analysis and discussion of findings: (a) model fitting, (b) discussion of survey results, (c) revised conceptual model as guiding frame for categories and themes of the case data and discussion, and (d) comparison of results from the two phases for additional insights.

4. Amended model: A revised model of trust within the virtual team.
This is a single study, conducted in two sequential stages, driven primarily by the practical need to obtain prior agreement to be interviewed, and the epistemological strategy of using the richer interview findings to augment the survey results. The interview informants belong to three companies as part of the project’s multi-case design. The decision not to undertake a single case study is deliberate. The researcher’s own work experience and feedback from various early meetings with senior IT/telecommunications industry managers indicated that the structure and configuration of virtual project teams vary widely even within a single industry sector and so establishing an industry ‘standard’ is difficult. The three cases were chosen for their different structural and situational circumstances. Findings from these distinct cases should provide rich data with which to explore possible perceptual and attitudinal differences that will further illuminate the survey results.

Throughout the research, attention was given to preserving methodological assumptions and project coherence. Issues include the problem of a residual belief amongst some in the research community on the incommensurability of different research paradigms and the lack of a common nomenclature that would sufficiently bridge the gap between the two worlds. Moreover, there is a paucity of accepted guidelines in presenting mixed methods research. This ‘crisis of representation’ highlighted by Denzin and Lincoln (2000:16) is a challenge when writing and reporting this project. Aesthetics aside, the strategy of this project is to stay as true to the originating epistemologies, styles and forms of representation as possible by recounting each stage of the research process separately.

The initial cross-sectional survey is followed by in-depth semi-structured interviews. The aim is to gather data to test the ‘fit’ of the model proposed in Chapter Three and to compare the quantitative results with findings from the later interviews. Although not a longitudinal study, the two-staged design should provide an insight into any events or changes that may have a critical bearing on the team members’ feelings and perceptions of team integration and relations occurring between the initial cross-sectional survey and the interviews. Collecting data over a period requires that enough time can elapse between contact points to capture relational or situational changes, but without leaving it too long for the possibility of case losses through human behaviour
or organisational changes. As all the interviews are conducted by the researcher, it is also a practical necessity.

**Phase One (the survey):** The object of this project’s departure from the more usual practice of a qualitative-then-quantitative method is to formulate the research problem and derive a theory for testing by first evaluating existing literature rather than relying on subjective opinions. Although Saunders et al (2000) suggest approaching ‘experts’ or conducting ‘focus groups’, the lack of knowledge of the parameters for the virtual project population and the issues of access to very busy people precluded them as viable alternatives for this part of the research. Besides, focus group or team-based interviews are unlikely to be useful as individuals might hesitate to express openly their feelings and evaluations of their organisation and team members. Recent exploratory studies in virtual teams and virtual organisations by the researcher have yielded some initial insights (Appendix A.) Together with other established literatures, they provided the basis with which to construct the self-trust and interpersonal trust statements in sections one and two of the survey instrument. In Part Three of Chapter Two, the climate dimensions (Figure 2.4) deemed relevant for the modern team context coincide with Litwin and Stringer’s (1968) original dimensions of structure, responsibility, reward, risk, warmth, support, standard, conflict and identity. These climate dimensions were used in section three of the questionnaire. As the climate statements used by Litwin and Stringer were constructed at a time prior to virtual or dispersed working, the statements were adapted to match the modern context. A more detailed explanation of the questionnaire structure and question items/statements is available later in this chapter. The first draft of the study questionnaire was shown to two senior academics overseeing this researcher’s project and two senior project managers from industry for their comments before conducting the first pilot.

Concern over the lack of opportunity to correct misunderstandings or to probe deeper for further explanations in cross-sectional surveys is reduced by this study’s survey-then-interview design. Initial discussions with project managers had also highlighted the need to ‘incentivise’ participants. After careful consideration of the problem of possible bias, and balancing that with Easterby-Smith et al’s (2002:7) caution of the difficulty of persuading ‘powerful’ and ‘busy’ people to participate in any research
Phase Two (case interviews): The second of the two-stage research design located the survey respondents who had indicated their agreement to participate in the interview stage. Members from three distinct companies working on Information Technology/Information System (IT/IS) projects were identified and in each case, formal permission was obtained either from their senior project manager or the human resource director. The justifications of the use of a case-based approach as part of this project’s research design may be summarised as the following:

(1) Although there is a relative wealth of literature in each of the constructs of trust and climate, there is real paucity as far as relating the two in general and within the virtual team context specifically. Hence the body of knowledge as regards the understanding of the interplay between trust and climate is limited and warrants investigation for theory building.

(2) The research questions posed by this project in understanding why virtual teams continue to exist despite the apparent technical, management and relational difficulties and how trust can influence climate and output matches Yin’s (2003) suggestion that the case study is appropriate for ‘how’ and ‘why’ research questions.

(3) To uncover the contextual conditions of the virtual team and members’ perceptual constructions, there is a need to focus on meanings and to understand what is happening and why, and to develop through induction from the data, insights and an overview of the situation as a whole (Easterby-Smith et al 2002). Getting ‘close’ to the participants in a case will allow the researcher to glean and relate to the socially constructed reality of the participants (mindful, of course, not to disrupt their work routines or affect their social constructions).

(4) Apart from the sampling and related problems mentioned above, there are practical challenges when researching in the business environment which the researcher has little control – something identified by Yin (2003) as characteristic of a
case study. Easterby-Smith et al (2002) highlight some of these issues which are also relevant to this project:

- The way in which managers (and researchers) draw on knowledge developed by other disciplines
- The fact that managers tend to be powerful and busy people. Therefore, they are unlikely to allow research access unless they can see personal or commercial advantages
- The requirement for the research to have some practical consequence. This means it either needs to contain the potential for taking some form of action or needs to take account of the practical consequences of the findings.

The researcher’s concern for the generalisability of this project’s findings is reduced by Walsham’s (1993) argument that in conducting this kind of case-based research, the validity of extrapolation is not dependent on the representativeness of cases in the statistical sense; but on the plausibility and cogency of the logical reasoning used in describing and interpreting the results. Yin (2003) agrees, citing examples such as Allison and Zelikow’s (1999) *Essence of decision: Explaining the Cuban missile crisis*. Indeed, in Whyte’s (1943/1955) *Street corner society*, he argues that it is it possible to build theory from case studies since the reasons for studying a case is the same as those that underline an experiment.

**Level and unit of analysis:** Researchers in the trust and climate literatures struggle with the issue of measuring group-based value attributions. This problem was highlighted and discussed in Chapter Two and again, in this chapter. For the purpose of this study, the level of analysis from which interpretations of the study data and conclusions are drawn is at sub-unit or team level of an organisation. The unit of analysis (or case) and the unit for coding is the individual whose personal history and lived experiences conceive the team climate. Epistemologically, the problem of research being too individualistic is centred on the argument that the grouped or aggregated results of individual variables are still only a collection of individual scores and not a true representation of group characteristics. Yet, Patton’s (2002:448) golden rule for constructing cases is: “No matter what you are studying, always collect data on the lowest level of unit of analysis possible....”
Gultung (1967) counsels that sampling individuals to get a holistic picture is methodologically sound only if there is true homogeneity since individuals tend to respond to surveys and interviews as individuals. While this is prima facie a problem for this project since team literature suggests that there is decreasing homogeneity in the modern virtual form, a closer examination in fact justifies the decision to sample at the individual level. By recognising that there are selectivity processes at work in any social setting, the concept of a truly random sampling process that is representative across the whole population is debatable in any case. Besides, Gultung has conceded that an individualist survey may be realistic in societies that are highly individualistic and/or when there is a high rate of individual mobility, geographically, horizontally or vertically. Since team variability and individual mobility are features of the virtual project team, they support this study’s micro-level design choice. Moreover, one of the key questions asked in this research is the likelihood and manner of a shared group identity for the modern virtual team. Given their temporal and distantiated characteristics, members’ differing cultural, educational and social histories, any attempt to treat the group as a homogenous whole is suspect. Asch’s suggestion of a whole-part relationship where inter-subjectivity of meanings is achieved without actors being absorbed is a strong indicator that researching the team starts with the individual.

Figure 4-2: Method and data triangulation for this project
Figure 4-2 shows the sequence of data analysis. Data analysis and interpretation were conducted in the first instance, with respect to their own paradigmatic preferences. Quantitative techniques were used to analyse the survey data for inferential statistics and trends, and qualitative techniques of coding and thematic analyses were used to analyse the interview data. The findings from the two data sets were then compared and discussed for convergence as well as possible explication of additional observations from the survey that are beyond its scope.

In summary, although deductive in process when assimilating the two sets of data, the core epistemological lens for analysis and inference is interpretative. Insights gained as a result should inform and aid the revision of the research model. Testing of the amended model is beyond the scope of this thesis. Step four of the research design is limited to presenting an amended model for future research. Parts Two and Three of this chapter detail the development and piloting of the questionnaire and introduction of each case and access.
CHAPTER FOUR

METHODOLOGY (PART TWO)

4.2 The survey

Although there is an abundance of literature, theoretical narratives and empirical works on the individual constructs of this research project, the researcher was unable to locate studies directly relating trust to climate in the virtual team working context. Accurate parameters for the population are also lacking since there is no ready-access sampling frame that one could refer, nor any existing classification/typology of 'ideal' firms that are known to operate virtual teams. Therefore, rather than adhering to the traditional sampling approach of pre-defining the population, the sample size and sampling method for this study is, by necessity, a variant mix of the traditional and a more iterative approach.

The UK Association for Project Management (APM) was approached for their agreement to post on their web-site, a notice of the research and a link to the web-questionnaire and to include an invitation to participate in the research in their practitioner magazine, *The Project Manager*. Aside from non-sampling error (such as non-coverage and non-response), it is recognised that the anticipated response rate from this form of self-select sampling is unlikely to be high and those who respond, do so because of their own particular interests or opinions in the research. Large 'solutions' companies operating within the information, communications and telecommunications services sectors that are known by the researcher to operate virtual project teams and are also corporate members of the APM, were approached directly for permission to conduct the study. Of the organisations that expressed their agreement to participate, three were selected on the basis of their distinctiveness from one another in terms of the strategy for their virtual operations. Their size, reputation and economic positioning qualify them as 'critical cases' (Patton, 2002; Yin, 2003).

An advantage of this second judgement sampling method⁴ is that once permission is given by the company and support by internal management is evident, individuals are

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⁴ In management research, convenient sampling and deliberately subjective, judgement sampling are more common than probability sampling (Bryman 1989:113-4; Royer and Zarlowski 2001:151).
more motivated to participate. This proved particularly important for the second phase of the study when requests for access for personal interviews were made. Although snowballing or judgemental sampling is unlikely to meet the equiprobability rule of randomised selection, it allows the project to reach a target population whose membership is difficult to identify, and the simple selection criteria enable dissimilar or heterogeneous variations for the desired high internal validity\(^5\). Accordingly, the goal for the survey phase of this study is to acquire a sample size suitable for statistical analysis rather than to achieve homogeneity in the sample. Theoretical inference should be possible on the basis of logical reasoning and when supported by detailed qualitative analysis of the participating cases (Patton, 2002).

4.2.1 Sample size
For the reasons cited above, it was not possible for this study to adopt a truly random sampling approach. Every effort was made to achieve a response size for the survey phase that would provide a suitable base for the elected statistical tests. The actual process was slow and difficult to hurry along, being dependent on APM website surfers and journal readers, and workers from targeted companies first noticing the invitation to participate, and then actually exercising their interest by completing the questionnaire.

The aim is to use structural equation modelling because of the inter-related nature of the hypothesised variables. Reference to SEM literature has revealed that small samples are prone to yield unreliable results. Despite a general agreement among the numerous research communities that a large sample size is preferable to a small sample size for better precision and confidence, opinions on the minimum required sample size vary. For example, while Alreck and Settle (1995) suggest one hundred as a minimum sample size, Sekaran (2003) argues that an acceptable sample size may range between 30 and 500. Hair et al (1998:11) caution that although larger sample sizes increase the power of statistical tests, there is a danger of ‘too much’ power. This can result in oversensitivity to the point of almost any effect is significant, and

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\(^5\) Cook and Campbell (1979) suggest that when testing a relationship in a situation where it is difficult to select random samples large enough to provide significant external validity, then the deliberate inclusion of dissimilar elements can actually aid generalisation, the usual condition of a homogeneous sample is thus considered less critical with this study.
extra vigilance is required with sample sizes that exceed 200 to 400 respondents (p.23). Oppenheim (2001) opines that if the research objective is to compare across groups, a small sample is less problematic. Fowler (1993) emphasises the absolute size of the sample rather than the proportion of the population as the nature and quality of the sample and collection techniques employed have a greater impact on the relative error. Fowler also questions the ability of survey researchers to predict in advance, the level of precision. Bryman (2004) concurs and argues against being overly concerned about sampling error as it is only one of many possible errors. Although Wan et al (1996) suggest that the minimum sample size for Maximum Likelihood is 100 to 150, a sample size of 200 is suggested as ‘practically reasonable’ (Chou and Bentler, 1995:47) and as it is also the cut-off used in Hoelter’s critical N calculations for sample size adequacy, 200 was deemed the minimum sample for this study.

4.2.2 Questionnaire design and development

The main object of the survey is to provide preliminary data on the study’s research questions and to serve as a base for model development and further qualitative investigation. Its design and content follows largely what Black (1999: 220) has identified as the logical or rational approach:

Theory → concept → constructs → question set [→ pilot]6

The original questionnaire7: An initial 5-part English questionnaire was constructed using attitude statements to capture participants’ dispositional responses to their surroundings and other people.

Section 1 (13 items, 7 text-boxes) collected data on the individual’s current work assignment, i.e. the type of team, his formal role in the team, team composition, current project status, the extent of technology use, etc. This yielded two sets of data – those who are working in conventional teams and those working in virtual teams.

6 Parenthesis added by this researcher
7 The final questionnaire used for the actual survey is in appendix A.
Respondents showing that they are working mostly on conventional face-to-face projects would be disregarded for this project.

Section 2 (55 items) had its focus on the respondent’s perception of the social system in which he works, i.e. the team climate. The instrument followed Litwin and Stringer’s (1968, Form B) a priori scales of structure, responsibility, reward, risk, warmth, support, standards, conflict and identity. Although the instrument was designed back in the late 1960s and fashioned in the structuralist perspective, the nine dimensions first isolated “for organisations functioning primarily around a task or group or task” (p45) appear to be relevant today (see discussion in Chapter Two, section 2.3.5). The statements for each dimension were adapted to fit the modern context. Primarily, all direct references to ‘organization’ in the original questionnaire were replaced with ‘team’ and while preserving the essence of each statement, they were re-stated to be more specific to project team working.

Section 3 (22 items) extended on the identity dimension of the previous section by collecting data on the respondent’s trust disposition including his reaction to strange and new surroundings or events, his need for organised routine or structure, a self-assessment of his own self-confidence etc. and his orientation towards his team members, its impact on his inclination to identify with his team and his perception of the degree of inter-personal trust in the group.

Section 4 (19 items) examined the perceived team behaviour and performance. It collected data on the respondent’s perception of his team’s professionalism and commitment, his job satisfaction level, his intention to continue his association with the team or organisation, and assessment of his own performance /contribution given the stated feelings/attitudes towards his work role and team.

Section 5 (8 questions) collected the personal/demographic data of the respondent (age, gender, education, professional association etc).

Willingness to participate in phase two: The final section asked the respondents if they would consent to be interviewed.
Scalin: The scales and scale items for this study were drawn from the salient issues identified in the various literatures and early related studies. Sections 1 and 5 collected categorical data about the respondent’s role, project type and status, and personal demographic characteristics. Sections 2, 3 and 4 consisted of percept/attitude statements anchored on a 5-point, agree-disagree, Likert (1932: 44-53) scale. The use of a scale to measure attitudes is based on the assumption that an attitude is a unique value held by an individual on a continuum of possibilities or scale. Each statement is assumed to represent an aspect of a common attitudinal domain. According to Nunnally (1978), the Likert scale is an ideal measurement of attitudes since it captures the intensity of respondent’s feelings. The items are scored 1, 2, 3, 4 and 5 (1 = ‘definitely agree’, 2 = ‘inclined to agree’, 3 = ‘neither agree nor disagree’, 4 = ‘disagree’ and 5 = ‘definitely disagree’). The sum of scores of the items in a scale is the scale score. The choice of a 5-point scale is deliberate: (1) as a precaution, in anticipation of a small number of responses, and (2) for consistency and to avoid confusing respondents since the adapted climate statements from Litwin and Stringer are already structured in a 5-point Likert-scale.

This summated rating method for measuring attitudes is simple to administer and easy to understand for respondents. For the researcher, it is easy to code and categorise the data; although it is accepted that the ratings are essentially ordinal rather than interval scales. This would leave us with only rank-order preferences, but not the magnitude of the difference in preferences (Sekaran, 2003). However, faced with intra- and inter-subjectivity issues, social science and market researchers have tended to treat Likert-scales as interval scales (Aaker et al 2001; Bryman and Cramer, 2001). That is, although identical scores do not automatically reflect the same potency in attitudes, feelings or perceptions, they do serve the function of dividing people roughly into groups by their attitudes and allow us a window into how one attitude relates to another. This appears to be the approach adopted by Litwin and Stringer in their climate study.

The main difference between Litwin and Stringer’s study and this research is epistemological. The original authors’ paradigm position saw structures as ‘real’, that people react to their environment and their performance is constrained by the underlying structural systems. This project’s inclination lies somewhere along the
critical realism-social constructionist continuum. It argues for the importance of history on subjectivity, that structure is situational and a subjective projection, while reality and meanings are personal mental constructions which can serve to act as constraints on choice and action. The person and the social context are mutually bound together and actors construct their group membership and relationships with one another, and ‘negotiate’ a level of consensus of commitment and understanding for economic and social cooperation. Litwin and Stringer, and many of the other climate researchers, did not examine personal circumstances in their research. This divergence is also a reason for further qualitative analysis, post the survey. The principle of triangulation through the use of different data collection methods is well accepted (Denzin, 1978; Jick 1979); in this instance, the later qualitative phase was used to augment the data collected by the initial questionnaire, and to provide additional insights which the cross-sectional survey was unable to provide.

4.2.3 First pilot: pre-testing the questionnaire

The first pilot was conducted in June 2003 by approaching two project units through personal contacts. Both organisations were judged to share similar characteristics to the main enquiry in that they are technology oriented, project-based organisations. The question of whether the two groups (conventional and virtual teams) should be drawn from the same sample population was deliberated. The lack of prior knowledge of the types of project or project organisational structures necessitated a single questionnaire offering the respondent the opportunity to self-select his group, based on his own rating of the majority of time spent on a current project. Definitions of conventional team and virtual team were included to guide the respondent.

The pilot questionnaire was formatted as a Microsoft Word document and emailed as an attachment to the team leader for distribution with a request for feedback on:

a. How long would it take to complete the questionnaire
b. Whether the questions were clear and unambiguous
c. Whether the format and layout of the questionnaire were easy to follow and comprehend, e.g. if the text boxes were large enough
d. If there were questions that might offend
e. Any other feedback or comments
After much gentle coaxing and reminding a total of 12 completed questionnaires were returned, of which only 10 were complete and evaluable. A summary of the email comments is shown in Figure 4-3.

Figure 4-3: A summary of Pilot 1 feedback

<table>
<thead>
<tr>
<th>a. The time taken to complete a questionnaire</th>
<th>Between 20 - 25 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Clarity of questions</td>
<td>Generally no problem, except for repetition of some of the questions ('double' questions). Respondents were unhappy about having to answer the questions again.</td>
</tr>
<tr>
<td>c. Format and layout of instrument</td>
<td>The Word document was viewed as an inappropriate mechanism for electronic delivery, especially the tick boxes which could not be 'ticked' and all felt that the text boxes were too small and required too much time to complete.</td>
</tr>
<tr>
<td>d. Possibility of offence</td>
<td>None</td>
</tr>
<tr>
<td>e. Other comments/feedback</td>
<td>There were typographical errors. The instrument was seen as too lengthy and took too long to complete. One respondent said that he 'had lost the will to live' by the end of the questionnaire! The question of confidentiality or anonymity was raised as essential to allow full and unreserved participation.</td>
</tr>
</tbody>
</table>

**4.2.4 First amended questionnaire**

The application of the initial pilot study was to get comments on the face validity of the questionnaire. Only the qualitative comments were considered and no statistical analysis was undertaken. In response to the first pilot feedback, various steps were taken to amend the questionnaire:

Firstly, to address the negative comments from the pilot respondents on 'double questions' (which were included by the researcher to increase the validity of the attitudinal statements), repeated questions appearing in the same sub-section were removed to avoid non-response. Additionally, to reduce the time that it would take to complete the questionnaire, it was decided that with the exception of the questions in the section covering the key constructs of 'self-identity' and 'interpersonal trust'
(being new and drawn from the literature), the remaining sections should not contain more than five questions. This should still meet the preferred criterion for greater reliability of a multi-item set of questions for each attitude dimension (Himmelfarb 1993).

Secondly, a thorough review of the open-ended questions was conducted. Some of the text boxes were deleted as they provided mainly descriptive information which, when removed, would not affect the integrity, depth or validity of the study. Other questions requiring free-text answers were removed on the basis that they could be posed at the qualitative stage of the study.

Thirdly, the original word-questionnaire was transformed into a HTML form and placed on the University of Surrey, School of Management’s staff profile webpage. This would enable the web-link to be emailed to target respondents along with an explanation of the reasons and aims of the study. Selection of the Likert scale questions would require only a click of the mouse. This should help reduce effort and time for respondents. As the questionnaire is targeted at specific avenues, this should meet the operating ‘netiquette’ of not sending junk mails or ‘spam’ (Saunders et al 2000:309). Every effort was exercised to make pre-contact to warn respondents of the impending arrival of the web-survey. There was still the issue of anonymity since the returning questionnaires could be identified by their email addresses. This matter was dealt with, at least in part, by deliberately structuring the questionnaire and the respondent’s details as two separate submissions. A respondent on completing a questionnaire could tick ‘no’ for further contact and elect not to submit his personal details and email address. The limitations imposed by the possibility of response bias for online surveys and likelihood of a non-representative sample are acknowledged (Coomber 1997).

Finally, on reflection of the telephone conversations with two of the pilot respondents who had kindly given their contact numbers, it was decided that the structure of the questionnaire should follow the proposed interpretive model of trust, climate and behaviour to maintain respondents’ interest and for easier interpretation. As regards the concern that the questionnaire was too long, the main challenge facing this researcher was the desire to remain true to the dimensions or ‘environmental factors’
used to conceptualise and measure climate in the Litwin and Stringer’s survey (Form B). Eventually, the total line items were reduced from 118 (excluding the final section asking for willingness to participate in the second part of the study) to 98.

The revised questionnaire to be used for the second pilot was formatted as below:

Section 1 (13 items plus 4 text-boxes) collected data on the respondent’s current work assignment.

Section 2 (20 items) collected data on respondent’s attitude on self-identity and interpersonal trust

Section 3 (45 items) collected data on respondent’s climate perception operationalised as structure, responsibility, reward, risk, warmth, support, standards, conflict, group identity.

Section 4 (15 items) collected data on respondent’s perception of team members’ behaviour and performance.

Section 5 (5 items) collected data on the personal/demographic data of the respondent (age, gender, education, ethnic origin and employment status)

Willingness to future participation: From early conversations with the project managers from various companies, it became clear that guarantee of anonymity is paramount. This was also a concern raised in the first pilot about the need for anonymity. Issues about possible ‘faked’ results from a fear of being identified or from the need to accede to the common social view would be overcome by ensuring greater privacy. In the first pilot survey questionnaire, this section asking respondents if they were willing to participate in the qualitative phase of the research, had formed part of the questionnaire, it would now be submitted separately. The downside is that the researcher no longer can identify or link a completed form to any specific individual unless the respondent chose to give personal details and his/her email address, but it did give the respondent anonymity and control over future participation.
4.2.5 Second pilot: testing the amended questionnaire

A second pilot study was performed with an aim to confirm once again the face validity and thoroughness of the revised questionnaire, and to evaluate the internal consistency of the scales. Through personal contacts, the project leaders from three other qualifying organisations were approached by email.

As with the first pilot, the companies chosen for the second pilot are project-based organisations with teams that are actively engaged in various projects. A short synopsis of the research question, the study’s aims and objectives, and assurance of privacy together with the web-link (http://www.som.surrey.ac.uk/phdsurvey/) to the revised and re-formatted instrument were emailed to the team leaders for onward distribution with a request for feedback along the lines of the first pilot. A total of 24 responses were received between 12th August and 23rd September, 2003. Figure 4-4 shows the qualitative feedback to the face validity questions.

Figure 4-4: A summary of Pilot 2 feedback

| a. The time taken to complete each web-questionnaire | Between 10-15 minutes. |
| b. Clarity of questions | Generally no problem. The questionnaire had asked respondents to select a project which required a majority of their time, three participants highlighted that it was difficult to keep focused on a single project when answering the questions. |
| c. Format and layout of instrument | There was consensus that the questions were very ‘thorough’ and ‘easy to follow’, although two participants suggested the need for greater attention to ‘risk’. |
| d. Possibility of offence | None |
| e. Other comments/feedback | The remaining typographical errors were identified. The question of confidentiality or anonymity was still a concern for the respondents. Of the 50% (12) who had declined to participate further, 7 of them actually withheld their names and contact details. |
The time required to complete the revised questionnaire appeared to be more acceptable to the busy project members and remaining typographical errors were identified. It was reassuring to know that respondents had felt the questionnaire 'thorough' and 'easy to follow', with none of the questions likely to offend in any way. The suggestion that there should be a greater focus on risk was noted. To avoid increasing the length of the questionnaire again, this aspect would be incorporated into the interviews stage. Respondents' concern with confidentiality was also noted and a more strongly worded assurance would be drafted in the covering email to the companies. At the qualitative phase, each interview would begin with a reiteration of privacy and that only summary reports of findings would be shown in the thesis and made available to the participating teams if requested.

4.2.6 Reliability and internal consistency

Another reason for the second pilot was to establish the reliability and internal consistency of the study instrument to ensure that it measured the constructs as intended and in a consistent manner. Cronbach’s Alpha (Cronbach 1951) was used for this purpose as it has become the method of choice for social science research (Bryman and Cramer 2004; Oppenheim 2001; Peterson 1994) and the survey’s small scale structure also precluded the use of split-half reliability test. Although the rule-of-thumb reliability value is 0.70 or higher, studies have shown that the number of items, the degree of correlation between the items and the number of dimensions of the concept being studied can impact the alpha value (Cortina 1993; Kopalle and Lehman 1997, Peterson, 1994). Cronbach values can also be quite small when only a few items are used in the scale - say less than ten (Pallant 2001). Individual preferences can also affect the alpha value in a small sample (Black 1999). These exceptions are important to the current study as the questionnaire is not a pre-validated instrument, and has a reduced number of items for each of the climate dimensions (5 statements each) subsequent to the first pilot. As neither Nunnally’s 1967 recommendation (suggesting a range of 0.50 to 0.60) nor 1978 recommendation (suggesting 0.70) of acceptable Cronbach’s alpha values has any theoretical or empirical basis, or analytical rationale (Kent 2001: 221), and given this study’s intentional heterogeneous cases and the hypothetical premise of diversity in trust and climate attitudes between those working in conventional, co-located environment and
those working in a virtual context, results below 0.70 should not worry the researcher excessively.

The results of the Cronbach’s alpha test on the ungrouped items are shown below in Table 4-1. The Cronbach’s alpha values for the larger self-identity (8 statements, $\alpha = 0.61$) and for inter-personal scales (12 statements, $\alpha = 0.66$) in Section Two of the questionnaire indicated acceptable levels of reliability and consistency. The scale internal consistency for the summated self-identity and interpersonal trust registered a Cronbach’s alpha value of 0.73.

Table 4-1: Pilot 2 Cronbach’s alpha coefficients for inter-item scores

<table>
<thead>
<tr>
<th>Scale</th>
<th>No. of cases</th>
<th>No. of items in scale</th>
<th>Cronbach’s alpha</th>
<th>Cronbach’s alpha for summated dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-identity</td>
<td>22</td>
<td>8</td>
<td>.6062</td>
<td>0.7289</td>
</tr>
<tr>
<td>Inter-personal trust</td>
<td>23</td>
<td>12</td>
<td>.6638</td>
<td></td>
</tr>
<tr>
<td>Climate: structure</td>
<td>24</td>
<td>5</td>
<td>.5814</td>
<td></td>
</tr>
<tr>
<td>Climate: responsibility</td>
<td>24</td>
<td>5</td>
<td>.7473</td>
<td></td>
</tr>
<tr>
<td>Climate: reward</td>
<td>24</td>
<td>5</td>
<td>.6799</td>
<td></td>
</tr>
<tr>
<td>Climate: risk</td>
<td>24</td>
<td>5</td>
<td>.4262</td>
<td></td>
</tr>
<tr>
<td>Climate: warmth</td>
<td>24</td>
<td>5</td>
<td>.4954</td>
<td></td>
</tr>
<tr>
<td>Climate: support</td>
<td>24</td>
<td>5</td>
<td>.7151</td>
<td></td>
</tr>
<tr>
<td>Climate: standards</td>
<td>22</td>
<td>5</td>
<td>.5718</td>
<td></td>
</tr>
<tr>
<td>Climate: conflict</td>
<td>24</td>
<td>5</td>
<td>.7034</td>
<td></td>
</tr>
<tr>
<td>Climate: group identity</td>
<td>24</td>
<td>5</td>
<td>.7841</td>
<td></td>
</tr>
<tr>
<td>Behaviour: members’</td>
<td>24</td>
<td>5</td>
<td>.6736</td>
<td>0.621</td>
</tr>
<tr>
<td>professionalism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviour: team cohesiveness</td>
<td>23</td>
<td>5</td>
<td>.7866</td>
<td>0.457</td>
</tr>
<tr>
<td>Behaviour: own performance</td>
<td>24</td>
<td>5</td>
<td>.5404</td>
<td></td>
</tr>
</tbody>
</table>
The statements in own performance were dichotomous in nature to the percept statements in team members’ professionalism and team cohesiveness; the latter two being subjective projections of others’ intentions and behaviours against a subjective evaluation of one’s own performance and contribution to the team. This difference is important in understanding how the self can affect the social construction of the group. The low reliability indicator is to be expected since the perceptions cannot be easily replicated with the passage of time or when circumstances have changed. At this stage, the questionnaire aims only at collecting perception tendencies, but the interview phase should elicit deeper explanations of changes in participants’ perceptions. From the above, it was surmised that the study’s revised instrument is reliable and consistent as measured by Cronbach’s coefficient alpha.

Table 4-2: Pilot 2 means and one-way analysis of variance (ANOVA) of self identity, interpersonal trust, climate and behaviour scores for conventional and virtual projects

<table>
<thead>
<tr>
<th>Scale</th>
<th>Items</th>
<th>Conventional Structure (N=10)</th>
<th>Virtual Structure (N=14)</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-identity</td>
<td>8</td>
<td>15.20</td>
<td>17.75</td>
<td>2.016</td>
</tr>
<tr>
<td>Interpersonal trust</td>
<td>12</td>
<td>22.22</td>
<td>26.79</td>
<td>4.048*</td>
</tr>
<tr>
<td>Climate structure</td>
<td>5</td>
<td>10.70</td>
<td>12.43</td>
<td>2.465</td>
</tr>
<tr>
<td>Climate responsibility</td>
<td>5</td>
<td>10.20</td>
<td>11.21</td>
<td>1.048</td>
</tr>
<tr>
<td>Climate reward</td>
<td>5</td>
<td>13.80</td>
<td>16.00</td>
<td>5.282*</td>
</tr>
<tr>
<td>Climate risk</td>
<td>5</td>
<td>14.20</td>
<td>13.14</td>
<td>1.202</td>
</tr>
<tr>
<td>Climate warmth</td>
<td>5</td>
<td>13.00</td>
<td>13.21</td>
<td>.0420</td>
</tr>
<tr>
<td>Climate support</td>
<td>5</td>
<td>10.80</td>
<td>12.79</td>
<td>4.776*</td>
</tr>
<tr>
<td>Climate standards</td>
<td>5</td>
<td>10.25</td>
<td>12.57</td>
<td>6.034*</td>
</tr>
<tr>
<td>Climate conflict</td>
<td>5</td>
<td>12.60</td>
<td>12.86</td>
<td>.0630</td>
</tr>
<tr>
<td>Climate group identity</td>
<td>5</td>
<td>8.50</td>
<td>10.64</td>
<td>2.521</td>
</tr>
<tr>
<td>Behaviour members’ professionalism</td>
<td>5</td>
<td>8.70</td>
<td>11.14</td>
<td>4.406*</td>
</tr>
<tr>
<td>Behaviour own performance</td>
<td>5</td>
<td>11.00</td>
<td>10.21</td>
<td>0.705</td>
</tr>
<tr>
<td>Behaviour team cohesiveness</td>
<td>5</td>
<td>14.00</td>
<td>13.79</td>
<td>4.882*</td>
</tr>
</tbody>
</table>

p <0.05*
Although only the data for virtual projects respondents would be processed and analysed for this project, Table 4-2 depicts the means and one-way analysis of variances of factors (ANOVA) for conventional and virtual projects. The significant F-ratios (p<0.05) reported indicate members’ experiences are different between conventional projects and virtual projects. They could be an early indication of the plausibility of the hypothesised relationships in this study. An examination of scale independence was also conducted. The conclusion from the second pilot is that the apparent convergence between the various constructs indicated completeness and quality rather than a mere overlap of the variables in measuring the intended phenomena or concepts. Accordingly, the questionnaire for the second pilot was used in the actual study and was uploaded onto the researcher’s personal page on the University of Surrey, School of Management website (see Appendix A):

http://www.som.surrey.ac.uk/phdsurvey/

4.3 Analysis of final data using structural equation modelling

The invitation to participate in the actual survey was posted on the Association for Project Management website and responses started to arrive between January and March 2004. The principal method used to analyse the final data consisting of 226 responses for the quantitative phase of this thesis is structural equation modelling (SEM). SEM is an extension of the general linear modelling (GLM) method. The key advantage of SEM is that it can incorporate both observed and unobserved (latent) variables, and that dependent variables can also act as predictor variables. The more popular or widely used packages are: AMOS –Arbuckle, 1997; 1999; EQS- Bentler, 1995, 2000; LISREL – Jöreskog and Sörbom, 1989, 1993, and Mplus – Muthén and Muthén, 1998.

SEM’s relevance for this thesis lies in its ability to explain variance in the dependent variables that are effectively latent constructs and cannot be observed or measured directly. The self-report responses are attitudinal scores which serve as manifest or observed variables of the underlying unobserved or latent constructs that are of interest to this study. However, the attitudinal and trait-based nature of the latent variables makes it difficult to achieve a clear and distinct set of measurement indicators. In addition, the thesis’ hypothesised relationships between independent-
dependent variables are complex, untried and untested. SEM allows the researcher the ability to investigate the whole phenomenon through simultaneous tests of model fit as well as individual parameter estimates. Another reason for using SEM is that conventional regression analysis assumes a unit weighting for each of the indicators of a theoretical construct, and that they contribute equally to the composite. SEM allows unequal weightings for the multiple indicators of a latent construct, and produces standard errors and \( t \)-values for each path coefficient; thus enabling the researcher to test for strength and significance of hypothesised relationships. Similarly, unlike orthogonal exploratory factor analysis (EFA) which assumes factors and errors to be uncorrelated and relies on factor rotation methods to achieve a simple structure where each measure is loaded mainly on one factor, factorial analysis in SEM loads the indicators designed a-priori to measure a certain construct on that construct and restricts their loading on other factors. Through a series of goodness-for-fit tests, the researcher is then able to identify the indicators that most explain each of the model’s latent constructs.

This thesis used the specialist programme called AMOS version 5.0 (‘Analysis of Moment Structures’, meaning analysis of mean and covariance structures) as it is fully compatible with the established SPSS statistical package used to produce the study’s descriptive statistics. Compared with the more established LISREL, AMOS is a flexible, easy-to-learn and user-friendly specialist SEM software package. Its graphical interface (AMOS Graphics) for model specification direct from a path diagram is easy-to-master for the novice SEM researcher.

Although critics (e.g. Hayduk and Glaser, 2000; Mulaik and Millsap, 2000) argue against adopting a step-by-step approach to SEM, Hair et al’s (1998) seven-stages of SEM was helpful as a methodical guide for this new SEM practitioner: (1) developing a theoretical model, (2) constructing a path diagram of causal relationships, (3) converting the path diagram into a set of structural and measurement models, (4) choosing the input matrix type and estimating the proposed model, (5) assessing the identification of the structural model, (6) evaluating goodness-of-fit criteria, and (7) interpreting and modifying the model, if theoretically justified. Results were interpreted and reported along the lines suggested by Hoyle and Panter (1995). Taking each step in turn, the approach for data analysis and model testing for this project is
explained below. More detailed explanations directly relevant to the statistical computations are given in the results chapter (Chapter Five).

4.3.1 Theoretical model
The hypothesised relationships were initially depicted as a conceptual model (Figure 3.1) in the theory chapter. The relationships are interrelated in that dependent variables are also independent variables for subsequent dependence relationships and have direct or indirect effects on the performance and behaviour outcomes. A graphical representation of the theoretical relationships can be seen from the path diagram in Figure 4-5 below.

4.3.2 The path diagram
The path diagram is a schematic representation of the latent variables in the conceptual model. When converted to the SEM model, it is the graphical alternative to the mathematical representation. The detailed measurement models and discussions are presented separately in the analysis chapter (Chapter Five).

The normal convention in path diagrams is to have observable indicators shown in the path diagram as square or rectangle nodes (for this study, they are the questionnaire items). The latent, unobserved constructs are represented as oval or round nodes (representing the key constructs of trust, self-concept, climate, cohesiveness and outcome/behaviour evaluations). When modelling in AMOS, both measurement errors and residuals are depicted as circled enclosures. Errors arising from the observed variables are measurement errors which reflect their inadequacy in measuring the related constructs or factors. These are also shown as eclipse or round nodes. Exogenous variables are criterion or source variables which are left unmodelled. Associated with each endogenous or dependent latent construct is the residual (e) which reflects the error in the prediction of endogenous factors from exogenous factors.

The endogenous or dependent constructs for this study also act as independent or predictor constructs. That is, the distinction between dependent and independent variables is not so clear cut as in simple linear regression models. A straight arrow →
shows a hypothesised direct causal relationship from one variable to another. A curved, double headed arrow \( \leftrightarrow \) indicates a correlation or covariance between two exogenous variables. Intervening or mediating variables are also involved in this project, where the mediating variable is a dependent variable with reference to the independent variable, but is itself an independent variable with reference to the dependent variable. Therefore, the total effect of the independent variable is the sum of direct and indirect effects on the ultimate dependent variable.

The path coefficients of the relationships between the variables represent the magnitude of expected change in the observed variables for every change in the related latent variable or factor. These may be reported as unstandardised or standardised estimates. Unstandardised parameter estimates retain the scaling information used in the survey instrument and therefore, cannot be used to compare across data sets. They measure the number of units change in the dependent variable per unit change in the independent variable. Standardised parameter estimates are transformations of the unstandardised parameter estimates by removing the scaling information and using standard deviations change rather than units change. For the purpose of this project, model estimations and discussions in the results chapter are based on the covariance matrices, but as they retain the original scaling information and are not so easy for the reader to follow, graphical model depictions are presented using standardised correlation matrices.

Figure 4-5 transforms the initial conceptual model into a path diagram, showing the hypothesised causal relationships of latent variables in the study tapped through observed measures (not illustrated here) that are intended to operationalise them. To avoid overcrowding, only the latent constructs are shown.
Figure 4-5: Path diagram showing the hypothesised latent relationships.

4.3.3 Model strategy

The aim of this thesis is to understand the bases for trust and identification and their transition from a dyadic to group-based phenomenon as represented by team cohesiveness, thus implying a longitudinal research design to examine the effects of stability and change. However, practical limitations in locating and accessing virtual teams meant that only a cross-sectional survey was conducted in the first instance and follow-on qualitative fieldwork undertaken only upon gaining the survey respondents’ agreement to participate further. It could be argued that the time-lapse between the initial survey and the subsequent interviews is effectively a longitudinal design. Nonetheless, the lack of panel data precludes a true longitudinal SEM model strategy. Instead, this project follows Wright’s (1934) argument that:

The method of path coefficients is not intended to accomplish the impossible task of deducing causal relations from the values of correlation coefficients. It is intended to combine the quantitative information given by the correlations with such qualitative
information as may be at hand on causal relations to give a quantitative interpretation (p.139).

Although starting from an a-priori model drawn from the literature and other existing studies, this project’s strategy is one of model development rather than a strict confirmatory model strategy. Hence, using the cross-sectional data the theoretical model was tested for ‘fit’ or plausibility to produce a model that is representative of the sample data and capable of further testing. The data from the second stage in-depth interviews could then be analysed for the effects of stability and change on the model constructs, and used to elaborate the survey findings.

4.3.4 Measurement model

The measurement model defines the relations between the observed and unobserved variables by creating a link between scores on the survey instrument (i.e. the observed indicator variables) and the underlying constructs that they are designed to measure (i.e. the unobserved latent variables). When the measurement model is successfully estimated, this leads to the structural model which defines the relations among unobserved variables – how change in one latent variable directly or indirectly affects (‘causes’) changes in the values of one or more other latent variables in the models.

In this study, having defined an initial theoretical model (Figure 3-1) and represented it in a path diagram (Figure 4-5) the next stage is to link the operational definitions of the constructs to theory for empirical testing. Using the path diagram as a guide, each endogenous variable can be predicted either by the exogenous variables or by other endogenous variables. For each hypothesised effect, an estimate is computed of the structural coefficient, including an error term (ε) which is the sum of the specification and random measurement error, since they are not easily distinguishable. Although item-reliability was performed and reported on the second pilot, a factor validity of scores would be the basis for determining the most appropriate indicators for each construct. Care was taken to ensure that changes made were substantive rather than just for a better empirical fit.
4.3.5 Model fit and significance testing

The extent to which the hypothesised model (Σ) is similar to the sample data (S) is known as the 'fit' or 'goodness of fit'. The plausibility of a model (i.e. the fit) is established through significance testing of the discrepancies between observed and predicted relationships among measures; the aim of which is to try to leave as little of the residuals unexplained as possible. The AMOS default for estimation of parameters is the maximum likelihood (ML) method, which tends to assume a large sample size, a continuous scale structure, multivariate normality of observed or manifest variables, and that the hypothesised model is valid (West et al, 1995). This could present a problem for this project with its modest sample data (226) but practical difficulties of access and willingness to participate preclude replication. The researcher’s own work and time pressure is another limiting factor. Therefore, the most direct way of assessing model plausibility is adopted; fit is evaluated using a series of significance and discrepancy tests, and comparison between nested models.\footnote{Models are said to be nested if two or more of the models share equivalent free parameters except for a subset of free parameters in one of the models which are constrained or fixed in the others (Maruyama, 1998:235)}

Model evaluation would be done in stages as suggested by Jöreskog (1993:313):

1. Separate estimation of measurement model for each construct
2. Estimation of pair of constructs, two by two, before estimating the measurement model for the entire structural model
3. For each measurement model, assess overall fit followed by detailed assessment of fit
4. Model respecification

SEM researchers have provided numerous comparative fit indexes (e.g. Bentler and Bonett, 1980; Bollen, 1986; Hu and Bentler, 1995; James et al, 1982; Jöreskog and Sörbom, 1989; Wheaton et al, 1977; etc.). Given the vast array of fit indices, it is neither practical nor feasible for this project to use every possible model fit test. The process adopted for model evaluations and determining the ‘critical value’ for each
Measuring absolute fit. The indices examine the difference or absolute discrepancy between the variances and covariances of the implied model and those of the sample, and therefore is more a measure of ‘badness of fit’, with optimal fit at zero:

- Minimum-Discrepancy (CMIN) representing the chi-square ($\chi^2$) likelihood statistic: If the value is large and the probability value ($p$) is below .05, the model should be rejected. However, to avoid spuriously rejecting a model owing to $\chi^2$'s tendency to reject complex models, Kline (1994) suggests checking the ratio of $\chi^2$ to degrees of freedom ($\chi^2$/df). A ratio of between one and two is good, and between two and three is considered acceptable or reasonable. The smaller the ratio, the better the fit; although it should be noted that very small $\chi^2$/df indicates a model that has too many parameters, and is one that is over-specified.

Critical values: $\chi^2$ near DF and $p>0.05$, $\chi^2$/df > 1.00 to 2.00, and definitely < 3.00.

