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# IMPROVING SUPPLIER RELATIONSHIP MANAGEMENT WITHIN THE AEC SECTOR

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Due to changes in many facets of projects and organisations, relationships between firms in the delivery of construction projects have consequently become more critical for the success of the project. Whether it is a transactional exchange or series of transactions spread over a period of time, relationships need to be managed. However, the concept of managing supply chains and relationships between firms has been relatively new to construction industry. Early pioneers of the concept, primarily automotive, aerospace and manufacturing industries, have greatly benefitted from non-adversarial, long-term and collaborative relationships. Although contextual factors within those industries largely shape each industry's approach to SCM (Supply Chain Management), its application within the AEC industry is slowly beginning to appear in a distinct shape and form.

Through a comprehensive review of literature on construction-specific SCM (cSCM), the study has identified that partnering, collaboration and trust are the three most prominent variables within the cSCM literature. Partnering and collaboration are considered to be relationship management tools, whereas trust is identified as the most significant relationship facilitator.

In spite of its significance on relationship development, there is very limited research carried out on the trust aspect of relationships. By understanding how trust is built and maintained, and what the conditions that result in mistrust are, firms can better manage their supply chains and their relationships with firms in the supply chains, manage factors that result in mistrust and mitigate potential conflicts arising from mistrust. Consequently this will facilitate better collaboration, result in high-level of commitment, improve project teambuilding, and avoid conflict and adversarial relationships. Drawing on organisational relationship management literature, we argue that trust must be approached from five dimensions; economic, social, psychological, inter-personal and organisational. These dimensions are unidirectional and they must be accounted conjointly as they are interrelated and interdependent.

**Keywords:** Construction Supply Chain Management, Relationships, Trust, Partnering, Collaboration.

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# INTRODUCTION

Management of supply chains within the AEC industry is beginning to attract more interest from academia and industry. Early pioneers of the concept, primarily automotive, aerospace and manufacturing industries, have greatly benefitted from non-adversarial, long-term and collaborative relationships. Although the concept of managing supply chains has been adopted and adapted to the construction industry from these industries there is still large amount of work to be done to improve the AEC organisations' supply chain management operations. One of the most prominent variables suggested in the literature for an effective and efficient supply chain management strategy is 'trust'. The purpose of this study stems from the fact that although trust has been suggested as the most important relationship attribute it is not considerably studied within the construction specific supply chain management literature (cSCM).

Importance of supply chains in achieving industry wide improvement plans, enterprise level business strategies and project level operational objectives is significant for all the actors involved in a construction supply chain. Most firms have realised that by managing their supply chains effectively potential cost-savings can be achieved on projects as well as throughout their relationship; for example, through better supplier management practices and long-term relationships with key strategic suppliers/subcontractors (Matthews *et al.*, 2000). Consequences of unmanaged supply chain relationships are 'arm's-length', opportunistic and adversarial relationships which further results in disputes and inefficiencies in construction processes and increased cost and waste (Briscoe and Dainty, 2005).

To add to the problem further, both the research and the practice had an hindsight approach where majority of attention has been given to firms who are at the upstream level (Akintoye *et al.*, 2000; and, Briscoe *et al.*, 2004) ignoring the downstream supply chains (Saad *et al.* 2002) where up to 90-95% of contractual relationships occur in a project (London, 2004). As reinforced by Briscoe and Dainty (2005) every relationship requires a different approach to its management which makes the management of supply chain relationships a complex process. In addition to this, it has been highly advocated that firms must re-evaluate their approach to engage with both clients and suppliers. It must be noted here that attention should not be solely directed on certain relationships which are only 'dyadic' (i.e.: partnering) but consider the extended network of relationships between buyers and suppliers where the aim should reflect a total relationship management approach.

The aim of this study is to explore the 'trust' attribute in construction supply chain relationships by conducting a desk study on relationships in construction supply chains. Although there are a few conceptual ideas beginning to form (McDermott *et al.*, 2005; Khalfan *et al.*, 2007; Lau and Rowlinson, 2010; and, Laan *et al.*, 2011) the discussion seems to be fuzzy and disconnected from one another. The conceptual base of 'trust' in construction supply chain relationships is not adequately developed for it to be empirically tested in the industry. It is repeatedly preached that supply chain firms should trust one another during a transaction/interaction however there seems to be limited study on how to execute a trust-based relationship. This study argues that a multi-dimensional perspective on trust is needed for comprehensive coverage of the concept in empirical studies.

