An exploration of the relationship between trust and collaborative working in the construction sector

by P. McDermott, M. M. A. Khalfan, and W. Swan

Salford Centre for Research and Innovation (SCRI) in the Built and Human Environment, University of Salford, Bridgewater Building, Salford, Manchester, M7 1NU, UK

Dr. Peter McDermott is a Management Board Member of SCRI (Salford Centre for Research and Innovation). He is the Principal Investigator for the "Trust in Construction" and "Integrating the Supply Chain" research projects that have informed the development of the paper published here. Through Salford he is also managing funded research projects against the Rethinking Construction People and Culture, and, doctoral studies including Design Quality Indicators, A Critique of Rethinking Construction, Lean Construction, Public Sector Infrastructure Projects and Procurement as a Driver for Change in Construction. He has recently taken on the Editorship of the international Journal of Construction Procurement.

Dr Malik M A Khalfan graduated with a first class degree in Civil Engineering from NED University, Karachi, Pakistan in 1998. He worked briefly as a site engineer before undertaking his postgraduate degree in Construction Project Management, followed by research on Concurrent Engineering in Construction, both at Loughborough University, UK. On completion of his PhD in 2001, he joined Loughborough University and was involved in an EPSRC funded project as a Research Associate. Currently, he is working with Salford Centre for Research and Innovation at the University of Salford as a Research Fellow. Dr Khalfan's research interests include Concurrent Engineering (CE), Readiness Assessment of CE in Construction, Sustainable Construction, Knowledge Management in Construction, Supply Chain Management, and Partnering and Strategic Alliances within Construction Industry. He was the winner of CIOB Innovation Award 2000 for the Best Research Paper Competition.

Dr. Will Swan graduated from Gonville and Caius College, Cambridge, in 1994 with a degree in Land Economy. After working in the IT industry, he attended Salford where he completed his PhD in Knowledge Sharing and Communities of Practice in 2002. He worked as the researcher fellow in the Trust in Construction Project looking at the role of trust in the delivery of projects. He currently works as a Senior Project Manager in the Centre of Construction Innovation in Manchester, supporting industry in the development of project integration tools and techniques. His current research interests are integrated working and knowledge sharing.

ABSTRACT

Within the construction industry, where the concept of supply chain integration and collaboration is gaining increased acceptance, the project participants are realising that the sharing of knowledge and information is one of the key elements of success. If we look at such an integrated project team or supply chain, however, what motivates its members to collaborate with each other? Does collaboration only occur where commercial self-interest exists? This paper argues that even where there are efficient supply chain processes in place, high levels of collaboration require trust. Trust makes information flow smooth, and creates a knowledge sharing environment in which the whole supply chain progresses and develops. This paper reviews the concepts of trust and collaborative working. Drawing from the findings of an EPSRC funded project on trust in Construction Project, we suggest the main drivers for, and barriers against, the development of trust in the construction sector The paper reports on a content analysis of interviews that explored the meaning of trust in construction and relates this concept to that of collaborative working. The paper concludes that effective supply chain integration and collaborative working requires good communication among the supply chain participants, and, further, that the absence of trust is considered to be a barrier to effective communication, information flow, and knowledge sharing.

Key words – Collaborative Working, trust, Construction Industry.

INTRODUCTION

This paper examines the proposition that while collaborative working needs effective and efficient processes and ICT support, trust development is the key element. In order to achieve success as a team, every team member needs to work in a collaborative manner. Collaborative working is engendered by mutual respect, a common understanding of the project objectives, and, through trust.

These and other propositions were explored and explained in a research project more fully reported elsewhere (Swan, McDermott *et al.* 2002). This project, in collaboration with industrial partners, undertook research into the nature of trust within project teams in construction. The main objective was to develop understanding of the role of trust and how it is impacted by factors both external and internal to the relationships that bind effective teams together. This paper will report on those aspects of the project salient to the concept of collaborative working; in particular the drivers and barriers to the development of trust in project teams are drawn from the case studies conducted as part of the main research project.

COLLABORATIVE WORKING IN CONSTRUCTION

A recent review of the theory and practice of collaborative working in supply chains has been provided by Barratt (2004). He concluded that collaboration is difficult to implement due to:

- Over-reliance on technology for implementation;
- Failure to differentiate between whom to collaborate with; and
- Lack of trust between trading partners.

Barratt (2004) emphasised that the following questions should be asked in order to understand issues related to collaboration:

- Why do we need to collaborate?
- Where and with whom can we collaborate in the supply chain?
- Over what activities can we collaborate? and,
- What are the elements of collaboration?