Measuring relative fit. The indices compare the fitted model with some baseline model, which tends to be the null or independence model, where the assumption is zero correlations among the variables:

- The Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) compare the hypothesised model with a baseline model, which is usually a null model that specifies no covariances among variables. The indexes in this group lie between zero and one. Zero indicates that the fitted model is no better than the baseline model. A value of one indicates perfect fit for the specified model - which is very unlikely in reality. TLI can have a fit value that is greater than one, but this suggests the model lacks parsimony. Although considered a good index to use, TLI has the tendency to over reject true population models and in correctly specified models, the TLI and CFI tend to demonstrate worse fit as the number of variables in the model increases (Kenny and McCoach, 2003).

Critical values: TFI and CFI > 0.95, although values > 0.90 can be considered a reasonable fit.
Measuring model parsimony (assessing the extent to which the smallest number of parameters can adequately explain the model). Aside from the normed $\chi^2$, there are other parsimony fit indexes:

1. The Goodness-of-Fit (GFI) and the Average Goodness-of-Fit (AGFI) indices are also absolute fit indices. More specifically, they test for model parsimony by measuring the relative residual value in the sample model ($S$) that is explained by the hypothesised model ($\Sigma$). AGFI takes into account the DF in the fitted model. The closer to 1.00 the better the fit. However, as with the chi-square statistic, these indices are affected by the sample size. AGFI tends to penalise larger models with many estimated parameters, and few leftover degrees of freedom.

   **Critical values:** GFI and AGFI $>0.95$ although values $>0.90$ can be considered a reasonable fit.


   **Critical values:** PGFI around or in excess of .50

- The Root Mean Square error of Approximation (RMSEA) takes into account the error of approximation in the population, addressing the question of “How well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?” (Browne and Cudeck, 1993:137-138). Resting on the argument that models with more degrees of freedom are stronger theoretical models, it gives a measure of error per degree of freedom. As such, it is sensitive to model complexity (the number of estimated parameters in the model). Values of .05 or less indicate very good fit, although more recently Hu and Bentler (1999) have argued for $< 0.6$ instead. Values as high as .08 to .10 can be considered as reasonable or mediocre approximations of the population (Browne and Cudeck, 1993; MacCallum et al, 1996). Both Steiger (1990) and MacCallum et al (1996) have urged the use of confidence intervals with this statistic. AMOS is able to report a confidence interval around the
RMSEA value and provides the result of the test for the closeness of fit (PCLOSE). According to Jöreskog and Sörbom (1996), researchers should look for \( p \) values above .50. Thus a RMSEA value of \(<.05\) whose upper bound of the 90% interval is less than the 0.6 cut-off, would indicate that there is a 90% chance that the hypothesised model fits the population well.

**Critical values:** For a close fit, RMSEA \(<0.05\) but better at .50 or less. Values up to .08 may be considered reasonable. Values beyond 1.0, poor fit.

**Sample size adequacy.** Only a few funded studies in the social and behavioural sciences have truly large samples (Hoyle, 1995). This study is no exception. The following test is used to double check that the sample size is sufficient to yield an adequate model fit for a \( \chi^2 \) test:

- Hoelter’s critical \( N \) (CN): In AMOS, they appear as Hoelter’s .05 and .01 indexes. Hoelter (1983) suggests a value in excess of 200 as indicative of a model that adequately represent the sample data. This test is important to the current study, given its sample size.

**Cross-validation.** One way of increasing confidence in the replicability of the exploratory respecified model is to cross-validate the final model either by testing against another independent sample or with sufficiently large samples, to split the data into two and treat one as the calibration sample and the other half is kept for any post-hoc analysis. A cross-validation index (CVI) may be used to measure the distance between the calibration sample and the validation sample (Hoyle, 1995; Byrne, 2001). However, neither of these approaches is suitable for this project. Instead, the expected cross-validation index (ECVI), which measures the discrepancy between the fitted covariance matrix in the analysed sample, and the expected covariance matrix that would be obtained in another sample of equivalent size, is used (Browne and Cudeck, 1989).

In summary, it would seem that a good fitting model is one depicting a non-significant \( \chi^2 \) statistic approximating the degrees of freedom, has goodness-of-fit indices in the .90s or above, and is accompanied by a RMSEA parsimony index value
of <0.05. In addition, Hoelter’s CN indexes are useful to check for sample size adequacy. However, Maruyama’s (1998:251) reference to the need to exercise ‘personal judgement’ is noted since it is possible that a model may be considered plausible even if the ‘fit’ results are not unanimous. The fit tests discussed here and their critical values were used to assess this project’s research model.

In the final part of this chapter, I explain my case sampling approach and the background to each of the three case studies.
CHAPTER FOUR
METHODOLOGY (PART THREE)

4.4 Qualitative interviews
This section introduces the three companies participating in the second phase of the study and explains the researcher's fieldwork strategy. In line with the qualitative research tradition, report, analysis of interviews and discussion of the findings are written in the first person to allow the full perceptual experiences of informants and the personal reflections of the researcher to be described.

4.4.1 Purposive case sampling
The identification of the cases for this stage of the project is based on (a) Patton's (2002:230) argument that using purposeful or purposive sampling to look for 'information-rich cases' can yield greater insights. Besides, the lack of a standard configuration or form for virtual projects means that the aim is not to look for homogenous cases of people with similar backgrounds, experiences and circumstances, but to look instead for illuminative cases which are capable of showing common patterns across cases as well as highlighting outliers or unique patterns between cases. My choice of the three companies was based on a set of defined criteria; namely:

(1) From the IT/IS and telecommunications industry
(2) Projects or programmes which are cross-functional and dispersed
(3) Organised in some form of a virtual team structure
(4) Offering differing high-tech product or service ‘solutions’
(5) Organisational size and/or market sector influence will mean that their findings are capable of logical transfer or generalization across the industry.

Through ex-colleagues and associates, I was given contact names for a number of high-tech solutions companies operating in the information technology/information systems and telecommunications sectors. Crucially, they are also corporate members of the Association for Project Management and are therefore a part of the loosely defined sampling pool. I rang or emailed managers from eight companies to explain
my research and to elicit their interest and willingness to support the project. Of the five who had agreed to participate, three were chosen on the above sampling criteria. The participating companies were Microsoft, British Telecom and Marlborough-Stirling.

4.4.2 Background to the selected case-studies

Case study A: Microsoft (MS)

Founded in 1975, Microsoft is a large multinational company with an international customer-base. Their operational structure is largely team-based, in sundry variants of a matrix to access talents and skills group-wide, and involving participating contractors. Geographically dispersed project teams are a common feature in MS. Early exploratory discussion with a senior manager had indicated that MS teams are encouraged to be self-sufficient or proactive in problem-solving and individuals are expected to work independently towards their given targets or goals.

Microsoft Business Solutions – Great Plains

The particular division that agreed to participate in my research project is known as Microsoft Business Solutions-Great Plains. Originally an independent solutions provider, Great Plains Inc offers a mid-market Enterprise Resource Planning (ERP) system aimed at addressing the business-process needs of small to medium sized companies. Great Plains Inc. was acquired by Microsoft Inc. in 2000 and Great Plains’ products are now marketed under the Microsoft Business Solutions banner. Subsequent references to Great Plains and its products in this thesis will be as ‘MS’.

I first made contact with the UK-based senior manager in December 2003. I was given the go-ahead to survey a ‘discrete’ group of 23 people dedicated to work on various documentation, testing, and development projects. Teams are formed from this group for specific projects ranging from product version upgrades to converting the American ERP system to be European compliant. Projects are centred on MS’ ERP products and last typically between 6 months to a year. Teams are disbanded upon their completion to return to the core group.

While I have permission to identify openly the corporate identities, the need to preserve individual anonymity required references to individual participants to be limited to their personal case number or their first name.
What is unique about this group is that they are not in employment terms MS employees. Their employer is in fact, a Belgium-based contracting agency named EDC which has a long-term off-shoring agreement with MS to provide and operate a dedicated group of high-skill IT knowledge workers dedicated exclusively to MS projects for the European market. The group are entirely situated in Bangalore-India and take directions from their local general manager to fulfil MS’ requirements. Similar collaborative arrangements with other contracting organisations are in place for Australian, New Zealand and Latin American conversions. It was clear from the survey and later on in the interviews that many of the EDC employees prefer to see themselves as working for Microsoft. In fact, 14 (61%) of the 23 survey respondents described themselves as direct employees of the project sponsor (MS) rather than on secondment. All 23 respondents are degree-educated Indian nationals who are in their 20’s and early on in their professional careers. References to them will be as ‘MS-EDC’.

Coordinated from the UK, projects are performed from a mix of four centres: Bangalore (India), Fargo (USA), Dublin (Ireland) and Reading (UK). While there is a high level of face-to-face interaction locally; projects are virtual at the interfaces between the centres, with little or no opportunity for meeting others across the globe. When I visited the Bangalore office in May 2004, exchange visits had only just been arranged to allow the more senior project leaders to travel to the UK and US. As the Bangalore group is indigenous to India this case study should provide a valuable insight into the role of cultural diversity on individual perception of work environment and social interaction.

Following the completion of the survey, two meetings were held in the first quarter of 2004 with Mr B and his colleague (and subsequent successor) Mr E. Mr E is currently the named project manager responsible for the overall management of the project group. Owing to past operational and communication difficulties, a recent decision was taken to channel all communications between the UK and India through two

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10 Off-shoring is a variation of outsourcing in which part or all of a project is contracted out to an independent partner operating outside the UK.
senior project managers for project related or technical issues, and via the local vendor director, Mrs V for other operational, budgetary and HR matters. This move further restricts any direct interaction between the local team members and their colleagues overseas, thus raising possible issues of interpretation and representation through an intermediary and how the change might affect individual workers. Additionally, for legal and employment regulation reasons, all HR and operational issues must be taken at the local level. Therefore Mrs V. enjoys substantial self-governing autonomy. Although initial agreement was given by Mr B, permission to conduct interviews had to be obtained from Mrs V (on behalf of EDC). Negotiations as to when would be a good time to visit their office took several weeks owing to their need to complete an important upgrade project for MS. The trip to Bangalore in India finally occurred in May 2004.

Case study B: British Telecoms (BT)
British Telecom Plc (BT) was formerly the British state telecommunications supplier. Since its privatisation in 1984 it has remained the dominant telecoms provider in the United Kingdom. BT's businesses are operated under the watchful scrutiny of the British telecoms regulator Ofcom (formerly known as Oftel). In 1991, the trading name was shortened to BT. The BT Group Plc as we know it today was conceived in April 2000. According to my senior contact, BT is one of the largest private sector companies in Europe, employing either directly or as contractors, over 122,000 people in the UK. Operating in separate strategic business units, BT seeks to provide private households as well as corporations with a full range of telephone and networking services. Its transformation from a fixed telephone line provider into a business communications solutions company included winning full-service outsourcing deals from their corporate customers. At the time of the interviews, BT operated the following divisions.

- **BT Global Services**: World-wide business solutions and telecoms network service (formerly BT Ignite)
- **BT Openworld**: Broadband and dial-up Internet access products
- **BT Retail**: Products & services for home & business customers
- **BT Wholesale**: Network services & solutions
- **BT Exact**: Technology research and development, and consultancy
BT Wholesale

The group to which I was granted access is BT Wholesale. It is seen by those working within that business unit as the ‘heart of the BT Group’. They provide network services and IT solutions to communication companies across UK and Europe. With over 500 corporate customers, BT Wholesale is responsible for the country’s network infrastructure, with a key role in moving BT towards data and advanced broadband and internet services. This business unit is almost entirely project-based. Working matrix-style, projects are complex and vary in size and duration.

BT Group actively encourages a mobile workforce and has well established flexible working policies. Staff opting to work from home is given a computer, fax, ISDN and furniture. It was reported in ComputerWeekly.com (13 July 2000) that BT had over 40,000 people working remotely with 4,000 of whom were formally home-based. More recently, in our March 2004 meeting, my contact in BT Wholesale (Mr M) estimated that they had ‘more than 10,000 people working from home’. Within BT Wholesale, broadband access has increased the push for virtual team working and most of the projects are conducted by skilled workers who are geographically spread across the UK. Projects undertaken by this group are leading-edge and often include outsourcing partnerships with large and small technology manufacturers and IT specialists to help deliver their projects. Interestingly, many of their contractors are ex-BT employees who had left BT during its various reorganisations.

Project engineers in BT Wholesale are predominantly white mature males with extensive technical and project management experience. Although UK-based, they are located all over the British Isles, working independently either from their homes or from local offices. Face-to-face project meetings do exist but vary in frequency since team members have to travel to a selected location.

My contact Mr M is a senior manager within BT Wholesale. Negotiations via emails and personal meetings for access started in August 2003 to survey and interview the project engineers. Through Mr M, I was able to survey a particular sub-set of BT Wholesale comprising of about 120 engineering managers working primarily on next generation networks and new technology mobility and voice messaging. Mr M is a line manager personally responsible for (at the time of negotiation for access) about
22 of the 120 engineers working on mobility and messaging products and services. He also works on projects, either as the project leader or as a team member. I met with Mr M again on 24th March 2004 to get a more detailed brief of the background to the particular group in BT Wholesale. Although it was agreed that I could proceed with the next stage of my research, work commitment and the need to liaise directly with informants for suitable meeting dates meant that interviews did not start until after my return from Bangalore-India in May 2004.

Case-study C: Marlborough-Stirling Group (MSG)

This UK group was founded beginning of 1987 as a specialist provider serving the financial services industry; in particular, the mortgage and life and pensions sectors. Originally a products company, MSG was founded on three key products: Omiga and Optimus are targeted at the mortgage market and Lamda services life, pensions, and investment products. It had first ventured into service solution by taking on the back-office administration of some of their life and pensions customers in 1988. In Europe offices are situated in Dublin, Madrid and Milan. It also has offices in Canada and more recently, in South Africa.

To meet its stated mission of ‘transforming the economics of the financial services industry, through the application of technology’ (extracted from MSG corporate brochure), MSG has had to acquire the requisite knowledge and capabilities through a series of acquisitions: Life Strategies Limited in August 2000, Webtech Software in August 2000 and Plexus Systems Design Limited in November 2000. In 2001, MSG took a major step towards the goal of full electronic straight-through processing by acquiring a leading intermediary solutions business, Exchange FS Group Plc. This latest acquisition gives MSG the ability to connect together all parts of the financial services value chain – linking the distributor's desktop to the provider's back office.

While the rationale for acquiring the Exchange may be economically sound, post-acquisition integration has been difficult. Although a project-oriented company, projects in MSG are traditionally product-driven; not unlike projects for Microsoft Business Solutions-Great Plains. However, projects for their recent acquisitions, particularly the Exchange, have a service-focused criterion. Outsourcing contracts for the life and pensions division in MSG are large, requiring cross-functional inputs
which are managed as a series of sub-projects under the programme umbrella. Projects for the Exchange tend to be smaller and more self-contained. In addition, Exchange personnel perceive and resent the strong emphasis by MSG managers on hierarchy, command and control.

At the time of my negotiation for access, MSG was undergoing a major restructuring initiative, dividing itself into three business divisions, each with its own operations board. Although the reasons given by top management are strategic, it could be recognition of the difficulty of integrating fundamentally different operational philosophies. Working in a fast, changing environment this case offers a rare window of opportunity to observe the impact of acquisition difficulties and different project approaches on group identity, trust and cohesion.

My contact with MSG was made through an introduction by a business analyst from the Exchange. Negotiations for access to MSG’s software development staff began by approaching the Group HR Operations Manager (Ms DM). Although there was strong interest from line management, I was informed that the matter had to be referred to the MSG Executive Board. Permission to conduct my research was finally given in January 2004, four months after my first approach. Furthermore, corporate policy dictated that the invitation to participate must be sent through their Internal Communications Department, which did not happen until late February 2004. Completed questionnaires started to arrive at the beginning of March. Owing to my own work and interview commitments, I was unable to get in touch with MSG again until July 2004. The first interview started in August 2004.

4.4.3 Assessing individual cases

The final web survey consisted of two submissions: the first was to submit the completed questionnaire and the second asked for an indication by the respondent of his willingness to take part in the champagne draw and/or to participate in the interview phase of the project. This limited my choice to those who had expressed their willingness to continue their participation. Figure 4-6 shows a breakdown of the total number of survey respondents from the three target companies, the proportion indicating their agreement to be interviewed and my sampling approach. The key objective is to preserve individual confidentiality by letting survey respondents decide
whether or not to disclose their personal details. As a result, I had little prior knowledge of the survey respondents until I met them personally. Effort was also made when possible, to be systematic in my selection of interviewees. This simple method is in line with random selection principles. The final column indicates supplementary interviews conducted for additional background, context and insight.

Figure 4-6: Sampling individual cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Total responses</th>
<th>Yes</th>
<th>Yes %</th>
<th>Main interviews</th>
<th>Selection criteria</th>
<th>Supplemental interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: MS</td>
<td>23</td>
<td>23</td>
<td>100</td>
<td>9</td>
<td>Nominated by Mrs V. Spread of experience and project roles.</td>
<td>2 UK-based project seniors + Local general manager</td>
</tr>
<tr>
<td>B: BT</td>
<td>42</td>
<td>21</td>
<td>50</td>
<td>9</td>
<td>Direct contact. Every 2&lt;sup&gt;nd&lt;/sup&gt; name on 'yes' list.</td>
<td>BT Wholesale senior manager</td>
</tr>
<tr>
<td>C: MGB</td>
<td>63</td>
<td>29</td>
<td>46</td>
<td>9</td>
<td>Direct contact. Every 3&lt;sup&gt;rd&lt;/sup&gt; name on 'yes' list.</td>
<td>Group HR Director</td>
</tr>
</tbody>
</table>

Although the Microsoft Business Solutions group had all said 'yes' to further participation, my understanding with the UK manager was that I should let their locally-based manager, Ms V put together a list of individuals based on a broad indication of the level and type of roles I would like to interview. Mr E. explained that he was concerned about language difficulties as some of the group members, although competent technically, did not speak much English. A list was produced in April by Ms V and agreed by Mr E. I did wonder whether the exclusion of those who did not speak English well would limit my understanding of possible language and cultural issues with virtual communication and cooperative team-working. Although not within my control, the persons I got to interview were a good mixture of experience and varying project roles.

In contrast, once agreement was given by the senior manager at BT Wholesale, I was expected to make direct contact with my interview targets. This I did by emailing each of them immediately upon my return from Bangalore. Unbeknownst to me, my research took place during a period of great turbulence within BT Wholesale as it was undergoing a major re-organisation. By the time I tried to make appointments, some individuals had left or were about to leave BT, and others had moved around sections
within BT Wholesale. At the same time, central Human Resource department had undertaken an initiative to move BT’s long established civil-service based job grades to the new concept of ‘job families’. Everyone in BT had to be re-classified into a ‘job-family’, with some suffering a reduction in perceived status or having to face a long period of stagnancy in terms of pay and grade. The implications of these events for my research could be positive and negative. Positive in that it provided me with an opportunity to witness how disruption to organisation structure, job role, status and perceived support (important constituents of organisational climate) and the possibility of a reduction in earning power can affect perceptions and attitudes at the interpersonal and group levels. Conversely, there was a risk that individuals might be too pre-occupied to talk to me. Of the people I had contacted, only two had refused to continue their participation and a third was leaving BT shortly. The two who had refused were replaced by someone next in the ‘yes’ list. The person who was departing agreed to see me right up to his time of departure.

Although I had to get top-level agreement to conduct my research project, the interview sampling process for the Marlborough Stirling Group was similar to that for BT Wholesale, but I was asked to forward a list of names to the Group HR Operations Manager before making contact with the individuals. Although I was reluctant to do this in view of the need to preserve individual privacy, I had reasoned that as only summary findings would be made available to each of the three participating organisations; it is unlikely that they would be attributable to any single individual. As I was the sole interviewer and had to travel to the interviewees’ designated locations, there was a need to balance scheduled work commitment and resources to meet my submission objective of late summer 2006. I took the decision to conduct as many interviews as was convenient to the participants between May 2004 and June 2005. A total of 27 interviews were conducted, lasting between an hour-and-a-half and two-and-half hours. All interviews were taped and sent to a professional transcribing service.

4.4.4 Interview structure

An interview is a useful way to gather data on a variety of issues or phenomena as ‘it allows the researcher to understand the meanings that people hold for their everyday activities’ (Marshall and Rossman, 1999:110). Unlike the cross-sectional survey,
follow-up and clarification is possible with this method of data collection. The challenge facing this project is balancing the trade-off between breadth and depth. Along a continuum of fully structured – semi structured – free format or unstructured interview approaches, a highly structured interview format would be too restricting and is unlikely to produce the desired rich data for this thesis. An unstructured or non-directive approach on the other hand, may be too difficult to maintain focus and the data too unwieldy for easy coding and thematic analysis. Taking into account time, access and resource limitations, the preference for this project lies with the semi-structured interview mode. An interview guide was used with a set of topics relevant to the research theme rather than a detailed sequence of carefully worded questions (Appendix B). The guide acted as an aide-mémoire for me to uncover information in key areas but without constraining my efforts to promote good interview interaction and encourage spontaneous descriptions of informants’ lived world. As this is a multi-site study with many interview informants, the guide also provided a degree of systematisation to aid subsequent data analysis.

Each interview had three ‘phases’. It began with a reiteration of confidentiality and the purpose of the project before asking questions about the informant’s general background, education, work history and time and role at the present organisation. The next phase asked informants to elaborate on ‘their experiences, upon which their opinions may be based’ (Seidman 1998:12/20) and to talk at length about themselves and their own perceived contribution to the team, their expectations of their teammates and team relationships, to elaborate on the relevance of structure, independent working and ownership, management and mutual support, recognition and reward, quality and standards, and socialisation for team bonding. I tried to avoid planting words such as trust and cooperation in my questioning. Instead, I looked to the informants to volunteer them or to derive their presence from their descriptions of events and acts. Interview subjects were allowed ample time and space to explain and narrate episodes or instances to support their perceptions and attitudes. In the final phase, I focused on asking for clarification of meanings, exploration of insights and unexpected factors gleaned during the interview.

In accordance with my stated analysis strategy (see Figure 4-2), Chapter Five begins with my report on the factor analysis and model development based on the survey
data. Discussion of the quantitative findings with reference to the literature follows in Chapter Six. In Chapter Seven I explain my interview analysis strategy and present my case-study findings in connection to the literature and the survey results, including insights that can explain or illuminate additional observations arising from the quantitative results. The final chapter (Chapter Eight) pulls together both the quantitative and qualitative findings to discuss their implications for theory and practice, concluding with a reflection of my personal journey and call for further research.
CHAPTER FIVE
SURVEY RESULTS

5. Introduction

Evaluable responses from the survey questionnaire totalled 284, of which 58 respondents are working primarily on conventional projects and 226 on virtual projects. The data set was ‘split’ into virtual and conventional groups, and only the data from virtual project respondents was used for inferential statistical testing. The virtual data set was first checked and corrected for entry or coding errors, and for any missing data using SPSS version 12.0.1. Section 5.1 below presents the study’s descriptive statistics with a view to establishing the characteristics of the ‘typical’ virtual team worker. Before moving on to inferential statistics, data screening and assumptions testing were performed and explained in Section 5.2.1. As the research model involves a series of hypothesised dependent-independent variable relationships, structural equation technique was used for factor analysis and model development and the findings are reported in Section 5.2.2.

5.1 Descriptive statistics

5.1.1 Respondents’ demographics

Age: The pie-chart (Figure 5.1) shows that 28% (64) of the participants are aged between 20 to 30 and 24% (54) belong to the 31 to 40 band. All the respondents (14) who had identified themselves as Black are in the youngest group. Over 90% (91%, 21) of Asian respondents are also in the 20 to 30 age group. The largest single band is the 41 to 50 range of which all but one of the 82 respondents, are White Caucasians. 12% (26) of the respondents are over 50; again all White Caucasians.
Gender: The apparent predominance of males (75%, 169) in Figure 5.2 was confirmed by various interview participants later on in the study; the main reason given is that the technical background of projects makes it difficult to recruit suitably qualified or experienced females. As the survey was on a self-select basis, it is not possible to tell from the data alone if this is a true reflection of the IT project industry as a whole. Chi-square $\chi^2$ on gender and education did not produce a significant ($p<0.05$) reading, indicating that the two variables are not associated but nonetheless, it may be something particular to the IT and IT related project population.
Education: Respondents are clearly well educated as over a third of them (76) hold a bachelor or equivalent degree. 20% (45) have master level degrees and 3% (7) are PhDs. 38% (86) have some kind of professional or technical qualification. Only a small proportion (5%, 12), all White Caucasians, returned as qualified ‘by-experience’.

Figure 5-3: Education

Of the 57 female respondents, 32% (18) hold higher level degrees, 26% (15) have a bachelor degree, 33% (19) are professionally qualified, and only 9% (5) have no formal qualifications. Proportionally, they compare favourably with the male respondents, of whom only 21% (35) are qualified at Master or PhD level, 36% (61) at bachelor level, and 39% (66) are professionally or technically qualified. 4% (7) of the male workers do not have any formal education.

Table 5-1: Age and education

<table>
<thead>
<tr>
<th>Age</th>
<th>PhD</th>
<th>Master</th>
<th>Bachelor</th>
<th>Professional</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 30</td>
<td>1</td>
<td>16</td>
<td>23</td>
<td>21</td>
<td>3</td>
<td>64</td>
</tr>
<tr>
<td>31 to 40</td>
<td>2</td>
<td>14</td>
<td>17</td>
<td>15</td>
<td>6</td>
<td>54</td>
</tr>
<tr>
<td>41 to 50</td>
<td>2</td>
<td>14</td>
<td>22</td>
<td>42</td>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>over 50</td>
<td>2</td>
<td>2</td>
<td>14</td>
<td>7</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>46</td>
<td>76</td>
<td>85</td>
<td>12</td>
<td>226</td>
</tr>
</tbody>
</table>
The results confirm later interview comments on the technical nature of the projects requiring skilled workers. Cross-tabulations (Table 5.1) between age and education revealed further insights: Respondents in the youngest age group are mostly qualified at bachelor or professional level (bachelor: 36%, 23; professional: 33%, 21). A respectable 27% (17) also hold higher level degrees. The next age group up (31 to 40) compares favourably, as 59% of them hold bachelor or professional qualifications (bachelor: 32%, 17; professional: 28%, 15), and a further 30% have a master or PhD degree. The ‘older’ categories of over 41 and over 50 are also well educated but a smaller proportion than their younger colleagues have higher level degrees. From the data, one can only speculate that there is an increasing trend in this particular industry sector toward higher level qualifications. There appears to be less pressure on the mature workers (or it could just be that they are already in-situ before the rising education trend). For those belonging to the youngest age group, they are likely, at some point, to go on to acquire a master or PhD degree. This is supported by the interviews where many of the informants had indicated that they were undertaking or considering some form of further education on a part-time basis. Both Pearson chi-square and Cramer’s V for age and education are significant at 0.05.

**Ethnic background:** The predominance of White Caucasians is evident in this sample (Figure 5.4). They account for 81% (182) of the respondents. A small proportion is of Asian descent (12%, 26). This category includes individuals from India, Pakistan and Bangladesh. 6% (14) are Black (Afro-Caribbeans and Africans), and four declined to divulge their ethnic origin. None reported as being from the Oriental category (Chinese, Japanese, Koreans, and Taiwanese). As the invitation to participate in the survey was issued to the membership of the UK Association for Project Management (APM), and the participating companies are of Western origins, this may account for the apparent ethnic group bias. Interestingly, while all the PhD holders (7) are White; non-Caucasian workers are more likely to be educated to master level than Caucasians (39% v. 16%). All the respondents who have no formal qualifications are also White.
Cross-tabulations of age and ethnic grouping (Table 5.2) showed that all the Black respondents and a majority (80%, 21) of the Asian respondents belong to the youngest age group. Workers declared under the ‘Other’ ethnic category are aged 31-40. Over half (59%, 107) of the White workers are over 40 years old. Although the questionnaire did not ask for length of service this does suggest that project participation by non-white ethnic workers is probably a recent phenomenon. Cramer’s V measure indicates a moderate (.383) and significant association (p=0.000).

Table 5-1: Age and ethnic group

<table>
<thead>
<tr>
<th>Age</th>
<th>White</th>
<th>Black</th>
<th>Asian</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 30</td>
<td>29</td>
<td>14</td>
<td>21</td>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>31 to 40</td>
<td>46</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>54</td>
</tr>
<tr>
<td>41 to 50</td>
<td>81</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td>over 50</td>
<td>26</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>182</td>
<td>14</td>
<td>26</td>
<td>4</td>
<td>226</td>
</tr>
</tbody>
</table>
5.1.2 Project context and characteristics

Employment status: The literature and initial informal interviews with senior project managers indicated that projects (virtual or conventional) are increasingly performed by teams of varying employment statuses. However, this study has found 'employee' to be the prevailing employment category (see Table 5.3).

Figure 5-5: Employment status

An examination of the respondent companies (where available) showed the majority are from larger firms who are more likely to use a variety of collaborative techniques. Yet only 16% (37) declared themselves as workers who are not a staff member of the immediate project organisation. This raises the question of whether respondents have correctly identified their legal employment status, especially when 19% (43) of the respondents reported that their teams are made of employees and non-employees, and a further 28% (64) reported that their projects are collaborative efforts, involving employees from more than one company (see membership mix breakdown in Table 5.3 below). It is possible that the questionnaire respondents were in-house personnel and few contractors or non direct employees had participated in the survey. A partial answer was provided in the qualitative phase of the project when it was discovered that, many of the team members of a particular participating company preferred to portray themselves as 'employees' of their sponsoring company (also participants of this study) as the latter's internationally renowned corporate brand was seen to bring more personal prestige.
Table 5-2: Employment status and membership mix

<table>
<thead>
<tr>
<th>Employee of:</th>
<th>Freq’y</th>
<th>%</th>
<th>Same</th>
<th>Diff</th>
<th>Mix</th>
<th>Colb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own company</td>
<td>189</td>
<td>83.6</td>
<td>40</td>
<td>63</td>
<td>31</td>
<td>55</td>
</tr>
<tr>
<td>Sister company</td>
<td>13</td>
<td>5.8</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Consulting firm</td>
<td>10</td>
<td>4.4</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Partnering firm</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Self-employed*</td>
<td>6</td>
<td>2.7</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Other*</td>
<td>5</td>
<td>2.2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>226</td>
<td>100.0</td>
<td>45</td>
<td>73</td>
<td>43</td>
<td>64</td>
</tr>
</tbody>
</table>

Formal team role: Team role indicated that the majority of the respondents are expert/technical members (48%, 109) or project leaders (35%, 80). Only 10% (23) classified themselves as non-technical members and 6% (14) as administrative or support roles. Over half (57%, 8) of the Black respondents identified themselves as project leaders, while only 19% (5) of the Asian respondents returned likewise. As both Black and Asian respondents belong to the same 20 to 30 age band, a possible explanation for the status differential is that proportionally, more Black (57%, 8) than Asian (27%, 7) respondents hold a master-level degree, and therefore enjoy either a higher-level entry into the industry or are fast-tracked ahead of their Asian counterparts.
Another observation is the high proportion of team leaders or managers. Although in line with the reported high complexity of projects, it does beg the question of ‘who does the donkey work around here’. It was only later on during the interviews that transpired to the researcher that much of the low-value adding work was subcontracted out, but the people who were participating in the survey formed largely the ‘core’ of the virtual network. This may also explain the apparent disparity in the findings for employment status. The anomaly is not just about deliberate employment identification; it could be the way the invitation to participate was issued from within the participating companies, and the self-select nature for those responding to the more general, APM invitation.

Predominant work mode: Despite the virtual status of their projects, only 12% (27) of the respondents reported working mostly from their own premises. A majority (74%, 167) declared that they spend over 50% of their time at a local office. This suggests that working on virtual projects does not mean working from home. Conversely, ‘working at a local office’ does not necessarily mean co-location with team members either. This was clarified by interviewees who had explained that many of them actually travel to an office somewhere but not necessarily to meet or work with others in their team. This is in line with the literature on the varying levels of virtual working. If, as indicated by many interview participants that their companies actively encourage them to work from home, this could be that some people actually prefer the routine of getting up, leaving home and going to a place of work. Alternatively, workers may find the office more convenient for computing and other infrastructure support. An additional explanation provided by later interviewees is the need to ‘be with people’.
The youngest respondents and those in the 31-40 age group are more likely to work at a local office (82.8%, 53; 81.5%, 44). The group with what appears to be a more flexible and mobile work mode are those aged between 41 and 50. In this group, over half (59.3%, 16) work from home and 18.3% (15) travel from site to site or have no set work mode. It is conceivable that being more mature, they are ‘trusted’ to work with the minimum of supervision and as they are likely to be also more senior than the younger members, the travelling may be a way for them to supervise or connect with their younger colleagues. Most of the over 50s (73%, 19) tend to work out of a local office, with 19.2% (5) choosing to work from home.

Table 5-3: Age and work mode

<table>
<thead>
<tr>
<th>Age</th>
<th>From home</th>
<th>A local office</th>
<th>Travelling to/from sites</th>
<th>Comb’n</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 30</td>
<td>3</td>
<td>53</td>
<td>7</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>31 to 40</td>
<td>3</td>
<td>44</td>
<td>4</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>41 to 50</td>
<td>16</td>
<td>51</td>
<td>2</td>
<td>13</td>
<td>82</td>
</tr>
<tr>
<td>over 50</td>
<td>5</td>
<td>19</td>
<td>1</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>167</td>
<td>14</td>
<td>18</td>
<td>226</td>
</tr>
</tbody>
</table>

It is possible that these participants although senior by age may not have supervisory duties or, rather than travelling to subordinates or team members, prefer to summon others to them. On the other hand, it could just be that this older set of project workers...
is habituated in some way to working in an office environment. All of the participants view technology as crucial for their work. Male workers are more mobile than females (15:1). Less than 10% (9%, 15) male workers work from home as against 21% (12) females workers. A similar percentage (c. 74%) of males and females work at a local office. Proportionally, more female workers use the home option than their male counterparts. This may be an early indication of differing domestic requirements faced by male and female workers.

**Project portfolio:** As can be seen from Figure 5.8, the majority of respondents (78%, 177) are working on one to five projects. 16% (35) hold a medium-sized project portfolio and only 6% (14) report that they are working on more than 10 projects at any one time. The tendency for smaller project portfolios may be due to the complex nature of the projects. It also confirms existing literature (see Section 2.1.1, Chapter Two).

Figure 5-8: Project portfolio

![Project portfolio chart](image)

A new observation is the apparent relationship between the number of projects handled by a respondent and his ability to work from a static place: 89% (158) of those working on small projects are able to work either from home or at a local office. For those handling medium (6-10) and large (over 10) project numbers, they are increasingly more mobile. None of those working on more than 10 projects perform
them from home, and only a minority (14%, 2) of those handling six to 10 projects do so. Over half (57%, 8) of those with large portfolios are having to engage in some degree of travel. It would appear that there is a limit to technology's ability in helping manage across the bigger number of projects. Alternatively, travelling may be operationally desirable for some managers or it may be a reflection of an individual need to feel ‘in control’.

**Project type:** An overwhelming number of the respondents are involved in design, development and upgrade projects. Only 15% are involved in the ‘other’ category which includes sales, general and administrative (SGA) projects, human resource management (HRM) initiatives, and various strategic and operational initiatives. The concentration on technology-oriented design, development and upgrade projects by the virtual team respondents suggests that their work is more easily carried out in a distributed manner. Both Chi-square and Cramer’s V statistics for project number and project type are positive and significant at 0.05, indicating some sort of association between the two variables.

**Project duration:** The majority of projects (69%, 156) handled are of short or less than 12 months duration. 19% (43) of the projects are of medium duration (between 13 and 24 months). Only a small proportion of the respondents (12%, 27) are working on projects lasting more than 2 years. Two thirds (67%, 118) of the projects in the smallest portfolio of 12 months or less duration, 20% (36) are of medium duration, and 13% (23) are projects lasting over 24 months. Chi-square statistics indicated that the two are not independent of one another (p<0.05), although Cramer’s V measure showed only a small association (.146).

Of note is that interview participants commented that although the entire project may be well over 24 months, their responses in the questionnaire were based on the stage or sub-project on which they were personally involved. This may have skewed the apparent split of durations and may also indicate that overall project identification is subject to the level of personal involvement.
Figure 5-9: Project duration

![Pie chart of project duration](image)

**Project complexity:** Reports by respondents on project complexity are either high (53%, 120) or medium (43%, 98). Only a small percentage of total projects handled are evaluated as of low complexity (4%, 8). Cross-tabulation of project complexity and duration (see Table 5.6 below) shows nearly half (48%, 13) of the longer-termed projects (over 24 months) are reported to be of high complexity; as with half (50%, 78) of the short-termed projects (up to 12 months). Over two thirds (67%, 29) of the medium duration projects are also viewed as very complex. Less than 5% (8) of the total respondents report that their projects are of low complexity. Perhaps this is due to the type of projects being handled – or it may be that people are unwilling to admit to working on projects of low complexity!

Furthermore, comparing project complexity with project type (Table 5.5) confirms that over half (54%, 87) of design, development and upgrade project belong to the high complexity category, and 44% (71) are identified as of medium complexity. Feasibility projects are also reported as mainly of high complexity (80%, 12), which is understandable given their unique or novel scope or outcome. Business integration projects are fairly equal between high and medium complexity, and the ‘other’ projects tend to be of medium to high complexity. Pearson chi-squares for both pairs are significant at 0.05.
Table 5-4: Project complexity and project type

<table>
<thead>
<tr>
<th>Project Type</th>
<th>High</th>
<th>Med</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design/development/upgrade/ migration project</td>
<td>87</td>
<td>71</td>
<td>3</td>
<td>161</td>
</tr>
<tr>
<td>Business unit integration project</td>
<td>9</td>
<td>8</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Feasibility studies/new proposals</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>16</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
<td>98</td>
<td>8</td>
<td>226</td>
</tr>
</tbody>
</table>

Project status: Most of the respondents (66%, 150) report their projects to be on time. Just under a third (33%, 74) of the projects is late, which may suggest a possible link between project complexity and project status. Cross-tabulation shows a fairly even split of complex and moderate complexity projects that are running late (54% v. 45%). Both projects that are on hold are of high complexity, and all but one of the eight low complexity projects are on-time. However, Pearson chi-square indicated the two to be independent and Cramer’s measure of association showed a small and non-significant link (.086; p>0.05) between project status and project complexity.

Table 5-5: Project complexity, duration and status

<table>
<thead>
<tr>
<th>Complexity</th>
<th>Months</th>
<th>Status</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>1-12</td>
<td>13-24</td>
<td>Over 24</td>
<td>On time</td>
<td>Late</td>
</tr>
<tr>
<td>High</td>
<td>120</td>
<td>78</td>
<td>29</td>
<td>13</td>
<td>78</td>
<td>40</td>
</tr>
<tr>
<td>Medium</td>
<td>98</td>
<td>74</td>
<td>14</td>
<td>10</td>
<td>65</td>
<td>33</td>
</tr>
<tr>
<td>Low</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>226</td>
<td>156</td>
<td>43</td>
<td>27</td>
<td>150</td>
<td>74</td>
</tr>
</tbody>
</table>

Membership mix: When discussing the personal profile of individual respondents, it was highlighted that there is a disparity in the data between reported employment status and project team mix. As this is a self-select survey, it is likely that only some individuals (who happen to be employees rather than contractors or independent partners) from any project team have chosen to complete the survey.
High complexity projects are performed by teams that involve more than one function (34%, 41) and often including external contractors and collaborative partners (50%, 60). Although projects of medium difficulty have a higher incidence of single department input (21%, 21) than high complexity projects (16%, 19), the majority involve participation from other functional departments and outside assistance (78%, 76). Low complexity projects are performed almost entirely using internal workforce. Chi-square statistics report the link between complexity and membership mix to be significant (p<0.05); albeit that the strength of association is small (Cramer’s V = 0.195). Of the respondents working on single department projects, 64% (29) are in small teams. Half (51%, 37) of the across-departments projects also involve small teams of 2 to 5. For projects requiring a mix internal and external input, the split is fairly even (17:15) between small and medium teams. About a quarter (26%, 11) of them are part of a large team. The pattern is different for collaborative projects are for large and medium teams. Over half (52%, 33) are involved in large teams and 28% (18) work in medium-sized teams; only 20% (13) are attached to a small team.

**Project changes:** Overwhelming ‘Yes’ responses to whether members leave and join the team throughout its life cycle suggest projects are organised in some form of matrix variant based on skill/competence requirements. People exit the team when their contribution is completed, and new members join to work on other required tasks. When members’ stability is cross-tabulated with membership mix, an interesting pattern emerges whereby the percentage of changes increases as team membership widens beyond the immediate function. For example, membership changes are recorded for just over half (56%, 25) of those from the same function and 70% (51) for those from across different departments. For projects involving a mix of employees and external contractors and collaborative partners, the responses go up to 81% and 82% respectively. Other possible factors for the changing team membership may be workers joining and leaving their organisations or re-assignment by line managers; although it deserves serious attention if either or both of these happen frequently and without consultation with the project leader.
Table 5-6: Work mode and membership change

<table>
<thead>
<tr>
<th>Work Mode</th>
<th>Membership Change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>from home</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>26</td>
</tr>
<tr>
<td>at local office</td>
<td>112</td>
</tr>
<tr>
<td>travelling to/from project sites</td>
<td>13</td>
</tr>
<tr>
<td>combination</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>165</td>
</tr>
</tbody>
</table>

Another interesting observation from the cross-tabulation between membership stability and work mode is that those who report no membership change are mainly working at a local office, and all but one of the respondents who work from home and those who are travelling around project sites, are part of the transient project structure. The chi-square statistics for membership stability and work mode are large and significant at 0.05. Hence, the two factors are not independent of one another.

Figure 5-10: Team size

Projects involving input from either other functions or outside participants tend to be the ones that have members joining and leaving the team throughout the project life cycle. Only 15% (25) of single-function projects operate that way. From the chi-square tests, this link is statistically significant (p<0.05).
Team size: The prevalent team size is small (43%, 97), consisting of between two to ten members. About a third report (33%, 75) that they work in a large team (over 20), and 24% (54) work in work in medium-sized teams of between 11 and 20 members. The importance of team size for virtual projects is indicated in the first instance by the significant chi-square statistics across a range of relationships, in particular with project duration (p=0.000); project status (p<0.05); membership changes (p=0.000); respondents’ formal role in the team (p<0.05); membership mix (p=0.000), and project types (p=0.000).

Face-to-face meetings: Although the literature on virtual projects often refers to the lack of physical proximity and face-to-face meetings, it seems that in practice only 10 (4%) claim not to meet at all. Over 40% (43%, 98) report that despite not being co-located, they do get together and meet regularly and over half (52%, 118) have some form of face-to-face engagement occasionally.

Figure 5-11: Face-to-face meetings

![Project Face-to-Face](image)

The need or reliance on face-to-face contact for the types of project in this study is unsurprising, given some studies have already indicated its necessity. Most of those who work from home still meet-up occasionally (89%, 24). For those who travel into
a local office but not necessarily working alongside their immediate project team members, they also manage to meet face-to-face (48%, 80). Likewise, for respondents who are travelling around or work in some combination of home, local office and travelling around, regular and occasional face-to-face contacts also take place. The association between work mode and physical co-presence is significant at $p<0.05$.

**Role of ICT:** Table 5.8 indicates a high level of reliance on technology by those working from home. Yet the descriptive statistics on face-to-face meetings suggest that entirely virtual projects are still few and far between, despite increasing speed and quality of ICT for remote communications, and the acknowledgement that ICT is vital to the conduct of a project.

Figure 5-12: Role of ICT

![Pie chart showing 68% absolutely vital and 32% as secondary support](image)

Technology is also important for those who are mostly based at a local office, although 32% (54) view its role as only secondary. The chi-square statistics from a cross-tabulation of ICT and work mode also indicated a strong significant association ($p=0.000$) between the two variables for the virtual sample. Interview participants reiterated the importance of ICT for both computing and communication. A review of
the job roles of the travellers shows that 6 out of the 8 are project leaders. Presumably their emphasis will be more on leadership and support.