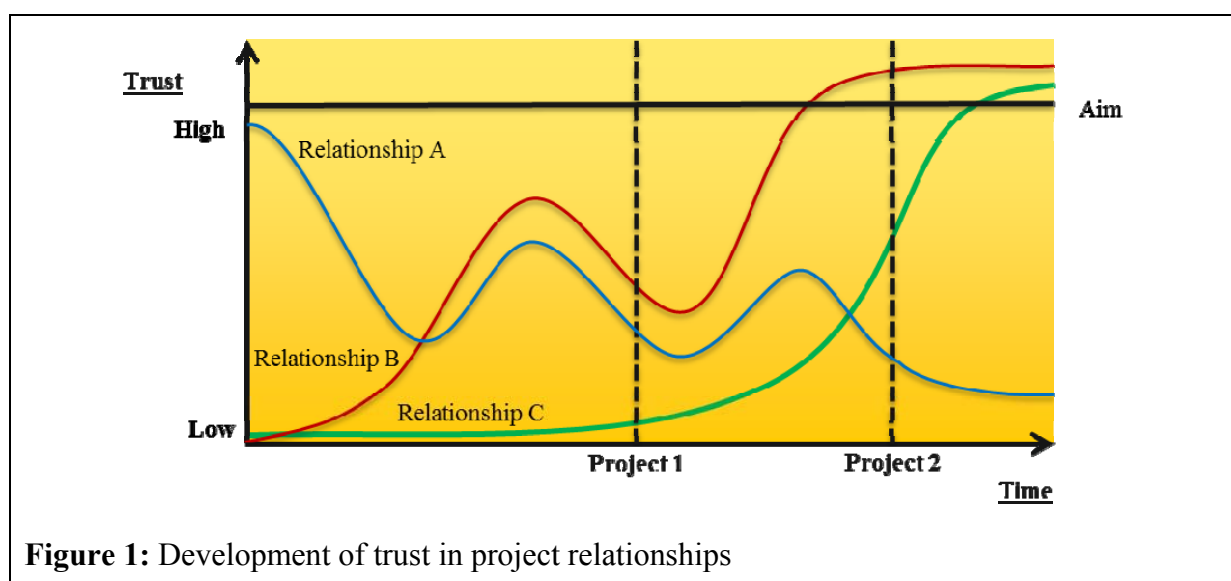
## **Trust in Construction Supply Chain Relationships**

Generally, relationships are characterized as having a multi-dimensional relationship structure where many elements (both human and firm) shape a relationship's type, form, duration and

intensity (Håkansson and Ford, 2002). Hence there could be many multiple, dynamic, and context specific relationship layers within construction supply chains (Pryke, 2006). Trust is placed at the core of these layers, however within the AEC industry lack of trust undermines majority of interactions within supply chains (Briscoe *et al.*, 2001b; Lau and Rowlinson, 2009; and, Laan *et al.*, 2011). Trust can have a direct or indirect consequence on almost every element of supply chain interactions. There is a unanimous agreement within the literature reviewed that trust is one of the most important constituents of long-term, collaborative and non-adversarial construction supply chain relationships.

In terms of its main function, trust has three primary roles in organisational relationships. Accordingly, it's a (i) 'social mechanism' that works outside formal arrangements (Möllering *et al.*, 2004); (ii) 'lubricant' that enables smoother flow of information, products and services (McDermott *et al.*, 2005); (iii) 'glue' that holds people and organisations together and creates synergy (Noteboom, 2002). For instance Spekman (1998) claimed that trust is the foundation of supplier relationship management. Eriksson and Laan (2007: 389) stated that *"to obtain advantages and synergies of cooperative relationships, establishment of trust is vital"*. Latham (1994: 87) noted that *"disputes will continue as long as people fail to trust one another."* Frödell (2011) argued that trust is the most critical factor and most important relationship enabler between strategic partners.

Despite its significance in supply chain relationships there appears rather limited research concentrating on this vital attribute specific to cSCM. The research carried out on trust aspect of relationships is primarily descriptive and lacks empirically tested studies. More specifically, there appears very limited research which explains how trust is built and maintained, and what are the conditions that result in distrust in construction supply chains. Anecdotal research generally focuses on impact of trust on partnering arrangements (for example Eriksson and Laan, 2007; Lau and Rowlinson, 2009; and, Laan *et al.*, 2011) and does not consider the various dimensions of trust embedded in construction supply chain relationships. By understanding and establishing high level of trust within and between firms and individuals; supply chain firms can manage their relationships with fewer resources, understand the consequences of their decisions, increase and maintain trust to the highest level and then reap the benefits of trust-based relationships. This is illustrated in Figure 1.