Dainty *et al* (2001) reviewed the purported benefits of collaborative working in construction, but found a strong degree of scepticism from sub-contractors about how far through the supply chain real benefits were flowing. Higher levels of supply chain collaboration within the industry, they argued, would only be achieved when benefits were truly shared through the supply chain and when trust existed at the key interfaces in the supply chain: client/contractor, consultant/contractor, contractor/subcontractor, and contractor/suppliers.

Even where projects were ostensibly being managed through some form of partnering or alliancing arrangement, Dainty *et al* (2001) found that traditional relationships and the adversarial culture in construction practice were all-pervasive. There was very little evidence of deeper engagement – of anything beyond the simple exchange of materials or services – amongst the supply chain. Expectations of evidence of knowledge exchange, shared back-office costs, shared training or the like were not met. To facilitate the implementation of collaborative working throughout the supply chain, Dainty *et al* argued, leading clients needed to drive the required attitudinal change amongst their first tier suppliers.

Elsewhere we (Khalfan *et al*, 2004) have defined a range of propositions (illustrated in Figure 1) concerning the relationship between supply chain effectiveness and efficiency and the degree of collaboration among the supply chain participants. This suggests that as a relationship deepens, moving from open-market, through co-ordination, through co-operation and ultimately to collaboration, then supply chain effectiveness and efficiency increases. Research currently underway is testing these propositions.

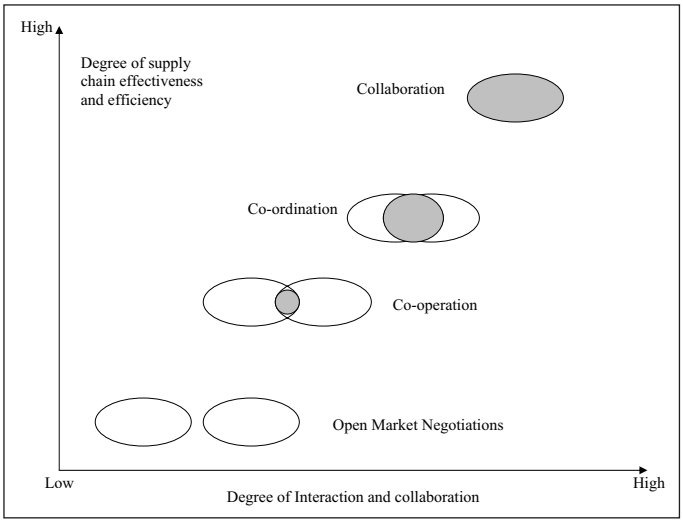

Figure 1: Move from traditional open market negotiation to collaboration (Khalfan *et al*, 2004)

Why collaboration?

Hall (2001) argues that the key to improving the performance of the construction industry lays in addressing the problems associated with creating better collaboration and communication through the supply chain. Collaboration requires:–

- a move from contractors' selection based on traditional, lowest cost to best value;
- a move to a position where all suppliers have a close relationship with the client (rather than just the "main" contractor); and
- the avoidance of the dispersal of the project team at the end of each project.

In a project designed to establish the readiness of the industry for the adoption of collaborative philosophies, Khalfan *et al* (2001, 2002) found that the key barriers to greater collaboration and integration are the fragmentation of project delivery systems, lack of trust, and adversarial contractual relationships.

Based on their investigation of subcontractor perspectives of supply alliances, Dainty *et al*. (2001) suggested some solutions to the lack of integration within the construction industry. One of them is that subcontractors and suppliers should be formally integrated into communication and reporting structures within the project organisational structure. This would also allow them to establish closer relationships. Barriers to integration could also be broken down through soft skills development, especially the improvement of communication abilities among project based staff.

Akintoye *et al*. (2000) identified the key barriers to collaboration, during a survey of supply chain collaboration and management in the UK construction industry, which included: the nature of construction project teams (each of them could be referred to as a 'temporary multiple organisation' (after Cherns and Bryant, 1983) which disappears after a project is completed), culture at the workplace, lack of commitment from senior managers, lack of trust, inappropriate support structure, and lack of knowledge about supply chain management philosophy in general.

Required culture for collaboration

Barratt (2004) proposed a 'collaborative culture' for an integrated and collaborative supply chain. The collaborative culture consists of the following elements: external and internal trust; mutual pain and gain; information exchange in the supply chain; transparency and quality of information flow; communication and understanding; effective cross-functional activities and process alignment; joint decision making; performance measurement of the supply chain; commitment of resources at the early stages of project development process; intra- and inter-organisational support; corporate focus on SCM; demonstration of a business case for collaboration; and a notion that collaboration does not need to be based on technology.