Table 5-7: Work mode and ICT

<table>
<thead>
<tr>
<th></th>
<th>Absolutely</th>
<th>Secondary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>From home</td>
<td>27</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>At local office</td>
<td>113</td>
<td>54</td>
<td>167</td>
</tr>
<tr>
<td>Travelling to/from project sites</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Combination</td>
<td>13</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>161</td>
<td>65</td>
<td>226</td>
</tr>
</tbody>
</table>

5.1.3 The ‘typical’ virtual project worker

An image of the ‘typical’ virtual team member for this study may be gleaned from the preliminary descriptive statistics: Aside from being educated to at least first degree or professional qualification level, he is likely to be a mature White Caucasian aged between 41 and 50, and who is an expert or technical member of a design, development and upgrade project. There is an indication of younger entrants into this highly technical field. They tend to be aged between 20 and 30 and are mainly from the Asian and Black communities. Despite the virtual nature of the project and loose team structure, he is an employee who tends to spend a fair amount of his time at a local office (but not necessarily with fellow team members). He works on or manages a small number of medium to complex design/development/upgrade projects that are mainly running on-time. The prevalent team size is small (2-10), involving a mix of internal colleagues and external contractors and partners who are organised in some form of a matrix structure. As such, the likelihood of membership changes during the project life cycle is high. Despite the virtual status of the projects and the fact that ICT is viewed as critical for computing and communication, team members still get together either regularly or at least, occasionally. A caveat to this typical profile is that the survey has a UK bias as invitations to participate were directed through the UK Association for Project Management and from the researcher’s personal contacts.
5.2 Inferential statistics

5.2.1 Data screening

Having checked for accuracy of coding and missing values, and reported on the categorical data, the metric data was then interrogated for the mean, standard deviation, skewness, kurtosis and normality of the independent or explanatory variables. Total scales scores were computed from the questionnaire items to determine the frequency distributions of each of the continuous variables. Violations in the distributional assumptions would indicate the possibility of removing data or transforming the data before parametric or multivariate analysis. The results from visual inspection of graphical representations indicated that distributions were mostly bell-shaped and some were approximately symmetrical, but all exhibited some deviation from normality owing to:

- the data containing a small number of scores that were depicted as outliers (interpersonal trust, structure, reward, warmth, support, and own contribution),
- the distributions were positive and negative skews (with one tail of the distribution longer than the other), and
- the distributions being often kurtosed and was flatter or more peaked than expected (the tails were too short or too long).

The results of the Kolmogorov-Smirnov and Shapiro-Wilks statistics were significant (p<0.05) across all but one of the variables (interpersonal trust); thus confirming visual conclusion of normality violations. Outliers were then examined more closely to ascertain the need to remove or transform them. Fortunately, none of the outliers were ‘extreme’. Tabachnik and Fidell’s (1996:73) conclusion is that skewness and kurtosis effects should be contained with reasonably large samples of 200 plus cases. Similarly, Miles and Shevlin’s (2001) ‘rule of thumb’ advice is that with a large sample, any skewness or kurtosis below 1.0 and not more than twice their standard error is unlikely to be a problem for analysis purposes. Visual inspection did not reveal distributions with skewness or kurtosis over +/- 1.0. As the project’s sample of 226 meets the general definition of a large sample size, and drawing upon Loehlin’s
(1998:7) advice that ‘mild departures from linearity [which presumably describes this study’s data] are often approximated by linear relationships’, the decision was to proceed to inferential testing.

5.2.2 Factorial validity and measurement model development for SEM

Reliability was tested using SPSS to compare the final sample data with the pilot data. Apart from climate ‘standards’ showing a slight fall in the Cronbach’s alpha value (from .572 to .538), all the other variables showed an improvement on the second pilot alpha readings. Additionally, an exploratory factor analysis (EFA) was conducted in SPSS using principal components. The latent factors revealed by the component analysis support the researcher’s argument for the appropriateness of SEM for this study.

As the stated aim of the project is model development for theory testing, the approach for CFA model estimation was the direct method (Hair et al, 1998) where improvements were made to the fit of the initial model while maintaining accordance with existing theory. Although model estimation in SEM is generally performed using full information approaches where the factor and regression components of the models are estimated simultaneously, the tentative nature of the indicators used in this study and the thesis’s aim of theory building required a more iterative SEM process. Hence, the SEM results and their interpretation are presented as separate components: first, the component showing the operationalisation of latent variables (the CFA measurement model) and second, upon ‘fixing’ the measurement model, the structural component of interrelating latent variables (the structural model) were estimated for individual hypothesis testing and toward a full structural model of all the hypothesised relationships.

The object is to establish the adequacy of each factor model as a whole and to examine the parameter estimates for possible misspecification. Fit indices, parameter estimates, critical ratios, squared multiple correlations, standardised residual covariances and MI reports were used to establish factor validation for each of the latent constructs depicted in the thesis’ initial path diagram (Chapter 4, Figure 4-5).
To achieve this, a variation of Hayduk's (1996) advocated staged process was adopted where, instead of progressively adding indicators from a large battery of indicators, the SMCs, factor loadings and error measurements of the five pre-specified indicators for each factor were examined against a set of critical values\(^\text{11}\) for inclusion or deletion (Hair et al, 1998). Substantive modifications were made following the initial estimates of each of the hypothesised factor models. What CFA does at this stage is to assist the researcher in determining the number of indicators to include per factor for the structural model stage. A point to note is that as the CFA models were fitted as stand-alone first-order dimensions with little to no reference to the possible correlations between the factors or cross-loadings on other factors, further modifications might be necessary on integrating the factor models to estimate the full structural model (Kenny and McCoach, 2003). Space constraint means that only the final CFA models for each of the study constructs are reported below.

**Self-concept:** Of the eight statements in Section 2 of the questionnaire which collected data on self-concept, seven were retained in the CFA measurement model (Figure 5-13). Initial component EFA findings had indicated that self-concept is not well represented as a one-factor model. Close inspection during CFA confirmed that the items should be divided into two distinct sub-scales: 'self-belief' (BLF) and 'self-preference' (PRF). The first measures an individual's intuitive belief in one's own worth, ability and judgement; the second reflects an adjusted attitude through experiential learning to the work context. The major key fit indices for self-concept are also shown in Figure 5-13. The RMSEA point estimate was well below .05 and its PCLOSE was non-significant at .693. Hoelter's .05 and .01 critical N values (315, 390) were comfortably over the recommended 200. Although the SMCs for Sid 1 and 4 were below .30, removing either resulted in the \(\chi^2/\text{df}\) and the TLI statistics being above 1.00, and a RMSEA at 0.00. Thus, balancing theory with fit and parsimony, it was decided that at this stage of analysis, the model depicted by Figure 5-13 is a good fit to the data.

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\(^{11}\) Given the exploratory nature of this study, critical values are set at the lower acceptable bounds of the traditional .05 significance level. For example, SMCs (\(R^2\)) measuring indicator reliability \(\geq 0.30\); the variance extracted or standardised factor loadings \(\geq 0.55\); critical ratios \(\pm 1.96\); and standardised residual values \(> \pm 2.58\) (outside of the acceptable range of 1 in 20 residuals exceeding the cut-off value).
Interpersonal trust: The initial factor model depicting all 12 items in the questionnaire produced poor fit values. Error covariances suggested either a high level of overlap in item content, or a reflection of respondents' biases. On reading through each of the questionnaire statements, it was possible to reclassify the items into sub-scales measuring particular facets of interpersonal trust: conventional trust formation and social categorisation point to implied reliability of individuals by another within a social setting through the development of shared or common language and typification processes, contextual cues, rituals and face-to-face socialisation. This human need to preserve ontological safety results in trust assumptions now labelled as TDISP (represented by statements 2, 3 and 4). On the other hand, the social exchange approach argues that actors seek to maximise their own utility and trust is a part of the calculated process of pooling resources for mutual benefit. This suggests that shared fate in a project outcome creates in team members the conditional willingness to rely on the performance of others. Hence, items 5, 6 and 7 were respecified as trust conditions (TCON) since they refer to the work-based preconditions or expectations for cooperation.
Statements 9 through 12 did not sit well with either category, and this finding was also evident in the rotated EFA matrix. This group of measures refers to the situational aspects of the individual where trust is necessitated by project constraints. Of the five statements referring to alignment of goals, lack of prior knowledge, organisational control systems, time criticality and tasks interdependency, only time and interdependency emerged as significant measures. A material correlation was observed between items 9 and 11 which necessitated further examination of the critical values for inclusion. As a result, only items 10 and 12 were retained to measure trust arising from the project context (CXT). The CFA model in Figure 5-14 below presents the three sub-scales of interpersonal trust and their fit values.

Figure 5-14: Standardised interpersonal trust measurement model

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$P$</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPT4</td>
<td>24.779</td>
<td>17</td>
<td>.100</td>
<td>1.458</td>
<td>.972</td>
<td>.941</td>
<td>.952</td>
<td>.971</td>
<td>.045</td>
</tr>
</tbody>
</table>

Climate: The climate construct is the largest of all the constructs in the questionnaire. The hypothetical climate measurement model and its relevance for the study were discussed in the literature review and theory chapters. As a multidimensional construct, climate is represented in the model by nine factors: structure, responsibility, reward, risk, warmth, support, standards, conflict and group identity. Each of the
factors is designed to be measured by five statements. However, initial principal component EFA indicated the possibility of climate being more effectively measured using a reduced number of indicators, and cross-loadings among factors could mean that some indicators should be removed or classified differently. Factorial analysis in SEM also showed varying degrees of factor reliability and validity. The next step was to test if it would be possible to present the climate construct as a second-order CFA model. A total of three alternative CFA models were estimated. The final model (Model 3, Figure 5-15) showed an improved likelihood χ² statistic over the first two models. The χ²/df value was within the 1.00 - 2.00 range. Although not quite at or above the minimum desired .90 level both GFI and AGFI were displaying closer fit than previous models. Crucially, the relative fit indices TLI and CFI for Model 3 were close to the upper .95 acceptability level.

Figure 5-15: The second-order climate measurement model

<table>
<thead>
<tr>
<th>Model</th>
<th>χ²</th>
<th>Df</th>
<th>P</th>
<th>χ²/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIM3</td>
<td>510.947</td>
<td>313</td>
<td>.000</td>
<td>1.632</td>
<td>.863</td>
<td>.834</td>
<td>.940</td>
<td>.947</td>
<td>.053</td>
</tr>
</tbody>
</table>
Despite Hoelter’s CNs (.05/157, 01/165) pointing to possible small sample difficulties, the RMSEA point estimate of .053 was non-significant \((p = .269)\) and the range between the lower and higher 90% interval bounds was relatively narrow (.045 to .061). These RMSEA values signal the precision of model fit between the hypothesised model and the observed data. Taking into account (a) the final modest sample constraint, (b) the statistical significance of all the parameter estimates, (c) the indication of model parsimony with reference to the RMSEA estimate, (d) both TLI and CFI were close to the higher acceptable value of .95, (d) the lack of other substantive evidence for further modifications and (d) Byrne’s (2001) advice that a marginally fitting model can still be a ‘valid’ model, the conclusion was that further respecification of the climate measurement model would be superfluous and done merely to suit data-specific idiosyncratic characteristics. [Note: the error covariance between GID and Warmth is discussed later in Section 5.3].

**Own performance:** There was a notable tension between statements 4 and 5: “My contribution to the project is well recognised” and “I find it hard to relate with my team members. It is affecting my work...”. The expressed negative statement of RO5 may be an attribution of one’s performance shortcomings to a relational problem with colleagues and their failure to show appreciation. Given RO5’s low SMC and to avoid biased attributions, it was decided that it should be excluded.

**Figure 5-16: Standardised own performance measurement model**

<table>
<thead>
<tr>
<th>Model</th>
<th>(\hat{\chi}^2)</th>
<th>Df</th>
<th>(P)</th>
<th>(\chi^2/df)</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>RO2</td>
<td>3.370</td>
<td>2</td>
<td>.155</td>
<td>1.865</td>
<td>.992</td>
<td>.958</td>
<td>.983</td>
<td>.994</td>
<td>.062</td>
</tr>
</tbody>
</table>
In the re-specified CFA model, the chi-square ($\chi^2$) statistic was non-significant and approximating the degrees of freedom. The normed $\chi^2$ was between the fit range of 1.00 and 2.00. All other fit indices also indicated superior fit while RMSEA at .062 ($p = .312$) was reasonable. Hoelter’s critical N values are also well above 200 (.05/362; .01/556). Thus the conclusion was that the modified factor model was a good fit between the implied and sample data (Figure 5-16) and would be used for SEM and hypothesis testing.

Members’ professional behaviour: There were two competing CFA models for this construct, both producing very similar fit results. In each case, the absolute chi-square ($\chi^2$) statistic was non-significant and approximating the DF (5.794, DF=4; $p = 1.449$; 2.862, DF=2, $p = .239$). The normed $\chi^2$ for both models stood at 1.4, indicating good fit. Apart from the first item (.352), all the other indicators reported SMC values that were above .50. The RMSEA values for the models were also very close (.045 and .044), and their Hoelter’s critical N values were well above 200. This presented the researcher with a dilemma as to which of the alternative factor models to use. The decision was taken to retain Model 2 (Figure 5-17) as items 1 and 2 were measuring very similar attitudes and the second model’s RMSEA had a lower point estimate and its low-high range was slightly more rigorous.

Figure 5-17: Standardised members’ professional behaviour measurement model
**Team cohesiveness:** The last of the factor models to be estimated was team cohesiveness. The covariances table in the MI report indicated a measurement error covariance between e4 and e5 (39.667). An investigation of the questionnaire revealed that their association lies in the assessed threat to team cohesiveness: “There is a lack of communication – people tend to keep things to themselves which may affect others’ performance” (Tch4), and “It’s every person for themselves. People are only interested in their own output” (Tch5). The importance of communication for group solidarity formation is clearly highlighted in the group identity literature and selfish acts or behaviours (e.g. the concept of free-riding) can affect feelings of ‘we-ness’. Although it was possible to simply add a covariance, it was felt that two negative statements out of a total of five could adversely affect the interpretation of perceived team cohesiveness. The model was respecified without items 4 and 5. Although the model is now a three-indicator model with no degrees of freedom, and therefore is a just-identified model whose fit cannot be improved, the SMCs of the remaining items (> .50) indicate that they are reasonable measures of team cohesiveness.

Figure 5-18: Standardised team cohesiveness measurement model

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>P</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>COH2</td>
<td>0.000</td>
<td>0</td>
<td>-</td>
<td>1.865</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>.064</td>
</tr>
</tbody>
</table>
5.3 Developing the full structural model and hypothesis testing

The central premise of this thesis is the need to examine trust’s transition and social identity formation. In Chapter Three, a series of research propositions were constructed to address the project’s research questions which formed the basis of the path diagram in Chapter Four (Figure 4-5). In Section 5.2 CFA was conducted for each of the latent variables in the path diagram. The next step is to develop the structural model for the hypothesised relationships.

This section begins with the first proposition (P1) that the willingness of individuals to form immediate relational links is only possible given a predilection or willingness to trust. It posits that self-concept and interpersonal trust and are positively correlated. At the CFA stage, it was noted that the measurement models for both self-concept and interpersonal trust are better represented as possessing sub-scales (Figures 5-13 and 5-14). Accordingly, nested structural measurement models (Models P1-1, P1-2 and P1-3) for self-concept and interpersonal trust were specified to derive a model of ‘best fit’. In addition, as project interdependency can affect members’ perceptions of team role clarity, workload distribution, ease of communications and ultimately, member-trust expectations, a third nested model (P1-3) was also specified with CXT asserting a direct influence on TCON. Table 5-9 is a summary of the three models’ fit values.

Table 5-8: Fit values for self-concept and interpersonal trust

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>Df</th>
<th>( P )</th>
<th>( \chi^2/df )</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>ECVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1-1</td>
<td>103.294</td>
<td>80</td>
<td>.041</td>
<td>1.291</td>
<td>.943</td>
<td>.915</td>
<td>.956</td>
<td>.967</td>
<td>.036</td>
<td>.815</td>
</tr>
<tr>
<td>P1-2</td>
<td>108.045</td>
<td>82</td>
<td>.029</td>
<td>1.318</td>
<td>.941</td>
<td>.914</td>
<td>.952</td>
<td>.963</td>
<td>.038</td>
<td>.818</td>
</tr>
<tr>
<td>P1-3</td>
<td>103.320</td>
<td>81</td>
<td>.049</td>
<td>1.276</td>
<td>.943</td>
<td>.916</td>
<td>.959</td>
<td>.968</td>
<td>.035</td>
<td>.806</td>
</tr>
</tbody>
</table>

12 Alternative models are nested if models are pitted against one another to examine plausibility of some hypotheses paths and/or alternative views about relationships. (Maruyama, 1998:235). This method of comparing two models of interest rather than incorporating an arbitrary null model is preferred by Browne and Cudeck (1993:137).
In Model P1-1 the five factors were allowed to correlate freely. The indicators had a non-zero loading on their respective factors and a zero loading on the other factors, and the assumption was that all measurement errors were uncorrelated. Although Model P1-1 reported a significant chi-square fit of 103.294.891 (DF= 80, p=.041), the normed chi-square (1.291) reflected a reasonable approximation of the population. The fit values for other indices (GFI, AGFI, TLI and CFI) also pointed to a model that satisfied current standards of fit. Sample size appeared not to be an issue and the RMSEA point estimate was <0.05 and not significant (PCLOSE=.815). The factor loadings or regression weights output did not reveal any offending estimates. Only four of the 10 factor covariances reported significant t-statistics or critical ratios (>1.96). An initial conclusion from Model P1-1 results is that weak (but significant) relationships exist between PRIF and TCON (.28) and TDISP and CXT (.20). Stronger relationships were observed between PRF and CXT (.44) and TCON and CXT (.65).

Model P1-2 was specified with self-concept (BLF and PRF) asserting direct effects on the dimensions of interpersonal trust. The significant relationship between TDISP and CXT estimated in Model P1-1 did not replicate in this model. Otherwise, the fit results were similar to Model P1-1. Overall $\chi^2$ statistic was also significant ($p=.029$) and the $\chi^2$/df value at 1.318 was not much above that of Model P1-1. The absolute fit indices were above the lower .90 threshold, and the relative fit values were greater than the higher .95 threshold. RMSEA and ECVI values, however, showed a marginal increase over Model P1-1, which suggested a marginal diminution of parsimonious fit. The regression weights between factors now reported only PRF$\rightarrow$CXT, PRF$\rightarrow$TCON, and CXT$\rightarrow$TCON as having significant critical ratios (above 1.96). There was no material cross-loading problem. Figure 5-19 shows the structural model for P1-3. Model P1-3's overall fit was excellent with the chi-square likelihood statistic being relatively close to the degrees of freedom. All the other fit indices pointed to a specified model that successfully reproduced the sample data.
Although Hoelter’s CNs did not indicate a sample size problem, given the relatively modest data sample, additional indication of fit was checked by comparing the point estimates of ECVI for the competing models. Of the three alternative models, Model P1-3 in Table 5-9 showed the lowest RMSEA point estimate and ECVI value and would appear to be the best fitting of the three models. However, the standardised coefficients between PRF and CXT (.28), PRF and TCON (.26) and CXT and TCON (.58) would appear to be lower than that reported in Model P1-1. Owing to the nature of the sub-hypotheses for Proposition 1, Model P1-3 was deemed more appropriate for use than Model P1-1 or Model P1-2.

HYPOTHESIS TESTING:

PROPOSITION 1 states that the willingness or ability of individuals to form relational links and rely on others is a product of their personality or belief system. The sub-scales identified by the CFA models indicated that P1 might be tested through a number of sub-hypotheses proffering correlations between self-belief (BLF)
and self-preference (PRF) with trust as a trait (TDISP), trust as a learned behaviour (TCON) and situational trust (CXT). The six sub-hypotheses for P1 are as follows:

**P1a:** A virtual team member’s willingness to trust and be reliant on another is an outcome of his/her own personality or belief system (BLF and TDISP).

**P1b:** A virtual team member’s self-belief system influences his/her view of the importance of trust prerequisites (BLF and TCON)

**P1c:** A virtual team member’s self-belief system influences his/her interpretation of the situational context project constraints (BLF and CXT)

**P1d:** A virtual team member’s willingness to trust and be reliant on another is a preference state internalised through past experience (PRF and TDISP)

**P1e:** A virtual team member’s preference state internalised through past experience moderates his/her view of the importance of trust prerequisites (PRF and TCON)

**P1f:** A virtual team member’s preference state internalised through past experience moderates his/her interpretation of the situational context (PRF and CXT)

There are only three significant relationships (marked as red arrows) in Figure 5.19: (a) between PRF and CXT, (b) PRF and TCON, and (c) CXT and TCON. Therefore, of the six sub-hypotheses listed above, P1e and P1f are supported but not P1a, P1b, P1c or P1d.

While PRF and BLF together account for only 8 percent of the variance in CXT signifying the presence of other unidentified variables, over half (51%) of the variance in TCON are explained by PRF and CXT. This suggests that personal work preference and one’s immediate work context as experience-based factors have a considerable effect on an individual’s willingness to trust in some future context.
An interesting observation is the significant relationship between CXT and TCON (.58) which was not part of the proffered sub-hypotheses. It can be seen in Table 5.10 that although the direct effect of PRF on TCON is modest at .27 its indirect effect on TCON through CXT is .16, thus making a material cumulative effect of .43. Apart from the aggregated total effect of .58 for CXT and TCON, there is no other significant or material relationship.

Table 5-9: Standardized total (direct + indirect) effects

<table>
<thead>
<tr>
<th></th>
<th>PRF</th>
<th>BLF</th>
<th>CXT</th>
<th>TDISP</th>
<th>TCON</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXT</td>
<td>.277</td>
<td>.046</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>TDISP</td>
<td>.026</td>
<td>-.054</td>
<td>.225</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>TCON</td>
<td>.425</td>
<td>.115</td>
<td>.580</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Inference from the indirect relationships is that an individual’s personal work preference and his/her learned responses to the preconditions necessary to engender interpersonal trust in a given work context are related. Conversely as none of the relationships between BLF and each of the three interpersonal trust variables is significant, trust-giving in the virtual context would appear not to be a function of an actor’s inherent self-belief. Instead it is contingent upon individual members’ learned responses and continuing sense-making of their immediate work environment.

PROPOSITION 2 posits that virtual project members perceive their team as possessing unique climate characteristics. That is, in the virtual project domain climate (represented by its various dimensions) is still a relevant and important cognitively conceived construct that ‘gives coherence, meaning and explanation to interpersonal relations’ (Jackson and Carter, 2000:39). P2 is effectively the climate structural measurement model depicted in Figure 5-15. Contrary to the prevailing literature understanding of the components of climate, conflict, risk and standards have emerged in this study as non-significant factors. It is possible that the observed measures were not properly operationalised owing to inadequate or unclear wording in the questionnaire, but as neither of the two pilots had indicated this to be a

13 Parenthesis [ ] and ‘interpersonal’ in italics are added by this author.
problem and CFA had signalled relatively discrete latent factors, it is plausible that they might in fact be less relevant in the virtual context as predictors of climate than within co-located teams. Alternatively, as a result of different working practices, they could have become too important to be determined as dimensions of climate. Certainly this possibility was raised in later interviews as project tasks become identifiable with one or a small numbers of team colleagues and whose performance and accountability are increasingly attributable and accountable by them. The reasons for these anomalous findings are not clear at this stage of the study. Fortunately the two-stage design of this project means that these surprising observations and others derived from the quantitative phase can be further explored in the subsequent interviews.

Of the remaining significant climate dimensions in Figure 5.15, the key drivers as evidenced by their regression loadings and variances explained are, in rank order: responsibility (.88), reward (.80), structure (.76) and support (.63). Although the regression loadings for warmth (.46) and group identity (.42) are both significant and material, they rank behind the other four factors, suggesting the possibility that in virtual projects social relations are secondary to the perceived enabling/constraining structural processes. Warmth and group identity residuals are also significantly correlated. This usually points to a prima facie violation of the assumption that covariation among the first-order factors are to be explained fully by their regression on the second-order factor and their error variances are uncorrelated.

Although error correlations between item pairs often indicate content redundancy, Jöreskog and Sörbom (1993) suggest that for some studies, especially in social psychology, correlated parameters can make strong substantive sense and researchers should include them in the model. In this single sample of virtual team workers, the feeling of a warm and caring/sharing atmosphere could indicate affective identification with fellow members, thus eliciting responses which are indicative of similar mental sets and interpretations; the residuals effectively capture the unexplained or unmeasured variance of the two climate variables. A CFA combining the two factors did not produce improved results which supports the conclusion that the two factors are complementary rather than synonymous: where there is warmth,
there is group identity and the stronger the affective social construction, the greater the social categorisation and identification. With six of the nine factors exhibiting significant and material factor loadings, the conclusion is that climate is still a relevant and important cognitive construct in the virtual team context; albeit the mix and importance of the components may be different to conventional teams. P2 is therefore supported.

PROPOSITION 3 argues that team climate as a mental construction of individuals is underscored by their self-concept and trust dispositions. As with P1 and for the purpose of hypothesis testing, P3’s over-arching proposition is restated as comprising two sets of sub-hypotheses: P3a and P3b examine the relationship between climate and each of the self-concept dimensions, P3c, P3d and P3e examine the relationship between climate and each of the interpersonal trust factors.

P3a: A actor’s team climate perception is a subjective response with reference to his/her personality or belief system (CLIM and BLF).

P3b: An actor’s team climate perception is a subjective response affected by his/her work preference internalised through past experience (CLIM and PRF).

P3c: An actor’s team climate perception as a subjective response fortifies or reduces his/her dispositional willingness to trust and be reliant on another team member (CLIM and TDISP).

P3d: An actor’s team climate perception as a subjective response fortifies or reduces his/her attitude on the preconditions of trust when working with others in a team (CLIM and TCON).

P3e: Team climate perception and project context as perceptual constructs are related (CLIM and CXT).

Three alternative models were estimated for Proposition 3 and its sub-hypotheses. Model P2-1 does not assume any causal link and simply represents the second-order team climate construct as freely correlated with each of the first-order self-concept and inter-personal dimensions. Model P2-2 depicts the two-factor self-concept (BLF
and PRF) as exogenous to climate. In line with the results of Model P1-3, this model specifies self-preference as having a direct effect on TCON and CXT, but not on TDISP. As self-belief was already found when testing Proposition 1 not to have any significant relationship with the interpersonal trust dimensions, belief in Model P2-2 is specified as affecting climate only. Climate in turn, is specified as an independent construct for the trust dimensions TCON, TDISP and CXT.

P2’s unexpected finding that conflict, risk and standards are not significant predictors of climate in the virtual setting is also relevant for P3. At-distance working and taking personal ownership through self management exposes the actor to a greater risk of personal rather than collective failure. It is plausible therefore that in virtual working quality assurance rather than quality control becomes more pertinent as individual actors work primarily on their own to meet target timeline and output. Team transience and member variability have already been highlighted in the virtual team literature as barriers for team-building and shared values. In this setting, it may be that self-belief becomes relevant as an enabler (or limiter) of environmental scanning and action. That is, an individual’s ability to undertake day-to-day activities and cope with the unknowable future in this situation requires a certain level of self-efficacy and reciprocal determinism in order to avoid performance failure and undue conflict.

While the opportunity for face-to-face engendered irritations is reduced in distributed teams, when a misunderstanding does occur, digital, spatial and temporal divides can delay resolution or worse, escalate any initial friction or discord. Without the luxury of past history, regular social interaction and physical cues, it is likely that a different basis is used for group solidarity and performance. In the light of these discussions, there is substantive and data-specific relevance in respecifying Model P2-2 to test possible direct links between risk, standards and conflict and self-belief. Hence, the third model (P2-3) takes into account the additional observations when estimating the climate structural model and when testing P1 and P2; in particular, the possibility that when working under one’s own volition, risk, standards and conflict may be too important to be explained as a composite of climate. The conceptual discussion above is represented by the following additional sub-hypotheses:
P3f: An actor’s self-belief underlines his/her perception of team risk (BLF and Risk).

P3g: An actor’s self-belief underlines his/her perception of expected quality standards (BLF and Stds).

P3h: An actor’s self-belief underlines his/her perception of situational conflict (BLF and Conf).

In accordance with SEM model development practice and for clarity of presentation, Model P2-3 was specified without the other non-significant relationships and was used to test the sub-hypotheses of Proposition 3. The fit values of the three nested alternatives are available in Table 5-10 below. Despite the increasing complexity of the models for P1, P2 and P3 and although sample size is flagged by low Hoelter’s CNs as a limiting problem, it is reassuring to see that each of the three models in Table 5-11 has a normed $\chi^2$ that is comfortably below 2.00. While the low values of the absolute GFI and AGFI indices would suggest a bad fit between the implied model and the sample data, the values for the comparative indices TLI and CFI (preferred by Bentler and Hu, 1999) are above .90, thus indicating the models to be of a reasonable fit. More significantly, their RMSEA point estimates are non-significant and each has an upper range value which is less than .05. The RMSEA estimates provide a valuable indication that despite the small sample size, there is good precision in reflecting model fit in the population; particularly when the upper and lower range values are close and when PCLOSE is not significant.

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$P$</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>ECVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2-1</td>
<td>1205.708</td>
<td>.834</td>
<td>.000</td>
<td>1.446</td>
<td>.813</td>
<td>.787</td>
<td>.911</td>
<td>.918</td>
<td>.045</td>
<td>6.354</td>
</tr>
<tr>
<td>P2-2</td>
<td>1227.432</td>
<td>.841</td>
<td>.000</td>
<td>1.459</td>
<td>.809</td>
<td>.785</td>
<td>.909</td>
<td>.916</td>
<td>.045</td>
<td>6.389</td>
</tr>
<tr>
<td>P2-3</td>
<td>1012.950</td>
<td>.724</td>
<td>.000</td>
<td>1.399</td>
<td>.827</td>
<td>.804</td>
<td>.927</td>
<td>.932</td>
<td>.042</td>
<td>5.355</td>
</tr>
</tbody>
</table>

Model P2-3 reflects the best fit and has the smallest ECVI value of the three models. ECVI is a useful means of assessing in a single sample, the likelihood that the model...
will cross-validate across similar sized-samples from the same population. An examination of the standardised regression weights in the earlier models (P2-1 and P2-2) revealed a number of non-significant relationships; namely the structural paths flowing from CLIM to TDISP (.118), CLIM to TCON (.107), CLIM to CXT (.115), and BLF to Conf (.039). The covariances between BLF and CLIM, PRF and CLIM and BLF and PRF are small but significant. As we move towards the full structural model it is not possible to show them in their entirety, therefore model presentation from here on is only of significant relationships between latent factors without their observed measures.

Figure 5-20: Standardised structural model of self-concept, interpersonal trust and Climate (Model P2-3)

The conclusion from the results is that of the first four P3 sub-hypotheses, only P3a and P3b are supported by the data. Although significant, the correlation effects are small; nonetheless they indicate that how an actor senses his/her environment is related to his/her self-belief and expressed work preference. Conversely, P3c, P3d and P3e positing a relationship between climate and each of the three trust factors appear unfounded. In Proposition 1 self-belief was found to have no significant influence on
each of the three interpersonal trust variables and person-to-person trust in the virtual context is drawn from an actor's lived experiences and continuing sense-making of his/her immediate work context. Similarly, climate also appears not to be significantly related to any of the interpersonal trust factors. This suggests that the basis for interpersonal trust-giving in the virtual team is neither a personality disposition nor a product of an actor's current sense-making mechanism. When interpreted with reference to the significant relationships between climate and self-belief and climate and self work preference highlighted above, and noting the non-significant link between climate and immediate work context (Figure 5-20), this apparently independent gratis trust must by logic, have its foundation in one's stock of knowledge and schemas that is amassed over time and underlined by one's own self-confidence (which through social learning is itself an evolving conception).

Of the additional sub-hypotheses (P3f, P3g and P3h), the significant regression paths from BLF to Risk (.27) and BLF to Stds (.34) indicate support for P3f and P3g. As the coefficient between BLF and Conf is not significant (P3h), that relationship has been excluded from Figure 5.21. These results confirm the anomaly that conflict is not a statically significant or material variable for individuals working in distributed teams. The small variances explained by BLF on Stds (.12) and on Risk (.07) suggest the possibility of unknown elements that are not included in this structural model and further research into these relationships would be beneficial.

The difficulty of operationalising trust and tracing its transition from the dyads to the collective was discussed in the literature, methodology and theory chapters, hence leading to this thesis' theoretical assumption that trust's presence in these distributed work groups is deduced through a latent factor labelled team cohesion. Accordingly, PROPOSITIONS 4 and 5 suggest that an actor's perception of the state of group solidarity and cohesion, or how well the team is functioning together, influences his/her cognitive evaluation of fellow members' skills and behaviour, and his/her own performance. Cohesion is measured by perception of the extent of cooperative behaviour between team members, their general willingness to work with out-groups for collective good, and a positive feeling about the team's overall performance. The
stronger the perceived cooperation and goodwill in the collective, the more positive an actor would see his/her team’s and his/her own performance:

P4a: Perceived team climate influences an actor’s evaluation of his/her own contribution to the team (CLIM and RO).

P4b: Perceived team climate influences an actor’s evaluation of fellow members’ professionalism and general behaviour (CLIM and RM).

Although earlier observation when testing the continued relevance of climate pointed to group identity ranking after the structural processes, one of the thesis’ hypotheses is that collective goodwill is not only felt or perceived as part of the team climate, it also directly affects team cohesion and member performance evaluation:

P4c: Group identity is important in explaining an actor’s perception of his/her team members’ professionalism and general behaviour (GID and RM).

P4d: Group identity is important in explaining team cohesion (GID and COH)

P5a: Team cohesiveness as a latent indicator of collective trust and team climate are positively correlated (COH and CLIM).

P5b: Team cohesiveness has a direct effect on an actor’s evaluation of own contribution (COH and RO).

P5c: Team cohesiveness has a direct effect on an actor’s evaluation of fellow members’ professionalism and general behaviour (COH and RM)

The next proposition follows the interpretative argument that meaning is a phenomenological experience and individuals interpret their surroundings and their own and others’ actions by reference to their sense of ‘self’ and personal systems lodged as stores of cognitive schemas or mental representations. People with a strong sense of self can devise coping or adaptive strategies to handle uncertain conditions. Accordingly, PROPOSITION 6 posits that a member’s self-concept is a useful coping
or adaptive mechanism which has an effect on how he/she would evaluate and affirm his/her own contribution. Expressed another way, an actor’s self-belief is an important factor on how he/she evaluates his own contribution to the team (BLF and RO).

The structural model is sufficiently developed for propositions 4, 5 and 6 to be tested together. Two alternative models were estimated initially. Although the original climate measurement model included conflict, standards and risk, Model P2-3 had established that they are not important factors for climate. Accordingly, Model P4-7a represents climate as a higher-order latent construct only for structure, support, responsibility, reward, warmth, and group identity. Model P2-3 also found that an actor’s views on performance standards and risk are underwritten by his/her personal outlook and confidence. Therefore standards and risk were specified in Model P4-7a as influenced by BLF, and conflict was excluded entirely. Likewise, TDISP appeared not to play any significant role in earlier models and was excluded. When testing Proposition 3, climate’s relationship with trust context was found not to be significant although there appeared to be a mediated relationship through CXT with TCON. In the interest of parsimony, the path from CLIM through CXT to TCON was also excluded. Climate, belief and preference were allowed to correlate freely. Own performance was specified as affected by climate and belief, and climate and group identity as having a direct effect on an actors’ perception of his fellow members’ professionalism and behaviour.

The second model (Model P4-7b) takes on board the theoretical discussion of the importance of group identification in the virtual context. In this model, the structural path between CLIM and GID was first set to zero, and two paths were included flowing from GID to COH and to RM. On running the model, it was clearly shown that GID is still very much a significant factor of climate, but it also exhibits a direct effect on RM and COH. Therefore, the restriction on CLIM → GID was lifted, and P4-7b re-estimated on the assumption that if the hypothesised effects of GID on collective solidarity and assessed team members’ behaviour are true, then the regression coefficients between GID and COH and GID and RM would be significant.
Although both Model P4-7a and P4-7b reported significant chi-square statistics and poor GFI and AGFI values, their normed $\chi^2$ values were above 1.00 but below 2.00. But the relative indices also reported values below the .90s, indicating poor fit. The RMSEA values for the two models were close to .50 and under .60. Each estimate sat within a tight low-high intervals band, with an upper limit that was below .60. With the exception of CLIM→COH, CLIM→RM and PRF→RO, all the factor loadings registered significant critical ratios (>1.96). Given the poor fit readings, a close examination of all the factor and parameter estimates in the MI report was undertaken. The regression weights MI showed ten structural paths with MI values >4.0 but all were below 10.0 with small expected parameter change values (EPC). Although there were numerous cross-loadings of factors on individual indicators, none was of any size in terms of either the approximate chi-square value or the EPC. The standardised residual covariance output was also scrutinised for significant cross-loadings (>2.58). 21 pairs were identified as large and significant. With 49 observed indicators, this represented only a small fraction of the allowable 10% rule-of-thumb. Individual variables were also examined for excessive skew and/or kurtosis. Only item 3 of self-belief reported a kurtosis value >2.0. Item 7 of trust preconditions was significantly skewed (>2.0).

Table 5-11: Fit values for the full structural model

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$P$</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>ECVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>P4-7a</td>
<td>1855.782</td>
<td>1104</td>
<td>.000</td>
<td>1.681</td>
<td>.762</td>
<td>.736</td>
<td>.865</td>
<td>.873</td>
<td>.055</td>
<td>9.323</td>
</tr>
<tr>
<td>P4-7b</td>
<td>1739.254</td>
<td>1102</td>
<td>.000</td>
<td>1.578</td>
<td>.770</td>
<td>.745</td>
<td>.885</td>
<td>.892</td>
<td>.051</td>
<td>8.823</td>
</tr>
<tr>
<td>P4-7c</td>
<td>1291.066</td>
<td>878</td>
<td>.000</td>
<td>1.470</td>
<td>.804</td>
<td>.779</td>
<td>.914</td>
<td>.920</td>
<td>.046</td>
<td>6.734</td>
</tr>
</tbody>
</table>

A third and final model was estimated (Model P4-7c) taking into account the cross-factor loadings and variables suffering from excessive kurtosis or skewness.

---

14 The modification index (MI) is chi-square statistic with one degree of freedom and reflects the extent to which the hypothesised model is appropriately specified. The MI value indicates the drop in overall chi-square value if the fixed parameters were to be freely estimated in a subsequent run. The expected change value (EPC) represents the predicted estimated change in either a positive or negative direction. Byrne (2001) advises that changes should be substantive and not aimed at 'fixing' the data.
Although, as expected, sample size adequacy is still an issue (Hoelter’s Ns .05/166 and .01/171), the individual regression statistics for Model P4-7c are now all above 1.96 and the model can be considered acceptable since the normed chi-square value is above 1.00 but comfortably below 2.00. The relative fit values are above the floor value of .90 and mid-point RMSEA is non-significant and <.50 (Table 5-12)

The challenge as always is “knowing...how much fit is enough” (Wheaton, 1987: 123). Thus, resisting the temptation to make further data-specific rather than substantive modifications, Model P1-7c was deemed the best fitting model of the three alternatives. Given the complex and inter-woven nature of the model and modest sample size (which has emerged as an obvious study limitation); the decision was taken to stop further estimation and use the interview data to explicate the findings here. Figure 5-21 below shows the thesis’ full structural model.

Figure 5-21: This project’s full structural model
Propositions 4, 5 and 6 were tested using this final model. The second-order factor climate has a significant direct effect on own contribution (.34). Climate and self-belief together explains 39 percent of the variance in own contribution. Thus, P4a is supported. However, climate’s influence on member performance is an indirect one, mediated through group identity. While P4b is not supported, P4c which posits a link between group identity and member behaviour depicts a significant regression coefficient of .30. Similarly, group identity’s direct effect on team cohesion is significant and material at .71 and accounting for over half of its variance, thus supporting P4d.

Another finding confirming P5c is the effect of team cohesion on member performance. GID and TCOH together account for 44 percent of the variance in member performance, thus suggesting that member evaluation of fellow colleagues’ behaviour is more positive when identity and mutual trust are in place. However, the P5a and P5b are unsupported as the results have failed to show a significant relationship either between COH and RM or COH and CLIM. Table 5-12 displays the full results for the six propositions ad their sub-hypotheses. Only the positive relationships in this table are represented in the final structural model (Figure 5-21), namely:

- (P1e) Self-preference and trust preconditions
- (P1f) Self-preference and work context
- (P2) Climate dimensions’ salience in the virtual team
- (P3a) Climate and self-belief
- (P3b) Climate and self-preference
- (P3f) Self-belief and risk perception
- (P3g) Self-belief and quality standards
- (P4a) Climate and own contribution
- (P4c) Group identity and members’ professional behaviour
- (P4d) Group identity and team cohesion
- (P5c) Cohesiveness and members’ professionalism
• (P6) Self-belief and own contribution
Table 5-12: Summary Hypotheses Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Support:</th>
<th>Hypothesis</th>
<th>Support:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes/No</td>
<td></td>
<td>Yes/No</td>
</tr>
<tr>
<td>1a</td>
<td>No</td>
<td>3f</td>
<td>Yes (.35)</td>
</tr>
<tr>
<td>Self-belief and trust disposition</td>
<td></td>
<td>Self-belief and risk perception</td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>No</td>
<td>3g</td>
<td>Yes (.27)</td>
</tr>
<tr>
<td>Self-belief and trust prerequisites</td>
<td></td>
<td>Self-belief and standards</td>
<td></td>
</tr>
<tr>
<td>1c</td>
<td>No</td>
<td>3h</td>
<td>No</td>
</tr>
<tr>
<td>Self-belief and situational context</td>
<td></td>
<td>Self-belief and conflict</td>
<td></td>
</tr>
<tr>
<td>1d</td>
<td>No</td>
<td>4a</td>
<td>Yes (.34)</td>
</tr>
<tr>
<td>Self-preference and trust disposition</td>
<td></td>
<td>Climate and own contribution</td>
<td></td>
</tr>
<tr>
<td>1e</td>
<td>Yes (.27)</td>
<td>4b</td>
<td>No</td>
</tr>
<tr>
<td>Self-preference and trust prerequisites</td>
<td></td>
<td>Climate and members’ professional behaviour</td>
<td></td>
</tr>
<tr>
<td>1f</td>
<td>Yes (.27)</td>
<td>4c</td>
<td>Yes (.30)</td>
</tr>
<tr>
<td>Self-preference and situational context</td>
<td></td>
<td>Group identity and members’ professional behaviour</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yes*</td>
<td>4d</td>
<td>Yes (.71)</td>
</tr>
<tr>
<td>Climate’s salience</td>
<td></td>
<td>Group identity and team cohesion</td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>Yes (.16)</td>
<td>5a</td>
<td>No</td>
</tr>
<tr>
<td>Climate and self-belief</td>
<td></td>
<td>Cohesiveness and climate</td>
<td></td>
</tr>
<tr>
<td>3b</td>
<td>Yes (.16)</td>
<td>5b</td>
<td>No</td>
</tr>
<tr>
<td>Climate and self-preference</td>
<td></td>
<td>Cohesiveness and own contribution</td>
<td></td>
</tr>
<tr>
<td>3c</td>
<td>No</td>
<td>5c</td>
<td>Yes (.41)</td>
</tr>
<tr>
<td>Climate and trust propensity</td>
<td></td>
<td>Cohesiveness and members’ professionalism</td>
<td></td>
</tr>
<tr>
<td>3d</td>
<td>No</td>
<td>6</td>
<td>Yes (.47)</td>
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<tr>
<td>Climate and trust preconditions</td>
<td></td>
<td>Self-belief and own contribution</td>
<td></td>
</tr>
<tr>
<td>3e</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate and situational context</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Six out of the nine proposed climate factors (Resp .869; Rew .790; Struc .782; Supp .629; Gid .442; Warm .464)
CHAPTER SIX
DISCUSSION OF SURVEY FINDINGS

6. Introduction

In this chapter the survey results and components of the final structural model (Figure 5.21) in the previous chapter are discussed with reference to the literature and the thesis' main research question, “Is there a climate for shared perceptions, group cohesion, solidarity and trust in the virtual team?” The chapter composes three sections: whether trust is a personal attribute that can help cooperative engagement in the distributed context; whether team members working on time and output focused virtual projects can still discern a team climate and the bases for behavioural and performance attributions. The findings are illuminating and while affirming some of the literature, additional observations have provoked questions for which explanations are not readily available from the present model and require attention when analysing the interview data. Chapter Six concludes with a reflection on the limitations for stage one of this thesis.

6.1 Trust as a personal attribute

Organisations’ growing tendency towards transnational activities increases uncertainty and the need for relationship management. As part of a virtual team, individuals have to liaise and work with other distant team members. Working primarily in a matrix project structure supported by increasing outsourcing and project partnering, they also have to cope with multiple and changing internal and external relationships. This kind of working practice challenges one’s need for familiarity, routine and predictability. In this scenario, self-concept can become an important foundation for action. Hence, P1 proposed that self-concept provides the lens with which an individual will make sense of his/her specific working context and allows him/her to develop relationships with others.