**Figure 1:** Development of trust in project relationships

## DISCUSSION

Within this study 40 articles published in various peer-reviewed journals were selected to identify the most common themes for effective and efficient supply chain relationships (See Appendix 1). Majority of these articles are empirical studies which are based on cSCM. Analysis of the articles was carried out using coding where each specific relationship attribute mentioned in the article was mapped in a matrix.

An effective and efficient supply chain is usually judged on social, economic, organisational, interpersonal and technological dimensions of interaction. Therefore the key relationship attributes were categorised into these five areas on the vertical axis where each specific attribute for effective and efficient cSCM were identified and then marked with a sign to indicate its agreement, disagreement or contextual arguments in relation to that variable.

*Appendix 1* shows there is more emphasis on improving the organisational aspects of supply chains. According to this matrix partnering, trust and collaboration are the top three relationship attributes associated with effective and efficient supply chains. Partnering and collaboration can be considered as the relationship management tools which give rise to the physical interaction between supply chain firms. The trust attribute can be described as the facilitator of the interaction which enables a relationship to form, develop and function.

### Development of Trust in cSRM

The effectiveness, efficiency and other resource qualities of a collaborative supply chain can only be as good as the weakest link in the chain. The primary reason for this is the knock-on effect which is triggered by the weakest firm in the supply chain which is further cascaded upstream or downstream in the chain. In addition to this, the transient, independent and multi-organisational characteristics of construction projects require development and alignment of *relationships* in a much faster way. Management and control of these relationships are crucially important to ensure that system works smoothly without any obstructions. Therefore the role of trust within these contexts can have a considerable impact on many facets of projects and organisations. In spite of its significance in relationships, 'trust' has been studied from a parochial view within cSCM literature where all of the constructs of trust have not been adequately discussed. Available literature on construction supply chain trust (for example McDermott *et al.*, 2005; Smyth, 2006; Khalfan *et al.*, 2007; and, Lau and Rowlinson, 2009) only studies the relationships from interpersonal or organisational perspective.

Trust is a multi-perspective and multi-dimensional construct which can be categorised into five broad dimensions: economic, social, psychological, inter-personal and organisational (referred to as 'ESPIO' dimensions of trust, see *Figure 2*). When studying the impact of trust on relationships the ESPIO dimensions of trust must be accounted conjointly as they are interrelated and interdependent. For example, organisational trust can be shaped by the individuals within that organisation and individual trust in turn, can be shaped by psychological or social trust vice versa.

The literature on trust is very diverse and covers a variety of levels within the scope of these dimensions. Some of the forms of trust identified within the literature are presented in the box opposite to the dimensions of trust in *Figure 2*. However, it must be noted that there could be many overlaps or cross-disciplinary dimensions of trust, hence a form of trust (i.e.: the label which addresses trust within that dimension) can be used interchangeably within

different dimensions (Figure 2). An example of this is macro-level trust within a socio-organisational dimension.

In relation to the sources of trust; that is the attributes of the trustee, there are wide range of sources (objects, traits and characteristics) identified and grouped according to its relative dimension. Contributing factors are considered to be the antecedents, in other words factors that facilitate development of trust. Several studies have revealed some construction specific factors within different project environments (for example Khalfan *et al.*, 2007), but the list mainly consists of inter-personal and organisational attributes that contribute to the development of trust and lacks economic, social and psychological dimensions of trust.

In most of the studies on trust, the trust construct is primarily regarded as a concept made up of several abstract entities which give rise to its existence. This is termed as ‘*sine qua non*’ of trust (Laan *et al.*, 2011) which is the conditions of trust, without which trust would not exist. For example, Rousseau (1998: pg.395) argued that trust is “*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another*”. This implies that trustor has to be vulnerable to the actions of trustee under the conditions of risk, uncertainty, vulnerability, opportunity, dependence and unpredictability.

Two arguments are noted with regards to the control and trust in relationships (Noteboom, 2002). On one side, it has been argued that more control on above elements will result in less trust and vice versa, and on the other side, it has been argued that trust and control are complementary in counteracting these elements (Schoorman *et al.*, 2007). In relation to the first point, for example the use of governing mechanisms to monitor a subcontractor’s activities and/or create reward structures that reinforce the contractor’s desired activities may not necessarily facilitate the development of trust (Noteboom, 2002). Therefore actions of the trustee may be attributed to the existence of these incentives or governance mechanisms rather than to the trustee.