Achieving effective collaboration and integration within the construction supply chain

Proverbs and Holt (2000) advocate that supply chain downstream (including principal contractor, subcontractors, material suppliers, etc.) should be targeted as a means of effectively reducing overall construction costs. They refer to it as 'downstream strategic alliances' (DSAs). They also advocate early involvement of subcontractors and suppliers in a similar manner to early contractor involvement. This would give an opportunity to downstream participants to offer their expertise which could result into potential cost savings. Such integration would help converting suppliers from providers of products to providers of services.

THE CONCEPT OF TRUST

The concept of trust has been the subject of debate and analysis from across the social sciences, from policy makers, and from across industrial sectors. This paper has at its focus the construction sector, but draws upon the concepts developed for all. Generally, the concern with trust has arisen from the need to understand social behaviour (in a variety of contexts) in the modern age, where that behaviour is evidently influenced, not only by self-interest but also by the larger social framework and context.

There is no widely accepted definition of trust. It is regarded by some as an attitude (Luhmann 1979, Flores & Solomon 1998), and by others as a vital social lubricant (Gambetta 1988, Fukuyama 1995). In spite of the large literature on the subject, Gambetta (1988) still saw trust as an elusive concept, and a few years later Misztal (1996) noted the continuing conceptual confusion that surrounded this social phenomenon. The difficulty of defining the concept in a functional sense led to the development of a working definition at the outset of the research upon which this paper is based. That working definition was:

'.... a willingness to rely on the actions of others, to be dependent upon them, and thus be vulnerable to their actions. We are mainly interested in trust as it affects the willingness to co-operate' (Wood and McDermott 1999).

Therefore, it was concluded that trust is an exchange-based concept that is centred on risk, with elements of reliance, goodwill vulnerability and with an expectation of outcomes. Trust is the foremost element of the collaborative working concept.

Another aspect of trust is transaction costs – defined as those costs over and above the costs of production that are imposed by the market (Williamson, 1985). In economic terms, where transaction costs are high, it is cheaper to operate within a hierarchy (i.e. within a firm) rather than rely upon the mark*et al*location of resources. Ouchi (1980), in an examination of decision-making concerning whether to expand the employment base of a firm, found that the only viable alternative was to continue transactions between separate firms, but to align the goals of the firms. From that, Ouchi (1980) showed that the costs of market exchange/transactions are lowered when levels of trust are higher

It can be argued that in construction, the need to minimise transaction costs has prompted some coalitions (i.e. client, contractors, and sub-contractors) to remain constant across a series of transactions.

Brenkert has summarised these views:-
"Trust is said not only to reduce transactions costs, make possible the sharing of sensitive information, permit joint ventures of various kinds, but also to provide a basis for expanded moral relations in business." (Brenkert 1998)

The primary value of trust is the reduction of control and monitoring mechanisms (Masden 1991) required to manage less trusted partners (Cummings and Bromiley 1997; Wilson and Kennedy 1999). This is especially prevalent in the construction industry, through the commonly described "man-to-man marking" across the contractual divides.

Partnering and collaborative approaches attempt to reduce fragmentation by building trusting relationships and therefore reduce transactions costs (Benheim and Birchall 1999). Trust is used to manage information flows, which is seen as a more effective approach than the use of contracts.

Trust is also seen as a key element of building the integrated project team called for by Egan (Egan 1998) in Rethinking Construction and again in Accelerating Change (Egan 2002).

DRIVERS FOR AND BARRIERS AGAINST THE DEVELOPMENT OF TRUST IN THE CONSTRUCTION SECTOR

Through a review of the literature, and the incites gained from a series of case studies (reported elsewhere – Swan *et al*, 2002), the authors have proposed the main drivers for, and barriers against the development of trust in the construction sector.

Market Structures create different trust environments

Drawing upon the broader management literature Shove (1996); and London and Kenley (2001) identify specific features that characterise market structures. These include issues such as: existing distribution of power among rival firms; nature of demand (buyer concentration); entry/exit barriers; government intervention; product differentiation; and horizontal and vertical integration.

The fragmentation of both the supply and demand sides, in the construction sector, potentially determines the level of trust at an industry level (Benheim and Birchall 1999). The industry does have a relatively complex structure, with many small firms engaging in one-off works of low value. Large firms dominate in terms of value, engaging in very large contracts (Dainty, Briscoe *et al*. 2001).

In transaction cost terms, the construction sector will consist of different market types – for examples, local markets, product markets, labour markets, materials markets and plant markets. Each of these markets will be subject to different transactional conditions. This could, potentially, give us different trust environments for the different types of the construction market. This raises the issue that the construction industry is not a special case, but is, rather, comprised of a number of different cases that will be driven by the different market structures. Therefore, it could be concluded that the level of collaboration (see Figure 1) differs in different market sectors according to the level of trust between different companies.

