Involving clients in innovation: Exploring expectation, knowledge, and competency gaps

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Competitive paper

Abstract

Focusing on relations, or interactions, between network members has been a primary concern for the Industrial Marketing and Purchasing (IMP) group since its inception. These interactions help to promote learning, which is seen as playing a pivotal role in firm development within the network. While the link between innovation and client input has been a feature of innovation research for some time, this input is usually conceptualized as either client need identification (to inform firm research and development activities), or client usage and adoption (to facilitate the wider adoption process of innovations in the marketplace). Some prior research has recognized the role of the client in business-to-business innovation processes and identified client knowledgeability as a key issue but does not place this within a network context. Other research has examined the client as part of an innovation network and the client as a co-producer of value, but does not examine the impact this relationship has on managerial practices and firm processes. Therefore there has been a call for further research investigating how specific company-client collaborations change over time and the need for client education in the co-creation of value process. This paper seeks to address this gap and extend knowledge in the field on expert clients in project-based settings.

Keywords: Innovation, Client involvement, Value Co-creation

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THE PURPOSE OF THE PAPER AND LITERATURE ADDRESSED

Focusing on relations, or interactions, between network members has been a primary concern for the Industrial Marketing and Purchasing (IMP) group since its inception (Ford and Håkansson, 2006). These interactions help to promote learning, which is seen as playing a pivotal role in firm development within the network (Håkansson and Johanson, 2001). Håkansson and Johanson argue that if an interactive view of business is taken, examining the embedded environment of any firm and its relationships with other individually significant and interdependent actors is essential to understand business activity, and one particularly significant actor is the client. Industrial buyers or clients often posses considerable market and product knowledge (Nataraajan and Angur, 1997), that provide learning opportunities for suppliers (Håkansson and Ingemansson, 2011); there is, however, a gap in our understanding of how client involvement with business-to-business networks may influence learning, value co-creation, and innovation.

While prior IMP research recognises that building a sustainable competitive advantage involves the development of core competencies both within the company and between the actors in the total supply chain (Brandes and Brehme, 2001), further research in knowledge sharing between expert organisations and their customers has raised issues of knowledge codification, and access to wide versus narrow areas of expertise by the buyer (Natti and Hanttu, 2003). Earlier research by Johnson and Ford (2000) identifies important activities in collaborative innovation (i.e. prioritising, timing, mobilising, communicating, exchanging knowledge, exchanging human resources, synchronising, and co-ordinating), however, they point out that their discussions focused mainly on supplier relationships and contained few discussions of customer relationships. Thus, the IMP related research could be furthered by a more explicit study of the interaction between clients and suppliers.

While the link between innovation and client input has been a feature of innovation research for some time, this input is usually conceptualized as either client need identification (to inform firm research and development activities), or client usage and adoption (to facilitate the wider adoption process of innovations in the marketplace). Some prior research has recognized the role of the client in business-to-business innovation processes (Martin, Horne and Schultz, 1999) and identified client knowledgeability as a key issue but does not place this within a network context. Other research has examined the client as part of an innovation network (Johnston, Peters and Gassenheimer, 2006) and the client as a co-producer of value (Blazevic and Lievens, 2008), but does not examine the impact this relationship has on managerial practices and firm processes. Blazevic and Lievens (2008) call for further research investigating how specific company-client collaborations change over time and the need for client education in the co-creation of value process. This paper seeks to address this gap and extend knowledge in the field.More specifically, we examine client knowledgeability in the construction industry where project-based activities (or so-called ‘temporary organizations’) are the norm. We now consider the characteristics of this particular context.

PROJECT-BASED INDUSTRIES AND TEMPORARY ORGANIZATIONS

Consider the many thousands of examples where companies collaborate on projects in the construction, advertising, engineering, and consulting industries, projects in the high-tech industries, as well as in the performing arts, among many other sectors. In these projects, companies collaborate and in effect create 'temporary organizations' that have a finite amount of time and resources to complete a project such as the construction of a new building, or design and development of a new commercial airliner.Although temporary organizations have many of the characteristics of similar organizational forms (most notably intra-company projects, alliances, and joint ventures), they also have characteristics that render them apart from traditional modes of competition. The ultimate purpose of the temporary organization is to eliminate itself through the successful completion of a task, hence the designation 'the disposable organization' (March, 1995). Forrester Research estimates that approximately 20%-30% of companies are experimenting with innovation networking in order to "…optimize profits and speed products to market" (Hamm, 2007).