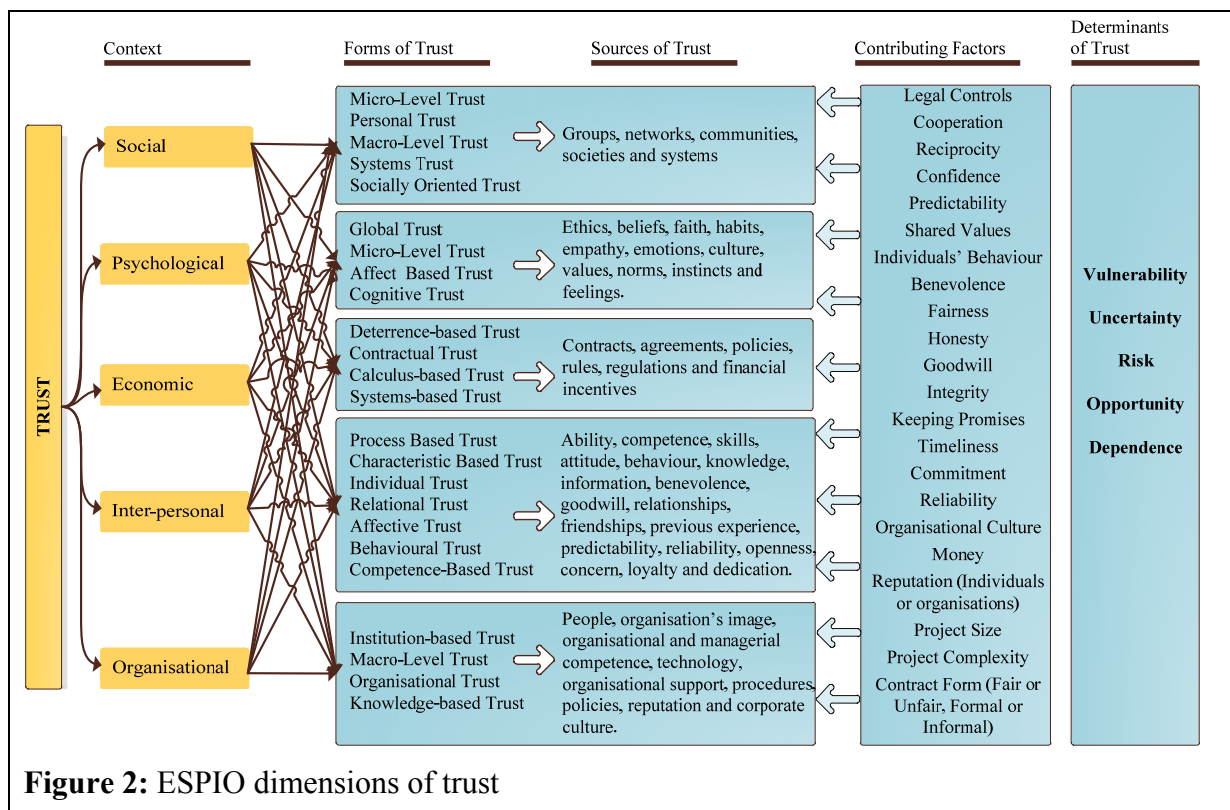


Figure 2: ESPIO dimensions of trust

With regards to the second point contracts can be regarded as sources of trust where existence of these control mechanisms eliminates the need for trust. However, no contract is complete in its scope for covering every possible factor that may affect the relationship. Therefore, conditional trust is adopted by the trustee until a relational trust is built between the trustee and trustor. For Smyth (2006) the development of trust requires a 'socially orientated' approach to build trust-based long-term relationships between supply chain actors.

In view of the above, two arguments can be made in relation to developing trust-based relationships in the AEC industry: formal and informal. Formal tools which are mainly applied from 'transaction cost economics' practices are not favoured for developing long term relationships and informal mechanisms such as social and cultural-structural dynamics embedded in supply firms are highly advocated for development of trust. In addition to this, there are many 'soft' tools such as high-level and individual commitment; effective information sharing and communication; team-working; openness of relationships; organisational culture; individuals attitude, behaviour and culture; honesty and reliability which have been mentioned within the matrix. For example Briscoe *et al.*, (2004) identified that collaborative relationships evolve more effectively when not constrained by the formal aspects of contractually defined relationships.

Furthermore, there appears two opportunities for further investigation. Measurement of different dimensions of trust may not be the same therefore how different dimensions of trust develop within and between supply chain firms must be studied in order to measure the inter-firm trust between supply chain firms. Secondly, in relation to social dynamics of relationships social capital should be considered in understanding how trust develops within socio-organisational dimension of relationships.