The Procurement and Institutional Framework create the rule set for collaboration

Generally, the role of institutions and their role in the generation of the trust environment is considered important (Rowe 1989). Institutions are seen as setting the rules by which activity, specifically economic activity, is undertaken (North 1990). The main rule set for the collaboration between the construction project team, could be seen as those created by the procurement framework. The behaviours of individuals within the construction sector have been determined by the rules of the contracting and procurement systems that, over time, define action and expectation.

The partnering literature addresses the main arguments against the traditional system of procurement:

- lowest cost competitive tendering creates adversarial relationships between the client and the contractor (Barlow 1996; Leveson and Pickerell 1998),
- the effects of these adverse relationships are felt down through the supply chain, and sub-contractors and suppliers are squeezed in cost and time (Benheim and Birchall 1999).
- The manifested problems are exploitation, short-term focus by all participants, and, therefore, poor relationship building, and poor decision making (Black, Akintoye *et al*. 2000).

The consideration of these procurement and institutional frameworks allowed the authors to create the following propositions: –

- It is easier to create trust in less fragmented project teams. Therefore, procurement frameworks that allow for integration of teams and, specifically, information flows will tend to engender higher levels of trust. (Kaglioglou, Cooper *et al*. 1998; Benheim and Birchall 1999; Holti, Nicolini *et al*. 2000)
- Models of contracting that are focussed on relationships rather than contractual or financial elements tend towards higher levels of trust (Holti and Standing 1996; Bejou, Ennew *et al*. 1998).
- The length of relationships is key (Holti and Standing 1996; Hoyt and Huq 2000). There are two aspects to this. The first is that past relationships allow for the development of shared values and norms. The second is that future relationships could be damaged and therefore represent an institutional sanction which may not otherwise exist (Selnes 1998; Coulter and Coulter 2002).
- The level of uncertainty within the contract, concerning factors such as the final value or payment terms, are potential drivers of conflict (Holti and Standing 1996; Edwards 1998).

The procurement approach – if it does not allow the processes of trust to take place, or makes trusting behaviour difficult – is potentially the greatest barrier to collaboration. We could consider the role of procurement as the institutional framework that does not only support or constrain collaboration, but also trusting behaviour (North 1990). In what was viewed as a highly trusting society, Japan, the role of institutions to control opportunistic behaviour is seen as key to the development of close inter-firm networks and collaborative working environments (Hagan and Choe, 1998).

Money as a barrier to the building of trust

Latham (1993) highlighted the role of trust and money as the gatekeepers to any real process improvements in construction. One of his informants said "there is no trust at all in this industry any more" (Latham, 1993, p.11). There was too little trust – and not enough

money. The lowest cost approach led to an adversarial stance between all parties in the project. The Latham and subsequent Egan Reviews (Egan, 1998) spawned a host of initiatives primarily aimed at moving away from the traditional system of procurement and its reliance on lowest cost tendering. Public sector moves in this direction were endorsed by a review by the financial watch-dog – The national Audit Office (Comptroller and Auditor General 2001).

Other sources support these endorsements. The claims game resulting from lowest cost tendering means that organisations involved will look to minimise their organisational risk, often at the expense of waste to the project as a whole (Swan, McDermott *et al*. 2002). In a wider context, relationships that are not generating mutual benefit in the long-term cannot be sustainable (Naude and Buttle, 2000). The issue of under-pricing of work to win work creates unsustainable business relationships and damages the collaborative environment (Darwin, Duberley *et al*. 2000).

Lack of Explicit Shared Goals and Values are barriers to trust development

We have already noted how the development of shared goals and values creates a basis for trust building in project teams (Arnold, Barling *et al*. 2001). These values are often driven by the strategic management relationships (Walker and Hampson 2003) and makes their influence felt on the rest of the network (Granovetter 1973). The Traditional Procurement Systems' assumptions of the power of the market to drive performance do not assist with the development of teams. Procurement mechanisms which support the collaborative working environment have an inbuilt explicit mechanism to develop explicit values and goals for the project. The advocates (Barlow and Cohen 1996) of partnering argue that "partnering charters" perform this function. An explicit attempt is made in these charters for the project team to define how the project will be undertaken, citing openness and honesty, as well as the outcomes, or mutual objectives, for all the partners involved (Carmichael and Cooper 1999).

Authority and Responsibility as pre-requisites for trust

It has been shown that trust is concerned with behaviours of individuals within organisations. It follows that for individuals to react to changing circumstances in a trusting way, they must have the authority and responsibility to do so. The Warwick Manufacturing Group put it this way:–

If we define issues such as flexibility and problem solving as important in building trust, then it is clear that those individuals on the ground who are building trusting relationships need the capacity to act. This requires an organisation to trust its own individuals and thereby give them the authority to respond to new project situations (Warwick Manufacturing Group 1999).