The study data appears not to support self-belief as a motivating factor for someone working on a virtual project to take a chance with another within the team. The
standardised structural model depicted in Figure 5-19 and incorporated into Figure 5-21 between self-belief (represented by a confidence in own ability, personal choice, and natural outlook and response tendency to strange or evolving situations) and the three interpersonal trust dimensions (trust disposition, trust preconditions and situational trust) did not reveal any significant relationship (P1a, P1b and P1c). These results are surprising given the long-standing literature assumption of trust as a part of the psychological and philosophical self grounded in our ontological need to overcome the unknown and the uncertainty of others’ behaviour.

Labelled as self (work) preference, the second of the self-concept factors refers to individual preference for role clarity and expected contribution, a known reporting structure, clear rules and protocols and prior knowledge or experience of fellow workers. While no significant relationship is evident for preference and trust disposition (P1d), work preference’s direct and indirect effects on trust preconditions are significant and material (P1e) and self-belief’s regression coefficients on risk and standards are also significant (P1f). As components of respondents’ mental constructions for uncertainty reduction, self-preference indicators are work-based attitudes emphasising structural rather than personality or physical attributes. The results suggest that in the virtual setting, experience-based work preference is more likely to be an enabler for interpersonal trust formation rather than the more enduring and complex personality-driven self-belief. The non-significant relationship between preference and trust disposition (P1d) is itself indicative of the awareness (if not acceptance) by individuals that virtual teaming is different from conventional teaming since direct stimuli (e.g. co-location), working with other people of a similar cultural or professional background and the assumption that people are unwilling to share information with relative strangers are characteristics incompatible with practical virtual teaming.

These findings are revealing and indicate that members employ a relativist coping strategy to reduce or contain the perceived external structures’ imposition on their practical reality. So while an actor may be anxious about the novelty of a situation, his/her fear of personal loss (say as a valued member of the team) is likely to encourage his/her willingness to cooperate. This is consistent with Mischel’s (1968)
situational differences argument and James et al’s (1990) social construction of mental representations to accommodate situational variables.

In this study, project demands are found to correlate positively with a member’s attitude on perceived trust enablers. The greater the need for cooperation owing to project specific constraints, the more workers will draw comfort from the trust prerequisites (e.g. role clarity, workload distribution, open communications, reciprocity). Although Cramton’s (2001) study concluded that in situations of high uncertainty individuals tend to rely on their dispositional attributes, this project’s results point less to dispositional inclinations and more to cognitive reasoning and agential appraisal of the situation. Despite the virtual team literature suggesting the possibility of opportunistic or selfish behaviour in distanced cooperation, the inference from the positive relationship between preference and situational context (P1f) is that when pressed by time constraint or workflow interdependency, people are likely to weigh up their immediate situation and adjust their uncertainty reduction mechanisms to accommodate the situation. This pragmatism is supported by the significant effect of context on trust conditions. As knowledge workers and knowing actors, the desire for a successful project outcome is strong for ultimate self-preservation and the lack of co-location or having to communicate remotely is unlikely to be the root of uncooperative and selfish behaviour.

The findings indicate that interpersonal trust in the virtual domain remains a part of the human psychological self but is moderated through experiential learning. This is substantiated by the finding that neither self-belief nor trust propensity is significant as independent variables. Instead, self-preference and project context have emerged as significant determinants of interpersonal trust. Together they explain nearly half (48%) of the variance in trust conditions; thus confirming trust writers’ conclusion (e.g. Hardin, 1993; Luhmann, 1988; Zand, 1972) that trust is dynamic and domain specific, and the act of placing one’s trust on another is discretionary.

The primacy of project constraints and expressed work preference on interpersonal trust depicted in the structural model refutes the kind of unconditional solidarity (pristine/pure trust and trusting trust) anticipated by Gambetta (1988). Instead the
results suggest that trust is conditional on reciprocity, open communications, role clarity, equitable workload distribution and unbiased rewards and decisions. The strength and mix of the trust variables are themselves subject to the situational context and personal work preference. Although bonds of friendship can become the social capital over time through extended interactions and shared experiences, the interpersonal trust presented here is not a personality trait, instinctive impulse or a even a generalised belief, but a ‘calculated’ response by workers in recognition of their unconventional work context underlined by an expected personal pay-off through the project outcome. Certainly in practice, commercial project success tends to be evaluated by reference to the traditional ‘iron-triangle’ of time, budget and performance with little concern for human issues or emotion.

The study’s results have established the possibility of trust between fellow members in the dispersed environment. Started as a ‘unit act’ of trust founded on mutual fate, task interdependency and the expectation of that trust being honoured and returned, it acts as a catalyst for enlarging the circle of collaboration. This conclusion was confirmed by numerous interviewees later on in the study. This does mean that interpersonal bonds when built can also be destroyed. It is not possible, however, to tell from the survey data whether the trust schemas or criteria are from direct prior experiences with virtual teams, or if the opinions of significant others are enough to alter attitudes to virtual working.

6.2 Climate’s continued salience and role

The study’s descriptive statistics identified that despite virtual members often working from an office location, the team itself tends not to be co-located and team composition varies throughout the project life cycle. Communication and project coordination are mostly by telephone or through an artificial medium such as email, intranet or extranet, and opportunities for face-to-face meetings or coffee-room chats are limited. Proposition 2 examined whether this modern way of working allows people to discern a team climate and if such a climate is ‘strong’ enough to provide a basis for intra-group identification and collective trust making. Based on actors’ perceptions of their surroundings and their interpretations of daily work experiences using their own personal values and schemas, climate is more fleeting than culture
and arguably more appropriate for the virtual context. As individuals enact their surroundings, climate has been linked to trust and willingness to cooperate. However, the problems of proximity and transience in the virtual team are often cited in the literature as a barrier to the development of a group-based climate owing to the reduced opportunity for group socialisation and solidarity identity. The question of how ‘reality’ in the virtual team structure is perceived or negotiated is therefore pertinent.

Significant and material regression coefficients are evident in six of the nine climate factors, leading to the conclusion that distributed project members do discern a team climate. The factor loadings in this study allow the climate dimensions to be rated and ranked. As team climate is a personalised reality affecting the way people see things and experience events, it provides a setting for relational behaviour. Hence the relative importance of each of the climate dimensions is of interest to this project. Although DiMaggio (2001) and Fligstein (1990) suggest that in network-based teams, teamwork not rules is the basis for success, observations from this study indicate otherwise. In rank order, responsibility, reward, structure and support are foremost in the conceptualisation of virtual team climate. The results suggest that rules are not only important, they rank ahead of the ‘soft’ climate factors of warmth and group identity. The finding that responsibility is ranked as the most important factor points to the value of self-management for team members. These knowledge workers appreciate the ability to perform their roles and tasks without intervention or close supervision. They also expect that they can rely on managerial support and the structural properties of the organisation to facilitate their performance. Members also want to feel that they are suitably and fairly rewarded for taking personal charge or ownership of their output. The strength of variance explained by the second order climate factor on each of the four first order climate dimensions indicates the importance of self-governance, perceived organisational support and fair or appropriate reward for virtual team workers.

The results also suggest that rules and procedures in the virtual team can help rather than hinder cooperation to achieve project goals, thus affirming Zucker (1986) and Shapiro’s (1987) postulations that in economic situations of high uncertainty and flux.
and where the scale and scope exceeds interpersonal trust relations, the bureaucratic organisational form can provide a framework for acceptable communication and conduct. It also functions as a trust-producing mechanism. In this study, the subjective structural properties of the virtual team (represented by clear reporting and decision making, clear and sensible policies and procedures, expert advice, match of skills to tasks) together with empathetic management and peer support, provide the underlying ‘tradition’ of the work environment. These daily experiences reinforce the dominant behavioural patterns within the team despite the spatial and/or temporal distance.

The importance of the perceived organisational support systems for employee commitment and performance has long been suggested by social exchange theorists. The rank order of the climate factors in this study stands testimony to the proposed hypothesised links. Litwin and Stringer (1968) and Payne and Pugh (1976) also suggested climate as an independent variable on staff morale, motivation and commitment. Although not explicitly one of the thesis’ hypotheses, staff morale, motivation and commitment are among the assumed outcomes of strong collective trust and group identity. Indeed, the perceived efficacy of the climate conditions in facilitating and recognising performance might well be the answer to Perrow’s (1961) query on the difficulty of achieving alignment between corporate goals and personal goals and the resulting disparity between organisational policies and employee performance.

Warmth and group identity are also significant climate dimensions, albeit ranking after responsibility, support, structure and reward. Their variances are more modest, implying that social identification and categorisation processes are complex and climate may be only one aspect of their composition. The error correlations between warmth and group identity and their possible explanations were discussed in Chapter Five. While accepting the possibility of some misspecification, the error covariance between the two in this instance can reflect the fact that distributed working leaves actors less opportunity for social enactment and in such a situation, warmth and group-identity are perceived as intrinsically linked (but not one and the same). An examination of the individual items for the two variables suggests that warmth is defined by the climatic conditions felt by the team members (for example, “The
overall work climate is relaxed and easy going in the team”) while group identity represents individuals’ responses to that warmth (for example, “There is an air of mutual confidence in the team…”). The conclusion that the two factors are complementary rather than synonymous makes logical sense for this single sample study, as the observed variables for warmth relate to the members’ subjective descriptions of the characteristics of their team environment expressed in terms of the relaxed or easy atmosphere experienced and identity refers to the personal identification by members with the team.

Having established that climate remains salient for intra-group sense-making and coherence, interpretation of the findings to Proposition 3 illuminates the extent to which team climate is linked with self-concept and interpersonal trust. The significant correlations between climate and self-belief (P3a) and climate and self-preference (P3b) seem to support the long standing hypothesis by culture researchers such as Schein (1988, 1992) that climate is a facet of culture underwritten by one’s value system – be it inherent or learned. Assuming a social construction view, the significant results reported by P3a and P3b affirm climate as a perceptual construct and self-concept (belief and preference) provides the schemas or criteria for perception. They suggest that regardless of work mode, people perceive and make meaningful their environment as they conduct their daily routines by referencing their personal stores of cognitive or mental representations.

Sub-hypotheses P3c, P3d and P3e were formulated to examine the hypothesised links between climate and dispositional trust, trust conditions and trust context; all three are unsupported by the data. As with the non-significant finding between work preference and trust disposition (P1d), climate awareness is not related with a person’s willingness to trust (P3c). However psychologists such as Sedikides and Brewer (2001) and Tesser (2001) insist that a person’s trust propensity is a manifestation of the self in a social context. Perhaps people working in the unconventional virtual context characterised by at-distance interactions with people not previously known to the respondents and on projects that are predicated on knowledge exchange, have already mentally attuned their dispositional attitudes. Therefore their team climate perception is an ‘adjusted’ reality which, together with their concern for project
success (and personal success) would be focused on the need to get the job done and with it, the assumption and acceptance of the need to trust.

The significant relationships between climate and self-belief and self-preference support the thesis' argument that the existence of a climate is conceived through team members' sense-making processes underwritten by their self-concept, which in this project is a mix of the psychological self and the situational self. Although surveying the individual, the strong and positive results on climate salience may be interpreted as an amalgam of the perceived climate characteristics becoming the tacit understanding of the 'atmosphere' amongst virtual team members. It stands to reason that a friendly, easy atmosphere between team members and with their managers can lead to mutual trust, loyalty and a collective will to do well and meet organisational targets. However, the results for hypotheses P3c, P3d and P3e are non-significant, indicating that team climate as a perceived mental frame is not derived from, nor has any moderating effect on the component factors of interpersonal trust.

The inference from this set of results is that interpersonal trust is a local phenomenon (between team colleagues) and not dependent on actors' overall impression of the wider work context. People are more concerned about their immediate surroundings and the motivation and degree of trust and cooperation at the local sub-group or interpersonal level is, as discussed in Section 6.1, more affected by project constraints and one's work preference. Trust has to be given to enable action. In the virtual team that trust is driven in the first instance by project circumstance and is more likely to be of the kind envisaged by Meyerson et al's (1996) swift trust and Kramer's (2001) presumptive trust. Although the proposed link between interpersonal trust and climate perception is unsupported, climate's role as a conduit for trust's transition from the dyad to the collective is plausible through the mediated relationships of warmth and group identity.

An unexpected finding is that despite the trust and climate literatures pointing to increasing relevance of uncertainty and risk for society and its workers (e.g. Beck, 1999; Stivers, 1994), risk has not taken a significant role in this study as a component
of climate. This does not mean that members do not find virtual working risky: on the contrary the emergence of work preference and context as significant factors in Proposition 1 suggests that uncertainty reduction or containment is still foremost in actors’ minds. Likewise, ‘standards’ has also emerged as non-significant in the virtual setting. In keeping with the literature assumption of the human tendency to avoid uncertainty, it is possible that a response to changes in working practice and increased individual accountability is to assume greater personal control over standards and risk.

The regression paths from belief to risk and belief to standards are significant but relatively low at .27 and .35 respectively; and the small variance explained for risk (7%) and standards (12%) by self-belief indicates the presence of unaccounted factors not covered by this study. Nevertheless, these results point to a change in virtual members’ attitudes to risk and standards. They are no longer felt or experienced as the overall team climate; nor are they just a part of the project mission. Instead members have taken personal ownership of these factors. Risk and standards are now part of the actor’s own subjective experience and are gauged by reference to their own value system. This finding is in keeping with the increased uncertainty from 21st century work practices of handling multiple projects, working for multiple organisations (portfolio working) and coping with multiple relationships. Self governance and self renewal as critical virtual project attributes add to the perceived risk and standards requirements for affected individuals. Bandura’s (1978) self-efficacy theory and Maslow’s (1954) self actualisation and autonomy hypotheses may be used to explain the link between self-belief and risk and standards. Individuals constantly strive to fulfil their potential and to maintain control over their destiny; security or confidence in one’s own ability and efficacy enables individual performance and provides the motivation for cooperation with others. It would seem that a sense of identity is crucial for maintaining inner balance and creating the willingness and ability to form relationships.

Another intriguing observation is that conflict appears no longer a significant dimension either of climate or in its own right as a latent construct. Does this mean that the lack of co-presence and having to rely on computer-aided communication and project coordination technologies has removed the occasion for conflict? This may be
logical given that relational self in the identity literature requires personalised bonds and the collective self is dependent on maximising intra-group similarity – neither of which is easy to achieve in the virtual context. While it is possible that virtual working and structured communication can be useful in reducing negative typification tendencies from inherent prejudices (e.g. gender, race, colour, social and education background), it is unlikely to be the full explanation since experiential learning from interactions produces mental images which can become a source for prejudice. Besides, meaning discovery for humans is through patterns and categories drawn from a variety of sources, and these mental constructions can be used for typification purposes. Hence, at distance working is a double-edged sword for conflict in that the literature is consistent about its possibility from missing social cues or common cultural backgrounds or shared values; ironically the reduced co-location and greater reliance on system rules and behavioural protocols identified by this study can serve as a preventative remedy for discord or misunderstanding. As no further explanation is available from the current data, attention will be given when analysing the interview data to understanding the reasons for their apparent lack of influence in the virtual team.

6.3 Group identity, solidarity and cohesion

This section discusses the results for Propositions 4 and 5. Already established by this study is that spatial and temporal distantiation does not prevent actors from enacting their environment and perceiving a work climate. Trusting another allows an actor to proceed with his own performance. This trust is rationally construed and interpersonal between a dyad or by a small sub-group. However the relationships between individuals still need some basis for transformation to the larger collective for overall concerted performance. In practice, management would probably encourage this through team building exercises and regular face-to-face meetings. Indeed, a recognised conventional team practice is the group meeting. It is held to encourage information sharing and social engagement to increase group identity salience. Given the virtual team's lack of physical immediacy, presumably group identity salience will have to be achieved via telephone and computer mediated communication systems, and accountability and identifiability through well-defined structural systems such as standards and protocols. The survey respondents confirmed these to be vital for
project coordination and project performance. Although not quite the rebirth of structuralism, this modern constraint on co-presence communication appears to result in a revival of the importance of structural and procedural systems on individual perception and behaviour.

The results in Table 5.13 indicate that group identity has a material impact on team cohesion (P4d) and a smaller but significant effect on members’ perceived professionalism and behaviour (P4c). The social or relational cohesion within that group is operationalised in this study as the presence of teamwork, a general willingness to cooperate within and without the team and ahead-of-target team performance. The link between group identity and team cohesion (P4d) supports the assumption by conventional group researchers such as Bonacich and Schneider (1992) and Van Lange et al (1992) that a high level of identity leads to a feeling of ‘we-ness’ and encourages members’ willingness to adopt cooperative behaviour and to apply self-restraint. It can be also be seen from the full structural model in Figure 5-21 that 44 percent of the variance in members’ professionalism and behaviour is accounted by group identity and team cohesion. This indicates that high group identity makes redundant the need for excessive organisational control as members are more self motivated and compliant. These findings also suggest that despite the expectation that virtual members are unlikely to enjoy the team development stages envisaged by Tuckman (1965) or Worochel (1994), selfish behaviour such as ‘free-riding’ does not have to be an outcome and in any case, can be contained through group identity and cohesiveness processes.

McGregor (1960) observed that strong organisational identification is associated with a sense of self-fulfilment and personal autonomy, and where individual goals become fused with the organisation. While virtual team working meets the personal autonomy and self-fulfilment criteria, it is questionable whether or not there is actual fusion of personal goals and corporate goals. The significance of project specific constraints for interpersonal trust and expressed work preference identified earlier support this thesis’ argument that group identity for the virtual team is more cognitive and rational. As knowledge workers, virtual team members are their own key resource, thus making achievement more salient than affiliation. Based on the depersonalised characteristics
of the self and alter as members, commitment to this collective identity is for increased personal control and protection rather than as an individual affective attachment resulting in the merging of personal goals with that of the collective. Hence group identity for this project is measured by apparent loyalty to the group; the collective will to do well and meet targets and mutual confidence in the actions and intentions of others in the team. Even at the group level, trust in this context is having faith in own self (self-belief) and confidence in fellow members and the technocratic systems supporting the project.

The study results indicate that, as with conventional teams, goodwill and group-identification are both desirable and possible. They provide the answer to this project's question of the inclination or opportunity for group identification in these changing structures. Although they are not the fundamental drivers of climate, their impact on team cohesiveness and perceived members' behaviour is clear and indubitable. The survey has found that team members are expected to be self-sufficient and effective - and judging from the rated importance of the major climate conditions, provided they are adequately supported by the system's structure and processes, and the reward system is seen as fair, members will respond accordingly. This finding underlines the realist-rationality ontology of the thesis; although individuals perceive themselves as 'creatures of their situations' (Hindness, 1988: 39), they find ways to accommodate the perceived limitations. In other words, when required to work virtually, individual cognitive reasoning evokes coping strategies (such as the assumption of others' ability, reliability and predictability) to enable interpersonal engagement and counterbalance increased personal risk and uncertainty. A positive or negative engagement outcome will be internalised and added to the stocks of knowledge and negotiated understanding of social norms and human behaviours and used for future trust decisions. Hence while group identity is still important for commitment and cooperation, it may explain why virtual team identity remains a component of the overall team climate and has its basis on individual competences, the structural systems and anticipated contribution to a common organisational goal rather than as a deep-rooted affective social-cultural bonding.
6.4 Performance and behaviour attributions

Even in a virtual project, co-located communications and social interactions continue. The project descriptives on face-to-face meetings reported that only 4 percent of virtual players work entirely on their own, 52 percent has some occasional face-to-face contact, and 44 percent of respondents do get together and meet regularly. Regardless of the media or form of interaction, as members interact they will automatically interpret and evaluate their colleagues’ ability, acts and reliability. The earlier finding of the importance of personal ownership, reward and the structural properties of climate suggest that positive experience of these climates attributes will act to fortify the level of intra-group cooperation and strengthen the commitment to group performance.

Propositions 5 and 6 examine the links between cohesiveness and own, and with members’ performance/behaviour. For the virtual players, good organisational citizenship is underwritten by a congruence of purpose and a desire for its achievement aimed ultimately at the satisfaction of personal objectives and self-preservation. Further, Moreland and Levine’s (1982) perception-based group socialisation model which draws on Heider’s (1958) balance theory, argues that the degree to which a member has valuable contributions to offer a group (as perceived by other members) determines the level of the group’s commitment to the member (as perceived by him/her) and in turn, the member’s own commitment to the group. In this project, the results point that way.

Structural modelling has failed to report any direct climate effect on members’ performance (P4b) and team cohesion (P5a), but its indirect effect on group cohesion and members’ performance is evident through group identity (Figure 5.21). Although paradoxical when seen through the traditional structuralist lens where team performance is a dependent variable of the external structures and context of climate, the current findings affirm climate as a subjective product underwritten by the self. Further, the significant relationship between climate and own contribution (P4a) lends empirical support to Button et al’s (1996) postulation that individuals’ perception of organisational support for learning and other contextual aspects influence their own
goal-orientation, and their evaluation of their own performance. For the virtual member, a positive perception of the team atmospherics would, through reinforcement and self-categorisation, encourage a positive outlook on personal achievement.

Together, self-belief and climate explain 39 percent of the variance in own contribution. These relationships suggest that a high self-esteem supported by a positive climate can act as powerful coping mechanisms to bracket the uncertainties of interacting with absent team members and having to work on one's own volition. This may be a useful indicator of the type of person who is likely to feel more at ease working in a distributed environment. However managers should be cautious about an over display of unsubstantiated confidence as this can lead to complacency and in the event of a trust betrayal the consequences may be devastating beyond repair. Trust never really loses its emotional elements of anxiety and fear, which serve to moderate attitudes and behaviours in social groups. The virtual team member by his team role will invariably be dependent on his team-mates. To reduce the risk of failure and personal loss there needs to be a balance between dependence (and vulnerability) and self-reliance.

Zand's study (1972) concluded that high trust groups perform better than low trust groups. Morgan and Hunt (1994) also found that high trust work relationships increase commitment to the organisation, reduce conflict and improve staff retention. This project's survey findings are modest in comparison and although 44 percent of member performance in this study is explained directly and indirectly by group identity and team cohesion with climate, it can make no claim on quantitative improvements or retention intentions or assume direct causal links between the collective and increased organisational commitment. The significant relationships represent only the qualitative views of individual members and are not actual quantitative measures of performance. Nevertheless, they serve as a good barometer to gauge members' cognitive attachment to their group and fellow colleagues, which in this study have revealed that trust and identity processes can still happen in at-distance settings.
The regression coefficients between team cohesion and members' performance (P5c) and team cohesion and group identity (P4d) are moderate to strong, suggesting that notwithstanding the utilitarian underpinning of collective output in the virtual team, a member’s evaluation of other team members’ professional behaviour is influenced by his/her perception of group relations and mutual trust, thus indicating the possibility of an affective component after all. In other words, the presence of intra-group trust is a positive signal of the way people think about their fellow members and their group. It helps members overcome the lack of co-presence, accept their obligations, apply self-restraint and have ‘faith’ in others to perform their roles; thus producing what Weick and Roberts (1993) have alluded to as success through ‘heedful’ joint-action. It is likely that within the team itself, dyads of stronger and weaker trust relationships will exist, depending on the extent of interaction and the degree of perceived personality and skills match. Additionally, the structural systems or organisational factors when thoughtfully constructed and implemented, can serve to create the predictability, reliability and confidence necessary for continued cooperation as identified in the trust literature. These results support the thesis’ hypothesis that identification and commitment in the virtual team happens through the recognition of a shared fate with others, and team cohesion and trustworthy behaviours are the consequence of a complex web of personal motives and subjective sense-making. However, a question that cannot be addressed by this data is the longevity and robustness of this general goodwill.

6.5 Survey analysis limitations

Research projects have to deal with many practical and theoretical constraints, and as a result there are numerous sources of errors that can have a major impact on inferences. This project is no exception. The main problems have been the study’s modest sample size and the lack of an universally accepted criterion to judge model fit and plausibility of hypotheses. The project’s subjective decisions and interpretations are themselves open to disagreements by other researchers. The major issues encountered in the translation of the thesis’ theory to a practical structural equation model are outlined below.
The unknown population of virtual workers forced the researcher to focus on practical access rather than adopting the standard ideal of a simple random sample. As a result, data collection was opportunistic and dependent on interested individuals responding to my invitation to participate through the Association for Project Management and from personal approaches to companies known to operate virtual teams and falling within the simple sample criterion by industry type. The resultant sample of 226 responses reflected Easterby-Smith et al.'s (2002) caution of the difficulty of persuading busy people to participate in any research project. The modest dataset was a problem in a number of fit tests. Allied to the issue of small sample is error from the inability to achieve asymptotic normality approximation, which could have affected the standard errors and chi-square readings. In addition, non-response or limited coverage from an incomplete sampling process raised obstacles to the validity of inferences, and necessitated its reliance on the RMSEA index and its interval boundaries to signal fit and parsimony. Another shortfall with the modest sample size is that it precludes cross-validation by sample splitting whereby one half of the data set is used to test the plausibility of a model and then using the other half to verify or fit the model from the first half. Although Cudeck and Browne (1983) suggested replication for small samples as an alternative strategy, time, resource and budgetary considerations in locating and persuading target respondents to participate, are important practical constraints for this thesis. Hence Cudeck and Henly's (1991) recommendation of using expected cross-validation index (ECVI) for a single sample is a welcomed alternative option for this study.

Although it is not uncommon “for social surveys to contain 300 or more variables” (Jöreskog, 1993: 303), the number of indicators and factors in the model relative to the sample size has been another source of concern when testing the theoretical validity of the postulated relationships in the virtual team context. Anderson and Gerbing (1984, 1988) noticed that fit indices suffer with increasing number of factors or when there is increased number of indicators per factor – which may be a clue to some of the fit difficulties encountered by this study. Indeed, in keeping with Loehlin’s (1998) advice that researchers should “want genuine improvement in measurement or theory, not just a procedure for decreasing chi-square in the present sample” (p187), the researcher’s refrain from making many of the suggested
modifications based on the sample data rather than on theoretical grounds has undoubtedly, affected the fit values. Kenny and McCoach (2003) in their study on the effects of variable numbers on measures of fit foresee not only the increasing use of CFA and SEM with greater computer power, but also that models with large numbers of observed variables are likely to become more common. They conclude that it would be unfortunate to penalise researchers for estimating elaborate, theoretically driven models. Perhaps what is needed is further development in SEM techniques that will allow the adventurous researcher to study more challenging and complex models.

Faced with these limitations, the goal for this thesis is by necessity, a modest one; that is, to use the data at hand to develop a structural model whose assumed relationships are shown to be reasonably good reflections of a hypothetical population. Decisions on the extent of fit and hypotheses testing at this point are made in relation to what is known about the substantive area, the quality of the data and in particular, the sample size limitation, rather than just on statistical grounds. However, the non-probability sample means that inferences drawn cannot be assumed to be generalisable in the strict statistical sense and should be interpreted with caution. Fortunately, the survey-then-interview design allowed the relationships presented in the final structural model to be triangulated against the observations from the case-studies. More in-depth understanding of the model components are provided by the qualitative data in the next chapter. The final model may then be extended to the larger general population through logical deduction and used for further research.

6.6 Summary

Notwithstanding the limitations, the results from the survey stage of this project have identified the motivation and basis of interpersonal trust in the distributed work team. They support the literature argument that there has to be trust for social and performative engagement. The results also indicate that climate perception is not dependent on co-proximity and workers use climate as a reference for validating their own performance. An important finding is group identity's significant role as a driver for team cohesion and its influence on how members view other members' professional behaviour. Finally, the significant relationships between group identity,
cohesion and performance evaluation suggest the extension of person-to-person trust to the wider collective.
CHAPTER SEVEN
ANALYSIS OF INTERVIEWS

7. Introduction

The survey results reported and discussed in Chapters Five and Six confirmed the possibility of trust and identity development within a virtual team. In this chapter I analyse and discuss the three case-studies to provide further insights into the emergence of group cohesion, trust and solidarity in virtual teams and possible explanations of the unexpected observations from the survey.

The generous time given and candidness shown by the interview informants resulted in a huge volume of data. Analysis focus was maintained via the three key research questions asking whether (1) virtual teaming presents a problem for informants conceptually or in practice, (2) shared perceptions, group identification and trust are possible or necessary for project progress and (3) virtual team working has any impact on perceived personal and team performance. The additional questions in the theory chapter (Chapter Three) used to derive the six theoretical propositions for examining the survey data and for model development were also based on these three research questions. Accordingly, the interviews data were coded using the predefined themes and constructs derived from phase one’s full structural equation model (Figure 5-21). In describing the informants’ social reality, I also used prototypical quotes culled from the interviews data. Presentation of my analysis and discussion of the qualitative findings is by case-study and in the order of the three key research questions.

I conclude this chapter with a comparison across the three cases to highlight the similarities and differences in practice and in virtual members’ cognitive conceptions or attitudes. In the final chapter (Eight), the cases findings are used to augment the survey findings view a view to providing an amended model for future research.

7.1 Preparing the data for analysis

Data analysis followed primarily Miles and Huberman’s (1984:21) four-step approach of data reduction, data display, conclusion and verification. I had taped the interviews after asking for permission from the informants. The tapes were subsequently sent to
be transcribed by an independent agent. I then replayed the tapes and filled in where possible, the gaps left by the agent. The transcripts (ranging from 27 to 60 pages for each interview) were then saved in ‘rtf’ format and loaded onto QSR Nvivo version 2.0 for coding, ordering and retrieval. Coder reliability was tested by requesting a colleague in the Management School to act as an independent second coder. She was given an interview script chosen at random together with a short explanation of the aims of the study, the key questions and the a-priori categories, and asked to code the script. In doing so, previously unspecified categories of ‘tribes’ representing strong and protective intra-group allegiance from long-term or extended working relationships and general ‘dissonance’ from perceived unequal recognition or reward rather than outright ‘conflict’ were also highlighted. As it is not the words per se but their meaning that matters, the problematic sections were noted and clarifications were obtained directly from the informant whose script was used for the independent coding.

Further, to check for intersubjectivity of meanings between the informants and myself, a second meeting (between February and March 2006) was arranged with one of the nine individual cases in each of the three companies. At the first interview, informants were asked if they would agree to be contacted again for this purpose. Unsurprisingly, most had declined, complaining of a lack of time and work pressure. In Case A (MS) I had to go through the local general manager again. This meeting was conducted on the telephone. In Case B (13T) three had agreed and for Case C (MSG) three had also agreed. For practical reasons, I chose one from each case who was able to meet me at an office that was convenient for me to drive or commute to. A summary of my tentative interpretations was presented and the informant asked to comment on its accuracy. This is not to say that informants ‘have privileged status as commentators on their actions’ (Fielding and Fielding, 1986:43) only that findings should reflect closely the negotiated reality of informants rather than that of my own. The subsequent meetings also yielded important additional data as the lapsed time between the first and second interviews were some nine months. During that time informants’ motives, attitudes and issues could have changed.

A combination of matrices and thematic maps were used as visual aids together with direct or verbatim quotes as characteristic exemplars to support and illuminate my
interview findings. The choice of display type depends on the intended explanation. For example, project attributes and issues, and virtual teaming benefits and difficulties for each case are represented in a thematic map using the ‘Mindmapper’ software version 2.5 (see Figures 7.1, 7.4 and 7.7). According to Miles and Huberman (1994), such diagrams are efficient devices in presenting a summary of observations gleaned from the fieldwork.

As the three cases were already introduced and their backgrounds described in my method chapter (Part Three, Chapter Four), I present in this chapter, my analysis of the interviews and discussion of the findings from each of the cases before comparing across the cases.

7.2 Case Study A: Microsoft-EDC (MS-EDC)

I visited EDC’s Bangalore office in May 2004. In the four days there I was able to interview a total of 10 informants; nine project staff and the general manager (GM) herself. The group to which I was granted access consisted of 23 personnel and forms the local resource pool for Microsoft’s Great Plains ERP products in Europe. Table 7-1 below is a role-ordered matrix of the project staff interviewed. I use role-ordered matrices to present at a glance, case informants’ line and/or project role, their length of service, education or qualification at the time of joining the company and their attitudes to virtual teaming. Direct quotes are included in the matrix itself to indicate informants’ personal explanations of their responses to virtual projects. These are used to compare and contrast their attitudes in the text discussion.

As can been seen from Table 7-1, only three of the nine employees have been with EDC for over four years. This is understandable as EDC itself was formed only about five years ago. It was revealed later in the interviews that only six of the current group of 23 have been with EDC from its inception, indicating a fair turnover in just five years. An interesting observation is that while the general manager insisted that promotion is merit-based, the two project managers and the two team leaders appear also to be the longest serving employees.
<table>
<thead>
<tr>
<th>Microsoft-EDC</th>
<th>Role</th>
<th>Service</th>
<th>Entry level</th>
<th>Attitude to the virtual team</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS1</td>
<td>Project Mgr: maintenance and systems integration</td>
<td>Nearly 5 years; First job with EDC</td>
<td>Bachelor degree + certifications on Microsoft technology</td>
<td>Positive. As one of the founding staff of EDC, he has benefited from the off-shoring arrangement with MS. “...working with people that I don't get to meet never affects project outcome in any way. We have been set up from the start that way. Over the past years I have worked with several people whom I don't get to meet and it doesn't bother be too much.”</td>
</tr>
<tr>
<td>MS2</td>
<td>Project Mgr: new products</td>
<td>Nearly 5 years; 4th company, previous IT industry experience</td>
<td>Degree in commerce.</td>
<td>Positive. He likes EDC’s association with MS, and that all communications with the UK &amp; US are supposed to be channelled through the PMs. “So I could answer for all the projects” “...so that we know of that situation, we control the project flow, we control the releases and all that so it makes sense channeling through us” “So that way Microsoft finds it very easy to track the project”</td>
</tr>
<tr>
<td>MS3</td>
<td>Team member: functionality testing</td>
<td>2 years</td>
<td>Certificate in computing + PT study on Indian Finance</td>
<td>Neutral. Appreciates the MS-EDC relationship. However, most of her interactions are local: “...although we deal with Fargo and UK at a distance, many of the other colleagues are sitting near by. We talk about the project all the time”</td>
</tr>
<tr>
<td>MS4</td>
<td>Team leader: SQA</td>
<td>Nearly 5 years; previous experience as an accountant</td>
<td>Law degree and a qualified accountant</td>
<td>Has some reservations but appreciates virtual teaming as a business imperative for EDC. “We miss the interaction but...it makes logical sense” “Yeah, it’s a change I think we should accept it”</td>
</tr>
<tr>
<td>MS5</td>
<td>Team member: testing</td>
<td>2 Years and 8 months, first job</td>
<td>Degree in commerce</td>
<td>Accepts in principle the lack of direct contract, but does communicate direct. Being groomed for possible team leader position. Has personally travelled to US and UK. “Talking with overseas, that’s basically done by the project manager. I mean if there are any issues...I also send mail”</td>
</tr>
<tr>
<td>Team</td>
<td>Leader/Role</td>
<td>Experience</td>
<td>Degree</td>
<td>Communication</td>
</tr>
<tr>
<td>----------</td>
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<tr>
<td>MS6</td>
<td>Team leader: coding</td>
<td>Over 4 years; Previous experience in Chennai</td>
<td>Degree in electronics and communications engineering</td>
<td>Has reservations but accepts VT as an operational necessity for outsourcing and global projects. &quot;...90% of my interaction is with others in India... but as a project leader with a project manager above me in India itself, I am also communicating with overseas&quot; &quot;Most communication now routed through the PMs. They speak better English and know the overseas people better&quot;.</td>
</tr>
<tr>
<td>MS7</td>
<td>Team member: documentation</td>
<td>Nearly 2 years; previous experience</td>
<td>Degree in commerce</td>
<td>Pragmatic acceptance. &quot;I feel that at-distance working is the shape of things to come&quot; &quot;the virtual members can respond to emails when they get to work, so it doesn't matter if they are not always physically present&quot;</td>
</tr>
<tr>
<td>MS8</td>
<td>Team member: developer</td>
<td>Just over a year; second job</td>
<td>Degree in engineering</td>
<td>Positive. Likes not having direct contact with overseas. &quot;They [the PMs and PLs] keep us informed. They are good at that. You know, what really goes from there. So even when we don't get to talk to them direct, it's as if we are there&quot; &quot;it's the company policy....since they have a connection between them I just leave it to them to communicate. It saves time&quot;. &quot;Yeah I prefer it that way&quot;</td>
</tr>
<tr>
<td>MS9</td>
<td>Team member: developer</td>
<td>Just over a year (14/15 months), 4/5 previous companies</td>
<td>Degree in commerce</td>
<td>Generally positive. &quot;I don't have a problem since if there is a need, I can still communicate with them, otherwise it's better and easier for the project managers to be in touch&quot;</td>
</tr>
</tbody>
</table>

Although selected by the local GM, the interview informants turned out to be a good mix of project managers, project leaders and team members who are working on different tasks throughout the stages of the project life cycle. Despite being well educated (eight of the nine have at least a bachelor degree) and often having worked for at least one other company, the Indian informants are relatively inexperienced as far as IT development work is concerned. This may be a function of their age as all nine are under 30 or the recent rapid rise of the IT industry in India where only younger applicants will have the requisite qualifications. It could also be EDC's
remuneration positioning attracts only the less experienced. A common consensus from the informants is that EDC is a middling rather than a top payer:

"The pay here is ok. Not very bad, not very good" (MS3)

Another possible explanation may be that the programming language and operating systems used are specific to Microsoft and this may have deterred others from joining for fear of lagging behind in a rapidly evolving IT labour market. The modest pay offered by EDC and the Microsoft-specific technology, may also explain the seemingly high staff turnover at EDC, given India’s growing demand for IT professionals. Certainly this point was alluded to when talking about the need for ‘better pay’ by the informants.

The project attributes in Figure 7-1 represent the typical organisation of projects and their teams including the work modes and communication media used by the Indian group. Already mentioned is the co-location of the workers in the local offices and that each centre is part of a larger global virtual team. The 23 Indian members are sub-divided into two groups, each under a project manager. Projects arriving from the US or UK are allocated to either of the two groups by the local GM depending on whether they are maintenance or development projects. The appropriate project manager then selects a team from his own resource pool. Team size varies according to the needs of the project but will consist of only MS-EDC members. Project leaders (PLs) have a dual role in that they also spend a part of their time actually working on project tasks. The shortage of PLs means members can find themselves reporting directly to the PMs, who are busy overseeing a portfolio of projects. Therefore, although each project is supposed to have a PM, a PL and relevant team members for the tasks required, members are often self-managing because of the workload and management styles of the PMs and PLs.
Figure 7-1: Mapping MS-EDC's project attributes, problems, and pros/cons of virtual team working

Project Attributes and Virtual Working for MS-EDC

- Project attributes
  - Varying team sizes
  - Stable membership
  - PM allocates from resource pool
  - MS-EDC staff only
  - Virtual project interfaces
  - Local office, collocation
  - Periodic F2F (USA/India)
  - Emails and MSN chat (daily)
  - Telephone conferencing (Tues & Thurs)
  - F2F meetings (ad hoc and planned)
  - Across centres communication
  - Hierarchical allocation
  - Project origin
  - Functional dedicated
  - Project structure
  - Self management
- VT advantages
  - Less misunderstanding from language use or accents
  - Less direct contact, more time working
  - Central query clarification
  - Improved relationships & reporting
  - Written emails less room for misunderstanding
  - Problem not personality centred
  - Focus on objectives/goals
  - Professionalism
  - Reduced personal/attribute based difficulties

- VT problems
  - Personal preference for contact
  - Little affiliation for overseas colleagues
  - Poor telephone lines
  - Emails - time consuming
  - PM's workload
  - Round-the-houses communication
  - Time-difference related delay
  - Indian culture - shy and indirect
- Project issues
  - Complexity
  - Interdependence
  - Dual roles (e.g., PLs also do-ers)
  - Team
  - Inexperience
  - Individuals
  - Long working hours
  - Personal agendas
  - Management style
  - Leadership challenges
  - Project management skills
  - New and untrained staff

Stakeholders
As all 23 are also sat together in one large office, lateral face-to-face discussions and MSN chat within and between the Indian teams are common. Emails and MSN chat are used on a daily basis to interact with overseas colleagues with telephone conferencing scheduled every Tuesday and Thursday. These generally involve only the PMs and PLs unless the technical nature of a particular inquiry requires direct input from the task owner. Project seniors from the UK and US make regular visits to the Bangalore office but the practice of allowing selected Indian team members to make trips to the UK and US was only just introduced when I visited the Indian office in May 2004.

My choice of the three case studies was based on their operative definitions of the virtual team and the degree of ‘virtualness’ practised by each. For the Microsoft-EDC group, products are first conceived or developed elsewhere (generally in the US) and handed over to them in the Bangalore office to be made specific for the European market. During the conversion process there would be communications with other MS centres such Dublin – but via Fargo, USA.

"We look at different other multi-languages. We don’t only deal with English language alone. We look at DSLA, that’s Spanish ...er Portuguese, German, French and Latin American" (MS1)

The ‘round-the-houses’ remark by MS1 indicates the unusual and indirect degree of ‘virtualness’ faced by the Indian office. The reason for this arrangement is historical as the Great Plains ERP system was originally a Fargo-based product. Following a recent reorganisation by Microsoft-EDC, all inter-unit exchanges with India are further filtered through the two local project managers.

"So we send them files via Fargo to Dublin and Dublin translates it, sends it back to us and we test it to see if everything is fine. Er...It’s pretty round-the-houses I know" (MS1)

Although the Indian informants are essentially a co-proximate team as all 23 are situated in a single, open-plan office, in project terms and for a range of products, they are a sub-set of a larger virtual project team with members sited in the US, UK,
Dublin, Brazil and India. MS-EDC teams are therefore, ‘virtual’ at the project interface between one project phase and another, with most of the work at each stage performed locally. This fact is recognised by MS6:

“Our team is essentially a conventional team, but we are part of a global virtual team” (MS6)

He went on to describe his current project and how it works. A hint of the need for good communication and coordination when working geographically apart is his comment about the possibility of the project going wrong.

“...because there are two development teams. In the US they are developing something...and we pick up later here. In here also we’re developing something... the two can be different if not careful” (MS6)

At the time of my visit a new structure had just been introduced where all projects passed onto EDC were classified as either ‘new’ or ‘maintenance’ and allocated to the relevant project manager (PM). The PM’s role is to assume overall responsibility for his respective project category. Each is supported by a project leader (PL) who is responsible for the day-to-day management of the project and the team:

“Their role [the PLs] will be day to day contact with the project team. Each team member will be mentored and monitored by the project leader” (MS2)

An important outcome of the restructure is the channelling of all communications through the two project managers and further removing the Indian grass-root project workers from their overseas counterparts. Hence, team virtuality in this particular case is defined not by physical distance and/or time difference, but by tasks division or project stage allocations to centres and crucially, inter-centre communication practices.

This reorganisation makes even more pertinent the thesis’ first research question:
Is virtual team working a problem for informants, conceptually or in practice?

The fact that the reorganisation took place to reduce the contact points between the Bangalore office and their overseas project colleagues is affirmation that at least some aspects of the virtual project were less than satisfactory. Other problems identified by the informants are shown in Figure 7.1 which maps the project attributes, problems and the pros and cons of virtual team working. I begin my analysis here by examining the different perspectives to the change before going on to examine the Indian members’ attitudes to virtual working.

Perceived relational difficulties were felt mostly by the overseas centres, especially the project seniors at Microsoft UK and US. From the reasons given by the UK project senior, I would argue that the perceived difficulties are mainly cultural. The first of the two examples given by Mr R. is attributable to the divide between Western and Indian concepts of etiquette and language use. Obviously the UK and US project personnel were offended somehow by the ‘blunt’ emails from their Indian team colleagues. These tended to be direct, to the point and focused on the technical aspects of the project with little preamble or social niceties.

“I think that the Indian guys can often be quite blunt in their emails.....they don’t always understand that maybe the polite way or English way of saying that, and I think that they’re thinking more about making sure that the email says the right thing rather than making sure it’s not gonna offend anyone” (MR R, MS-UK)

Yet, from Mr R’s second comment justifying the reorganisation, Western expectations of ‘honesty’ and ‘openness’ are at odds with the Indian culture which is more reverential and non-confrontational. The local general manager (GM) who was educated in an elite private school in India and had completed her higher education in Australia, is more used to working with Westerners. She explained that direct challenges are frowned upon by the Indians as it is impolite to disagree with someone openly - especially if that someone is more senior in the hierarchy or simply, a ‘Westerner’. This may sound quaint to the Western recipient but as India had only finally become independent from British rule post World War II, instinctive deference to the ‘White man’ may still persist. Taking this line, a possible explanation of the
apparent bluntness of email correspondences may be the Indian group finding it hard to interact ‘on an equal basis’ and their way of coping is to keep exchanges on a professional rather than social level. Owing to a combination of language and cultural difficulties, it would seem that the Indians find it hard to be openly discursive in their problem-solving. Indeed when asked for their perceived advantages of virtual teams, the Indian team pointed to the ability to keep transactions on a work basis (Figure 7.1, VT advantages). Perhaps in time and if given the opportunity, the Indian informants would have developed the social skills expected of them.