## CONCLUSIONS

Responses to the challenges that plague the construction supply chains have predominantly discussed partnering, collaboration and trust between supply chain firms. This was also confirmed from the review of 40 articles in construction specific supply chain management literature. Partnering and collaboration are two important practices for relationships to function whereas trust is the single most quoted facilitator of that mechanism which has a multiple role between the supplier buyer interfaces. The importance of managing supply chain relationships should never be underestimated. Management of the various interfaces that a firm has with other supply chain actors could have an impact on the project network where many buyers and suppliers contribute to the development of a project. If mistrust between the parties overshadows the collaborative environment it can result in adverse relationships between supply chain actors but if the opposite is the case than benefits gained from trust-based relationships must be persistent and further developed for subsequent interactions.

cSCM must be a high-priority at the project level and enterprise level for long-term, non-adversarial, mutually beneficial and synergistic inter-firm relationships. In order to develop better relationships between supply chain firms 'trust' must be deeply embedded into these relationships so that benefits of the high-trust relationships can be fully reaped. The literature discussing trust in construction relationships is inadequate and falls short of covering various dimensions of the trust construct. This paper introduced the argument that trust as a construct comprise of economic, social, psychological, inter-personal and organisational dimensions which are intertwined and enmeshed in a complex web of interactions between individuals

and organisations. A conceptual base for developing trust is what is needed so that further research can focus on each element in more detail.

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APPENDIX 1

Key:	
Paper supports SCM & SRM, and discusses this variable	●
Paper mentions this variable but does not discuss it	○
Context and Relation Dependent variable	△
Paper is counter argumentative	Red

		Core Themes																																												
		Partnering										SCM										SRM					Trust				Power															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40					
	Google Scholar Citation Index	90	47	115	166	260	147	47	96	53	40	1	11	103	4	2	2	166	245	2	74	40	34	26	99	139	1	42	9	116	19	16	38	66	25	11	1	3	6	62	16	Total '●'				
Generic Attributes	Specific attributes of effective and efficient supply chains																																													
Social	Honesty	●	●	●																																								10		
	Trust (Universal)	●	●	●	●	△		●	●	●	●	○	●		●	●		●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	△	●	30	
Economic	Open book accounting	●		○										△	●					●	●	●	●	●																					7	
	Joint conflict resolution					△	△		●	●				●	●						●	●		●	●					●	●	●	●	●	●	●	●	●	●						16	
	Best value approach		●	●	●	△	△		●	●							○	●		●	●			○	○	○									●										11	
	Profitability and repeat business					△												●	○					●			●														●	△	●		7	
	Logistics and operations management																			●						●						●													3	
	Alternative forms of procurement and sourcing	●	●	○	△			●	●			●				●	●	●		●	●	●		●	●	●					●	●	●	●	●	●	●	●	●	●	●	●			22	
	Sharing of risks and rewards			○	●			●	●				●	●	●	●			○	●		●			●			●				●	●	●	●	●	●	●	●	●					16	
	Transparency	●	●	●						●									○	●					●								●	●	●	●	●	●	●	●	●			△	●	11
Organisational	Power					△																△							●											○			△	△	1	
	Partnering	●	●	●	●	△	△		●	●	●	●	●	●	●	●	●	●	●	●	●		△		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	△	○	33
	Reliability and interdependence	●	●					●	●					●	●	●	●			●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	△	●	16
	Previous experience							△	△					●	●	●	●				●	●	●					●	●	●	●	●	●	●	●	●	●	●	●	○					7	
	Common purpose-mutual Interest	●	●			△			●				●	●	●	●	●	●	●	●	●		●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	△		23	
	Project teambuilding						△	●								●								●	●																			6		
	Structural alignments for strategic interactions	●		●					○			●				●	●	●							●					●	●														12	
	Organisational trust			●	●				●	●																				●	●														12	
	Relationship Management														●		●	●											●	●										○	●	●		11		
	High level commitment					△	△	●	●	●						●	●	●																											14	
	Organisational culture	●			○	△	△		●	●																																			9	
	Cooperation	●	●	○		△	△		●	●		○				●	●	●	●	●	●	●			●	●														○	●	●	△	20		
	Project Culture	●	●																																									3		
	Early involvement	●	●	●			●	●	●																															○	●	●	●	15		
	Continous Improvement	●	○			△			●	●						●	●	●																											10	
Long-term focus					△	△		●							●	●	●																								○		12			
Individual	Alignments for operational interactions				●	△	△				●					●	●	●	●	●	●	●																							11	
	Individuals' trust in and between organisations				●															●	●	●	●	●	●																			6		
	Individual commitment				●																																								7	
	Training and skills	●	●	●	○				●	●																																			12	
Technological	Individuals' attitude, behaviour and culture	●	●	○	●	●	●	●																																					13	
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	Integrated ICT infrastructure/Virtual Organisations	●		○																																								13		
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