According to Brower, Schoorman *et al*. (2000) the trust of individuals within an organisation is generally associated with the level of responsibility they have been given . Further, they argue that the individuals themselves will make a similar assessment of the level of trust within their organisations. For behaviours to be affected the individuals must perceive this responsibility as "real". Individuals must wield real authority if they are to be trusted (Tschannen-Moran 2001) or indeed if they are to trust the person that is devolving the authority. In addition, the person to whom authority is devolved must not feel exposed to a high degree of risk; that they are trusted even in the face of difficulty.

It should be noted that this authority, often in the form of flatter, less status-driven organisations has been seen to be a characteristic of high trust organisations (Whitener, Brodt *et al*. 1998; Wong, Then *et al.* 2000).

Relationship Uncertainty as a barrier to the development of trust

The duration and stability of the relationship is a key not only to the development of trust (Bejou, Ennew *et al*. 1998) but also to the development of the collaborative working environment. Individuals may even pay a premium or settle problems to mutual benefit in order to protect the relationship, giving it a level of economic value (Wilson and Kennedy 1999). Where individuals feel there is a longer-term collaborative relationship that the other party is committing to, they are more likely to trust (Wong and Sohal 2002). This supports the concepts of longer-term contractual relationships, such a framework agreements or strategic partnerships, providing a stronger basis for trust than traditional one-off contracts (Holti and Standing 1996; Bejou, Ennew *et al.* 1998).

It is also the perception of a potential future relationship and its associated value, that will create a trusting behaviour (Wilson and Kennedy 1999). Individuals at different levels of the organisational structure may perceive trust from a different perspective. Project or site based staff will be driven by events and behaviours within their work domain, while directors will look at the personal and commercial relationships within their domain (Swan, McDermott *et al*. 2002). This highlights the importance of shared values being successfully communicated throughout the organisation.

Creative Problem solving as a driver for the development of trust

Constructive problem solving is seen to improve the levels of trust in relationships (Selnes 1998), but also it should be viewed as an outcome of trust. Effective teams, where the level of trust is high, will be demonstrably open to giving and receiving help. This means that the shared goals of the collaborative working team will enable individuals to seek out team members to assist, and the members of the group will feel positively towards this behaviour (Jones and George 1998). This problem-solving behaviour is concerned with how group members see their roles towards achieving shared goals. It is considered that forms of collaborative working are better enabled to deal with the type of uncertainty that requires problem solving approaches.

THE ELEMENTS OF TRUST

This paper has established that there is no widely accepted definition of the concept of trust. It's part in effective collaborative working has been described.

Propositions concerning the drivers for, and barriers against, the development of trust in construction have been proposed. This section examines the trust and collaborative working concepts, adapting the work reported by Swan, McDermott *et al.* (2002).

Where trust actually exists, it exists between individuals. While it exists in relationships between individuals, it can be mitigated by the organisational or industry context (Lewicki, McAllister *et al.* 1998). Therefore, prior to any investigation in construction, we should understand the elements of trust as defined by actors from that sector.

Where trust actually exists, it exists between individuals. While it exists in relationships between individuals, it can be mitigated by the organisational or industry context (Lewicki, McAllister *et al.* 1998). Therefore, prior to any investigation in construction, we should understand the elements of trust as defined by actors from that sector.

The Trust in Construction Project (Swan, McDermott *et al.* 2002) undertook to investigate cultural change and trust in construction delivery supply chains. An Organisational Trust Inventory was developed to measure the value of trust in project team relationships. A full explanation of that is beyond the scope of this paper. However, the results of a content analysis of interviews conducted in the construction of the inventory, throws light on construction sector participants' perceptions of the meaning of trust and their willingness to collaborate.

Through the use of a semi-structured questionnaire elements of trust were identified 32 semi-structured interviews were conducted. With personnel drawn from across the project case studies and from site staff, contracts managers and client representatives.

Table 1 presents the results from the content analysis of 32 interviews. Each number in the table indicates the number of times a specific word was mentioned in interviews. The interview transcripts were interrogated for words or terms (in the category column of the Table 1) for the frequency of occurrence, using the SphinxLexica software package. This generated an initial lexicon of 152 words, which were, after further examination of transcript fragments, grouped into fourteen natural groupings based on usage by respondents. Table 1 gives the results of this informally coded content analysis in terms of the fourteen groups and their relative emphasis (determined by the number of mentions).