“We cannot have a flat structure between us and the EDC because there’s just too many relationships to have to cultivate and you know I think getting two guys to understand this level of honesty that we wanted you know the level of openness that they can communicate with us is a lot easier than getting thirty people to do that or even ten if you just took the teams you know” (MR R, MS-UK)

“People from here are naturally very shy because they don’t speak ‘till they’re spoken to. It’s our culture even if we are English speaking. We are not very good at talking to...at dealing with foreigners, er...I mean Westerners on an equal basis. (The GM, MS-EDC)

“The Indian culture is different...we don’t challenge openly. At work we prefer a clear structure. We respect our managers. So, this can be a problem when G or R expects to be told directly that something is wrong or that we don’t agree with what they say.” (The GM, MS-EDC)

Another challenge for this case is India’s poor telephone lines. Overseas connections are slow and unreliable. Mr R called it his ‘pet hate’ owing to the time and effort required each time they tried to communicate with Bangalore. Emails are not always the answer owing to language use and time-zones differences. They cannot replace the more real-time, cue-laden discussions that other remote methods such as telephone conferencing and video conferencing can provide. Therefore faced with a mix of cultural, language and accent difficulties, frustrations are understandable. The obvious solution to Microsoft was to reduce the number of named contacts.
"... a half an hour call takes an hour because we have to keep repeating each other and because we have difficulty in understanding each other and stuff like that" (Mr R, MS-UK)

"See email is there but sometimes when we er... when we send emails they come with another question. Now we are sending another email. They come in another question. The interaction goes on and on there'll be emails flowing up and down the chain" (MS4)

The EDC management was well aware of the difficulties. Anxious to improve its service to Microsoft, they had little option but to agree to the reorganisation.

"Emails were going back and forth, back and forth because they... er... Fargo couldn't understand... how it was put across to them. So then we had to like change... we just had to, nothing was getting done" (The GM, MS-EDC).

In the words of one of the informants, 'what Microsoft wants Microsoft gets' (MS4) and the move to restrict access between India and overseas to the project managers was implemented. Subsequent feedback from Microsoft was positive. A telephone conversation with Mr R. in July 2006 reaffirmed Microsoft's conclusion that projects are more on time and communications perceived to be more effective since the reorganisation.

The general reaction by the Indian group to the further distancing from their colleagues in the other centres is acquiescence. This is unsurprising given the MS-EDC power-relationship; after all, Microsoft is EDC's largest (and some would say, only) customer. Indeed the company was founded on this off-shoring contract, and MS1's statement below underlines that fact and signals a relativist approach to their situation. The view that EDC's major function is to serve Microsoft is widely accepted by all the informants and MS1's explanation below is prototypical.

"Either they [EDC's staff] like it or not but the work that comes to them they have to handle it whether talking directly or indirectly to Fargo and UK right?.... that's how EDC functions. We have actually been set up as a dedicated arm of Great Plains then and now Microsoft. We do what they ask us, it's our job. We all know that" (MS1)
However, it is clear from the interviewees that pragmatic acceptance of the MS-EDC relationship which has led to the extreme lack of contact between the Indian group and the rest of the virtual team, does not mean psychological buy-in since the need for contact is fundamentally a human phenomenon. Even MS1, as one of the two named contacts, iterates his preference for direct interaction.

"I would follow what the management rules are ... but... for me, I personally would like to meet people who I interact on a regular interval but that's just for personal reasons" (MS1)

MS1’s explanation of his personal preference for social interaction (above) is supported by MS4 who also highlights the consequence of reduced socialisation on cooperation and forgiveness. This implies that while general schemas are useful for initial relationship formation, personal knowledge is beneficial for trust repair. If I know someone, I am much more inclined to make allowances for his/her lack of competence or even wilful transgression. Furthermore, it would seem that direct experience from working with another person fosters an affective attachment over and above rational judgement and encourages altruistic acts.

"I must admit I do miss the interaction. Also I wonder sometimes whether without knowing people we are missing out on ....I mean if you know someone personally right, you somehow feel more easy to forgive them if they do something incorrect or you don't like. You are also more likely to be willing to do extra for them because you know them. Here we do it because it's the right thing to do, not because we want to. You know what I mean?" (MS4)

Another insight is the cultural concept of doing ‘the right thing’. While it makes logical sense to work together for mutual gain, for the Indian group, cooperating and going the ‘extra mile’ for another is a matter of honour and therefore, can be a powerful self-governing mechanism – something which perhaps has escaped the notice of Microsoft.

The newly crafted channelled communication has its advantages in overcoming misunderstanding and delay as the two PMs are much more fluent in English and with
increasing contact, they will also develop a better understanding of their client’s needs and preferences. The PMs become central for query clarification for all involved in the global team. While the relationship between MS-UK and MS-US with Bangalore was subsequently described by Mr R. as ‘congenial’ and that communications and project deliveries are much improved, there is no indication of any real affective bonding that might result in friendship. Despite the operational and supposed relational improvements, EDC is still viewed as a contractor whose association with Microsoft is subject to its continuous quality performance. Although known as a long-term provider, EDC’s vendor relationship with MS remains fragile, being operationally focused and targeted at getting MS’ products out as planned. Failure to meet Microsoft’s expectations can have adverse consequences for EDC and its staff.

Despite its apparent success, a possible downside to the new virtual arrangement is MS and EDC’s increased reliance on the dependability and competence of the project managers. This is a risky strategy. If either of the PMs (or both) chooses to leave or have a dispute with their employing organisation, Microsoft will be left with a team of EDC workers they have chosen not to know. Even if new PMs can be found, it will take time to develop the knowledge and trust relationship again. Given the relative inexperience of the group, there are only a small handful of people with sufficient technical expertise and communication skill to succeed either of the PMs.

"...some of the issues that we've faced with MS are that at times if you are not familiar with the person you are speaking then you may not understand everything that is said or conversed" (MS1)

Other disadvantages include slow project initiation. MS3 below suggests that projects are often slow to get on the way because of the circuitous route for task initiation and the PMs’ heavy workload - problems are not reported up the line fast enough.

"It [the project] would be downwards from Fargo and UK to our PMs and them to us usually. It could be because of time difference and also the PMs being very busy people. It is not escalated at the time. It needs to be done quicker" (MS3)
MS8’s summation of the project manager-project leader role differences is illuminating in that the reduction of the number of project leaders to one for each project manager means that some projects may not have a team leader and members find themselves reporting directly to the project managers (whose workload prevents them from giving their staff the time and attention they require). This can lead to a bottleneck or the possibility of an oversight or mistake by the PMs and/or the team members. This calls into question the wisdom of channelling project communications through the PMs only.

"Project managers... they overlook the work and report on the project. But project leaders deal with us day-to-day and also make report to the project managers. Only thing is, the amount of thing that they code" (MS8)

Comparing the perceived virtual team advantages with the problems in Figure 7.1, we see further anomalies. While MS and EDC’s PMs and PLs identify better relationships and reporting with the virtual structure, team members (e.g. MS3, MS5 and MS9) caution that the around-the-houses communication is acceptable only if direct access is possible for urgent or technical problems. In addition, while the MS project seniors and EDC management following Western management practices, prefer written communications and weekly and monthly status reports, team members, in particular the PLs, have found them to be time consuming and not always effective as a management tool. An inference from this is that in the Indian office, structured time and project status reporting are perceived as poor substitutes for proximity and personal relationships. Over-emphasising rules, procedures and reporting protocols can be counter-productive. By diverting the already hard-pressed PMs and PLs from project performance to administration, the unintended consequences could be inefficiency and disaffection.

"...we all are working in the same place back here so I interact with my team members directly. So I know what they’re doing, how much time they’re spending and whether their work is ok. So it’s just a...how do you say it, it’s only a record" (MS6)

Nonetheless, although social interaction and relationship are personally important, language-use difficulty is recognised by the Indian informants as a barrier. MS1’s
comments illustrate the communication problems faced by team members who do not have a strong command of the English language. Being disinclined to ask for clarification can exacerbate technical problems (MS4) and may lead to disputes later. As the new project reporting structure removes the need for Indian staff to cope with multiple external relationships and possible embarrassment from any language difficulty, the Indian members may actually be relieved that their project managers are acting as a buffer or interpreter to the outside world. As can be seen from Figure 7.1 (virtual team advantages), the Indian informants have expressed their preference for being left to concentrate on their project tasks. MS6's comment that the PMs 'speak better English and know the overseas people better' substantiates my supposition of a cognitive acceptance of the new arrangement for self-protection and to maintain self-esteem.

"A typical example would be when a team member attends conference calls for the purpose of reviewing requirements; at times each party may have to repeat themselves. Most often a senior member may have to interrupt to sort out this communication problem" (MS1)

"You know sometimes they say something, and I think ok do they really mean this? I know I should ask again for clarity but I say to myself 'oh I think I know it I don't want to ask it again.' and when things go wrong it is embarrassing" (MS4)

"Most communication now routed through the PMs. They speak better English and know the overseas people better" (MS6)

MS1 and MS2 are understandably positive about virtual team working as they are the designated contacts between EDC and overseas. MS1 states that he does not find having to work with people that he does not know or meet often (if at all) a problem. This is interesting because MS1 was described by his manager (the GM) as possessing 'good one-to-one interpersonal skills' and is 'a good learner' but who is also a cavalier with 'a huge ego'. It is possible that this self-confidence has allowed him to reach out and engage strangers. MS2 on the other hand, was highly praised by the local GM for his technical excellence. He is 'a consistent performer' who is 'fully up to it' in terms of his 'trustworthiness and reliability'. However, he is less people-oriented and has a tendency to make 'cutting remarks that people don't take to easily'.
His own preference is for control (e.g. ‘So I could answer for all the projects’ and ‘… so that we know of that entire situation’) and his approach to client management is through project efficiency rather than relationship building. Fortunately, this approach happens to suit Microsoft with its American culture. Feedback about him and his projects from the US and the UK are very positive. Interestingly, the team leaders interviewed (MS4 and MS6) are the ones with reservations and who are missing the interaction. They desire the access to overseas colleagues enjoyed by the PMs and see that privilege as one that they deserve. The remaining informants appear not to be too concerned, preferring to take the pragmatic stance of concentrating on their tasks and trusting the management and their PMs to maintain a good relationship with Microsoft. Perhaps it is sufficient to know that while strictly speaking all communiqués should be channelled through the PMs, there is some room for direct access through the email system – ‘if there are any issues… I also send mail’ (MS5).

A conclusion from the above discussion is that problems experienced by the Microsoft global virtual team are not from a lack of physical co-location or the project processes, but down to something more fundamental. Cultural differences affecting the team dynamics are exacerbated by India’s poor telecommunications infrastructure. The trust between the MS-EDC partners is instrumentally construed and fragile with a focus on project delivery and contract maintenance. The individuals within the Indian group exhibit a more culturally-driven honour-bound trust of ‘doing the right thing’ by their colleagues, which may be overlooked by Microsoft as a possible resource. When faced with their predicament of non-contact with other overseas project colleagues, the Indian members rely on their PMs to shield them from further embarrassment or misunderstanding. However, without proper succession planning, this reliance on the PMs can be a risky strategy for Microsoft and EDC.

Another observation is that in situations or relationships of unequal power, the will of the more powerful prevails. That Microsoft is EDC’s key customer is well understood by all the members. ‘Keeping Microsoft happy’ (MS2) has become the common goal and its achievement is paramount for EDC and individual well-being. For individuals in this scenario notwithstanding one’s own work preference, as long as the expected benefits of working on MS projects keep EDC afloat and the MS brand gives EDC staff status in the community, they outweigh the perceived problems of virtual team
working and individual preferences for social contact. The Indian informants are likely to continue their pragmatic compliance with the unusual local-virtual teaming arrangements.

Given that we have identified that trust between MS-EDC is rationally grounded and the restricted access of the Indian team to the rest of the global virtual team is tolerated rather than embraced by the Indian members, it is essential to understand whether this particular virtual team practice is a barrier to group identity and categorisation processes.

Are shared perceptions, group identification and trust possible or necessary?

Following the recent policy of channelling communications through the two project managers, direct exchanges with other MS colleagues overseas are minimal to non-existence. The overlap between circles in Figure 7-2 below denotes the level of direct contact by the Indian teams with other centres such as Brazil or Dublin, and Fargo. Interactions between EDC India are primarily with MS-UK with some exchanges taking place between EDC and the US and other centres such as Dublin and Brazil. Direct contact by project members with overseas is limited to technical queries that cannot easily be relayed or explained by the project managers or team leaders.

Trust and identity processes for the MS-EDC case are at two levels: locally amongst the Indian members and them with other members of the global virtual team. I discuss the Indian office and their within-group relational and identity dynamics before examining the identification and trust processes between the Indian group and the other units in the wider Microsoft virtual team.

Despite continually reiterating my assurance that comments would not be linked with individual names, I had great difficulty encouraging the Indian staff to talk openly about their feelings and emotions. As I was forewarned by the local GM about ‘Indian shyness and reticence’, I was not overly surprised. Most were very at ease talking about their project and project-related problems or personal aims and drivers, but were reluctant or non-committal and even directly refusing to venture an opinion when asked about their relationship with their MS colleagues. Nonetheless it is
possible to draw insights from their responses on the perceived organisational context as enabling or constraining and their explanation or attribution of the reasons to understand team cohesion, trust and solidarity formation.

Figure 7-2: A Venn diagram representation of MS-EDC relationship

Although periodic face-to-face visits do occur, they are limited to project seniors travelling from the UK and US. Unless there is a specific technical issue that requires a team member’s input, the involvement of the other staff during these visits is limited to informal exchanges with the visitors at break time, lunch or dinner. This restriction on contact has effectively produced a global team comprising of local sub-teams that are self-contained and isolated from others except through a small number of project seniors. Assuming George Homans’ (1995) tenet that the three key components of group behaviour are ‘activity, sentiment and interaction’ (p110) and that sentiment-based attachment and intra-group solidarity are dependent on the frequency and quality of social exchange (p.112-3), it follows that the limited interaction allowed the Indian members with other non-Indian colleagues would reduce the opportunity for self-reflection and the development of shared perceptions, group identification and trust formation, all of which are predicated on social interaction – hence MS6’s comment about working in a conventional team that is part of a global virtual team.
My conclusion of a general consensus amongst the Indian group that the restricted access to the global team is an economic and operational necessity is further supported by the local GM’s comment below.

"...they know they are coordinating the projects from there and you know they’re the contact points for Microsoft and they’re in charge of the EDC project, so the team here will be more willing to cooperate" (EDC GM).

Both social exchange and interdependence theories assume a net gain relationship based on costs and benefits/rewards. Therefore aside from the kudos of being associated with the MS brand, the fact that they have chosen to stay and continue working despite the lack of social contact outside of their immediate work environment would suggest that a relationship is possible when there is no better or more lucrative alternative or when individual and organisational goals are complementary. However, any affiliation and categorisation with the wider virtual team is sustainable only as long as the off-shoring agreement continues, whereas the homophilly and homogeneity literatures point to demographical or personal history similarity as a trigger to starting social identification. As the local arm of the virtual team, members work in close proximity, are of a similar age and have at least a bachelor degree or a professional computing qualification. Although coming from different parts of India they share a national culture and therefore will have similar beliefs and values. These similarities enable quick socialisation; the common characteristics providing a point of reference and allowing people to identify and become comfortable with one another. This is in line with Festinger et al’s (1950) discovery that residents of an apartment complex were more likely to interact and like others who lived on their floor than residents from other floors or in other buildings. They called this the ‘propinquity’ factor. In the current context, proximity not only helps newcomer socialisation, it reinforces initial attraction or similarity between people.

"If you are a newcomer you will say it's a very good environment" (MS4)

"Most of us have a kind of ...more than just work related we have a kind of attachment to each other. Like we...we talk about our families and all that." (MS2)
The Indian group sits together in an open-plan office working closely on their projects, sharing work and personal information, and creating and being influenced by the office norms. This process of group socialisation is the basis for group identification where extended exposure and shared fate allow the development of shared meanings, and goals. In effect, the shared mental models from social interaction become the bounded rationality of the individuals in the local Indian team. Relations with similar co-workers may be further improved as they have something extra in common: the shared vision of producing quality and timely work for Microsoft. These individuals sharing a common purpose will have a personal interest in achieving that mission and any occasional dissonance are less likely to escalate into open conflict or to affect productivity.

"People don't have bad feelings about others for long. They don't harbour them and let them get in the way of work" (MS8).

As sharing creates a sense of belonging to a community, its role is to provide predictability and stability and a context with which work could be performed. Friendships may develop between employees more readily, leading to a friendlier workforce. Even though the Indian office is only just over five years old and at the time of the interviews, only six or seven of the 23 staff were there from the beginning, as a visitor I felt that members were more than comfortable with one another. There was genuine rapport and warmth expressed by the informants as an 'attachment'.

The willingness of this co-located group to cooperate and therefore trust that unseen others will not let them down when reciprocated with successful project deliveries, should lead to mutual respect and commitment, and if that feeling permeates across the teams, then team-wide shared perceptions and identity are achievable. MS2's reference to mutual affection is illuminating as it is not limited to the local office but includes the UK and to a lesser extent, the US. This implies that trust and identity have transcended from the local to some parts of the wider virtual team, but as with Wiesenfeld et al's (2001) study finding that the quality of communication among members of virtual teams affects their identification, remoteness and lack of interaction with the other centres in this case has limited opportunities for identification throughout the global virtual team.
"It's true that our attachment that we have with our team members out here is pretty higher than we have in Fargo or even the UK" (MS2).

"The one thing good is we are comfortable with the UK. We have a good relationship there. Fargo is not so strong" (MS4)

It would seem that the depth and strength of attachment feelings are correlated with the quantity and quality of social interaction. As social psychologists have long argued that interaction or the anticipation of interaction is positively correlated with attraction and perceptions of similarity, they are accepted as the bases for social categorisation and identification for this study. Amongst the Indian colleagues, their co-proximity and opportunities for lateral communication allow them to get to know and understand one another, to develop a liking (or dislike) of other team members, to evaluate and approve (or disapprove) of others’ actions or performance and to begin to identify with them as part of the team. But the lack of interaction with the other centres is a real challenge for their identification with the wider global virtual team.

The fact that EDC’s vendor agreement with Microsoft has lasted over five years and looks set to continue, however, would indicate that somehow the various local teams must have found it possible to trust and cooperate with their absent overseas colleagues. Any trust-giving and cooperation in this context by the Indian team with their overseas colleagues is not the outcome of co-located activity, or emotional sentiment or interaction density, it is based on the realisation that cooperation is better than non-cooperation owing to the unequal power-status of MS and EDC. Furthermore, common product standards and requirements mean inter-centre interdependence and stresses the operational necessity to cooperate as it is not possible for any single centre to achieve overall project success. Hence ‘interdependence makes cooperation a valued commodity’ (Markovsky and Lawler 1994:115) and the cost of not cooperating and trusting outweigh its benefits. In the MS-EDC context when there is no better or more lucrative alternative, when individual and organisational goals are complementary and even with limited interaction, positive cooperative experience will lead to a sense of ‘we-ness’ not just
within the immediate co-located work group, but with others in the global virtual team.

Moreover, the reality of a group is evident when people see themselves as members of the same social unit and when others recognise them as so (Asch, 1952; Turner, 1982). As EDC workers are motivated to categorise themselves as a part of Microsoft, and those external to Microsoft are unlikely to know about or view the EDC teams as other than a part of Microsoft (particularly when MS markets the finished ERP products under its own brand) then, it is feasible that another way to develop a sense of belonging to a social unit or with others who are involved in the project is through individual identification with the Microsoft brand. Through categorisation, differences within the category are attenuated and it is this intracategory assimilation effect that the Indian group will assume the attributes, values and practices of MS as their own, and their properties provide the foundation for a wider, group identity. MS2 and MS8’s comments support this supposition.

"When you talk about Microsoft it is international and much respected right? It is important to be associated with a big name like Microsoft. To say you work for it makes people respect you." (MS2)

"The whole habit of the Microsoft is in the EDC culture too. We were very new to the IT ways and Microsoft is established worldwide. We have learned a lot, both as a company and as individual workers." (MS8)

Lewin (1948) was the first to suggest that task interdependency and shared fate are important in the formation and functioning of the group, and Deutsch (1949) demonstrated that groups working under positive interdependence conditions are more friendly and cooperative, more open in their discussions, more willing to help one another and generally more productive than groups faced with negative task interdependence. The Indian informants are certainly ‘in the same boat’ (i.e. positive task interdependency) as they all work exclusively on MS projects and the iterative nature of IT development projects mean high work flow interdependency, with each member playing an important role in enabling or preventing the next to start his/her task. 50 years on Deutsch’s findings are still applicable as the prevailing themes
emerging from the Indian team are friendliness, openness, willingness to share and mutual support. These affective processes are consensus-seeking mechanisms, serving as trust indicators. One is effectively placing oneself at the disposal of others with an expectation that colleagues will reciprocate that trusting behaviour. Successful intra-group cooperation will increase cohesion and promote high morale (see Brown, 2000: 48-9).

"As for trust within my team, both local and virtual, we have it in plenty" (MS7)

"I’m always in a mood to give help to people there. Even... I just want to sacrifice my work. That’s how I feel.... I know my colleagues here and overseas will do the same for me if I ask" (MS8)

"The team works well together. We have good relations" (MS9)

MS has the choice and can rescind its vendor-agreement with EDC, but as long as it continues, members in the US and UK share the contingent outcome of the project. Over time the EDC team has proven itself sufficiently for their MS project partners to be able to trust and rely on them to deliver their contribution without close supervision or intervention.

"You know you just become to rely on the fact that it’s gonna be two days it’s gonna be two days it’s gonna get done... It’s taken a while to get to that point where I can say ‘ok just go and do this and I don’t want to hear about it until it’s finished’... I trust them enough to not micro manage” (Mr R, MS UK)

In summary, the unusual local-virtual structure of this case has revealed that, despite the lack of interaction across all units of the virtual project, people can still ‘perceive themselves to be members of the same social category’ (Turner 1982:15) or social unit as they are dependent on the contribution of others to the project outcome. The conclusion of a shared mission for project success is evidenced by the continuing vendor relationship and confirmation by informants of their relationships with the UK and the US, indicating identity with at least the key parts of the wider virtual team.
As the virtual project organisation structure does not appear to have prevented social categorisation and social identification beyond the immediate co-located team, and as 'role positions carry with them expectations of the kind of behaviour that the persons occupying them will engage in' (Brown 2000:75), the next question is 'what expectations do individuals performing their roles in the various project sub-groups have of their own and others’ competence?'

Does virtual team working affect perceived personal or team performance?

The organisational context is represented by the team climate construct which was found in the first phase of this study to have a direct effect on individual assessment of personal performance. Team climate is members’ perceptual evaluations of the level of personal responsibility, the transparency and equity of the reward system, the organisational structure as enabling or constraining efforts, the level of support by management and between members, the affection or emotional attachment felt for one another and importantly, as Turner (1982) had anticipated, the extent to which individuals define themselves as members of a team and willingly abide by the team’s attributes and norms. The assumption that belonging to a group forms part of a person’s self identity is, according to Brown (2000), central to the study of groups and is reflected in this project’s significant survey relationships between self-belief and climate, self and own performance, and climate and own performance. The findings also support the interdependence and shared fate arguments that individual experiences, actions and outcomes in a team (such as the EDC team) are inextricably linked to the other team members’ experiences, actions and outcomes.

As the project management team is quite small and team leaders and sometimes even the project managers are also actively working on projects, a self-managing leadership style has emerged. Team members are allowed and encouraged to use their own professional judgement and initiative to work on their project and for problem solving. (Interestingly, responsibility was found to be the most important factor of team climate in the survey). This approach when supported by an appropriate recognition system allows individual autonomy for performance and rewards success. Staff reaction is positive as it gives them an excellent opportunity to apply their skills and knowledge and to be recognised for their achievements adds to their self-esteem.
Presumably it will motivate them to do even better. From the number of positive comments below there can be little doubt that members like being given the personal freedom and responsibility to perform their tasks, and appreciate the recognition of their efforts:

"I have enough authority to do it. They leave me to design and plan my work. I can do it in the way I feel comfortable just so long as I meet my target timeline and quality, and I make sure I do." (MS3).

"You have enough freedom to work here and there’s not a fixed time schedule like you have from nine to six. I like the flexible working…you see people coming at ten working to their satisfaction." (MS8)

"I am recognised in the company. I feel that. Yeah I feel I have got enough recognition. I don’t know about others" “They usually give something called a performance award every year end and I usually get something. I admit it's good getting it actually. It’s their way of saying ‘thank you for your hard work’. Yes. I am happy to get that. I know I am good and I work hard but this makes it public and gives me great confidence in myself.” (MS5)

The support dimension includes active and perceived management responsiveness and support. As leadership consideration, group autonomy and morale are assumed to be related, a good leader is someone who can organise and manage group activities while remaining responsive to their views and feelings (Fleishman, 1973 and Stogdill, 1974).

"It has really been an enriching process….I like being given the freedom to solve problems but knowing I can go to someone more senior or knowledgeable if I can’t. I find this very empowering” (MS7)

However adopting a laissez-faire style of management could be seen as poor and unhelpful unless managers and leaders are careful to balance between empowering members and being accessible when the need arises - which appears not always achievable given the workload and the leader-doer role of PLs and PMs:
"If we are again not in a position to solve it we should go to the manager... But for the project manager not everything you say is taken in. They just feel that they don't want to be disturbed" (MS8).

By all accounts, MS-EDC and intra- and inter-team behaviour and performance would appear to be good. This may be explained by the personal ownership, professional drive and commitment of the team members. The interrelated fates and behaviour outcomes of individuals across the global team are described by MS3 as a 'chain reaction'. Presumably responsible and professional behaviour will reverberate through the team across the project interfaces to other centres, and back.

"I think first of all it's the professional drive of the individual team members. Most of the people that I work with on a project, it's my responsibility that I have to do my best expected of me for my piece of work. If I give it half done, it will land others into trouble. It's good commitment here because working in such an environment where one product works with ten other products, it's good to remember that it's chain reaction. One break in the chain, affects ten other places". (MS3)

"We don't ask people to stay back but they automatically commit themselves. When they have a deadline to meet, they stay back, they stay overnight. They do it without even being asked to do it" (EDC GM)

Alternatively taking a more critical and less-charitable stance, it may be interpreted as people having to work longer hours because of their inexperience.

"They turn up and work and are trying to solve issues and do the project on time. If you see that half of them are working late most of the time, must be committed right?... In fact with their experience I don't feel that they deliver and they are committed because they are not the best" (MS6)

Certainly time estimation is a regular problem despite the GM and the project managers' insistence that

"Microsoft has never given us a deadline and say, 'ok work towards it'" (MS2)
Further probing concluded that the main reasons are (1) new and inexperienced staff and (2) many of the MS products and feature updates have pre-defined launch dates, so EDC is obliged to work backwards from the end dates. Furthermore, MS3 has already alluded to the interdependent nature of the project tasks and any slippage will have a knock-on effect on subsequent tasks. When this happens, team members further down the project life cycle have to work late to avoid missing the project deadline. Yet surprisingly, there was no blame placed by anyone on another, apart from the realisation that difficulty up the line puts pressure on subsequent project tasks. Given their reluctance to express their opinion openly about their colleagues, this apparent generous attitude to project difficulties or mistakes might be a manifestation of the Indian cultural unwillingness to be confrontational or to be seen as publicly denigrating their colleagues or, it could be evidence of genuine mutual understanding and support amongst team members.

Staff inexperience is likely to be a combination of access to training, staff calibre and turnover. Although informants agree that they are given project specific training, there is no policy in place for non-project personal development. Moreover, all home-grown and among the longest serving, the project managers and leaders themselves are also new to their roles. According to the GM, they were chosen for their personal character and ability to communicate and get on with the MS personnel. Like the team members, none has any formal project management skills or has been given any personal training as managers/supervisors. MS as the client company see themselves as a ‘third party’ to EDC’s employee development while the local GM explains that she has a budget to maintain. Presumably, MS budget considerations or operational protocols also mean that they are willing only to provide direct training by experienced professionals from the UK or US for new tools. The local member given the training has to pass it on; a case of the partially sighted leading the blind?

Against the limiting ‘climate’ conditions, the Indian members’ display of group identity, commitment and solidarity is encouraging. The possibility of a circular relationship between behaviour and cohesion was discovered by Mullen and Cooper (1994). Their study found that a strong performance would lead to cohesion, although the link between cohesion and subsequent performance was weaker. In the present case we are aware of a strong sense of self-belief by their reference to their own and
colleagues’ capabilities, quality of work and a high level of professional commitment. The prevalent ‘we’ used and the assertion that ‘we are a strong team’ below also portray a strong sense of intra-group identification. The inclusive pride evident here defines the expected behaviours among members (such as professionalism, trustworthiness or reliability, and quality performance standard).

"We know that UK or US understands our capabilities. We can be trusted because we do what they expect of us.... They are willing to pay more money, they’re gonna give us more projects and...simply because we deliver quality software." (MS1).

"Mainly because people are well educated and have learned to act professionally. We have been successful so far because we are a strong team working together always. We want to provide a good standard of work so that our colleagues in the UK and US will say ‘we can always trust the work quality from the Indian office’ (MS4).

"Being professional is very important both for your own self and for other people. Luckily, I think here there is a lot of professional practice at all levels" (MS3).

Although belonging to a larger global team, this group is essentially a conventional team through their proximity. Nonetheless, they are directly affected by the decisions and practices of the wider virtual team. Whether through peer pressure, fear of losing their jobs or simply a belief in their own ability, they appear professional and committed to high standards and timely completion of their tasks. More importantly, against the odds of working in an extended virtual team with the project end-dates mostly predefined by the client, where individuals are relatively inexperienced but are expected largely to be self-managing, and the support (e.g. training) structure as well as reward and recognition are relatively basic, members’ expressed positive evaluations of their own and colleagues’ commitment and behaviour confirm the strong sense of identity within the Indian group, and some level of identification with the larger group. This is in keeping with my earlier quantitative finding that group identity alone explains over half (51%) of the variance in team cohesion and has a direct and indirect influence on member performance evaluation.
7.3 Case Study B: British Telecoms (BT)

Informants from BT were drawn from one of the functional groups within the Wholesale division. Comprising of 120 engineering-based personnel, this group is responsible for delivering network services and solutions to corporate clients. The 120 are further divided into smaller teams. Describing themselves as a ‘project leader’ or ‘project manager’, they are actively engaged in project delivery, but may also have functional responsibilities.

“They are all leading virtual teams. Um, and they themselves are quite often in a virtual team. My 22, only three of them are in the same building, same office. Everybody else is scattered across the UK” (BT1)

“I have 3 direct reports who work to me, and they in turn have the rest of the 22, by now its 17. Yeah it’s a tree. So 3 work to me and then in total of them 22” (BT1).

They are long-service employees, the majority of whom joined BT straight from education and had worked their way up the corporate ladder via the technical route. They see themselves as ‘a part of BT through and through’ (BT6). The technical knowledge and experience of this group of workers have made them central in performing BT Wholesale’s projects.

Until recently, there was no requirement in BT for their project personnel to be professionally trained as project managers. Recruitment tended to be on technical criteria. However faced with increasing competition, growing market demand for project accountability and the realisation that many of its employees ‘have been with BT all their lives and know very little outside of that environment’ (BT2), BT introduced a policy to support and encourage their engineers to gain accreditation from the Association for Project Management and to adopt a more structured approach to projects. The scheme started around the end of 2000 and the beginning of 2001 and at the time of the interviews, just under half of the engineers in the group of 120 had gained their project management qualification. However, this strategy is not always appreciated and benefit for the individual (e.g. as an additional qualification in the curriculum vitae) may be ignored. Aside from the human preference for preserving the status quo, it is viewed by some as a passing fad and that BT’s
organisation structure is not appropriate for a formal project management focus ‘because it hasn’t naturally streamlined itself’ (BT9).

“People are happier I think doing things the way they’ve been doing it and see BT’s introduction to project management as a flavour of the month or flavour of the year change and people inevitably have got used to that. It’s here for a year or two years and then drift away” (BT7)

Table 7-2: Role-ordered analysis of attitudes to virtual teaming (BT)

<table>
<thead>
<tr>
<th>BT Wholesale</th>
<th>Role</th>
<th>Service</th>
<th>Entry level</th>
<th>Attitude to the virtual team</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT1 Wholesale Line + project</td>
<td>Long &gt;20 years; only employer</td>
<td>Bachelor in physics, now with MBA. First employer.</td>
<td>Positive. Views it as an important and practical tool to manage modern projects. “I think it is much more beneficial to the business” “...in my team, I encourage people who want to work from home to do so”</td>
<td></td>
</tr>
<tr>
<td>BT2 Wholesale Line + project</td>
<td>Long &gt;30 years; only employer</td>
<td>Apprentice-ship, worked way up.</td>
<td>Positive. Views it as necessary to compete “nowadays” Also likes being able to work uninterrupted, not having to worry about colleagues’ physical attributes and the variety in team mix. “...you’re not faced with dealing with the same people all the time”. “...when it works, it’s like clockwork”</td>
<td></td>
</tr>
<tr>
<td>BT3 Wholesale Project only</td>
<td>Long &gt;15 years; only employer</td>
<td>‘O’ Levels, worked way up.</td>
<td>Positive. Particularly likes the output oriented approach and individual flexibility. “As long as work gets produced and delivered as expected which is why it suits working mums”.</td>
<td></td>
</tr>
<tr>
<td>BT4 Wholesale Line + project</td>
<td>Long &gt;20 years; only employer</td>
<td>Apprentice-ship, worked way up.</td>
<td>Negative. Argues that virtual teaming adds to project coordination complexity, especially for a large programme with a number of sub-projects that are competing for resources. “a project where there are high number of dependencies and complex tasks and different expertise... no, I don’t believe it would work”</td>
<td></td>
</tr>
</tbody>
</table>
| BT5 | Line+ Long >20 | Joined as a technician, starting 'from scratch'. Worked elsewhere before joining BT. | Positive. Personally benefiting from not having to travel and able to self-manage. 
"Now we can be anywhere literally. It saves a lot of time travelling. We can spend that time more fruitfully." "I find it very empowering" |
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</thead>
<tbody>
<tr>
<td>BT6</td>
<td>Line+ Long &gt;30 only employer</td>
<td>Apprentice-ship straight from school, worked way up.</td>
<td>Positive. Views it as an operational methodology and argues that &quot;people [working on virtual projects] are not that different to others working more locally&quot;</td>
</tr>
<tr>
<td>BT7</td>
<td>Project Long &gt;20 only employer</td>
<td>Bachelor in electrical engineering, worked elsewhere before joining BT.</td>
<td>Positive. Appreciates the flexibility and self-reliance offered by virtual projects. &quot;In my case it's wonderful&quot; &quot;... there is a plus in that you're encouraged to go and sort it out for yourself because that's the best way of doing it so you tend to learn more&quot;</td>
</tr>
<tr>
<td>BT8</td>
<td>Line+ Long &gt;20 only employer</td>
<td>Apprentice-ship, worked way up.</td>
<td>Positive. Has been involved in matrix working for a long time. &quot;... for projects it's really a way of life these days... it's probably industry at large but especially[in] BT.&quot;</td>
</tr>
<tr>
<td>BT9</td>
<td>Project Long &gt;30 only employer</td>
<td>Bachelor in physics, first job.</td>
<td>Neutral. Works mainly on his own. As with BT6, does not see virtual teaming as having much impact on the individual. &quot;... regardless of which way you chop it, when you get down to a certain...below a certain level that person's job does not alter at all&quot;</td>
</tr>
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</table>

Figure 7-3 is a diagrammatic representation of the member composition in a ‘typical’ virtual team and Figure 7-4 maps BT Wholesale’s project attributes, problems and the pros and cons of virtual teaming. The projects undertaken by this group are technically complex involving inputs from different people at varying stages of the life cycle. Projects are approved centrally and added to the online ‘workstack’ (BT1) via the organisation’s Sieble-based system.

"They just load it up with new projects. These come automatically through to me and for the ones that I am involved in, I start talking to them about specification" (BT1).
Each team consists of the project manager and his team of project personnel which expands and shrinks during the project life cycle. It can be as small as three or it can grow to 30 or 40 members (BT5). Operating matrix style and drawing expertise from across divisional and organisational boundaries, members are seconded from BT Wholesale and from other BT divisions. A project manager may request for a specific individual with whom he/she had previously worked or if he/she happens to know that a certain individual has the expertise or skills to match project requirement. A number of past reorganisations had left BT with a shortage of technical expertise and the rest of the team is likely to include some ex-BT employees who are back working as self-employed advisers or contractors and relevant corporate partner/s. Most of the team members would be located all over the UK, communicating electronically or by telephone, emails and coming together every so often for project progress updates. All are given the opportunity to work from home, but as was evident from the survey, many of them seem to prefer to work in a local office - to use its facilities or to be able to socialise with other BT colleagues or some just find working from home too distracting. Small clusters of two or three project colleagues happen sometimes to located in the same office and therefore enjoy regular face-to-face interactions.

Figure 7-3: A ‘typical’ BT virtual project team
In Figure 7-3 each team is represented by a yellow ‘sprig’ extending outwards from the inner-core of project managers. BT1 uses a Sun Tzu (The Art of War) defence metaphor to describe the core group (to which my interview informants belong), its purpose, how it works, and the extent and manner of individual involvement in virtual projects. Using the diagram it is easy to picture BT1’s enactment of a group of individuals standing ‘back-to-back’ against the outside world. His statement is a classical demonstration of in-group categorisation.

"Yeah, they all stand back-to-back in a circle facing out and working in a virtual team, defending and deflecting the flack" (BT1).

My interviews followed yet another of BT’s reorganisations and a recent company-wide HR job-evaluation and reclassification initiative. The ‘job-family’ exercise in particular, had upset many of the longer-serving BT employees who saw the re-categorising of their job roles as an erosion of their status in the organisation and their earning capacity curtailed owing to changes in the pay-bands and pension policies. Throughout the interviews there were references to early retirement or leaving the organisation. Hence BT1’s siege imagery of a group of people having to defend themselves against some perceived external danger hints at the attitudes of many of the BT employees. The extent to which the disaffection from the organisational changes might have affected individual commitment and performance is explored later when discussing virtual teaming and performance.

BT2 as a functional manager, who also leads projects, uses another metaphor likening the core team to ‘the centre of a wheel’. Both BT1 and BT2’s comments indicate that identity is salient amongst those who have defined themselves as a unique group of people occupying functional roles and are also responsible for project success. The identification is interesting as it includes players from across other divisions or parts of BT and from outside BT. This suggests that intracategory similarities are maximised to develop a common identity. It also supports the literature that social identity with a group can have its basis on depersonalised characteristics - in this case, the job function or role.
"They are in their own right individual project managers and therefore they will have working with them a whole er...matrix of individuals from different parts of BT and even outside companies. You know, a core team like the centre of a wheel with spokes linking others to the core" (BT2)

Although working as virtual teams, some team members experience a higher level of co-presence than others. In line with the shared fate assumption, the majority view is that complementary skills are more important for project delivery than physical co-location - after all, BT employees are seasoned virtual team players and are used to emails and long-distance telephone interactions.

"...it's just the way that we work and we use telephones and emails all the time. Er, it's easier on the telephone to do it" (BT6)

It was clear from the interviews that the virtual projects share many of the challenges facing conventional projects (Figure 7.4). For example, team size and variability are a problem for supervision and coordination of the project or programme.

"The whole programme is too large. Too many people and some from outside...you know... contractors. Too much chopping and changing is not effective...and it's hard as a project lead to keep on top of things." (BT4)

The inability to ‘keep on top of things’ is unsettling for the team leader as it reduces certainty and increases personal and project risk. The flexible team composition offered by the matrix project structure can also be problematic for the project manager and his team when projects have to compete for resources. Resource issues are highlighted by the informants as a major problem and many attribute the shortage to BT’s enforced response to market pressures.

As long-service employees, my informants are familiar with the periodical delayering throughout BT. In operational terms, overstretched engineers and technicians may not be released from another project or there is simply no one available and project managers do not always have the budget to bring in contractors.
Figure 7-4: Mapping BT Wholesale’s project attributes, problems and pros/cons of virtual team working

Project Attributes and Virtual Working for BT

Project attributes:
- Team size varies through life cycle
- Changing membership mix through life cycle
- May express preference for team members
- Mix of employees and consultants/contractors
- Totally virtual
- Occasional F2F
- Regular F2F
- At a local office
- A mix of work modes
- Communication and project coordination
- Emails
- Telephones
- Mobile cell phones
- Intranet database
- F2F meetings
- Hierarchical allocation
- Project origin
- Matrix
- Increasing use of project management discipline
- Project structure
- Less time travelling, more producing
- Working mode
- Working hours
- Decision and problem solving
- Work-life balance
- Number of contacts
- Knowledge acquisition/sharing
- Problem not personality centred
- Focus on objectives/goals
- Useful member feedback & appraisal system
- Increased networking
- Personal choice/empowerment
- VT advantages
- Reduced personality/attribute based conflict
- Work-life balance

VT problems:
- No previous VT experience
- Distance and reduced socialisation
- Resources and team members’ availability
- Artificial communication media
- Self-reliance; increased personal risk
- Multiple relationships and reporting

Project issues:
- Size
- Mix
- Complexity
- Stakeholders
- Leadership challenges
- Supervision
- Coordination
- Interdependence
- Resources
- Changes
- Mix
- Scope not clearly defined
- On-demand variations
- Novelty (e.g. new technology)
- Dual roles (e.g. sponsors also doers)
- Contractors
- Team
"We’d piped down the organisation to such an extent that it’s threatening our ability to do our jobs" (BT7).

"...there is a general tendency to try to downsize the entire division that I’m in at the moment so it’s been extremely difficult to get the...to get resources. So it’s not just bad senior management support...it’s er... erm... political as well.....in those cases where I haven’t got people in place erm...I had to matrix in from BT Exact to fill the gaps." (BT7).

‘Deadline is everything’ (BT4) so new members joining a team are expected to be up to speed and productive very quickly and a systematic handover is not always feasible. The lack of newcomer induction and socialisation has relational implications especially when the focus is purely on output but project members are working away from one another.

"Things are different now...far more time critical and being late is no longer tolerated or acceptable. This puts pressure on good quality team working" (BT7).

Other common problems include unclear or ill-defined scope, on-demand variations by the project client or owner, pressure to complete and technical novelty. These project issues can cause employee stress and become effective barriers to success. BT4 gives an example of the chaotic state in one of their projects:

“We’ve got... five delivery managers at the moment and all are...are quite confused. They’re not quite sure of what they’re supposed to be delivering, when they’re supposed to be delivering, how it’s all to integrate together how it’s all to stick, they don’t know who to turn to get advice and this project started a year ago. A long time ago erm...and so it’s still at this stage. We still have not got a project team that is fully integrated together and works correctly and the reason...why is that? I don’t know...don’t forget, I only came into it part way. I think the problem is that at time zero it was not possible to completely define erm...their deliverables, their objectives that they needed to deliver and it is fast becoming apparent. And erm...and still we’re dealing with issues and understanding between them and I think the...one of the main reasons is that these capabilities, these functions all have to fit and work together to direct the interdependence between all of these projects. Erm, and so they do need to
In summary, the BT informants are long-service, mature engineers. Through the support and encouragement of their employer, many of them have recently gained professional accreditation as project managers. However, there is a strong hint of a growing disaffection amongst the group from perceived erosion of their status and threat to their earning power; how this might affect their commitment and performance has yet to be explored. BT's projects are organised as virtual teams drawing members from across various functions and divisions of the organisation and including external members who may be individual sub-contractors/consultants or corporate partners. Team members are located all over the UK with only a number of small sub-groups working in close proximity. Project communication and coordination is via some form of electronic media and not face-to-face, although occasional project progress meetings are held where members will travel to a designated meeting place.

Operating as a virtual team, BT members also face many of the challenges of traditionally structured projects such as membership variability, project and technical complexity, stakeholder problems, leadership challenges, and increasingly, resource and time constraints. Additionally despite being used to working virtually, there are further barriers or difficulties unique to virtual projects. How these and the conventional project issues might affect team members' attitudes to virtual teaming is discussed next.