Table 1 – Content Analysis of Trust Interviews

Category	Example vocabulary
Trust (654)	Trust/trusted/trustworthiness (577), mistrust/untrustworthy (24), betray trust (17)
Relationships (124)	Partnering/relating/friendship (57), support/co-operation (26)
Value (76)	Value (76)
Confidence (51)	Confidence (33), faith (18)
Competence (28)	Competence (28)
Professional (21)	Professional (20), unprofessional (1)
Promise keeping (149)	Promise/promise keeping (42), delivery (74), reliability (27)
Fairness/Reasonableness (110)	Fairness (58), Unfairness (16), Reasonable (28)
Mutuality/Reciprocity (97)	Mutuality (39), reciprocity (14), expectations/obligations/duty (32)
Honesty/integrity (94)	Honesty (51), integrity (13), truth (16)
Openness/communications (82)	Communications (42), openness/frankness (40)
Values/ethics (72)	Values (39), ethics/morals (19)
Reputation (70)	Reputations (44), respect/valued (26)
Blame culture (21)	Blame culture (21)

Further examination of the fragments of text extracted by the software, allowed to reduce the fourteen groups to eight: promise-keeping, fairness/reasonableness, mutuality/reciprocity, honesty/integrity, openness/communications, values/ethics, reputation, and blame culture. By incorporating the openness/communications into our observations on honest/integrity and the observations on blame culture into the fairness/reasonableness category, these eight were reduced to a final six. Inevitably in a study focused on trust, the word trust and its derivatives appeared frequently. It was evident that it was often discussed in the context of other of our categories, such as promise keeping, honesty and fairness, so the same observations are being captured twice. The interviewees wanted to collaborate with those who were competent, professional and who could add value to their organisations. These are necessary pre-requisites for having the confidence to engage in business relationships with other organisations.

The results suggested that the Trust Inventory, reported elsewhere (Swan, McDermott *et al*. 2002), that was developed should concentrate on four identifiable, albeit related, factors. This review of the content of the items associated with each of the factors resulted in the team labelling the factors as: communications, reliability, commitment, and relationship. We have interpreted the views of our interviewees here to be describing their willingness to collaborate through these four key elements of the concept of trust.

CONCLUSIONS

When we consider the constituent elements of what we consider trust to be, it is clear that the absence of trust creates a barrier to effective flows of information. While effective management processes and relational procurement systems create opportunities to communicate, trust remains a requisite for that communication to be effective. Without trust in communications, the flows of information become unreliable, with project participants attempting to second-guess the activities of partners, undermining their willingness to collaborate.

The other two factors provide the context, or pragmatic, within the relationship. This is the arena of trust in which games playing may arise. Commitment is concerned with working towards the shared goals of the project. Without the establishment of these shared goals it can be difficult to attach expectations of collaborative behaviour of project partners. Relationship is concerned with a higher level of trust with regards to the social norms and values within the industry and society as a whole. People trust people who they perceive to share their values with regards to how they carry out their lives, and are more willing to collaborate.

The above mentioned factors interplay and act on one another; as we have already stated, trust is highly complex. However, in terms of addressing the impact on the supply chain and collaborative working, lack of trust leads to a breakdown of information flows. This creates uncertainty between project partners and generates an associated risk. At the worst case, when an absence of trust causes a breakdown of relationships, individuals can work against one another, deliberately withholding information and acting against the interests of the partners. Without effective information that links closely back to action, we cannot effectively manage complex supply chain and collaborative activities, and this information cannot flow effectively without trust.

REFERENCES

Akintoye, A.; McIntosh, G. and Fitzgerald, E. (2000), 'A survey of supply chain collaboration and management in the UK construction industry', European Journal of Purchasing and Supply Management, Vol. 6, 2000, pp. 159 – 168.

Arnold, K. A., J. Barling, *et al*. (2001). "Transformational leadership or the iron cage? which predicts trust, commitment and team efficacy?" *Leadership and Organization Development Journal* **22**(7): 315-320.

Barlow, J. (1996). *Introduction – Partnering in Construction*. Partnering in Construction, Salford, and University of Salford.

Barlow, J. and M. Cohen (1996). *Implementing Partnering: Some Common Red Herrings in the Literature*. Partnering in Construction, Salford, and University of Salford.

Barratt, M. (2004), 'Understanding the meaning of collaboration in the supply chain', Supply Chain Management: An International Journal, Vol. 9, No. 1, 2004, pp. 30 – 42.

Bejou, D., C. T. Ennew, *et al*. (1998). "Trust, ethics and relationship satisfaction." *International Journal of Bank Marketing* **16**(4): 170-175.

Benheim, M. and D. Birchall (1999). *Networks in the Construction Industry: Emerging Regulation Procedures in the Production Process*. Profitable Partnering in Construction Procurement: CIB W92 and TG 23 Joint Symposium, Thailand, Routledge.

Black, C., A. Akintoye, *et al*. (2000). "An analysis of success factors and benefits of partnering in construction." *International Journal of Project Management* (18): 423-434.

Brenkert, G. (1998). "Trust, Business and Business Ethics: An Introduction." *Business Ethics Quarterly* **8**(2): 195-203.

Brower, H. H., D. F. Schoorman, *et al*. (2000). "A model of relational leadership: The integration of trust and leader-member exchange." *Leadership Quarterly* **11**(2): 227-250.

Carmichael, S. and R. Cooper (1999). Adversaries or Partners – Best Practice Guidelines for Partnering in Construction. Salford, University of Salford.

Cherns, A.B. and Bryant, D.T. (1984). "Studying the Client's Role in Construction Management", Construction Management and Economics, 2: 177-184.

CIB World (2004), CIB World [online], available from: http://www.cibworld.nl/

Comptroller and Auditor General (2001). Modernising Construction. London, National Audit Office.

Coulter, K. S. and R. A. Coulter (2002). "Determinants of trust in a service provider: the moderating role of length of relationship." *Journal of Services Marketing* **16**(1): 35-50.

Cummings, L. L. and P. Bromiley (1997). The Organisational Trust Inventory. *Trust in Organisations*. R. Kramer. Thousand Oaks, Sage.

Dainty, A. R. J., G. H. Briscoe, *et al*. (2001). "New perspectives on construction supply chain integration." *Supply Chain Management* **6**(4): 163-173.

Darwin, J., J. Duberley, *et al*. (2000). "Contracting in ten English local authorities: preferences and practices." *The International Journal of Public Sector Management* **13**(1): 38-57.

Edwards, P. (1998). "Risk Management and Risk Management Techniques." *Journal of Constriction Procurement* **4**(2): 103-115.

Egan, J. (1998). Rethinking Construction. London, HMSO.

Egan, J. (2002). Accelerating Change. London, Rethinking Construction. Review of the changes since rethinking construction and key issues to be addressed.

Flores, F. & Solomon, R. C. (1998) *'Creating Trust'* Business Ethics Quarterly, 8:2, 205-232

Fukuyama, F (1995)Trust: *The Social Virtues and the Creation of Prosperity*, Harmondsworth, Penguin Books

Gambetta, D (Ed) (1988) *Trust: making and breaking cooperative relations*, Oxford, Basil Blackwell

Ganesan, S (1994) *Determinants of long-term orientation in buyer-seller relationships*. Journal of Marketing, 58 (April), 1-19

Granovetter, M. S. (1973). "The Strength of Weak Ties." *American Journal of Sociology* **78**(6): 1360-1380.

Hagan, J. M. and S. Choe (1998). "Trust in Japanese Interfirm Relations: Institutional Sanctions Matter." *Academy of Management Review* **23**(3): 589-600.

Hall, M. (2001), 'Root cause analysis: a tool for closer supply chain integration in construction', in proceedings of 17th Annual ARCOM Conference, University of Salford, 5 – 7 September 2001, pp. 929 – 938.

Holti, R., D. Nicolini, *et al*. (2000). Building Down Barriers: The Handbook of Supply Chain Management Essentials. London, Tavistock Institute.

Holti, R. and H. Standing (1996). "*Partnering" as Inter-Related Technical and Organisational Change*. Partnering in Construction, Salford, and University of Salford.

Hoyt, J. and F. Huq (2000). "From arms length to collaborative relationships in the supply chain: An evolutionary process." *International Journal of Physical Distribution and Logistics Management* **30**(9): 750-764.

Jones, G. R. and J. M. George (1998). "The Experience and Evolution of Trust: Implications for Cooperation and Teamwork." *Academy of Management Review* **23**(3): 531-546.

Kaglioglou, M., R. Cooper, *et al*. (1998). Generic Design and Construction Process Protocol. Salford, University of Salford.

Khalfan, M. M. A.; Anumba, C. J.; Siemieniuch, C. E. and Sinclair, M. A. (2001), Readiness Assessment of the Construction Supply Chain – A Necessity for Concurrent Engineering in Construction', European Journal of Purchasing and Supply Management, Vol. 7, 2001, pp. 141 – 153.

Khalfan, M. M. A.; Anumba, C. J. & Carrillo, P. M. (2002), 'An Investigation of the Readiness of the Construction Industry for Concurrent Engineering', Construction Information Quarterly, Vol. 4, Issue 2, 2002, pp.13 – 17.

Khalfan, M., McDermott, P.; and Cooper, R. (2004), *Integrating the supply chain within construction industry*, Proceedings of 20th ARCOM Conference, Heriot Watt University, 1 – 3 Sept. 2004, Vol. 2, pp. 897 – 904.

Latham, S. M. (1993). Trust and Money. London, Department of Transport and Regions.

Leveson, R. and S. Pickerell (1998). *Partner or Competitor? Reframing Relationships in Construction*. 3rd National Construction Marketing Conference, Oxford, Oxford Brookes University.