Is virtual teaming a problem for informants conceptually or in practice?

Although I had noticed an underlying hostility to recent corporate changes, the BT informants accept that their projects are constantly evolving and as experienced project workers, they have developed effective coping strategies.

"I've witnessed people fairly recently getting agitated because of change...you know, the larger picture, not changes within a project. Erm, for projects it's really a way of life these days." (BT8)
While informants agree that BT's increasingly devolved management style which focuses on project management skills and emphasises ownership by project managers and their teams, is a necessary response to market pressures there are misgivings, such as the difficulty of managing a team of varying size and composition of internal and external members, gaps between tasks and their effect on the project itself and on accountability and the possibility of duplication. In addition, BT7 questions the assumption of the general applicability of the project management approach across all projects and throughout their life cycle. He argues that the techno-mechanistic techniques of project management are not applicable for those who are at the project peripheral.

"With a matrix team of people all over the country rather than having a control centre in Euston where all...everybody is together. Things get missed that way...and it's...and it's ...harder for reporting and accountability" (BT4)

"...if your allowance is providing technical advice and consultancy you are peripheral to the project so the project management skills of planning, scheduling and control are less critical and some would query its strict application" (BT7)

Of the nine interviewed, only one (BT4) informant was negative about virtual teaming, arguing that it increases project communication and coordination complexity and is not appropriate for a large programme with a number of small sub-projects that are competing for resources. The predominantly positive attitude towards virtual team working by the other informants on the other hand, shows a practical appreciation of BT's forced reaction to industry changes and their own increasing awareness of the cost economics and operational efficiency available with new technologies.

"We're under immense competition as an incumbent and under attack... We started breaking down those structures more recently as we change the way we run projects. We had to. The whole industry was moving away from the old hierarchical emphasis" (BT2)

"It's more prevalent now that technology is better suited to it. Now we have broadband access, it's faster....." (BT1)
"It's erm...economy of scale within the organisation in that if you don't use virtual
teams you have to have dedicated teams and it means that you've got specialists that
you're either going to have to say well 'we no longer require your services'... at least
you've now got virtual teams you've got a pool of resource that you can go and ask
for someone. At the end of the day, it's having the most economical structure." (BT6)

Beside, some individuals (e.g. BT2, BT3, BT5 and BT7) find that virtual working
suits their personal preference for self management. Not having to travel to and fro
work allows more time for work. Not being in an office with other people helps focus
and concentration. For those with family virtual working suits their domestic needs.
BT2 also points to the removal of attribution-based relationships enabling focus on
problem-centred exchanges. Hence personal choice, empowerment, increased
networking opportunities are among the beneficial outcomes attributed to virtual
project working depicted in Figure 7-4. The match with personal agendas such as
domestic needs and work-life balance is particularly relevant given BT's realisation
that in this division at least, there needs to be greater 'diversity' (by which they mean
the men-to-women ratio):

"Distributed working is part of BT wanting to move people out of central London to
drive down the costs and some people were encouraged to work from home, which
suited them" (BT7)

"I am able to keep the business and social life separate from each other" (BT3).

"Er, not a very diverse mixture of people I'm afraid. There are some women in the
team, just not many. And where they are I'm afraid, most of them are in clerical
roles. We have tried and I've tried but quite often we just don't get the candidates
applying" (BT1).

Another advantage associated with virtual projects is that for the reflexive worker,
they promote ownership and professional behaviour since task interdependence
precludes individual achievement, requiring clear project goals, real cooperation and
effective communication. BT2's explanation of the need to communicate project
changes and decisions suggests that the management of identity formation in
dispersed groups involves the management of information. For BT projects, individuals work largely on their own and are distanced from other team members. In this environment of relatively sparse social cues, being included and kept fully appraised about project developments elsewhere in the team not only helps ease isolation concerns, but is critical for social (group) identity formation.

"I think the onus is on them to be more professional, and I think the onus is on me as their manager to be more professional as well, because I have to be much clearer in defining their objectives" (BT1)

"If I need to make the change as the owner of the delivery then that's down to me to make the decision whether I need to make that change. But I must then make sure my colleagues in the team are informed and understand the need for change. I also should check whether the change I am proposing will have any negative impact on outcomes further down the line. As change owner, the onus is on me to reduce the risk of delay or failure and to ensure project quality does not slide. If that is done conflict is kept at bay" (BT2).

BT projects share similar problems with conventional matrix-style projects such as membership variability, differing stakeholders' agendas and perceptions and project technical and relational complexities. As with most traditional projects, BT projects are also subject to the 'iron triangle' of time, specification and resource constraints; adding to the project leader's headache of remote monitoring and coordination of project activities, and ultimately affecting his/her ability to deliver the project and 'keep them [sponsors] happy' (BT2). In BT's case, both time and resources are becoming increasingly critical, putting pressure on their ability to maintain quality standards. Team leaders are not entirely on their own about the need to preserve quality as the consistent message from informants is that a member's performance is far more noticeable when working in smaller sub-groups on activities requiring specialist or skilled input than as part of a larger, process-based team. Faced with the increased transparency and accountability in virtual working and coupled with the peer group review operated by BT's appraisal system, individuals are careful about preserving quality standards and being seen to be 'doing a good job' (BT5). This task
ownership and self-monitoring is a form of quality assurance and effectively replaces the need for quality control.

Personal risk rather than project risk is potentially more important for BT informants whose projects are subject to a myriad of external project forces when commenting on individual flexibility and responsiveness, BT8 provides a useful example, and BT6’s explains that although BT does not operate a blame culture, its competitive environment makes people hesitate to admit mistakes.

"Frequently people promise things, senior people promise things and they haven’t got a clue where those gates come from. ‘Sounds about right.’ When I have to do my project plan I’m thinking ‘hello? How are we gonna do this then?’ It’s always a challenge and that becomes a personal risk to those of us who are judged by the project outcome” (BT8)

"I was being called in as the ‘expert’ and like....don’t we all expect our dad to tell us the answer to everything? ....to own up to...to a mistake means subjecting yourself to a human emotion of humiliation, ok?... I think we live in a competitive environment don’t we and admitting your mistakes opens you up and allows...long knives...." (BT6)

BT informants as project managers find that although they are fully accountable for the project outcomes, they do not have control over all the project elements and are often subject to direct intervention by other stakeholders. BT1 and BT4’s comments reflect the literature that the lack of power and status relative to other individuals or groups can threaten individual self-concept. But instead of preventing social identity with their ‘devalued’ group, their position has prompted them to exercise greater trust on their team members as a compensation for the identity threat by effectively elevating trust and cooperation as cues for an effective group. This move for cohesion and solidarity within the group is both a coping device to preserve the self and reduce personal risk and stress, and a motivation mechanism for the membership who, as knowledge workers, appreciate being trusted to perform their tasks and to solve task-related problems locally.
"We are not masters of our own fate...we are project managers and are subject to people...there are all kinds of interference ...from all quarters... this makes you feel vulnerable and unless there is solid trust in the team, you don't get a lot of sleep" (BT4)

"We have to rely on people being responsible and of course to manage their own time effectively and to make sure they do meet their deliverables" (BT1)

Nevertheless, despite the overall positive response to virtual projects, an uneasy feeling of not always being on top of things is common across the informants. Even those highly in favour of project management methodology, project partnering and virtual team working admit that virtual teaming presents unique challenges. Working away from others can lead to 'individual isolation' (BT7) and a 'loss of a sense of community' (e.g. BT3 and BT8); thereby requiring a review of existing managerial assumptions. BT4’s apparent negative attitude to virtual teaming underlines the operational difficulty of coordinating at a distance large, time-limited and demanding project, especially when members’ expectations are that they should be given the space to perform their task without close supervision.

"...we don’t get together. No eye-to-eye contact. I haven’t spoken to any of them today. In fact I haven’t spoken to any of them for a few days now. I don’t know how they’re getting on ...what...what we try to do to overcome has to be done using conference calls. A weekly conference call to talk to one another but it doesn’t replace the daily contact you would get." (BT4)

Interestingly BT5 does not agree and offers the counter argument that for a project with a large number of team members (over 20) it is impractical to try to locate everyone in the same office. BT2 also emphasises the multidisciplinary nature of projects which generally means having to recruit help from across the company. The differing views (between those who need to be in control and those who do not) suggest a diversity in power-related social behaviour. For the control-seeker virtual leadership over technically competent and experienced knowledge workers who prefer self-management can leave him/her feeling helpless and vulnerable. BT6’s observation of sub-groups within the larger project team suggests the possibility of a practical compromise between BT4’s and BT5’s views and supports the reference by
informants to small ‘core’ groups working closely and getting together more regularly, but it still falls short of satisfying those who prefer close supervision.

In sum, although the BT informants are unhappy with the organisation on their recent strategic decisions, they accept that project changes are ‘a way of life’ and as a result, only one of the nine interviewed had expressed any concern about distributed working. Nonetheless, they have to tackle problems common to conventional projects as well as problems that are unique to virtual projects. Some of the problems can have adverse psychological and physical effects on the project managers. But despite the operational challenges, virtual teaming can moderate excessive face-to-face group norms and in-group/out-group categorisation by focusing intra- and inter- group exchanges on task and outcome-based problem-solving rather than on members’ attributions. This leads us to the question of the inclination or opportunity for virtual members to redefine their self-identity towards the group norms.

Are shared perceptions, group identification and trust possible or necessary in the virtual context?

Despite acknowledging the need for virtual projects, informants bemoan the loss of personal contact and suggest that the lack of face-to-face interaction removes the norm socialisation process, making bonding harder. They also add that having to rely on the telephone; email and intranet can act as a barrier to interpersonal trust and team identity formation, or in the words of BT7 ‘you lose that sense of community’. The lack of cues with artificial modes of communication makes it easier for an interactant to be less circumspect with his/her comments and more difficult for the recipient to tell the truth or motive of what is communicated.

“You can’t see the other person at the end of the line so they’re more likely to...to say something to you. Something that he would find hard face-to-face. Er, and you can’t really see if there are...a cringe of embarrassment or anything like that in the body language that’s coming through” (BT5).

Following the survey finding of the ascendance of rules and protocols in virtual structures, more formalised communication and procedural protocols were

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implemented by management to avoid misunderstanding and inappropriate behaviour. These internal code-of-conduct and structural systems reduce the opportunity for misinterpretation and enforce a level of civility and consistency in expected behaviours, but they also remove the spontaneity necessary for creative exchanges and opportunities for bonding.

The lack of co-location and use of artificial media for communication would suggest that it is difficult to create a sense of identity for these virtual projects. However, BT4's definition of trust, his explanation of its role as a precursor for action and performance and emphatic insistence that a project cannot succeed without trust ("I just know if there is no trust the project is doomed to fail") and BT7's differentiation between trust and confidence supports this thesis' survey conclusion that trust as a personal property is voluntary and important for engagement and action.

"Trust? Er, it's to do with a certain pre-existing, taken-for-granted, assumption that my colleagues, like me, are here to work and therefore, when they say they are working on something and will deliver on a certain time, I have no reason...unless they consistently let me down...not to believe them" (BT4).

BT7's comment suggests that we should trust ourselves and our own ability and have confidence in our achievements. Either way, self-belief is fundamental to both: the trust that things or events will unfold without mishap is a cognitive attitude which, according to the earlier survey, stems from the learned self to allow action. The confidence expressed here, on the other hand, denotes one's belief in his/her own effectiveness and thoroughness (self-efficacy).

"I suppose we could use the word confidence as opposed to trust. From the team members' perspective, they have to be confident that they've got all the queries ironed at the initial meeting and we will have to trust that we've got it right and that things will move on until some event proves otherwise. In the meantime, it's important to have the structure in place like VVT [Verification, Validation and Testing]" (BT7)
The realisation that no-one can achieve a project on his/her own together with the fear of failure are powerful trust motivators. One needs to trust others in the team not 'to let you down' (BT8) and through trust, there is cooperation and with cooperation, project progress.

"We have to collectively move together as a team. We have to trust one another. It has to happen. The same way that my mind trust that my body is going to do what it...you have to be...you see I think you have to be confident ...be sure that your colleagues are not going to let you down" (BT8).

"I'm actually committed to my team and everybody is worried about delivering on time because we are all worried about what's happening to us, so united we're...as a group of people we don't want to seem a failure. They just don't want to let each other down" (BT2)

Williamson (1983; 1993) argues that individual and collective endeavours are based solely on expected payoffs. As such, personal trust (characterized by the absence of monitoring and favourable or forgiving predictions) is only present in relations with family, friends and lovers. BT informants’ consistent reference to member-member ‘rapport’, ‘recognition’ and ‘respect’ as the building blocks for mutual understanding, tolerance and support are contradictory to Williamson’s pejorative dismissal of trust relations outwith the family, friends and lovers. They suggest that even if interpersonal or sub-group trust and identity are founded on instrumental motives initially, positive experience can lead to further trust and affective attachment.

"Recognition amongst peers is very high” (BT1)

"It's about rapport. It's difficult to pin down how you build the rapport of the team because it's actually...something to do with tied fate...” (BT2)

"It's important to show my respect for them by saying I don't know, well not everything” (BT4)

"You're building a degree of respect and commitment to each other to achieve your final objective” (BT9).
The power of shared experience for social bonding is clearly identified by BT7 – ‘the ones who share your success or failure’. Of note are the expressed confidence in the knowledge and know-how of colleagues and the trust in them to fulfil their obligations. From the discussion, I infer that interpersonal (and possibly sub-group) trust and identity are task-based but can have a socio-emotional component which is underwritten by the increased knowledge and experience of another from direct and extended (although not necessarily co-located) work exchanges.

“I suppose it’s got a considerable loyalty to the company but more so to your immediate work colleagues. The ones who share your success or failure” (BT7)

While the survey findings found group identity to be central to positive cooperation and performance, the interview data provided further insight into the possibility of genuine fellowship between workers reinforced through current interactions (remote or face-to-face) and shared work experiences, and which individual actors can use as a quick mental reference in future encounters - ‘I think the relationship carries on into the next job. Yes’ (BT3). Further, BT3’s reference to the wider team as ‘a family’ without the need for proximity and BT7’s stability proposition for identity formation indicate that relationships at the interpersonal or sub-group level can be the foundation for a wider group-based identity.

"We may not see each other often but we’re a family...we’re a family with different people occupying different roles but everyone knows what’s expected of him...we look out for and work to our own core team...” (BT3)

“...the small group of people who stay with the project throughout its life ...erm...they can sense it and they provide the foundation for others joining the project to get on with doing their jobs. They are the stabilising force. They give the team its identity” (BT7)

Some people are more ‘groupy’ than others (McGrath, 1997) and individual behaviour is affected by group processes. The closer knit the group, the stronger is the group influence on its members, demanding greater personal commitment to its right
of existence. While BT9 is not against at-distance team working, he seems to have some trouble seeing himself as an integral part of any team; instead he refers to himself as a ‘singleton’ who ‘has an odd job’ and happens to work with others in a team, doing ‘little bits required of a wide range of projects’. Throughout the interview, he was very focused on detailing the technical aspects and functionalities of products/services to be delivered by the projects. I had to work hard to extract his views on virtual interactions and relationships. It is possible that, as commercial manager, he feels that he is not directly contributing to project delivery as his output is used by others who are more actively involved and therefore sits only at the project periphery. As intra-group cognitive processes determine the extent to which an individual sees him/herself a part of a collective, BT9’s concurrent involvement in a large number of projects may explain the lack of belonging and attachment to any single collective.

BT9’s lack of association due to limited participation or quality of interaction as he works primarily on his own may explain his and others’ (like him who are not fully integrated in any group) awareness of the groupiness of certain collectives (‘tribes’) and their response or reaction to other collectives or out-group. While the term ‘tribes’ was actually used by only four of the nine informants (BT9 being one of them), others had referred to the existence of a ‘them and us’ syndrome and a lack of empathy and understanding and at times a downright ‘combative’ (BT3) atmosphere between business units. In the BT case, it would appear that inter-tribe rivalry through social comparison and tribal boundary identification has resulted in psychological in-group favouritism and out-group discrimination.

‘Tribes’ are formed in more traditional or so-called primitive societies to reduce differences within the group and amplify their differences with other groups. The expectation is that individuals in the same tribe would react, behave and make decisions in a uniform way. Individuals are either a member of the tribe or not and there is no compromise membership. The grouping cue for the BT ‘tribes’ is with reference to individuals’ membership of their business units (e.g. BT Ignite, BT Wholesale). A possible explanation for the strong affiliation within each business division could be a reaction to the effects of corporate reorganisations on employees’ sense of self-worth and their desire for stability and to belong. On the other hand, BT9
suggests that tribes may be the outcome of internal-market mechanisms introduced by BT. For example the central allocation of cross-disciplinary projects requiring project managers to compete for scarce resources can create or add to inter-unit tension and rivalry. There is also the natural tendency for players to have an inflated view of the superiority of their group as compared to other groups. Whatever the reason, allegiances are formed based on the symbolic bond of needing to protect the shared or collective interests in each tribe, and as the mutual trust in these intensively cohesive groups follows BT1’s defensive metaphor of standing ‘back-to-back’ against other out-groups.

"Sometimes they reflect current organisation structures so you get a retail tribe and you get...you get a wholesale tribe and some of that is due to the silly way we have to operate in terms of internal trading and there's a lot of rowing" (BT9)

"Mutual dependence guarantees trust to avoid the other tribe getting the better of us" (BT7)

Of interest is the controlling influence by the leader over his/her tribe. Taking the line that leadership is a function of the demands of the situation, it is understandable given the turbulent state of BT as a whole coupled with the matrix virtual project structures, that tribe leaders are viewed as best equipped to steer the collective towards their objectives. His/her agenda is the tribe’s agenda and therefore, there is a risk that tribal differences may be personal antagonism between leaders rather than protection of the group.

"...groups of people form allegiances and they look after one another. They may not know it...they form a self-help group looking after their own collective interests. Wholesale self-help group was looking after it's own collective interests based upon what it's leader required. You know they look after one another and so these two Ignite and Wholesale became the biggest tribes I have ever seen or felt." (BT4)

The presence of such inter-group prejudice is interesting as projects are multidisciplinary. It is a common practice for different divisions (e.g. Wholesale, Ignite and Exact) to participate in the same project. The question is whether working for an over-arching or superordinate project goal (Sherif and Sherif 1969) would help
re-focus energies and encourage a more cooperative team atmosphere between colleagues from different units working on the same project. This possibility is indicated further on in my analysis when examining project specific team identity.

Of significance is BT3’s explanation of why ‘tribes’ is a non-issue for her personally as it implies that at-distance interaction can overcome the emotional over-identification experienced in face-to-face relationships.

“I don’t find it [tribal differences] particularly an issue where I’m working. People just don’t see each other enough to get upset needlessly” (BT3)

In fact, she argues that not working in close proximity and the lack of direct contact can actually make cooperation easier. Presumably by this she means that relationships are built without reference to physical attributes or human idiosyncrasies but are role-based with a strong focus on the project goals and deliverables. Once project requirements and the division of tasks are clear, members can perform their part. This individualist perspective does imply a robust project methodology where the scope is defined, specifications and quality standards are clear, resources identified and their allocation and work schedules agreed with the relevant line managers, and critically, that the client does not want changes.

“I think actually it sort of makes collaboration and peoples’ understanding of what’s required perhaps easier and once there’s understanding, we get on to produce what’s needed” (BT3)

A possible barrier to identity formation is the involvement of third-party non-employees. BT7’s comment reflects a tension between informants’ realistic acceptance of outsourcing and at-distance working and Festinger et al’s (1950) propinquity effect on identity formation.

“Trust is far more difficult to build with somebody you don’t see and don’t know....particularly who is outside the company and again a...I would say that the lack of a face-to-face approach does not help at all” (BT7)
The indication from the informants is that pressure for timely delivery of a quality project with increasingly tight resources forces project managers and team members to be pragmatic about working with contractors and other corporate partners. Earlier discussion of the lack of power of projects managers to prevent stakeholder intrusions revealed that trust is important as a coping device and as a motivation factor to encourage cooperation throughout the team. However, the reduced social contact for group identification processes such as development of common attributes and norms would suggest that non-BT employees’ ascribed team membership will remain only as a label both in their own minds and in the BT members’. There needs to be another basis for BT7 and other like-minded individuals to be willing to trust and to identify these third-party individuals as part of their in-group. Obviously team members will try to get to know their fellow members and to build trust and understanding, but it takes time and the result is unpredictable.

"Yeah I guess there has to be some signals so that you...at least subconsciously you know that you've achieved a level of trust there erm...with somebody and I don’t know what those signals are. It must be in the dialogue or some gesture, or maybe the way people communicate...you know going back to the willingness to allow... and the amount of disclosure you get. It’s almost like running a confessional really 'tell us everything you know. What...where are we...?' The priest is in a position of trust. I am in a position of trust and colleagues to which any disclosure is made is in a position of trust. Cannot let people down. There must be honest empathy at a point where it's...like the AA, you know Alcoholics Anonymous. Yes. 'I'm an alcoholic.' Yes that's right, yes” (BT9)

A more likely explanation lies in the nature and complexity of BT projects. Applying Campbell’s (1958) concept of perceived entitativity which refers to the extent to which actors are perceived by the others in the in-group as members of the same group or an ‘entity’, we ask the question of whether the BT employees find it easy to trust and relate to the independent third party members in their teams. Campbell’s criteria for category fit is physical proximity, similarity and interdependence of fate. We know that apart from a very small number of workers, BT project personnel are not co-located. We also are aware that the technical novelty and complexity of BT projects require a multi-skilled team drawn from across organisational boundaries
including outside contractors and partners. This means a high level of task and fate interdependence for all those involved in a project and which is arguably, the essential similarity cue for team members to categorise themselves as distinct from another project team. High interrelatedness of tasks and outcomes effectively create a context of positive interdependence and each party needs the other for project delivery, making worthwhile social identity investment by the non-BT members and their inclusion by the BT employees. As team members regardless of employment status are 'in it' together, each and everyone in the team will be evaluated in relation to the project outcome.

Additionally, BT4’s comments below indicate the basic human need to belong is another possible explanation why virtual team identity and collective trust are possible, even if only temporary. For the BT case identity may be gleaned on two levels: at the team level and at the interpersonal or sub-group level.

"I think they will feel a lot of identity despite not being together... Members need to belong, even if only for a short duration" (BT4)

"There are two levels of relationship, creating a little society and culture and a way of behaving and bonding as family and once that family is formed it will then become effective. These guys don't just know one another, they have history.....they are, how do you say it, they are well tuned into their team mates...the way they like to work or think" (BT4)

Unlike the interpersonal and sub-group level relationships discussed earlier, team identity is primarily task-oriented and based on shared fates and workflows interdependency, lasting only for the duration of the project or one's active involvement with the project. Owing to the fleeting nature of the identity, it is not likely to involve the deindividuated or self-redefinition behaviour envisaged by crowd writers such as Le Bon (1896), Reicher (1984) or Zimbardo (1969). Exposed to the same environmental stimuli BT virtual project workers will identify with the goals and structural norms of their teams and are willing to trust their colleagues to do their best for the team but they retain their personal identity or self-awareness. Hence the kind of identification experienced by BT virtual workers for their team is more in line
with Allport’s (1962) proposition that the social psychology of group processes are about the behaviour of individuals and their interpersonal relationships. Indeed from BT6’s comments below it is the personal experiences of significant others that will provide the foundation for future behaviour expectations. At the team level, positive experience promotes confidence in others.

“It’s not because we have sufficient opportunity to meet face to face...that erm...over the four years that we work together we’ve built up a knowledge and understanding of each other...we are confident of our colleagues’ technical skills and trust that they will do their jobs well” (BT6)

Essentially this study has found that identity formation at the team level is not proximity-based nor because of shared past history, but a factor of actors realising that individual well-being depends on the well-being of the group (or tribe) as a whole.

“We’re very powerful as groups of people if we open up and trust one another but we’re very, very weak if we close down. We can also decide to close up against other groups. That happens between teams...but not in Wholesale...but between the BT units. I think yes” (BT4)

From my analysis above, I conclude that despite the lack of proximity and complex projects, trust and identity are possible. As social identity with a group is through the self categorisation process and is part of one’s subjective belief system aimed at self-preservation and self-enhancement. Actors can identify with more than one group – and they do. In the BT case the trust displayed by the project leaders on their teams is instrumental and for self-protection. In turn, the solidarity displayed by team members is temporary identification founded on shared fates and tasks interdependency and is cognitively construed to avoid project failure as it is reflected on the individual and making it a personal risk. At the interpersonal or sub-group level, trust and identity are a mix of cognitive reasoning and affective attachment. Starting from a rational standpoint that member-member cooperation requires trust, extended exchanges and shared experiences will lead to a longer-lasting affection which is stored for future encounters. A third form of category of solidarity identity is observed among members of BT business units. The strength of cohesion in these groups (labelled as
'tribes' by the informants) is inward looking and can be destructive should the leaders, who drive the tribes, wage 'war' against one another.

What is clearly evident from the above analysis is that trust plays an important role throughout: (1) as a social glue, it binds groups of colleagues together to form 'tribes' to protect common interest, (2) as a lubricant for the virtual project, it enables members' concerted performance, and (3) as a tonic for virtual managers and workers, it satisfies their ontological need for security by allowing them to assume good intentions and consistent professional behaviour from their absent colleagues.

Does virtual team working affect perceived personal or team performance?

When I posed the question "Is face-to-face working more effective than virtual working?" the consistent response was 'no' as proximity does not guarantee effective communication. Despite the identified personal and operational problems of distributed working, all except BT4 saw virtual projects as beneficial to their employer, and ultimately to themselves.

"I don't think it is because I think a lot of time's wasted when you're working in the same office. I have worked in the same office with a wider team and it got to the stage where I actually put my foot down and said that I refused to deal with anybody who thought they'd do business with me by sending me an email when they were sat across the desk from me! So it doesn't necessarily aid communication" (BT2).

But within Wholesale, there is a culture of interference, which was identified earlier when examining project managers' lack of control. BT3 reaffirms that culture and his extension of project dependency to 'suppliers and their developers' further illustrate the paucity of control available to the project managers. It also provides another possible explanation to the 'back-to-back' siege metaphor used by BT1 when describing the core of project managers in BT Wholesale. Unable to exercise much control over one's situation, control over one's own behaviour and response tendency is the next best way to maintain one's self-esteem and ability to perform.
"I think within the Wholesale project culture because quite often it's not really in your hands erm...you're dependent on suppliers and their developers and everything else and so it's perhaps a little more understanding that you know actually you can't put things in black and white. You become more flexible and responsive to emergencies and less panicky" (BT3)

BT4 talks about having the 'mindset' or a 'can-do attitude' to overcome project difficulties be they conventionally associated or unique to virtual teaming. An alternative to the above response-based coping strategy, project managers should have the self-confidence to tackle problems head on.

"...because we couldn't be physically together in tackling even a simple problem, this can become a very difficult problem. But it's a matter of...to get the mindset going...of a can-do attitude of 'let's work out what it is we can do' (BT4)

However, this does not mean that they are unaffected by project problems, only that the BT informants have learnt to find ways around the problems. Individuals tasked with managing technically complex projects that are highly interdependent can suffer physically and emotionally. The example given earlier by BT4 describing the considerable problems in one of his projects shows the effect of project difficulties on his psychological (and possibly physical) well-being:

'It's really frustrating ...and frightening. I lose sleep over it'. (BT4)

In the survey, self work preference referred to clarity of roles, procedures and expected contributions, a familiar work environment and structure, and working with people already known to the respondent. Although these were reaffirmed by BT informants, when asked to elaborate on the reason for 'coming to work'. BT4's answer provides insight into why virtual working is less of an issue for the individual than the belief that the task or project on hand is 'achievable'. That is, performance is a function of the project's technical feasibility rather than its structural organisation or mode of working. The reference to tools for performance ahead of work group may be interpreted as people being less important in a virtual project than being given the right support (tools) to make the project 'achievable'. Alternatively, following
Brown’s suggestion that socio-emotional factors, although subservient to task-related activities, act to reinforce rather than to inhibit relations and the relationship, it could indicate that positive past experience with certain colleagues reinforces BT4’s preference in working with people he can trust and with whom he shares common values and work ethic. This expressed work preference together with other informants’ attitude on the critical importance of complementary skills and emphasis on their own and others’ professionalism are strong indicators of their motivation for project performance.

“It’s not to work with a group of people, any people, not even people I am friendly with. I can always go out and have a social evening with them. It’s definitely not to work with a group of people on a task that you feel you can’t achieve. Work in that instance is from obeying orders from someone more senior. It is to work on a project that you and your team mates believe that is achievable. Mind you, we also need the tools to work with. Once you’ve got that the next thing is well ok if I need to be working with a group of people, then can I have people that share my beliefs and that I get on well with. This way, it makes working more pleasant and we can actually achieve this together. That’s I guess in terms of coming into work” (BT4)

Furthermore, with reference to Festinger’s (1954) social comparison argument that other people serve as reference points for the evaluation and validation of one’s own abilities and opinions, any actor unless perpetually working or living alone and without interacting with other people, will have opportunities to compare and identify with others. This is clear from BT and BT8’s apparently self-effacing comments that there is a strong sense of pride from others’ positive evaluation of one’s own work ethic and abilities.

“People tend to underrate their own performance. Whenever we do this um, 360 degrees feedback ... we ran one last year, er, it came out that you had to assess yourself and then everyone assess you as well, and without failure everybody assessed themselves lower than they were assessed by their peers”. (BT1)

“A couple of comments came back, different people different projects. I thought I’d missed the mark and what I was trying to achieve I didn’t think I’d achieve and the
feedback told me I'd achieved it 100%. This is absolutely wonderful, brilliant so it made me very, very happy" (BT8).

Just as perceived difficulties of multiple relationships, external project constraints and lack of proximity have not prevented members trusting one another or for them to identify with their team, virtual teaming appears not to affect informants’ perceived ability to deliver their projects; if anything, they appear to have strengthened informants’ resolve to ‘move together as a team’ (BT8), ‘be less panicky’ (BT3) and ‘to do a good job’ (BT5). It seems that, as reflexive actors, members can learn not only to overcome the perceived problems but also to develop and improve their own ability to handle the unknown as ‘professionals’. BT2’s reference to ‘professionalism’ is an example and BT6 explains the motivation for this professional attitude.

“It’s not about being positive or comfortable, it’s about professionalism. They understand their job, they know what’s required of them as part of their role and they know full well that they’re gonna get called in to deliver elements of projects and they will discharge that in a very professional way” (BT2)

“I would still want to do a good job just for my own personal satisfaction and personal pride” (BT6)

When faced with strong inter-group competition (for example, between the ‘tribes’ and between project teams vying for resources), group members tend to rally around one another, displaying increasing solidarity and cohesion. This is evident throughout my analysis of the BT case with frequent references by the informants to the need for existence of ‘trust’, ‘identity’, ‘confidence’ and ‘commitment’, including warmth descriptors such as ‘respect’, ‘rapport’ and ‘recognition’. And although critical of BT’s recent corporate restructuring, informants’ views of their fellow team mates’ motivation and behaviour are very positive.

“People at BT, our people at least, are very self-motivated and focused on getting a good job done. They will go a long way to support one another and to help others in the team. It’s not loyalty but it’s a commitment to achieving the project outcome”. (BT9)
However the goodwill towards BT itself may be on borrowed time. As professionals who are 'highly motivated' and 'care passionately about what they do' (BT1), it is unlikely that these knowledge workers will withhold their cooperation or reduce their productivity, the implication is an increase in turnover intention (articulated by informants) and the possible loss of expert knowledge.

"I think people are generally very professional and are still hoping in my work area that somebody somewhere's going to see the folly of the situation and correct it. Personally I can't see that because we know that the pay scale that it's...can be very limited so...and the long term effect will perhaps mean our cutting down further on resources or even people so I don't see things improving. People are soldiering on" (BT2)

"I don't see deliberate slippages in my project. My people are professionals. Being disgruntled [about the recent corporate restructuring] is one thing, but letting the project fall behind or not meet its objectives is another". (BT2)

From my analysis of the interviews, I have found the BT informants to exhibit a remarkable resilience to their situational challenges. Although unable to categorically conclude that virtual working has an impact on actual productivity or performance quality, the indication from the interviews data is that informants accept the importance of virtual projects for corporate survival and are committed to project success. As the multidisciplinary and complex nature of their projects demands full cooperation by members along the project life cycle, this interdependency of task and project outcome make the fate of one, the fate of the team as a whole and the informants being aware of that, device coping strategies to ensure positive results.

7.4 Case Study C: Marlborough-Stirling Group (MSG)

Of the 63 MSG responses to my questionnaire, 29 indicated that they were willing to be contacted for an interview. The 29 names were arranged in the order that each completed questionnaire was returned and I then emailed every 3rd name on that list for an appointment. Interviews started in August 2004. Table 7-3 below is a matrix of the nine interview informants, their functional and/or project role, length of service, initial entry qualification/s and their personal attitude towards the virtual team.
Table 7-3: Role-ordered analysis of attitudes to virtual teaming (MSG)

<table>
<thead>
<tr>
<th>Role</th>
<th>Service</th>
<th>Entry level</th>
<th>Attitude to the virtual team</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG1</td>
<td>Project: Lead analyst</td>
<td>7 years /MSG</td>
<td>From School, not first job, lots of previous always in IT</td>
</tr>
<tr>
<td>MSG2</td>
<td>Project: Senior implement ations consultant</td>
<td>3 1/2 years/ Exchange</td>
<td>‘A’ levels, no higher education, previously with AXA for 13 years</td>
</tr>
<tr>
<td>MSG3</td>
<td>Project: Senior analyst/ business manager</td>
<td>&gt;15 years in total/ Exchange</td>
<td>National Diploma in Computer Studies, very experience</td>
</tr>
<tr>
<td>MSG4</td>
<td>Project: Senior portal consultant</td>
<td>3 1/2 years/ Exchange</td>
<td>Degree in Computing, very experienced</td>
</tr>
<tr>
<td>MSG5</td>
<td>Project: Developer</td>
<td>5 years/ MSG</td>
<td>History degree + programming diplomas, experienced.</td>
</tr>
<tr>
<td>MSG6</td>
<td>Project: Implementation analyst</td>
<td>2 1/2 years/ Exchange</td>
<td>Degree in computing, one previous job.</td>
</tr>
</tbody>
</table>
| MSG7   | Project: Systems analyst | 5 years/ MSG | BSc in computing, experienced | Is critical of MSG for its slow response to changing project methodology. Also bemoans the fact that MSG personnel are not actively encouraged to develop project management skills. "We are in danger of being the industry's dinosaur...if others can see fit to outsource and to work differently, we should not fight shy of it. We may be missing out..."

| MSG8   | Project: Developer       | 3 years/ MSG | BSc in computing, two previous jobs | Has always worked in conventional projects, explaining MSG's preference for face-to-face teams: "Erm, home working is frowned upon to a certain extent. I think that is down to a lack of trust"

| MSG9   | Project: Business analyst | Just over a year/ Exchange | Degree in business studies, new to the IT industry. | Joined the Exchange post the acquisition and therefore does not have a 'history' Welcomes the chance to work in a geographically distributed team, using the latest share-ware databases or computer-mediated communication technology. "I think if it works for the big boys like BT, it should work for us."

MSG informants are all actively engaged on projects in various roles such as lead systems analyst, business analyst, portal consultant and developer. MSG3 is the longest serving with 15 years of service followed by MSG1 with seven years service. The remaining informants are more recent MSG employees with five or less years' service. Most of the informants are educated to bachelor level but there appears not to be a set hiring policy as regards the type or level of educational qualifications. While five out of the nine have a bachelor in computing degree, others' bachelor qualifications include degrees in history and business studies. For example, MSG2 has no formal higher education but is very experienced, having previously worked for AXA for 13 years.

At the time of my negotiation for access, MSG was undergoing a major corporate restructuring splitting itself from one to three business divisions, each with its own operating board. By the time of the interviews, this restructure was nearly complete. The new MSG consisted of (a) life and pensions software products and third party...
administration (TPA) where MSG acts as the back-office and actually manages the administration on behalf of the providers (b) mortgages and (c) financial services portal provider, the Exchange. The reason given by top management for the change was strategic: to position MSG as a full solutions company that can offer a complete package of back-office administration through to front-end portal interface for independent financial advisers (IFAs) and their customers, and between the pensions and financial services providers and the IFAs.

"With this latest re-organisation there is quite a lot of business benefits because our three main things are the exchange which is components; mortgages, we have a lot of applications around mortgages, so group those together, keep them discreet; life pensions is our other major market and we have some applications or components, that support life and pensions, put them over there and put all those people over there and just align those pieces" (MSG2).

Informants, however, suspected that this is effectively a 'decentralisation' (MSG3) in recognition of the difficulty of integrating fundamentally different 'cultures' following the recent acquisition of the Exchange (the terms 'culture' and 'mindset' were used over and over again by the informants).

"And if you're having separate finance for each company, HR and all that, it's decentralisation, no matter what label you give it" (MSG3)

"The culture of work in old MSG is very different from the Exchange and the result in mindset is about how you develop a basket of core products against how you would provide a quality service" (MSG4)

While informants agreed that the rationale for acquiring the Exchange is economically sound as 'The Exchange provides a portal for between 20,000 IFAs and thirty major providers' (MSG1), post acquisition integration of the Exchange into MSG has been challenging. A well-known name amongst the providers and IFAs, the Exchange is still seen by staff and clients as a separate entity. MSG2 and MSG4's comments echo other Exchange colleagues' 'mindset' which is essentially against Exchange being absorbed into MSG.
"We know we are part of a larger group called Marlborough Stirling Group, but we see ourselves as a separate entity, we can't help it" (MSG2)

"We may have been taken over but we never merged...I don't think we'll ever share the same mindset ...you know, our culture is just too different" (MSG4)

As there were no informants from the mortgages side of the business, this analysis is limited to the life and pensions and the web-portal operating divisions. Of the nine informants I interviewed, four were from MSG and five from the Exchange. In explaining their key business, MSG informants described themselves as 'a software house working for the financial services providers' (MSG5), while the Exchange personnel see themselves as a more service-centre solutions company. Figures 7-5 and 7-6 show the different organisation and nature of the projects undertaken by the two business units and Figure 7-7 maps the MSG/Exchange project attributes and issues as well as the perceived pros and cons of virtual teaming.

The conceptual difference between the businesses stems from the nature and structure of their projects. Projects for life and pensions administration (LAMDA) are large, containing most of the development work and requiring cross-functional inputs. They tend to last over a year and can take up to five years to complete. These in turn are managed as a series of mini (or sub) projects under the programme umbrella and overseen by a programme manager. Duration of the smaller projects is usually about a year or less. The programme office consists of a small core team and all other resources are 'borrowed' from other functions.

"Yeah, essentially we treat each phase as a mini-project and go through the requirements and project definition, planning and scheduling. You have to...each phase needs careful planning." (MSG5)

At the project level, the organisation is a functionally dedicated team structure but at the programme level it is a matrix structure as each phase of the programme is effectively performed by different disciplines across the functions and sometimes will involve third party contractors. Each project will also have its own project manager and team leaders (e.g. for development, for testing etc).
"So the Sun Life programme if you like...erm...has five major phases to it and lasted... I think the best part of five years" (MSG1 referring to a particular programme)

"...we haven’t got matrix management here. We are from the same department, all developers or analysts, and our line manager allocates the projects. So although I don’t expect to work with Sue, David and Nick again in the next phase, they are still in the same department as me, we just don’t see one another that often" (MSG1 explaining the project organisation structure at the project level)

In Figure 7-5, the yellow inner-most triangle denotes a multi-phased programme which is represented here as having five discrete outcome stages managed as mini-projects (1 to 5). The product from the completed programme (represented by the red triangle) is effectively the aggregated efforts or deliveries from the five mini-projects. This finished software product can then be sold to clients as an off-the-shelf life and pensions administration package. Alternatively, the outermost white triangle shows the software programme being made-relevant for internal application by MSG itself for their third-party life and pensions administration.

Figure 7-5: A ‘typical’ multi-phased, multi-functions programme by the life and pensions division
Exchange informants, on the other hand, do not see themselves as ‘just another software house’ (MSG3) producing software programmes for sale. They maintain that, as a solutions company, their projects have a customer-service criterion. For them, Exchange is a service database that clients with a services contract can access. As such, they have to offer a high-quality 24/7 web portal, which they argue, is a far cry from the ‘develop, test and push-through-the door’ (MSG2) mentality of product development projects.

"Stirling bought the Exchange in order to complete their portfolio of products and services effectively and Exchange is a service rather than a product and you know there is that kind of difference between producing something for sale and providing a service that is very complicated and fully supported night and day" (MSG3).

The Exchange has around 10 to 15 business analysts or consultants supported by about 70 developers, various support teams, a helpdesk and back-office administration. Its projects tend to be smaller than those in MSG, of a shorter duration and more self-contained. They also operate on a kind of mixed matrix structure - Exchange staff tends to be involved in two or more projects at any one time. For example, MSG3 at the time of the interview was a member of six project teams. At its purest, an Exchange project will have a core team consisting of a project manager, analyst, developer and tester.

The dotted line in Figure 7-6 indicates the Exchange as an independent unit within the larger Marlborough Stirling Group. Its key business activity, the business portal is shown as the middle circle. The day-to-day maintenance of the web service is the responsibility of a 10-man team sitting in the maintenance project circle. Requests for work (maintenance or new features/enhancement) from clients come through the portal or through the business consultants who interact regularly with clients. The arrows show projects being issued through the portal to the respective project groups. MSG4 explains the relationships between the three functional areas in the Exchange:

"If you sort of like split us into three functions, we’ve got the existing service, the maintenance of that service, and we’ve got all the new areas type development. So you find a
problem and fix it. You've then got the existing service and erm...enhancing it and just adding little new bits to it and you've got all new areas type development” (MSG4)

Figure 7-6: Exchange maintenance and enhancement/new development projects

Is virtual teaming a problem for informants conceptually or in practice?

MSG1’s retort to my question of whether they operated as virtual teams is in direct contrast to MSG6’s reply and they represent the identity divide between MSG staff and Exchange employees. As a senior project lead, MSG1’s own inclination is for face-to-face working while MSG6 who had joined the Exchange after having worked in a virtual mode finds the 9.00 to 5.00 co-located working too restricting and not conducive for creative problem solution.

"Whether it’s a virtual team or not, statements like that are in fact a distraction. You still have to get the job done. The main thing is to get people to realise they’re in it together and any selfish act can be a problem for all” (MSG1)

"It’s more flexible that way and people can plan their day and the way they see fit to do their jobs. It’s important when you have to think creatively, you know, not too much over the shoulder” (MSG6)
The MSG 'culture' or 'mindset' is preference for face-to-face contact, so they tend to try and circumvent the distributed nature of their programmes by attempting to situate each project (or programme phase) in a nominated office. My discussion with the Group HR director prior to the interviews had found that operationally, the programme/project managers are still adamant on the need for direct supervision, hence the company's interest in my study. Certainly from the interviews, this culture has grown through management practice, and is not really the choice of individual project members. Grounded in the belief that one cannot be in control 'if you are miles away' (MSG5), individuals have to uproot physically for the duration of their involvement or be willing to travel two or three days a week from their base stations to a designated office where the project leader or manager is able to monitor progress. LAMDA projects are therefore virtual at the programme level with sub-projects, whenever possible, located at various local offices. As can be seen from MSG3's description below, even within an office, individuals are expected to be physically co-located with their team members.

"...with MSG if you are on a project team everybody moves desks and the project team has an area where everyone working on the project is sitting together...and then if you go off a team you know, move people on and off, you move desks again so somebody else moves in physically" (MSG3)

MSG5 cites query resolution as an example of the superiority of conventional communication methods over the electronic media.

"Email exchange can get horrendously long with ten of you all having a conversation by email it can be horrendous. Erm, and getting round a table and discussing things and coming out with a set of actions can be much easier" (MSG5)

But MSG7's caution that MSG is 'in danger of being the industry's dinosaur' suggests that staff realise that virtual projects are the way forward for global commerce and competitive advantage, but the counter to this argument is the need for people to communicate, which in the opinion of the managers, cannot be done effectively when working apart. Their supposition that people will only communicate when seated together and under the watchful supervision of their superiors may be
equally fallacious and reminds one of McGregor's Theory X assumption of the negative side of human nature. The irony of course is that even those who had expressed their personal preference to face-to-face working acknowledged that virtual projects are the products of modern computing and communication technologies and are likely to continue.

Although familiar with large multi-functional inputs, this explains why MSG informants have little direct experience of geographically distributed working. MSG5's reservation about at-distance project control echoes the prevailing MSG management mindset, although MSG1's observation suggests there is a growing individual preference for using ICT and underlines his unease with individuals preferring to use modern modes of communication rather than to 'talk'. Newer (and younger) staff such as MSG6 and MSG9 welcome the empowerment of virtual team working with its increased self-management. MSG9 points to the need for MSG to modernise - 'if it works for the big boys like BT, it should work for us'. Both MSG2 and MSG7 agree urging MSG not to 'miss out' on the potential benefits of modern working practices.

"I'm sat in Cheltenham and the people round me who don't even talk to one another; they prefer communicating by phone or email" (MSG1).

"The current trend to stay in the marketplace is going virtual; we must not ignore the trend" (MSG2)

"If others can see fit to outsource and to work differently, we should not fight shy of it. We may miss out" (MSG7)

Other project issues summarised in Figure 7-7 include lack of project management skills, over-reliance on face-to-face, little input in their projects as regards cost estimates, delivery timelines, resource allocations and project content. This is unsurprising since MSG as a mature organisation shares with many other large organisations, the characteristic of its project management staff being largely untrained and the existing project methodology having grown from a trial and error approach. There is also a high level of conflict and dissonance between individuals,
centres and among sub-groups. These difficulties suggest a MSG management struggling to engender cooperation and team identity despite their insistence on co-proximate project teams. Looking at it from the eyes of the team members, managers’ persistence on physical proximity would suggest a lack of trust and a high need for control – as is reflected by MSG8’s comment on the company’s reluctance to allow home working:

‘Erm, home working is frowned upon to a certain extent. I think it’s down to a lack of trust’ (MSG8)

Contrary to the MSG work mode preference, Exchange workers appear not to share their need or argument for physical contact. Although there is a small development team based in Dudley and an office in Cobham, Surrey where the helpdesk, customer care teams, various other admin and supporting functions and a small development team are based, most of the project members for the Exchange are now located on various floors in one building at Cheltenham. Unlike MSG teams where most of the communications are channelled via the project leader, Exchange personnel tend to prefer more lateral communications, not so much to by-pass their leader, but for a faster response to queries and problems. MSG9 suggests that it is common practice to ‘pick up the phone or emailing each other’ despite being located in the same room! MSG3 argues against the necessity for proximity.

“Well it’s just the fact that you don’t actually have to be together to talk to people. You know I mean you can share documents, you know email. You can share documents, you can have telephone conference calls, you can have video conferences you know if you actually need to you know...because there’s the telephone, great for one to one, you know it depends how many people need to get involved.... There’s no need to sit round a table” (MSG3).

The difference in work mode preference caused strong resentment on both sides on occasions when MSG and Exchange personnel had to collaborate. Linking this to Exchange’s customer-centric approach, the emphasis on speedy response for problem solving is understandable. The way MSG3 explains it, projects for the Exchange are virtual not by location but through individual choice on the medium for
communication. They prefer using emails and telephones and get together only during review meetings.

"The building's got more than one floor; it's got more than one room. You're not physically face to face with everybody that you work with. You're face to face with some of them. So I would say that we do work in a virtual way - if you take virtual to mean the means and form of communication we choose to use" (MSG3)

Exchange informants are not concerned about working with people at a distance and are critical of the need by managers to be central to all communications. They are particularly keen on home-working, flexible working and for more lateral communications.

"I and most of my colleagues have been used to working erm...email and telephone with the providers for a good many years most of us are very comfortable with this diverse way of working" (MS3)

Even those who prefer working at close quarters appreciate that it is not be the most effective or cost-efficient. Knowing that team members are around and available seems to encourage 'a lot of meetings' (MSG2) and MSG4 adds that it is expensive to have everyone co-located.

"It's [face-to-face], in my experience, the best and the most efficient way of doing it but it is quite costly because there's no guarantee" (MSG4)

It is small wonder therefore that informants, particularly those from the Exchange and the more junior or new members of MSG see the freedom and choice associated with virtual working as a form of personal empowerment (Figure 7-7).
Figure 7-7: Mapping MSG/Exchange's project attributes, problems and pros/cons of virtual team working

Project Attributes and Virtual Working for MSG

Programme/project attributes
- F2F status meetings
- Virtual communications
- Work mode
- Geographical proximity
- Duration <1 year
- Small core
- Varying membership
- Sane Orientation
- Programme: >1 year
- Project <1 year
- Programme: distributed
- Project: co-located
- Programme: matric
- Project: Functional dedicated
- Programme: varying team size and membership
- Project: Small core team plus developers
- Programme: Small core team
- Mix of contractors & internal staff

VT problems
- Supervision
- Getting people to communicate
- Query resolutions
- Identity formation

VT advantages
- Reflecting IT industry changes
- Home-working
- Personal empowerment
- Lateral communications
- Outsourcing low-level work
- Fast
- Less misunderstanding
- More cost effective
- Budget for high skilled, high value employees

Project issues
- Duplicated reporting
- Lack of project management skills
- Over reliance on F2F for control
- Too centralised monitoring
- A culture of telling
- Fatigued
- Time critical, promised delivery
- Resource issue
- Availability
- Skills
- Pressed by general management
- High conflict & dissonance

MSG
- Fatigued
- Ex-MSG development staff
- Workload of key staff

Exchange
- Skills issue
- New & inexperienced Exchange staff
- Inter-group rivalry
- Business analysts x project developers

Between centres
- Between individuals
- Between sub-groups

Aging systems
- Workload of key staff

Ex-MSG development staff
- New & inexperienced Exchange staff
- Inter-group rivalry
- Business analysts x project developers
Moreover, as a software house and therefore supposedly at the forefront of IT development, informants are somewhat surprised at their seniors' distrust of modern computing and communication technology. As a result, of the three case studies MSG/Exchange is by far the most limited in practising virtual team working, and the advantages in Figure 7-7 are more a 'wish' list of potential benefits. It would seem that for the MSG/Exchange case the barrier to virtual team working is less about operational difficulties and more of a psychological preference by the project seniors, or as MSG7 puts it, 'it's in their heads'.

The dichotomous mental models between the project grass-root and the project seniors are apparent from my interviews. As a result of their acquisition by MSG, the Exchange staff who failed to adapt had left, and those currently working at the Exchange are fairly new, with varied experiences and backgrounds. Although I did not specifically ask for their age, from observation and their references to their families, Exchange members are younger than MSG personnel. Their apparent positive views of virtual teams are possibly a combination of shorter service (and therefore less exposure to the MSG culture), personal background, work experience and age. Significantly, they have highlighted that a project or team may be virtual by communication mode, rather than from physical distance. This case, together with my earlier observations of the difference in 'virtualness', extend on Millward and Kyriakidou's (2004) socio-psychological definition of the virtual team.

Are shared perceptions, group identification and trust possible or necessary?

The presence of conflict and dissonance throughout MSG are felt by all the informants. Owing to the differences in work mode preference between MSG and the Exchange informants, I start by discussing MSG project and programme team structures.

There is an alarmingly strong sense of negativity between the business centres and different work groups, but apparently not within the project teams. MSG1 attributes the positive climate in the teams to extended exposure creating a tolerance and understanding among team members. Presumably Festinger et al's (1950) propinquity effects will apply in this case despite some informants’ argument against the need for
face-to-face coordination and communication. Further probing of MSG1 found that the rapport tended to exist within the mini-projects and seldom extended to the programme at large. The process of identity transition from one’s immediate work environment to the bigger work group is unclear and calls into question whether shared fate through programme delivery is secondary to direct involvement and interdependence of tasks and fate in a project within the programme.

"Because of the length of time working together on one project, there is good rapport within the team. As I’d mentioned, the difficulty is between centres, and sometimes between projects but never within the immediate team itself. Certainly that’s my experience in the seven years here" (MSG1)

In the MSG context, group dynamics or the interplay between expectations, actions, values and attitudes are multi-levelled. The representation of a ‘typical’ multi-phased LAMDA programme in Figure 7-5 shows clearly that a programme is divided into discrete phases and each phase or project is performed by a group of people that are sat in close proximity to one another. Therefore, although aware of other teams and their own membership within the larger distributed programme assembly, individuals’ priority is naturally on getting ‘the job done’ and are unlikely to be too concerned beyond the local rules, norms and events. This tendency towards the local and contextual variables can be divisive and judging from the interviews, has resulted in self-serving, uncooperative behaviours (e.g. ‘little kingdom’), which must delay if not threaten solidarity identity across the projects and at the programme level.

"Erm, we have had numerus similar types of problems before where programmes span over many departments and people only identifying with their own bit, their little kingdom and they work hard together, supporting one another but only for that bit, no larger picture, they’re not interested." (MSG7)

Arrow et al’s (2000) argument that system integrity is important only after a group has been formed is not dissimilar to the social categorisation and social identity theorists’ views that extended interaction is necessary for the cognitive process of perceiving groups and group boundaries, and identifying oneself as a member of a group and its fate. At the project or sub-programme level proximity, time, shared
tasks, similar functional skills and roles, and shared outcomes provide the ingredients for identity and trust formation. For the programme itself, common fate appears more likely to be the driving force for any identification, although we have already discussed the possibility that programme identification is secondary to the identity processes at the project level. At any rate, actors will want to see that their energy investment in the programme will produce benefits for themselves and for their immediate group; even if only for public relations purposes where association with a particular programme can elevate someone’s worth or contribution in the eyes of others.

"People identify strongly with their own little projects. They are very protective about them. The programme is nice for dinner parties, you know saying you belong to this huge team working on a complex project for an important client" (MSG1)

Project leaders and members have limited say over their projects or programmes and partnership deals, technical functionalities and delivery dates would appear to be predetermined by those from the upper echelons of the organisation. Therefore, following Arrow et al’s emphasis that groups are open and susceptible to a wide array of internal and external contexts and their developments, MSG management decisions and perceived autocratic style must have an impact on the way people work and relate in the programme and may have contributed to the negativity between centres and units as individuals compete for resources and worry about the risk of project failure on themselves.

"I know the size, erm...the monies involved for our projects are huge and so top management makes strategic deals...you know, what people call strategic partnerships to make us the preferred providers. That’s all very well, but before you even know at a...a functional technical level what is actually going on, the company has signed up to deliver so the development cycles are squeezed and developing things without testing properly... you know I’m being completely honest with you there. These things happen in real companies in real life and it’s happening here" (MSG1)

The power-position of the internal stakeholders vis-à-vis the project team itself means that the latter are unlikely to protest overly and can only redirect their frustrations of a
lack self-determination at others in the programme. In addition, there is a long history of competition between the Cheltenham office and the Brighton office. Apart from historical reasons, the central premise of social identity theory is that groups strive for a positive identity through social comparison and it is possible therefore, that the continuing inter-centre conflict or dissonance is another venue for team members to vent their anger and to assert their dominance as a way to retain team pride and own self-esteem.

"Yeah it’s like what we say about the French... individually we may like them, but as a nation, our history goes back a long time and we can’t see our way out of that even now. Between the centres, that’s exactly it. You know so and so personally and you like him or her but at the group level erm...it’s frustration...frustration with the group as a whole especially if that means it’s affecting what I need to do my job. The project is at risk and I am at risk” (MSG5)

Lead analyst MSG1’s argument for the need to focus on the ‘job to be done’ and that project success lies in acknowledging the project outcome as the common goal and for members to behave in a responsible way since ‘any selfish act can be a problem for all’, is an illuminating reflection of the MSG mindset. This underlines the credence given to people who ignore interest and/or perspective differences and rely on rational information, task and role clarity for problem solving. MSG8 on the other hand, attributes a ‘lack of trust’ as the underlying reason for MSG’s preference for face-to-face working. Given management’s predilection for close supervision and co-location, the idea of distributed collaborative working requiring leaders and managers to rely on the goodwill and dependability of their team members is unlikely to be appealing. This low-trust climate is reflected by MSG1’s assumption of ‘selfish act[s]’ by team members. His view of opportunistic behaviour by team members places the onus of trustworthy behaviour on the employees. In contrast, MSG8 questions the company’s apparent low faith or confidence in its staff.

From my observations and discussion of the data, I am led to conclude that MSG is a low-trust organisation where trust and identity are formed only locally and are specific to those who work closely together on their projects. Identity formation at the programme level is a descriptive label which has only limited value to individuals.
The high level of dissonance and conflict between centres and between teams/groups is a consequence of the frustrations felt by the workers and can have an adverse effect on output performance. Indeed the disaffection with MSG appears to be general. Of the four MSG employees interviewed, one was about to leave the firm and one of the remaining three had openly stated his lack of loyalty to the company - 'I don't necessarily feel loyalty to the company' (MSG7), while the other two are also critical of the company's lack of long-term vision - 'We never go for long-term profit we always go for short-term revenue' (MSG5).

I move now to the Exchange. Employees of the Exchange are strongly identified with the Exchange and its established ethos and goals. Its personnel perceive and resent the strong emphasis by MSG managers on hierarchy, command and control (per MSG9's comments contrasting MSG with the Exchange). MSG’s more formalised, process-driven project approach with a focus on timely delivery is at odds with the Exchange culture which encourages self-determination and flexibility to maintain a 'high level of customer-responsiveness' (MSG6) and that 'quality rather than delivering on time' (MSG3) should be paramount. The commitment shown by Exchange staff to high customer responsiveness and quality performance provides the basis for strong cohesion, demonstrated by their refusal to be assimilated into the MSG culture. Hence, MSG4's commenting that there is 'a lot of conflict' between the two - essentially the acquired (Exchange) and the acquirer (MSG).

"Within Marlborough Stirling the culture is one of control. Within projects, there is quite a lot of freedom but it is really down to individual project managers" (MSG9)

"They[the Exchange] are far more laid back...too laid back sometimes. Basically the culture is how you do it is up to you. You do the job, they leave you to it" (MSG9)

"Erm, then you've got both teams, one team [the Exchange] really, really don't like the MSG team or the old MSG team. Partly that's because they don't agree with the way they work, they don't agree with the way they do things, they don't agree with anything. There's a lot of conflict there" (MS4).
The ‘very, very strong’ (MSG 6) identification to the Exchange by those working for it has permeated down to the projects despite their shorter cycles and team members’ preference to use technology for day-to-day communication. Although Exchange staff claim attachment at the dyad or sub-group level, I had detected a negative undercurrent throughout my visits.

"We don't just do our jobs; we have emotional feelings about people. I don't mean in the boy-girl sense, but what I mean is, if we work together for a while we become friends and the dynamics are different then" (MSG3)

"It's important to build a relationship because that relationship is what makes someone wants to go that 'extra mile' for you" (MSG2)

Their awareness of the importance of ‘relationship’ is countered by the conspicuous political tensions between dyads and sub-groups within the project team - Yet, within team dissonance appears not to be a problem for MSG projects. A significant amount of energy is spent by informants managing attitude differences and outbursts, and getting consensus to progress the project. A possible explanation is that the acquisition of the Exchange by MSG has made membership of the Exchange salient and bolsters the link between the self and Exchange prior to its acquisition – ‘they are the people I know and have worked with personally, we have that pride’ (MSG5). Unsurprisingly, identity for Exchange personnel is more at the corporate level (the Exchange) than the project.

Fortunately, Exchange personnel are given room to perform their tasks and this laid-back operational management style coupled with the flat project structure, have provided a work climate that is just about adequate for performance. It seems that Exchange employees have successfully bracketed the bigger, global level patterns, but against their better cognitive judgement they have somehow channelled their frustrations internally. According to frustration-aggression theorist Berkowitz (1989), frustration is not only the product of objective deprivation, but is also the outcome of perceived deprivation when people fail to meet their expectations or deprivation from people’s perception of the fortunes of their group versus another. Further, attitude-changing factors such as social norms, degree of cognitive control and social status
can add fuel the frustration problem. This can be seen by the differences between the business consultants/analysts and the developers. It is plausible that out-group discrimination here is the perceived status superiority of the business consultants over the developers and the latter’s reaction to interference by people who are seen as mainly ‘non-technical’ (MSG8). Below are some examples of how conflict or dissonance manifests itself within the Exchange teams:

“Sarcastic emails, sarcastic telephone calls, sarcastic comments within the team directed at another project manager or team member or something like. I won’t say it goes as far as sabotage, because nobody is that unprofessional, but just not being forthcoming or cooperative or.... or something like ‘your crisis, not mine’ or ‘tough not my problem’ Mine you, difficulties like that are in pockets...particularly between certain factions like the business side and project delivery” (MSG2).

“Most of it is just arguing over what we want doing” (MSG3).

“So it’s kind of backstabbing, comments here comments there” (MSG4).

“It’s mostly verbal. It’s sort of they’re always trying to either put you down or your work or your team or something” (MSG6)

In summary, the Marlborough Stirling case is unique in that within one legal entity, there are effectively two separate and distinct business identities. Despite the Exchange’s acquisition nearly three years ago, there is little evidence of its assimilation into the MSG identity. In the market-place and at the office, it is business-as-usual for those working on Exchange projects. In addition, given MSG management’s intervention and the Exchange staff’s preference for the electronic media, there are definitional issues on the meaning, constitution and practice of a virtual project.

Owing to the differing nature, objective and form of MSG and Exchange projects, it has been challenging to discern shared perceptions, group identity and collective trust, particularly when there is clear evidence of tensions between individuals and groups in both business units. Without trying to ‘force’ the data, it is plausible that for MSG group identity and shared perceptions exist at the project level, but are only a label at
the programme level. This local-global project-programme structure has created the tendency for people to focus on local variables and disregard the bigger picture. Additionally, management policy and behaviour have resulted in a low-trust environment that further exacerbates the lack of ‘warmth’ and perceived ‘support’ amongst colleagues and by management.

For the Exchange, group identity sits at the corporate level. The strong identification together with a shared belief in customer-orientation and quality service and supported by the enabling climate factors of project responsibility and structure, a shared vision is constituted for performance. Team members are able to act independently and in cooperation with other members in response to the team’s purpose and shared outcome expectations but they still hang on to their identity with the pre-acquired Exchange. It is possible that this corporate level shared identity is sufficient to compensate for within group relational difficulties. Finally, the underlying reasons for conflict and dissonance in the Exchange are different from that in MSG; whereas in MSG the triggers are historical or situational frustrations arising from management interventions, in the Exchange over-identification with the company and excessive in-group/out-group comparisons are responsible for any intra-group discord.

Does virtual team working affect perceived personal or team performance?

Although MSG projects are performed by conventional, face-to-face teams, they are virtual at the programme level as it is impractical to locate the entire programme on a single site. Since team members are used to co-located working, they are inexperienced at working in a distributed manner or they simply have not devised an effective system for regular coordination and communication at programme level, and as MSG managers are used to close-quarter supervision, distributed programme management takes them out of their comfort zone, challenging their feelings of being in control - ‘it’s a constant worry for managers to know what’s going on, and where are the problems that need their attention’ (MSG1). Problems associated with externally imposed decisions and contract conditions highlighted earlier are likely to have an adverse impact on managers’ and possibly team morale. Furthermore, the low-trust climate in MSG has produced a culture of fear among the managers and
members that can adversely affect programme delivery. Managers are paranoid about not being in control and are worried about the consequences of failure — ‘Within MSG if you don’t deliver on time you’re walking around sweating, ooh am I gonna stay?’ (MSG4). This insecurity explains the trust and support displayed at project level because

“....there’s a lot at stake and whenever possible the project managers, erm...they would want to choose their team. They want people they can trust” (MSG1)

“The manager may be too busy or not at base whereas these people have the expertise and if they are willing to help, which they generally are, then why not save time and ask them? Within the team, we work well together. Our standards are high and we support one another. The project is our life line. After all every project is pressed for time and you need to find solutions very quickly to avoid delay” (MS8)

Staff commitment and loyalty is evident but local to their immediate project, making their efforts and focus ‘too myopic’ and tending towards a ‘siege mentality’ (MSG1). They are fiercely protective of their projects and keen to show that they are doing well, but are less concerned about the larger programme. The inclusive expression of pride (‘we’) in their own work and generous acknowledgment of others’ contribution and professional behaviour is interesting given the relational difficulties highlighted earlier. The climate for working in MSG has prevented rather than encouraged local identity and trust to extend beyond the immediate context and workers’ apparent positive evaluations of others are really a way of elevating their own status and achievements relative to colleagues in other projects. This over-identification or local focus has negative implications for individual contribution to the overall programme performance.

“People looking out for themselves. Not really caring about the company or what they do can affect others’ ability to do their job. Most people are more keen on getting their own job done and there’s a lot of inter-group rivalry...it’s all about one upmanship” (MSG4 referring to MSG)

Unlike MSG, the Exchange appears not to operate as much of a ‘blame culture’. This puts less pressure on its staff about losing their jobs and places greater emphasis on
producing a quality service and maintaining good relations with their clients. Therefore, attitudinal differences between the MSG and the Exchange team members are expected and noticeable. But as with MSG members, Exchange staff also feel ‘ownership’ of their project and share a commitment to succeed. MSG3’s comment below is a typical example of his fellow colleagues’ responses.

“Now the Exchange erm... didn’t really care when it’s delivered as long as it’s right. So there’s an instant difference in idea of what’s priority. For us it’s quality, for them [MSG] it’s time... so there’s been conflict mainly.... really through extreme views because delivering on time means that things are done badly whereas we always do things properly, get it right then release it” (MSG2)

“They are the people I know and have worked with personally, we have that pride. We have a certain sense of ownership and if the service is unreliable in some shape or form or for some reason of poor quality, it does put additional pressure on for us to work flat out to pull things back” (MSG3)

Nonetheless, this overall positive view is qualified by comments about the effects of within team dissonance and strife on service quality and delivery. Role differentiation and differing business orientations (delivery-led versus customer-led) have resulted in two distinct categories of workers - the business analysts and developers. The business analysts assume that they are superior and perform a more important function than the developers. The developers on the other hand are resentful of this attempt to belittle their contribution. As roles form part of our self-definition, the differentiation within the Exchange has resulted in an inter-group conflict situation described by MSG4 as ‘a complete power struggle’ and the antagonism is so strong that MSG7 has described it as a ‘battle ground’. Despite claims otherwise by the Exchange personnel, this by logic must serve the customer ill in terms of timely project performance, and calls into question whether their consistent reference to the need to maintain ‘quality rather than delivering on time’ (MSG3) is just a smokescreen for their fundamental differences affecting overall performance.

“’The delivery people actually write up the business requirements in... in conjunction with the business and that could be a six month process. It takes forever and even when you get to a stage where you say ‘look we want to do it that way. Do it.’ I’ve
actually said to people in meetings 'look this is a business requirement. It's not what
you think it is, it's what I tell you it is.' So it gets quite...it's a complete power
struggle, yeah" (MSG 4)

"...people think that developing on the web is simple and all you have to do is just
give them a book or take them on a training course and they can do it. Well, if
business thinks that way, let them try." (MSG5)

"At the end of the day we're almost a delivery driven company not a business driven
company so their prioritising things based on their resource requirements which
completely mess up the business end and if you not pay attention to the regulations
and so on and so forth which would totally mean we're just not a compliant system so
it won't be used. If we don't get the changes then in a timely fashion we're out of
business. It's a constant...it's a battle ground" (MSG7).

Of even greater concern is that within the developers group, there is also dissonance.
With the acquisition by MSG, some of the development staff from MSG were
transferred to work on Exchange projects. Unfortunately for them, their new ascribed
status as Exchange personnel is not accepted by the original incumbents. These
newcomers have yet to earn their 'rites of passage' (MSG5) although it is not clear
what the rituals or socialisation processes are to achieve that. Essentially the longer
serving Exchange developers see themselves as 'superior' in web experience and
skills. This apparently unfounded prejudice and mode of self-elevation may be
interpreted as a displacement of the frustration by Exchange developers seen as
inferior to their business consulting colleagues. In line with Festinger's (1954) social
comparison theory their attempt to differentiate themselves from the new joiners is to
regain and retain their self-esteem.

I conclude from my discussion above that while programmes and projects are being
performed and delivered regardless of work mode and structure, MSG's overall
effectiveness and efficiency is at risk from the flawed management logic, a lack of
understanding and use of best-practice project management techniques, and crucially,
the patently obvious inter-group and interpersonal relational difficulties which are
hindering cooperation and coordination.
7.5 Case comparisons

In Chapter Four I had explained my rationale for choosing Microsoft, BT and Marlborough Stirling as my three case studies. Each of the three operates in the IT/IS and telecommunications industry offering high-tech product or service ‘solutions’. has projects or programmes that are cross-functional and are organised in some form of a virtual team structure, and whose organisational size and/or market sector influence makes the case findings capable of logical transfer or generalisation across the industry. I present a comparison of the summary findings for each case below.

Although corporate members of the Association for Project Management, a surprising observation is the low emphasis placed on formal project management skills for individuals and the apparent assumption that technical knowledge match (in some cases, backed by prior experience) is sufficient for project performance. Microsoft has a vendor agreement with a local Indian company called EDC. None of EDC’s group of 23 young, well-educated but relatively inexperienced Indian nationals has any formal project management training. Interestingly, Microsoft itself does not require its own project workers to have any specific project management knowledge or accreditation. In BT, I was able to approach for interview, individuals from a pool of 22 mature, experienced and long-service technical engineers from the BT Wholesale division (all are over 40 years old). It was only recently that BT had started encouraging their project personnel to work towards full membership of the Association for Project Management. At the time of the interviews, nearly half of the 120 BT engineers throughout the Wholesale division had their professional accreditation. A similar pattern emerges from the Marlborough Stirling Group. As with MS-EDC, MSG does not require its project workers to be professionally qualified - none of the 29 who had indicated their willingness to be interviewed is personally qualified as a project manager. The reason for this laid-back approach may be that IT projects have well-established methodologies (Payne and Turner 1999). However, Payne and Turner also highlighted that they tend to suffer from poorly defined project goals. The evidence from the current three cases points to inherent technical complexities, constantly evolving technologies, stakeholders’ interference and time constraints as critical barriers. It is possible that structured professional training can help project members manage or cope with the barriers more effectively.
as the increased knowledge should enhance decision-making and bolster their self-confidence.

When I was negotiating for access, the managers from all three cases confirmed that their projects or programmes are operated as distributed or virtual teams. However, from the interviews, it soon became clear that there are degrees of ‘virtual-ness’ and the motivation to operate in a virtual manner is not always driven by the company. The MS-EDC workers are co-located in an open-plan office in Bangalore, India. They work to convert a range of ex-Great Plains ERP products (acquired by Microsoft) for the European market. Language and accent difficulties and poor telephone lines made untenable the cultural differences between the Indian group and their Western team colleagues and prompted Microsoft to initiate a reorganisation. With the exception of really technical problems that required the direct input of the task-owner, the Indian workers now only communicate through their two project managers with their overseas colleagues (who are sited in the US, UK, Dublin or Brazil). Hence, for this particular range of products and with reference to existing overseas vendor-agreements, Microsoft operates essentially a local-virtual team structure where projects are virtual at the interface between project phases with most of the work within each stage or phase performed at a local office.

BT, on the other hand, has a stated policy of remote working and they have workers situated all over the UK. Within the Wholesale division, project engineers are allocated to join projects based on their skills and knowledge regardless of their location. Many of their projects also include third party inputs by independent consultants and BT corporate partners. Aided by BT’s internal online project management system and other electronic communication means, team members work primarily on their own (from home or at a local office), communicating remotely with others on the same project and coming together only occasionally for project update meetings.

The MSG case is entirely different from the other two cases in that its life and pensions administration division has large, lengthy programmes lasting up to five years or more and for operational reasons are managed as a series of sub or mini projects. MSG projects are essentially phases of a programme and their teams through
the insistence of their management, are almost entirely co-located. At the programme level, apart from a small core team that is monitoring programme progress; its size and scale preclude co-location of all the programme participants. MSG programmes are therefore, geographically distributed through practical necessity but at the project level management practice is to sit the project team members together.

MSG’s recently acquired Exchange tends to have small, discrete projects of shorter duration (a year or less). Unlike the MSG project teams the Exchange teams are not sat together even though most of the project workers work from the same building in Cheltenham. Team members resist any intervention by MSG management to co-locate their projects as they do not see the need for close-contact communication. They voluntarily choose to use the telephone and email for their interactions despite their relative proximity. Hence Exchange project teams are virtual not by location but through the communication modes.

BT’s projects are the closest match to this thesis’ working definition of a virtual team (Chapter Two, Section 2.1.2). Although MSG life and pension administration projects and MS-EDC projects are effectively performed by co-located teams, they feed into their respective larger project or programme whose composition, structure and management characteristics are in line with my working definition. Exchange projects are unique in that they are psychologically virtual as team members voluntarily elect to communicate using electronic means.

As there is only limited research on the practice and process of virtual teaming, the cases’ varying backgrounds and contexts offer us important insights into how readily the virtual team is accepted by those who have to perform their project tasks, whether in their various extended environments, cooperation and team identity are possible and the way team members evaluate their own and their colleagues’ behaviour and performance. Taking each company in turn, I present my findings on their attitudes to distributed working, the constitution of shared identity and trust and members’ evaluation of their own and other members’ behaviour and performance.

Attitudes to distributed working. Attitudes towards the virtual team concept are largely positive across all three teams, although some informants (particularly those in
MSG) have expressed their personal preference for face-to-face interactions. In the MS-EDC case, the idea that the Indian office was conceived to act as a dedicated off-shore resource for Microsoft was firmly planted into the workers’ psyche from the day they started work for EDC and that message continues to be reinforced by the regular instructions from MS-UK and MS-US and having to work to the standards and timescales expected by Microsoft. As Microsoft remains EDC’s largest customer, the power of Microsoft over EDC’s survival and ultimately its employees’ own well-being effectively means that ‘what Microsoft wants, Microsoft gets’ (MS4). As virtual projects are favoured by Microsoft, so EDC personnel will agree to the sense and logic of virtual teaming. Furthermore, as association with Microsoft can elevate individual standing in the community, the Indian workers are willing to accept Microsoft’s solution of channelling all communication through their project managers.

Hence, for the MS-EDC group, their problem with the virtual team concept is not about personal preference, distance or time difference but one of communication and understanding owing to cultural and language diversities, exacerbated by poor telephone connection.

In the case of BT Wholesale, homeworking and virtual team working have been in place for a while and most of them as long-serving employees are used to at-distance working and would have found ways around problems early on. Being more mature, virtual working suits individuals with children or other domestic needs. They enjoy the flexibility and personal empowerment of self governance and self reliance. They have also personally witnessed and survived various BT delayering and structural reorganisations, including the latest in the form of a job re-evaluation project which resulted in the majority of the longer-serving and more mature employees suffering income freezes and threats to their pension entitlement. Nonetheless, they are able to differentiate between their personal disgruntlement with BT and their work-related challenges. That is, despite talks of leaving and early retirement, they fully accept that project changes are ‘a way of life’ (BT8) and there is a consensus that virtual projects using the latest computing and communication technologies are a cost-effective way of keeping BT at the leading edge.
I have been analysing the data from an interpretative-realist perspective in which external structures, although mentally conceived, can and do impose on individual free-will in a practical way. Although the consistent message from the interviews is acceptance that virtual teams are a modern 21st century reality and they are needed to undertake large multi-disciplinary and multi-centred projects, this pragmatic realism I surmise, is in effect a ‘forced’ response to preserve the self by attempting to maintain a sense of control over one’s welfare and destiny. Actors who find themselves working on projects requiring distributed team efforts will sub-consciously analyse the reasons for the virtual projects in relation to the corporate good and at the same time assess any possible risk to them personally. From the responses of the informants from the MS-EDC and BT groups, the conclusion is that unless there is a better, more beneficial alternative to their present situation, they are likely to articulate publicly (at least) their understanding and support for virtual projects, and once that notion is internalised, will act to ensure a successful outcome for self preservation.

The Marlborough Stirling Group appears to be an exception. A closer examination of the reasons given for the conceptual and perceived operational difficulties of virtual teaming showed negative attitudes emanating primarily from the project seniors and management and not so much from the workers themselves. MSG managers’ high control needs make at-distance supervision uncomfortable and their assumption that communication and cooperation are best achieved through close proximity is a barrier to virtual team work. Despite the projects involving inputs from across a number of functions and capabilities, MSG managers circumvent their distributed nature by insisting that team members are sat together for the project duration. But MSG programmes are too large and extended in participation to be able to expect co-location. Many employees (especially the new joiners) would welcome the flexibility and self-determination of virtual teaming. They also recognise the rising trend for virtual projects and that MSG may be ‘in danger of being the industry’s dinosaur’ (MSG7). In line with my argument about the tendency for actors for instrumental rationalisation, the management’s mindset that proximity is desirable, making control, teamwork and relations easier are internalised by the workers. Further, references by informants to a ‘lack of trust’ (MSG8), ‘culture of control’ (MSG9) and fear of ‘ooh am I gonna stay?’ (MSG4) indicate a low tolerance of mistake or failure in MSG. Employees are naturally unwilling to risk being seen as too contrary since ‘thinking
outside the box is dangerous’ (MSG4). This induced attitude closes down any interest beyond their immediate co-located context, thus resulting in the programme being seen as secondary to the project and further aggravating any existing or historical differences between groups and centres.

In contrast, the management style in the Exchange is more hands-off (‘how you do it is up to you’, MSG9) with lateral communications across the teams, and even though most of the members are located in the same building (but on different floors), there is a marked preference for emails and the telephone for day-to-day project communication. Although Exchange employees know that they will be assimilated eventually into MSG, they resist reclassifying themselves as MSG employees and are determined to maintain their own systems and project methodologies - ‘our mindset is the Exchange’ (MSG3). They see MSG as only ‘just another software house’ (MSG3) peddling products and not delivering a high quality service. This refusal to identify with MSG preserves them as a distinct in-group and their MSG colleagues as the out-group, and making irrelevant MSG’s argument for close-contact and conventional communication.

In essence, actors across all three cases are aware of the pros and cons of virtual teaming but their own attitude to it depends on the contextual and management cues and their possible effects on individual safety or well-being.

Trust and identity. The reorganisation initiated by Microsoft to overcome communication and project coordination difficulties resulted in local Indian teams that are self-contained and isolated from the rest of the global virtual team except through a small number of project seniors. The removal of contact would, according to the literature, limit if not prevent entirely, the development of shared perceptions, identification and trust development with the wider team. In fact the data points to two levels of identification and trust: one underlined by the ‘propinquity’ factor in the local Indian office and the other through self categorisation with the common attributes and practices of the global team, and the discovery that association with the Microsoft brand serves as an important boost to one’s status and therefore, self-worth in terms of future employability and personal standing in the community.
Within the Indian office, apart from cultural similarities, there is genuine rapport and warmth (‘attachment’) from extended face-to-face social interactions and knowing that they are ‘in it together’ (MS8). This state of affective affiliation enhances one’s sense of belonging and people are willing to trust and cooperate with similar others to enhance their community and effectively, themselves. The solidarity identity does not stop at the local level as reflected by the inclusive language used by the informants which extents to MS-UK and MS-US. Feelings of ‘attachment’ (MS2) and being ‘comfortable’ (MS4) underpin their identification with at least the key parts of the global project community. Hence, social identity as members of the Microsoft global team help overcome individual work mode and transactional preferences.

In this context, the goals of the corporate complement that of individuals’ – EDC’s survival depends on timely and quality delivery of Microsoft projects and its employees benefit from this preferred provider-relationship. Concerted performance or group solidarity is an operational necessity understood by all involved in the project and framed by the MS operating standards, work protocols, and identified deliverables. Despite the lack of interaction, this formalised or guided behaviour provides the stability and uniformity necessary for a shared reality across the wider virtual team; albeit that its basis is more socio-economic rather than socio-emotional. Locally, the association or team identity is understandably stronger, reinforced through daily face-to-face work (i.e. discussing the project) and personal (i.e. talking about domestic lives and sharing private concerns) exchanges and role performance. Together, the two forms of identities define the MS-EDC workers’ self-concept.

Unlike the co-located MS-EDC group, the BT Wholesale group are dispersed across the British Isles. The lack of co-location and having to rely on artificial media for communication makes pertinent the question of identity and trust development. But only one of the nine BT informants has indicated his unease at managing virtual projects – although on a personal level, they miss ‘just being with people’ (BT1) and accept that it is more difficult through telephone and other digital media to build a sense of community. The match with personal domestic needs and preference for self-management has already been identified and being used to this manner of working, the BT group has reconciled their need for face-to-face contact with the economics of virtual projects.
As a group of workers who are habitualised at working remotely from other team members, they have devised coping mechanisms to bracket uncertainties and to enable project performance. Trust is a key mechanism. Without exception, all the BT informants confirmed the importance of trust as a catalyst for action ('as a basic courtesy point of view in our culture and society I think we do start with a level of trust', BT4). It is a ‘survival mechanism’ (BT6) that reduces stress and vulnerability in individuals by enabling team members to assume good intentions and competence in others. As individuals are dependent on others in their team for project delivery, this interdependency is also a motivating force for solidarity performance. Hence, positive interpersonal experience helps reinforce the initial instrumental and tentative trust, and the relationship can take on an affective component, turning a ‘mental partnership’ into ‘friendship’ (BT2).

In BT Wholesale, projects are susceptible to interference by internal and external stakeholders so informants are concerned that tasks should be ‘achievable’ (BT4) in terms of time, resources, specification and quality standards; that team members’ skills are complementary, and that expectations and behaviour patterns are regulated through standardised protocols reporting to avoid misunderstanding and conflict and clear roles. They add that relations are easier when interactions are problem-centred rather than based on personal characteristics or interpersonal chemistry. This focus on the structural and functional properties of relationships (namely, the ‘team climate’) may be a Western inclination, or alternatively, they are another safety device to ensure successful team outcomes.

As with MS-EDC, identity exists on two levels for the BT group: at the interpersonal or sub-group level and at the team level. My informants were drawn from a group of 22 senior project engineers who form the core of the project managers’ pool. Although they do not often work on the same project together and are not co-located, they have been colleagues for a long time and would have worked together sometime in the past. Their descriptions of themselves as a ‘core team’ (BT2) and as ‘a circle facing out’ (BT1), indicate a distinct sense of identification with one another through mutual empathy of their work contexts and accompanying challenges, and shared past experiences. Likewise, despite the distributed nature of their projects, interpersonal
friendship from positive exposure, similarity in work context, task interdependency, and shared fate can provide a strong basis for identification and trust at the team level. Indeed, aside from personal identification with one’s team (‘I am proud to be associated with my team’, BT2), informants’ references to strong rapport, recognition, respect and professionalism by team members also indicate social identity. BT3 by referring to his team as ‘a family’ confirms the transition of relationships from the interpersonal to the team. There are exceptions of course, such as workers who perform a support function to the project team or those whose skills or inputs are important but required only fleetingly.

Rather disturbingly and as a consequence of BT’s history and recent market-driven corporate upheavals, there is a third identity to which many of the BT employees would belong. Branded by the informants as ‘tribes’, membership of these groups are by virtue of individual membership in one of the BT business units, which have been designed to compete for resources rather than complement one another. Tightly knit with agendas that are driven by their leaders, inter-tribal tensions can be a threat to the success of individual projects. It is unclear whether the temporary recategorisation (but not relocation) of individuals from their tribal groups to a project team tasked with a cooperative undertaking of a superordinate goal would be sufficient for individuals to recalibrate their social identities; if so the extent and permanency of that changed attitude.

The MSG case is complex and difficult to analyse because of the inter-group differences between the acquired Exchange and MSG. MSG had found the integration of Exchange post its acquisition extremely challenging and apart from relocating many of the Exchange staff to Cheltenham, they left in situ most of the Exchange management and allowed them to continue operating as a separate entity under the same roof. Exchange staff resist losing their corporate identity and seek to elevate their status relative to MSG by arguing that they are more customer-focused and quality-driven than MSG. The tension between the two entities was very clear from the interviews. The tendency for Exchange personnel to hold on to their old identity has fuelled (if not created) a ‘them and us’ mentality so that everything held sacred by MSG is seen as inferior or irrelevant by those in the Exchange. An example is
Exchange informants’ positive attitudes to the virtual mode in contradiction to MSG’s preferred practice of co-location and conventional communication.

The extreme identification has filtered down to the project teams where there are signs of conflict and dissonance even within the Exchange teams. An example is the discord between MSG developers now working on Exchange projects and their Exchange colleagues; the latter being hostile and aggressive towards the ex-MSG team members. A possible reason for the aggression shown by Exchange staff towards the MSG personnel is the integration efforts failing to produce a new merged identity to which all parties can relate. Moreover, as long as performance continues to be measured by business units, inter-group competition will persist, keeping the ex-MSG staff as ‘the enemy’. Despite MSG2 and MSG3’s acknowledgement of the importance of relationships, the presence of ‘emotional feelings’ and the possibility of ‘friendship’, tension also exists between the Exchange business consultants and their own developers. This may be attributable to the frustrations by the business consultants of being acquired and therefore psychologically, they see themselves as the losers who have to suffer a (perceived) reduction in their role status inspite of their competence and skills (e.g. ‘I’m probably one of the most experienced internet people in the country, yet I have to answer to them [MSG]’, MSG4).

Following the self-categorisation argument that people do not need to interact nor be in the same physical presence to perceive themselves as belonging to a group (Turner et al, 1987), the dissonance and strife experienced in the Exchange teams who have proximity and can interact face-to-face frequently are not about virtual working. Crucially, despite their label as a team, psychologically they do not see themselves as a team. They are, in effect, a group of individuals sharing a common project and its fate, and despite their claims, I can detect identity or trust within this group.

Within the larger MSG there is also discord between business centres and among different work groups, but within the co-located project teams, goodwill and rapport are present. The team-based trust is understandable as proximity, extended interactions, similar functional skills and roles and shared project outcome are ingredients for trust and identity formation. However, MSG project members concentrate on their projects at the expense of the overall programme. Their
association with any particular programme is superficial and used for impression management at ‘dinner parties’ (MSG1) - which is hardly identification. Further, MSG management's insistence on co-located working whenever operationally possible is founded on the assumption that people are prone to ‘selfish act[s]’ (MSG1) and will need to be supervised and their projects closely monitored. This mindset produces a low-trust climate for working and it is not surprising that MSG employees feel disenfranchised and are critical of their employer's strategy and vision. Therefore, unlike MS-EDC or BT where social identity is present at the interpersonal and team levels, in MSG there is little identity or loyalty with the organisation itself and trust and identity are formed only locally within MSG projects. Identification at the programme level is only a descriptive label rather than conveying a sense of belonging. Conversely, Exchange workers identify strongly with their pre-acquired corporate entity, claiming that they can only really trust fellow Exchange employees because of their shared history, but members struggle to build team solidarity and identity.

From my analysis above, I conclude that despite the lack of proximity, or management interference or complexity of project structures, trust and identity are possible; albeit not easily in MSG and the Exchange. In BT and MS-EDC particularly, there is trust between and among team members and individuals have either accepted or found ways to work around their basic need for social contact and lack of control over their environments. As the virtual project organisation does not appear to have prevented social categorisation and social identification beyond the immediate co-located team as in BT and Microsoft (albeit that this is less clear in Marlborough Stirling), it would be incorrect for this study to assume that at-distance working with its accompanying contextual barriers (be they corporate, structural, operational, relational or psychological problems) will automatically result in a fall in performance quality or output. I review below the impact of the virtual team structure on individuals' evaluations of own and others' behaviours and performances.

**Behaviour and performance.** The study's earlier survey results revealed that team climate has a direct effect on individual assessment of own performance and group identity underlines team cohesiveness and members' behaviour evaluation. Expectation states theory (Berger and Zelditch, 1985) points to the tendency of
individuals performing group task developing expectations of the relative performance abilities of their fellow members. How members evaluate their fellow members’ behaviours, whether positively or in a bad light, therefore, are related to their self-esteem, the team climate and influenced by the degree of identification and cohesiveness in the team.

Project time estimation appears to be a challenge for the MS-EDC group – both the project senior from MS-UK and local project managers had raised that point. Possible reasons are varied. The project managers and the local general manager proffered the explanation that people are committed and willingly work long hours, but do not claim the actual time spent on a task. Not declaring the true hours may be about self-confidence and self-worth; workers dare not or do not want to be seen to take too long to complete a task. From the workers’ profiles and the discussions I had with management about the difficulty of recruiting qualified and experienced staff, it could be that people are working harder because of their inexperience and that they are taking longer to achieve a task than a more experience person. The practice of Microsoft providing specialised technical training to only a select few with the expectation that they will then disseminate that learning may also indirectly have contributed to the poor time performance. A third explanation is that as many of Microsoft’s products and feature upgrades have predefined launch dates, there is little room for manoeuvre for the Indian team. Slippages are problematic owing to the interrelatedness of workflows (a ‘chain reaction’, MS3) but throughout the interviews, there was no attempt to lay blame on anyone else, apart from the recognition of the domino effect of being late. This response may be interpreted as mutual support and commitment or an aspect of Indian cultural reticence. People may be unwilling to be openly negative about their colleagues, management or their Western client, Microsoft. With this in mind, one has to really read between the lines as to the ‘truth’ of their evaluations.