Lewicki, R. J., D. J. McAllister, *et al*. (1998). "Trust and Distrust: New Relationships and Realities." *Academy of Management Review* **23**(3): 438-458.

Lok, P. and J. Crawford (1999). "The relationship between commitment and organizational culture, subculture, leadership style and job satisfaction in organizational change and development." *Leadership and Organization Development Journal* **20**(7): 365-373.

London, K. and R. Kenley (2001). *The Development of a Neo-Industrial Organisation Methodology for Describing and Comparing Construction Supply Chains*. International Group for Lean Construction Eighth Annual Conference (IGLC-8), Sussex, University of Sussex.

Luhmann, N. (1988) *'Familiarity, confidence, trust: Problems and alternatives'*, in Gambetta, D. (ed.) (1988) Trust: making and breaking cooperative relations: 94-108 Oxford, Basil Blackwell

Masden, S. E. (1991). "The costs of organization." *Journal of Law Economics and Organization* 7(1): 1-25.

McAllister, D.J. (1995) 'Affect and cognition based trust as a foundation for interpersonal cooperation in organisations', *Academy of Management Review*, 38:1, 24-59

Misztal, Barbara A. (1996) Trust in Modern Societies, Cambridge, The Polity Press National Audit Office – *Modernising Construction* – (2001) HMSO

Naude, P. and F. Buttle (2000). "Assessing Relationship Quality." *Industrial Marketing Management* (29): 351-361.

North, D. (1990). *Institutions and Institutional Change*. Cambridge, Cambridge University Press.

Ouchi, W. G. (1980). "Markets, Bureaucracies and Clans." *Administrative Science Quarterly* **25**: 129-141.

Proverbs, D. G. and Holt, G. D. (2000), 'Reducing construction costs: European best practice supply chain implications', European Journal of Purchasing and Supply Management, Vol. 6, pp. 149 – 158.

Pryke, S. D. (1999). *Proposing a Social Network Analysis Approach to the Evaluation of Post Latham Initiatives in Construction Project Management and Procurement Systems*. COBRA, Salford, RICS.

Rowe, N. (1989). *Rules and Institutions*. Hemel Hempstead, Phillip Allen.

Selnes, F. (1998). "Antecedents and consequences of trust and satisfaction in buyer-seller relationships." *European Journal of Marketing* **32**(3/4): 305-322.

Shove, E. (1996). *Chain Reactions: notes on partnering and supply chain management in construction*. Partnering in Construction, Salford, and University of Salford.

Smyth, H.J; Thompson, N.J (1999) *Partnering and the Conditions of Trust* ed. Bowen, P.; Hindle, R – CIB W55 & W65 Joint Triennial Symposium: Customer Satisfaction: A Focus for Research and Practice

Swan, W., P. McDermott, *et al*. (2002). Trust in Construction: Achieving Cultural Change. Manchester, Centre for Construction Innovation.

Tschannen-Moran, M. (2001). "Collaboration and the need for trust." *Journal of Educational Administration* **39**(4): 308-331.

Walker, D. and K. Hampson (2003). Developing Cross Team Relationships. *Procurement Strategies: A Relationship-Based Approach*. D. Walker and K. Hampson. Oxford, Blackwell Sciences: 169-203.

Warwick Manufacturing Group (1999). Implementing Supplier Chain Management in Construction. Warwick, Warwick University.

Webber, S. S. (2002). "Leadership and trust facilitating cross-functional team success." *Journal of Management Development* **21**(3): 201-204.

Whitener, E. M., S. E. Brodt, *et al*. (1998). "Managers as Initiators of Trust: An Exchange Relationship Framework for Understanding Managerial Trustworthy Behaviour." *Academy of Management Review* **23**(3): 513-530.

Williamson, O.E. (1985) The Economic Institutions of Capitalism. New York, Free Press.

Wilson, P. N. and A. M. Kennedy (1999). "Trustworthiness as an Economic Asset." *International Food and Agribusiness Management Review* **2**(2): 179-193.

Wong, A. and A. Sohal (2002). "An examination of the relationship between trust, commitment and relationship quality." *International Journal of Retail and Distribution Management* **30**(1): 34-50.

Wong, E. S., D. Then, *et al*. (2000). "Antecedents of trust in intra-organizational relationships within three Singapore public sector construction project management agencies." *Construction Management and Economics* (18): 797-806.

Wood, Graham; McDermott, Peter – *Searching for Trust in the UK Construction Industry: An Interim View* – CIB W92 Procurement Systems Conference (1999) – Thailand

Woodward, D. and T. Woodward (2001). "The Efficacy of Action at a Distance as a Control Mechanism in the Construction Industry When a Trust Relationship Breaks Down: An Illustrative Case Study." *British Journal of Management* **12**: 355-384.