That being said, even if they were to adopt a more differential approach when dealing with their MS colleagues overseas, I detect in this group of Indian informants a strong sense of self-belief by their references to their own and their colleagues’ capabilities. quality of work and their dedicated professionalism. Referring to their colleagues as ‘well educated’ (MS4) and ‘professional’ (MS3), they also use the inclusive pronoun
‘we’ to indicate their pride in the motivation, quality and achievement of the team as a whole. In this way, by highlighting the achievements of similar others, MS-EDC informants are effectively providing a guide their own competence and achievements.

This social comparison process is important as it has consequences for informants’ self-esteem. Of interest are the different comparison strategies by the informants in the three cases. MS-EDC workers are genuinely and unconditionally inclusive, referring to their colleagues as equals. Whereas BT informants perceive that they have little control owing to Wholesale’s culture of interference and understandably, are more concerned about having the right project tools, complementary skills and enabling structures and protocols for performance before talking about the people with whom they would like to work (‘that share my beliefs and that I get on well with’, BT4). The language used (‘my’, ‘I’) indicates a more self-centred focus. As a group of self motivated, senior project engineers who are used to working in the distributed mode and have learned to cope with at-distance working, they enjoy a stronger status (and therefore higher self-esteem) as a group and as individuals than either the MS-EDC or MSG informants. Indeed, most of the BT informants share a common work ethic that emphasises quality performance for personal satisfaction and pride – as opposed to the EDC group’s culturally-based perspective of ‘doing the right thing. Equally strong emphasis is placed on the need to be self-motivated and professional. But characteristic of British underplay, the BT group when asked how they would rate their own performance prefer to use others’ comments and feedback to compliment themselves.

In MSG identity and trust reside only at team level and dissonance and conflict exist between centre and programmes. Management’s preference for co-location has meant that focus tends to be local and insufficient effort is given to building a climate that is capable of supporting the distributed programmes. Furthermore, the low-trust climate in MSG has produced a culture of fear among its managers and employees. MSG informants are far more worried about failure than either the Indian or the BT informants. Over time, the different centres and different groups have developed a kind of siege mentality and are fiercely protective of their own boundaries, which must work against collaborative achievement. The jockeying between the groups
arising from role differentiation and differing business orientations can be destabilising for the project programmes and the company.

Among the project issues identified by the Exchange informants are, having to work with aging systems, high workload, skills problems pertaining to ex-MSG development staff and new and inexperienced Exchange staff and the inter-group rivalry between business analysts and project developers. So, they are fully cognizant of the relational difficulties. This lack of social harmony within the team is personally stressful and would normally hinder concerted task performance. Ironically, self-pride and strong categorisation with the Exchange identity creates a commitment to preserving the corporate whole, and can serve as regulators of own efforts which, supported by the latitude allowed them by their managers and a flat structure that enables lateral communications for fast problem-solving, are sufficient as a basis for task performance; although not always in the most efficient or effective way. MSG-Exchange informants feel their self-esteem threatened by their recent acquisition by MSG, hence their comparison strategy is to first differentiate their roles and status from others within the team and as a corporate entity (the business analysts v. the developers; Exchange v. MSG), thus creating dissimilar others (who are considered inferior to them) with which to compare and aimed at protecting their threatened self-esteem, thus producing a negative atmosphere for cooperation and performance. As a result of the relational difficulties, members in the Exchange and to a lesser extent, those in MSG itself tend to have a low opinion of dissimilar others. As they are essentially emotional evaluations, negative assessments do not necessarily reflect actual behaviour or performance.

7.6 Limitations

Discussion of the structural model developed from the questionnaire data in Chapter Six included an analysis of methodological limitations in relation to the survey stage of the study. The main problem was the unknown population having prevented the use of a defined sampling frame. In this section, I discuss some of the challenges for the case-study phase of my project.
My choice of the three companies from the five that had indicated their agreement to participate in the interview phase did meet the heterogeneous rather than homogenous cases criterion, and yielded varying virtual project structures and practices. However, I had originally planned this phase to be longitudinal, tracking informants over a period of six months to capture events’ effects on trust maintenance and identification. But work, funding and access constraints had limited the interviews to a single session with each informant. Also, organisational developments between the survey and phase two interviews resulted in the departure of some survey respondents who had signalled their agreement to be interviewed, thus reducing my access pool. Ironically, the six to nine months’ lapsed time between the initial survey and the interviews allowed insight into the effects of organisational changes and from the interviews, I was able to conclude that corporate level reorganisation did not affect project-level relationships or productivity for BT or Microsoft. But post-acquisition identity integration difficulties between MSG and the Exchange resulted in conflict and tensions that permeated through the organisation. Although 27 main interviews were conducted, it would be desirable to extend the participation to other qualifying organisations and if time, access and funding permit, to have at least two interviews with each informant for wider cross-case comparisons.

Just as the survey instrument needed to be supported by the relevant literature, the case-based qualitative interviews and their findings required a comprehensive discussion by individual case as well as the similarities or differences across the cases. The rich data from the interviews required the use of matrices and thematic maps to capture key observations, word-limit and time permitting, they would benefit from a more detailed discussion of the identified variables.

My choice of using the pre-structured categories drawn from the structural model for coding the interview data can restrict analysis so as to miss interesting and important additional insights. According to Sacks (1992), many categories can be used to describe the same person, act or phenomenon and that analysis based on a given set of categories can deflect attention away from uncategorised activities. There is the additional problem of relevance or, as Silverman (1997:23) puts it in his Discourses of Counselling, ‘explanatory orthodoxy’ where we become so obsessed with finding an
explanation to a phenomenon that we fail to question whether it really exists and if so, how it is locally 'put together'. While guided by the model and its predefined constructs to address the key questions, every effort was made not to 'force' the data and to look for deviant examples while remaining receptive to additional concepts and context-specific relationships. A possible way forward is to conduct only a qualitative study using this study’s revised conceptual framework as a guide so that greater effort can be given to analysing the rich data.

Notwithstanding the above limitations, the qualitative phase of this study has not only provided possible explanations to the unexpected survey finding that risk, standards and conflict seem not to play a significant role in the virtual model, they also confirmed the trust and identity processes depicted in the structural model and highlighted additional problems associated with over-identification, unequal power and status relations and different cultural perspectives.

In Chapter Eight I present my conclusions from the thesis’ findings. I discuss their implications for organisations operating virtual teams and where possible, suggest strategies to encourage trust and identification.
CHAPTER EIGHT
SUMMARY AND CONCLUSIONS

The study's overall conclusion is that voluntary cooperation and collective identity are possible in virtual teams. Project mutual dependence makes unlikely deliberate opportunism or trust betrayal. In this final chapter I reiterate my reasons for choosing the research topic and problem and summarise the study design, methodology and structural modelling strategy. I discuss the major findings in relation to the literature and offer a revised conceptual model (Figure 8.1) for future testing. I highlight my project's contribution to literature, theory, methodology and practice. I also reflect upon the limitations of my research design and discuss how I might have done things differently and how this work may be taken forward.

8. The significance of the research topic and problem

When I was working in the engineering and clinical research industries, I found that many of our projects were performed by groups of people not located in the same office or even in the same country. They often involved independent contractors and corporate partners. Increasing adoption of virtual projects across other industry sectors prompted me to research leadership in virtual teams for my MBA dissertation. As one of the conclusions from the leadership study was the importance of team dynamics, it was a logical base for my PhD project. I had also gleaned from the literature the importance of the people effect on project outcomes (e.g. Lechler, 1997); the relative paucity of research in the dynamics of work groups in their embedding environments (Arrow et al, 2000) and the predominance of research into inter-rather than intra-group relations (e.g. Ahuja, 2000; Rennecker, 2002) – making apparent the need to study the drivers and impact of interpersonal and collective relationships within non co-located teams. Kramer's call to understand the bases of trust within organisations added to the logic of researching how distributed working can facilitate or deter shared perceptions and trust formation.

Virtual team literature generally agrees on the importance of co-presence, communication and relationships and that trust as a relational construct is an important precursor to cooperation. However, it is sparse on inter-member experiences within the team, especially the basis of trust giving and trust making, the
transition of interpersonal trust relationships to the wider collective and the difficulty of relating trust directly to performance. Importantly, references to the development of shared values and attitudes were essentially drawn from the culture literature, which I have argued in my thesis as more suitable for co-located groups or teams enjoying greater permanency. Culture’s focus on deep-seated bonding fails to acknowledge the temporal and temporary nature of virtual projects. Being transient and subject to reinterpretation of perceived stimuli, climate is more measurable than culture in empirical terms (Moran and Volkwein, 1992). As actors’ perceptual interpretations of the organisation’s supporting structure and systems, and colleagues’ abilities, intentions and behaviours form the basis for the social climate within the work group, I posit that climate, not culture, would be a more appropriate basis for subjective reference by virtual team workers. Central to this thesis therefore, is the possibility of shared perceptions and attitudes in virtual teams based on the more immediate and explicit organisational structure and support systems, the project mission, constraints and shared fates.

In line with my argument for the need to investigate the transition of interpersonal trust and identification to the wider virtual collective, the thesis’ normative model in Chapter Three (Figure 3.1) reflects the study’s assumption that how team players perceive their team and their identification with that collective is dependent on a combination of individual willingness to have faith in their team and their confidence in the structural systems. My research question asking: ‘Is there a climate for shared perceptions, group cohesion, solidarity and trust in the virtual team?’ links, for the first time, the individual self and attribution processes with social cognition (through climate) to unravel the bases of trust and identity formation.

8.1 The empirical work, model development and hypotheses testing
The study was structured as a two-staged survey-then-interview design to address the project’s research question. This methodology was able to accommodate practical difficulties of access and sampling while recognising the pluralism of the context, and allowed subjective experiences and attitudinal inclinations to be collected, analysed and triangulated. A survey of IT/IS project professionals accessed through the Association for Project Management produced 226 completed questionnaires. The data was used for the study’s inferential statistics. Three distinct companies were
identified from the survey responses for the second qualitative phase using a systematic sampling approach.

Structural equation modelling (SEM) was used to analyse the survey data and to derive a structural model whose factors provided the themes and constructs for the qualitative analysis. An initial conceptual model was constructed and presented in Chapter Three (Figure 3.1). The three components of the model were: individual attributes and attitudes, organisational context and evaluated outcomes. Six propositions were formulated depicting the ‘flow’ of trust and identification by actors working in distributed teams and were the basis for the initial SEM path diagram (Figure 4.5, Chapter 4).

Heated controversies exist on whether SEM should be used only for model confirmation purposes. The general five-step applications of SEM identified by Bollen and Long (1993) of (1) model specification, (2) identification, (3) estimation, (4) testing fit, and (5) respecification also lend themselves to model development as the final step, respecification, allows researchers to review and revise their models. Hair et al (1998) suggested the possibility of a more iterative SEM process for theory testing. As models are only ‘best guesses’ subject to further verification or refutation (Jöreskog, 1974), and Bollen and Long’s advice is that in areas with little prior work, less demanding standards may be accepted to build theoretical knowledge rather than model fit, this thesis’ model strategy was one of model generation rather than for strict confirmation. For this study, the a-priori path model served as a first-pass to the development of a final path model which could be presented for future testing.

Following Jöreskog and Sörbom (1993), this thesis’ SEM approach was first to derive acceptable CFA measurements models and then systematically estimate each pair of the structural components in the path model for hypothesis testing. Proposition 1 was based on psychology literature in which the individual self is portrayed as the driving force for action and behaviour (e.g. Baumister, 1998; Sedikides and Brewer, 2001; Tesser, 2001). Founded on the thesis’ theory that self-concept becomes an important foundation for action in situations of flux and multiple relationships, I first tested the proposed relationship between self-concept and interpersonal trust. Next to be estimated was Proposition 2 which suggested that despite their unconventional work-
mode, virtual team members can still perceive a team climate distinct to their collective. Proposition 3 followed, positing that actors’ self-concept and trust disposition influence how they ‘see’ and ‘feel’ their work environment. The literature suggestion that perceived cohesion is high when group identity salience is high was the basis for Proposition 4. It tested the possibility of a positive relationship between group identity and team cohesion. The final two propositions drew on the climate literature, suggesting climate’s effect on actors’ commitment to mutual benefit and group performance. Specifically, Proposition 5 examined actors’ evaluation of their own contribution and his colleagues’ professional behaviour and Proposition 6 tested the proposed correlation between actors’ self-concept and their evaluation of their own performance. Significant results from the model estimations yielded the final structural model in Chapter Five, Figure 5-21.

The study’s model generation strategy has provided this project with valuable insights into the psychological reality of virtual team relationships, dispelling many of the thesis’ suppositions while affirming others. Importantly, the iterative model re-specifications for theory building also yielded additional and unexpected findings which would be beyond the scope of a strictly a-priori SEM approach. The qualitative interviews data could then be used to augment and provide further explanation to the SEM findings.

8.2 Major findings and insights

The six thesis propositions derived from the literature were designed to show the flow of trust and identification processes from individuals to the team. In this section, I report and discuss the study findings and additional insights, starting with the conception that trust as a personal property is linked to an actor’s self-concept and belief system.

The SEM results did not support the first hypothesis on individual propensity to trust but significant covariances between actors’ work preferences and their trust preconditions and situational context were evident. The finding that workers’ willingness to trust is not a personality trait affirmed the social learning and personality development literature (e.g. Bandura’s self-efficacy theory and Giddens’ reflexive self) and supported trust writers such as Hardin (1993) and Zand’s (1972)
assertion that trust is a learned behaviour. An inference from the results is that workers' previous positive or negative experiences frame their current preferences for role clarity, contribution expectation, a defined structure and reporting system with clear rules and protocols and prior knowledge of fellow workers. In applied terms, new members join a virtual project with a pre-existing willingness or reluctance to trust others. They bring with them their emotional 'baggage' derived from previous good or bad life and work experiences which define their current preferences and trust behaviour. Organisations can help precipitate the trust process (i.e. encourage that 'unit act') through their team selection and team building policies. Aside from relevant skills match, each virtual project should contain at least some project personnel experienced at virtual working. Members' curriculum vitae listing their qualifications, competences and project achievements could be made available for easy checking of credentials. Management should allow time for team development and newcomer induction as the findings indicate that although initial trust need not be conditional on prior experience, reciprocal interpersonal trust and its subsequent transfer beyond the dyad requires social praxis.

The next step in the model estimation process was to look at the possibility of convergence in team perceptions to explain the transformation of interpersonal trust and identification to the collective.

Although the virtual team literature indicates that the lack of physical proximity and missing or poor quality verbal and non-verbal cues can limit individual sense of belonging and willingness to cooperate, both the survey and interview data suggested otherwise. Climate's significant role from the survey data supports this thesis' argument for climate's relevance instead of culture. According to Schneider (1975) climate constitutes the emotional dynamics of team life as 'seen' or 'felt' by the participants, serving to fortify the level of interpersonal and intra-group cooperative behaviour. In the case studies, BT interview informants talked of 'rapport', 'recognition', 'respect' while the Indian informants' comments included references to the 'environment', 'structure', 'rules' and 'attachment'. MSG and Exchange informants were concerned about the quality of senior management support and the effectiveness of communication via emails, phone calls and video conferencing. Thus confirming the thesis' assumption in Proposition 2 that people continue to scan and
enact their environment even when working apart. The strength of the coefficients and variances explained for climate in this project points to a convergence in perceptions, indicating collective cognition. Evidence of sense-making convergence in this project is substantive in that it signifies the transformation of the interpersonal to the group at large.

Interpretation of the findings to Proposition 3 illuminates the extent which climate as a perceptual construct is influenced by individual self-belief, work preference and willingness to trust. Significant correlations were found between climate and self-belief and climate and self preference, affirming the study hypothesis that self-concept provides the schemas and values criteria for perception. The results indicate that actors reference their personal stores of mental representations to evaluate their work contexts. Hence, following James et al's (1990) suggestion that people interpret their surroundings and alter their mental representations to adjust to the situational context and Craib's (1992) proposition that people are ‘positioned’ by their circumstance and environment and can only act within that position, an important conclusion by this study is that individuals who find themselves in non-conventional, dispersed teams will apply a relativist strategy to reduce anxiety. Workers assess their immediate context and adjust their trust pre-requisites to accommodate the situation; making Meyerson et al’s (1996) ‘swift trust’ or Kramer’s (2001) ‘presumptive trust’ possible. That is, aware of the project pressures of time, budget and resource availability, virtual team members will be keen to perform the project and are inclined to assume that colleagues have the knowledge and the will to fulfil their part of the project. This is in line with suggestions by behavioural theorists such as Axelrod (1984), Coleman (1990) and Gambetta (1988) that a social actor will act rationally, investing in a relationship only if there is a basis for it. MS4's assertion that the Indian group are ‘well educated and have learned to act professionally’ and BT4's insistence on the need for ‘solid trust in the team’ because of the impact of project externalities on team members, further support the thesis’ conclusion that trust giving and trust making in virtual projects are more a rational judgement than a personal propensity.

Despite the literature’s concern about distance, reduced social interaction, members’ variability and multiple dimensional relationships, the study’s overall conclusion is
that trust and identity formation is possible at both inter-member and intra-group levels: 'there are two levels of relationship, creating a little society' (BT4). The ability to bond ('we’re a family’ BT3) is fundamental in answering the thesis’ research question of whether a sense of belonging and shared schemas can develop when working with distanced colleagues. This important finding confirms Turner's (1982) perception-based theory of social identity – people perceive themselves as members of a group or team through intra-category assimilation. Hence it is understandable how the Indian team (MS-EDC), although culturally different from their overseas colleagues and suffering an extreme lack of direct contact, could still perceive themselves as a part of Microsoft (MS) by assimilating MS’ attributes, values and work practices as their own. Interestingly, the MS-EDC workers were also motivated to categorise themselves as part of MS as the MS brand gives the EDC staff status in their own community. Similarly in BT, team identity was possible even though project engineers were not co-located and tended to work from a local office, meeting only when necessary ('I think they feel a lot of identity despite not being together’ BT4). The MSG case also indicated identity formation at least at the local project level: ‘people identify strongly with their own little projects’ (MSG1).

It is also possible with the present study to rank the climate conditions: responsibility, reward, structure, support, warmth and group identity. Ranking provides us with further insight into virtual workers’ mental criteria for evaluating their work and relational contexts. Personal responsibility was found to be the most important climate factor, affirming the literature assumption that virtual team members are knowledge workers who possess certain personal attributes and competences including the desire for self improvement and self-expression (Bal and Teo, 1999, 2000; Fisher and Fisher, 1997). In other words, workers appreciate being trusted and left to perform their job as they see fit: ‘I have enough authority’ (MS3), ‘You have enough freedom’ (MS8).

When reviewing the climate dimensions for inclusion in this study, I had argued that distance makes leadership facilitation and decision centralisation less relevant for distributed working. An unexpected insight from the cases is that although distanced working restricts close quarter supervision and allows project individuals to assume greater autonomy over their work-flow and output, the increased self-governance had
an unwelcome effect on some managers who saw virtual teaming as a ‘distraction’ (MSG1) and felt threatened by the possibility of losing control: ‘I don’t see how you can really be in control if you are miles away’ (MSG5). Akin to Cassell’s (1993) hypothesis of the human need to keep anxiety low through rules and procedures and standardised forms of contact, the MSG managers’ response strategy was to circumvent the distributed nature of their projects by forcing team members to be sited together for close monitoring and control. The finding that managers or project seniors with a high control need are uncomfortable with remote supervision and suspicious of the efficacy of at-distance communication explains the persistent managerial logic of close quarter supervision against growing corporate preference for cross-boundaries collaborative projects. Nonetheless, BT’s gradual move from homeworking to full-fledged virtual teaming is a positive indication that virtual projects can be effectively managed. When pursuing their economic goals, organisations should be sympathetic to the need for co-proximate interactions and be aware that managers’ continuing distrust of at-distance working can be a barrier for virtual projects. Attempting to circumvent the naturally distributed nature of a project or programme can have unintended consequences, creating (as in the case of Marlborough Stirling) localised and myopic project focus and in-group/out-group distinctions which can heighten any operational or interpersonal difficulties.

Effective communication was identified by the BT respondents as paramount for successful virtual team-working. Therefore, rather than withdrawing contact entirely as in the case of MS-EDC or in the MSG case, to force people to sit together, it may be more useful to look for ways to encourage people to ‘talk’ and to learn more about one another. Allowing opportunities for informal face-to-face social exchanges, providing more structured communication protocols such as change notifications and status reports, and taking time out for team-building exercises should keep distributed players integral to the project process and improve inter-cultural awareness and social skills. At meetings, an independent or well-respected individual may act as facilitator to encourage ‘equal’ participation.

Another unexpected but interesting finding is the impact of social categorisation as ‘tribes’ and the influence of the tribal leaders on collective behaviour and project outcome. Both BT and MSG/Exchange exhibited evidence of excessive intra-group
cohesion and inter-group prejudice, making the question of whether shared fates through the project mission are sufficient to overcome tribal allegiance. In BT the strong allegiance to their particular business units stems from the organisational structure and its reward system, whereas in the MSG case, over identification was essentially from differences in work culture and practices between the acquirer, MSG and the acquired, Exchange. Although there were signs of dissonance and strife in the two cases, the lack of quantifiable data on project delivery meant that it was not possible to draw any definitive conclusion on their impact on project outcome. Nonetheless, inter-group differences in MSG-Exchange were described variously by the informants as a 'power struggle', a 'battleground', each sub-project or work group was a 'little kingdom' and therefore focus was very 'myopic'. This implies the possibility that performance could be improved with better relations. In BT despite despondency about their personal situation following a recent reorganisation, there was a greater sense of 'personal pride' and 'professionalism' amongst the informants who were also adamant that colleagues in their team were 'highly motivated' and committed to their project.

Critically, the project's results indicated that at-distance working does not have to increase the likelihood of conflict. One of the BT informants (BT3) suggested the possibility that reduced co-location and greater reliance on system rules and behavioural protocols can minimise friction and discord. In the MSG and MS-EDC cases, conflict is more likely to grow from unchecked local tensions rather than as a direct consequence of distanced working. For example, in MSG, excessive in-group/out-group identification resulted in competitive intra- and inter-group tensions with a single programme. In effect, if individuals from different sub-group categories do not see themselves as part of a team, merely sharing the 'team' label and its fate may be insufficient ground for trust and identification at the team level.

Another striking observation from the cases, supported by the quantitative data, is that virtual teaming heightens perceptions of personal risk. Projects are subject to external stimuli and interventions, regardless of their internal attributes. This was true of the BT, MSG and MS-EDC projects. In BT, project managers found themselves fully accountable for their project outcome but were not in control over the project elements. The internal market system operated by BT leaves project managers reliant
on the functional or line managers making available project personnel when needed. Projects are also subject to direct intervention by clients and top management. The lack of power and status relative to other stakeholder-groups increases personal risk and threatens both managers and workers’ self-confidence. Hence the concern expressed by the BT engineers that project objectives and outcomes should be clearly defined and achievable, and that they should have access to the right tools. As a consequence, individuals would want to minimise personal risk by assuming control over their work mode, task flow and quality. This may account for the unexpected survey observation that risk and standards in the virtual context are directly related to members’ self-belief system.

With the feeling of greater personal risk, it is not surprising that reward is highly rated by the virtual project workers. Members would expect to be recognised for their contribution and that their compensation package should be commensurate with their personal effort and increased exposure. They also would want to know that decisions are transparent and workload allocations are fair.

Support and structure followed personal responsibility and reward in the rankings. Trust writers such as Bachman (2001), Button et al (1996), Shapiro (1987) and Zucker (1986) suggest that in conditions of high uncertainty, organisational support systems and procedural and legal frameworks act as a basis for engagement and can encourage conformance and performance. The relative importance of policies, procedures and protocols in the present study affirm the literature, indicating that they can play a stabilising role, enabling trust giving and maintenance by defining acceptable behaviours and performance standards. A cautionary note is that over-emphasis on the bureaucratic systems can be counter-productive. For example, in the MS-EDC group, Microsoft’s requirement for structured time and project status reporting was perceived as a poor substitute for proximity and personal relationships, and a burden on local project managers and project leaders. The unintended consequences could be inefficiency and disaffection.

Teams are defined by their set purpose and goals (Cohen and Bailey, 1997; Hackman, 1987). As both the survey and case studies reported medium to high project complexity and high task interdependence was common across the three cases, the
project mission became the superordinate goal which could only be achieved through the combined and collaborative efforts of the team players. A caveat to the superordinate goal explanation is my earlier reference to tribes and inter-tribal rivalry. As 'mutual dependence guarantees trust' (BT7), individuals have to trust that their colleagues can and will do their jobs properly and is a strong motivator for members to break the ice and cooperate with others who share ‘your success or failure’ (BT7). In social exchange and agency theory terms, this willingness to trust is founded on the need for self-preservation and risk-reduction. By not having to be overly concerned about others’ intentions and capabilities, actors are able to keep work pressure and stress to a low or manageable level and to get on with their own performance. This is an encouraging result for companies but that initial interpersonal trust needs to be nurtured and extended to the group. Hence, task and fate interdependency could be another explanation for support and structure’s rank status ahead of the softer relational climate factors of warmth and group identity. A project’s structural, procedural and contractual attributes can facilitate concurrent project working, stage handovers and query resolutions. This suggests that organisations should ensure that the work climate is perceived as enabling and workers are given adequate ‘space’ and support to perform their tasks.

Team climate was found in this study to be salient in the various virtual domains and the shared views of ‘who we are’ and ‘how things are done’ are themselves indicative of identification and categorisation by team members as a collective. It was apparent when exploring the literature and discussing the difficulty of operationalising intangible constructs such as trust and identification that their presence has to be deduced rather than confirmed directly. Accordingly, the assumption made by this thesis and expressed in Proposition 4 was that evidence of group identity (mutual confidence, in-group loyalty and a collective will for team success) and solidarity cohesion (teamwork, esprit de corps and striving for ahead-of-target performance) are indicative of interpersonal trust transcending from the dyad to the collective. As both group identity and team cohesion were found to be significant factors (albeit ranking after the ‘hard’ climate factors in the structural model) and identity’s impact on cohesion was strong, the conclusion is that collective trust is possible.
Of the three sub-hypotheses for Proposition 5 positing possible effects of group identity and cohesion on actors' evaluation of own and other team members' professional behaviours, significant relationship was found between cohesiveness and member professionalism evaluation. The result suggested that embedded trust has a positive influence on perceived productivity – affirming the literature on the importance of group cohesion and trust on group performance (e.g., Bollen and Hoyle, 1990; Sako, 1992, 2002). High group identity and cohesion makes redundant the need for excessive organisational control as members are likely to be more self motivated and compliant. But as a personalised projection of the way an individual would see things, experience events and attribute outcomes, climate's role in the virtual team was found to be a predictor of own rather others' performance and behaviour. The study results also supported the thesis' postulation of workers' self-belief influence on their evaluation of their own performance (Proposition 6).

The study conclusion that individual subjective assessment of own contribution to the team is based on a combination of personality (self-belief) and perceptual cognition of the work context (climate) has theoretical and practical significance. Attention should be given to the type or kind of person suitable for voluntary self-directed working and their ability and willingness to form distanced relationships. Seamless progression through the project life cycle will require careful design of the institutional structure and supporting systems such as the logistics of the organisation, the general role and expectations of peers and project seniors, the tacit norms governing behaviour and performance standards, the formal and informal status and power structures, selection and training, recognition and reward policies and practices and communication protocols. The generally low-trust climate perceived by MSG-Exchange staff and its negative effect on group identity and cohesion stands testimony to the need for management to provide a climate for trust, avoid unwarranted (and unwanted) interference on projects and to address any discord quickly to prevent it turning into full scale conflict. Another lesson from the case-studies is the need for organisations to resist operating a 'blame culture'; even in its absence people are naturally unwilling to own up to their mistakes, which can have a knock-on effect on fellow workers' performance.
A possible innovation would be to include as part of the common project practice of ‘lessons learned’, personal reflections on the relational, along with the technical or operational aspects of the project. This should fulfil the dual role of allowing individuals to reflect, rationalise and learn from positive and negative experiences, and to allow the organisation to decode and capture the essentially tacit emotions for future reference. Moreover, the importance attached by the BT and MS-EDC case informants to quality communication and appropriate tools for performance further supports the need for management to provide organisational support and coordination systems that are accessible, reliable and which will help them settle into their job roles and perform their tasks quickly.

The question of virtual teaming’s effect on performance is the most challenging for this study. By its nature, this project’s cross-sectional survey is unable to provide an answer to what is effectively a time-based phenomenon. However, as with discerning a team climate and shared identification of membership in the virtual setting, logical deduction is possible, albeit not fool-proof. Already established is that strong group identity and team cohesion are more likely to produce positive evaluations or views of colleagues’ performance. This conclusion does not assume that positive evaluations reflect actual achievements; merely that the presence of collective trust represented by group identity and solidarity cohesion suggests a trust that has graduated from its economic-rational foundations to incorporate some affective and more tolerant sentiment. Indeed, Giddens’ (1991) suggestion that the link between motive and early trust can lead to the formation of social bonds is also supported by this study. Even in MSG, the least coherent and cohesive of the three cases, informants indicated the possibility of friendship developing (‘if we work together for a while we become friends’, MSG3; ‘that relationship is what makes someone wants to go that extra mile for you’, MSG2). The case studies (in particular, BT and MS-EDC) clearly indicated a relationship between depth and strength of attachment feelings and quantity and quality of social interactions, but the extent or depth is not known.

In sum, the project has revealed that although personal linkages remain important because of reduced social presence and sparse social cues, trust in the virtual work context is not based on moral bonding or personal propensity but on self-preservation and self enhancement. Workers use trust as a coping strategy to overcome the
increased uncertainty of virtual teaming and to start performative interactions. Working apart, actors can still develop a sense of belonging through the team climate and remain as an integral part of the larger virtual collective. The perceived structural and support systems are critical to how well members feel they can work and contribute to their team. The ‘sympathy’ between people is primarily from an appreciation that their fates are tied to the project outcome. Positive experience when internalised becomes the foundation for future reference. Fundamentally, task and fate interdependency is the underlining driver for collective trust, identity, cohesion and solidarity.

Before moving on to the study’s limitations and future research, I should highlight some important insights related to the concept of the virtual team and additional findings and observations which, although outside of the original study scope, have helped us understand better the relational dynamics in virtual teams.

In order to research the virtual team I had offered a working definition (Chapter Two, 2.1.1) from a synthesis of the literature. The characteristics in my definition included skilled workers, fluid membership composition, mixture of employees, contractors and organisational partners, use of information and communication technology (ICT) for communication and choice of working from home or in some regional office. Important and substantive findings emerged as I review the data against these assumptions.

An illuminating observation is the lack of emphasis on formal project management skills. Descriptive statistics from the survey supported the thesis’ knowledge worker hypothesis and the case studies also indicated that virtual team workers are well-educated or very experienced – but have little to no formal project management qualification. The smaller proportion of mature workers with higher level degrees as compared to their younger colleagues indicates an upward trend for qualified entries. Interview comments on the technical nature of the projects requiring skilled workers added further support. The lower than expected emphasis on formal project management skills evident in the case studies is a surprise finding, as all three cases displayed inherent technical project complexities, evolving technologies,
stakeholders’ interventions and time-criticality – which could have benefited from professionally trained project personnel.

Apart from BT’s relatively recent encouragement to its technical staff to acquire more formal project management skills, neither MS nor MSG require their project workers to be professionally qualified in project management. In the MSG case, the lack of professionally trained project personnel and management’s persistence for co-located working may account for informants’ allegations that the company’s short-term focus, low-trust climate and failure to move with the times is in danger of making it the industry’s ‘dinosaur’. Likewise, there is little to no personal development in MS-EDC and project training is limited to the tools required for specific projects. None of the project personnel from project seniors down had any formal project management training. Even in BT, the requirement for their project engineers to be professionally qualified was a recent development. The prevailing assumption appears to be that technical knowledge (and past experience) will suffice for project success. However, this head-in-the-sand approach is at odds with the growing preference by government and major project clients for PRINCE 215 certification. It is also contrary to the identified trend for more qualified workers and warrants further investigation. Given the strategic and operational importance of many of the projects for an organisation’s competitive standing, encouraging individuals to develop their professional competence can benefit the handling of projects directly, booster the self-confidence and outlook of the workers and create a positive climate for performance.

Another observation is the varying reasons for adopting the virtual structure. They range from strategic partnering for resources and skills, to cost-containment, to operational necessity owing to the geographical spread of team members or specialised tasks performance by discrete sub-groups. As most of the interview informants acknowledged the economic necessity of the virtual project, this finding confirms the study’s adapted relativist position and suggests that despite their apparent ‘dialectic of control’ (Giddens, 1984) as knowledge workers, the economic reality for many is to accept working in a manner that may not be their natural

15 Known in full as ‘projects in controlled environments’, PRINCE 2 is one of the most widely used project management methodologies for IT projects in government departments and is increasingly being adopted by large multinationals.
preference. However, of interest is the finding that people are not automatically negative about virtual working. Domestic needs and personal preferences can influence workers’ choice of work mode. Therefore, organisations might include with the initial project resource and skills audit, an assessment of the domestic needs and work preferences of intended team members.

Despite my best efforts at reviewing the literature to glean a profile of the virtual team, definitional issues resulting from differing motivations for and practices of virtual projects remain largely unresolved and would benefit from further research. Among the assumptions by this study were the relative lack of face-to-face interaction and the importance of technology for project coordination and communication. Yet, despite the virtual nature of projects and a general consensus on the importance of ICT, the survey and the case studies indicated that entirely virtual projects are a minority. Only 10 percent of the survey respondents claimed not to meet at all, while over 40 percent reported regular meetings and 74 percent declared that they spend over 50 percent of their time at a local office. Qualitative findings from the three case studies confirmed varying virtual working practices, ranging from wholly remote working to full co-location for some project sub-groups. BT engineers are allocated to projects based on their skills and knowledge regardless of their location. Working matrix-style, BT projects involve many cross-functional parties as well as contractors and strategic partners. Hence, the BT project team fits well with this project’s definition of the virtual team. Although Microsoft projects are distributed geographically and involve third-party input, they are virtual only at the interface between project stages or handovers between different performing groups. Most of the work within each stage or phase is performed at a local office where sub-teams are co-located. MSG programmes, being large and of a long duration are split into smaller, discrete projects managed by separate teams. The team composition and structure of an MSG programme would fit this thesis’ working definition but management preference for co-located projects means that effectively, they also operate a local-virtual structure.

Definitional issues notwithstanding, problems specific to virtual team working were identified through the case-studies. These included personal preference for face-to-face contact, indirect third-party communication, query resolution using artificial
communication media, reduced socialisation, cultural differences, language usage and
time difference-related project delays, no previous virtual team experience,
technology connectivity, increased personal exposure, multiple relationships and
remote supervision.

Although composition and size variability are also a problem for co-located matrix-
style projects, this project's case-studies further highlighted that decreasing
homogeneity from differing cultural, language and social status can add to the
complexity of team relations. The MS-EDC case revealed that cultural similarity and
proximity aid socialisation and interpersonal trust. Conversely, diversity issues can
prevent effective interaction and should not therefore be ignored. As cross-border and
cross-culture projects become more common, increasing members' cultural sensitivity
and communication skills can help social categorisation and identity development.

Other project problems which are also relevant for conventional projects include
stakeholders' interference, leadership style, new and untrained staff, aging systems,
workload of key staff, and inter-group rivalry. Project complexity and constraints
were also flagged as major challenges by the survey and interview data. The survey
supported by the case studies indicated fair to high technical project inputs and
interrelated work flows that required 'close' cooperation. A staggering 97 percent of
the projects in the survey were reported to be of 'high' or 'medium' complexity. For
example, MS-EDC often has to meet the pre-set roll-out of MS product upgrades. For
the BT engineers, time and resource allocation issues were particularly difficult to
resolve in their leading-edge, multi-party projects. Members working on their own or
in smaller sub-units on activities requiring specialist or skilled input may find the
increased accountability unnerving and uncomfortable.

The latter set of problems is an additional burden for virtual project members, making
relevant the question of the type or kind of people who might be more suited to
working on virtual projects. One of the informants (BT7) in the BT case elaborated on
the importance of self-belief in virtual teams. Aside from trusting others not to let
them down, workers also need to trust themselves and their own ability and have
confidence in their own achievements. Virtual team working therefore would suit
people with higher self-confidence and are willing to assume the 'burden' of personal
ownership of risk and standards. Also, already highlighted above, are domestic needs and personal circumstances.

Finally, returning to the challenge of defining the virtual project, the issues and difficulties highlighted above would suggest that virtual teams are arguably a sub-set of task-based work teams with features and challenges that are common and distinct from other more conventional teams.

8.3 Caveats and reflections

Before concluding this final chapter, I should reflect and highlight the caveats and limitations of the study. There is little prior work on charting the phenomenon of trust and identity processes within virtual teams that I could reference, and as such, this project is effectively an exploratory study. The relational issues on virtual teaming on which I have tried to cast some light are complex with inter-related dependent and independent variables. Adopting a mixed-methods approach, the survey-then-interview design allowed me to explore further the relationships presented in the final structural model and to investigate the unexpected survey findings in the case-studies.

Structural equation modelling was used for inferential purposes as it allows the researcher to study a series of relationships simultaneously. I had explained my reasons for choosing SEM and justified my exploratory model development approach which was aimed at finding a model that is substantively meaningful and statistically well-fitting rather than the more usual practice of model confirmation. However, some SEM practitioners might still argue that it is a violation of the underlying assumptions of the SEM technique and that there are grave dangers associated with post hoc model fitting. With this in mind, I was careful that changes to the model were substantive and adequately explained. The final structural model appears substantially different from the original path model which is understandable as the latter was intended only as a starting point to model development. Systematic model iterations allowed me to test various hypotheses and eventually produce a structural model that has both theoretical and practical significance. Crucially, the study findings have justified my choice of the perceptual climate construct to show sensing and attitudes convergence. Therefore, I feel I have been able to extend our theoretical
understanding of team dynamics in virtual projects and to contribute to their practical management.

Of the survey analysis limitations highlighted in Chapter Six, the modest sample size was the most problematic. As the model became larger and more complex, Hoelter's critical Ns were frequently reported as inadequate. Strictly speaking, respecified models should be tested on new data and according to Hoyle (1995), the addition or removal of parameters using modification index can yield invalid results even under ideal conditions. Access difficulties precluded my ability to cross-validate the results through replication and the current data was too small to be split into two. The final structural model also yielded unexpected findings which could not be easily explained by the survey data (but were addressed during the qualitative phase of the study). The simple sampling methodology and the exploratory nature of the model meant that inferences drawn cannot be assumed to be generalisable in the strict statistical sense and should be interpreted with caution.

As far as I am aware, the use of SEM in the study of trust in virtual teams has never been done before and therefore, notwithstanding the limitations highlighted above, I hope my novel research design and analysis will serve as an incremental advance to the methodological approaches in the research of task groups and teams.

As to the question of 'what would I do differently?' I would do a number of things: I would start by revisiting the literature for relevant new empirical studies by other researchers to incorporate their findings, thereby adding to the theoretical foundation of my own research. For example, I highlighted the lack of a validated instrument specifically applicable to this study. It is possible that by now someone who is researching the same topic as mine may have designed a valid questionnaire that can be used or incorporated with my own. The definitional difficulties identified in this study support my explanation of the lack of a ready sampling frame of organisations operating virtual projects. However with hindsight, instead of using judgement sampling, it is possible to select a defined industry sector and apply a systematic statistical sampling approach. This may increase the sample size and improve the generalisability of the findings and conclusions.
The paucity of theory and prior research and my effort to recognise the pluralism of the context led me to choose a quantitative-qualitative strategy. First designing a survey questionnaire from available literature and then using multiple cases to augment the survey data. Although I had intended the case-study part of the research to be longitudinal, I was unable to do so for varying reasons (staff changes, access, personal commitments etc). On reflection, a query for myself is whether the mixed-methods approach, although coherent, was in fact too ‘big’ for a single PhD effort. Selecting three diverse cases with a view to collecting unique and common patterns across the cases was a good strategy but my inability to follow through my original intention of three interviews with each informant meant that the data collected and subsequent analysis and interpretation would be superficial with no opportunity to examine time effects on team relations. Moreover, by limiting myself to the predefined categories from the final structural model when coding the interview data, I could have missed many interesting and important additional insights. With hindsight, an in-depth longitudinal study of a single case following a more grounded theory approach is likely to yield richer data than my current study and will provide a greater understanding of how and why a virtual team might ‘hang’ together. Nonetheless, although exploratory in nature and the research method tentative, I hope that this project will have raised awareness on the importance of understanding the bases for trust and identification in virtual teams.

8.4 Future research

The present research has answered many questions but has also raised others which are as yet unresolved. As virtual projects are likely to become more popular as new technologies develop, they provide various promising avenues for future research that can extend our knowledge and understanding of trust and identity processes in the modern teams. For example, both the survey and the interviews identified risk, standards and conflict as no longer significant components of climate. Although risk and standards are well explained by the data, the literature’s specific reference to conflict as an outcome of at-distance interactions would suggest the need for a focused study into the causes and the effects of conflict in the virtual team. Accordingly, I present below my revised conceptual model (Figure 8.1) which is derived from the key constructs and their relationships in the summary version of the full structural model (Chapter 5, Figure 5.21). The variables and their implications for
organisations and management, including possible additional research, have already been discussed earlier in section 8.2.

Figure 8-1: Revised conceptual model

The paradoxical finding of trust and cooperation driven by the power-status disparity between the team members and other stakeholder-groups indicates a coping strategy consistent with this thesis’ agency assumption that people seek to maximise a situation to prevent personal loss and to preserve their ontological need for security. Further research into the effects of varying aspects of power-play and stakeholder intervention should increase our understanding of the extent to which this strategy is used.

Language-use and cultural diversity issues identified by one of the case-studies reflect the growing practice of global and multinational teams. This project has merely ‘scratched’ the surface of the effects and responses to diversity problems in virtual teams. Further research into this important area is urgently required.

Excessive in-group/out-group identification was observed in two of the three cases, but for different underlying reasons. Individuals are overly committed or loyal to their
sub-group and refuse or find it difficult to re-categorise and identify with their allocated team. Tensions from over identification can exacerbate attitudes and behaviour of team-mates and can have a negative impact on project outcome. Given the common practice of matrix-style internal market mechanisms where projects have to compete for resources and individuals often have to work with others from competing departments or functions, research into the effects of inter-group comparisons in the virtual context is both interesting and desirable.

Further, although the mixed-method research design has a coherent structure and caters for the pluralism of the context and subjects’ experiences and attitudinal inclinations, the actual data collection methods were by necessity pragmatic. Indeed, the original intention of a longitudinal study to capture events’ effects on trust maintenance and identification had to be shelved owing to problems of access, sampling, funding and personal work commitments. Fortunately the lapsed time between the study’s two-staged data-collections did allow insight into the effects of changes in organisational and personal circumstance. As mentioned in section 8.3, a carefully structured longitudinal study should provide even richer data than was available for this study.

The project’s results affirmed that how workers perceive other team colleagues (and therefore their identification with that particular collective) is dependent on a combination of personal willingness to put faith in the team and their confidence in the organisational structural systems. But the relatively weak relationships between self-belief and climate, self-preference and climate and self belief and self preference also warrant further investigation. It is possible that the questionnaire needs to be expanded to include additional indicators for better measurement of the latent constructs. Alternatively, a further detailed review of the survey instrument’s factor indicators and their parameter estimates to remove and replace the items that are currently used but with low indicator reliability or with error covariances, and performing structural equation modelling again may produce a questionnaire that can capture more readily the attitudinal realities of virtual workers. Additionally, a project identifying the components of the structural and abstract systems considered as ‘enabling’ should be useful to managers in their attempt to provide a social climate conducive for team identity and solidarity.
A review of the methodological limitations highlighted in Chapters Six indicates other possible improvements. A straightforward replication of this study using a larger sample would be beneficial to test the veracity of this thesis’ structural model. As virtual projects become more wide-spread, extending the study to derive a taxonomy of virtual trust and identity processes by country and industry and possibly even by key project characteristics would be of value to theory and practice.

Finally, although this study is only exploratory and therefore cannot provide definitive or universal conclusions, by drawing together relevant theories from different research disciplines, it has yielded findings and conclusions that are novel and capable of broad interpretation and application. The thesis’ revised conceptual model and additional insights from unexpected findings presented above offer a good basis for further research into an under-researched but rapidly growing industry practice.
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