Temporary organizations are situations where individuals from different organizations collaborate on a task for a defined period of time (Bechky, 2006; Grabher, 2002), and are different to other forms of company collaboration (such as projects and joint ventures) as they have characteristics such as institutionalized termination and conflicting loyalties and tensions, as participants have 'home' organizations. Temporary organizations, unlike traditional hierarchical organizations, rely on co-operation within a network (Jones et al. 1997) rather than by easily identifiable "…lines of authority" (Bechky, 2006: 3). The individuals selected to complete the assignment are chosen based on the nature of the task (Lundin and Soderholm, 1995). Hence temporary organizations are similar to what Lambe et al. (2000: 212) refer to as 'intermistic' relationships; short-term relationships defined as a "...close, collaborative, fast-developing, short-lived exchange relationship in which companies pool their skills and/or resources to address a transient, albeit important, business opportunity and/or threat" – a phenomenon that has received limited research attention.

Individuals and firms face the challenge of maximizing opportunities to learn. This particularly acute in project-based industries where temporary organisations are typically found, projects are often short-lived and thus the time frame in which actors can learn is often limited and pressured (Grabher, 2002), and where "...organizations are collections of overlapping knowledge systems each of which may be embedded within a wider occupational community" (Araujo, 1998:331).While much attention has been afforded to the knowledge held by firms and their knowledge dissemination practices, less attention has been directed towards knowledge and learning at the level of the temporary organization or network.Understanding the formation of knowledge therefore cannot simply focus on the learning of isolated actors. Rather, such learning also depends on the capabilities and competencies of the wider network (Bangens and Araujo, 2002). Such organisational capabilities, defined as the dynamic and non-finite mechanisms that enable the acquisition, development and deployment of resources to achieve superior performance, include innovation and entrepreneurship, organizational culture, and organizational learning. Competencies, on the other hand, are defined as the linking of specific capabilities and resources. Specific competencies recognised by Lado and Wilson (1994) include managerial, input and output based, and transformational and are presumed by them to yield sustained competitive advantage for a firm. The development of such capabilities and competencies are subject to the dynamics of network interactions and, simply put, "networking increases learning" (Håkansson et al. 1999:450), or rather, opportunities to learn.

The present study focuses on one prominent example of temporary organizational forms, namely the construction industry, where activities are typically organized on an individual project basis (Bygballe et al. 2010); an industry that affords an interesting research context in which to understand network learning as it is characterised by:

i. Slow diffusion of new technologies and practices often due to adversarial relationships, where a focus on operational management issues rather than long-term benefits predominates (Anderson and Cook, 2004; Miozzo and Ivory, 2000);
ii. Potential radical change of construction network relationships from project to project and loose network couplings, inhibiting the ability of members to form sustained cognitive structures that support learning (Dubois and Gadde, 2002; Teece, 1998); and
iii. Short-lived site-specific project-based activity and uncertainty due to a lack of complete specification (Dubois and Gadde, 2002).

In contrast to previous often adversarial relationships between firms traditionally, a move to partnering between firms "...changing traditional relationships to a shared culture without regard to organization boundaries"has taken place in the construction sector (Construction Industry Institute, 1991: iv), in an effort to improve project performance.Such industry-level changes emphasise "that the involvement of other parties is important since product and process innovations often come from suppliers, architects and consultants and from the collaboration between them" (Bygballe et al. 2010: 244). This represents what Macdonald and Uncles (2007) termed a new ethos of consumer literacy, with an emphasis on relations of collaboration, participation, dispersion and distributed expertise. They note that increasingly savvy consumers demonstrate metis, the Greek term for a wide array of practical skills and acquired intelligence (such as local knowledge, common sense, cunning, and know-how)in responding to the environment.

Knowledge and learning is important in construction settings (Robinson et al. 1995), particularly "both in terms of knowledge about the building object and its function (houses, commercial buildings, roads, dams, etc.) as well as of the construction process" (Håkansson and Ingemansson, 2011: 67). Although perhaps perceived as a sector with limited examples of best practice in terms of innovation or sophistication, the modern construction industry is one of virtual design tools and planning platforms and low energy technology solutions; hence "theuse of existing knowledge and renewal of this knowledge, including developing innovations, is certainly crucial for the modern construction company" (Håkansson and Ingemansson, 2011: 67).

Once source of knowledge is that held by the customer or client; some clients in the construction industry are 'expert' customers where a client regularly commissions construction work and has personnel that manage the relationship between contractor and client often with a construction background. For example, Beach et al. (2005) observed that the client may have specialist competencies that are of benefit to subcontractors, particularly during the early phases of a project, while Kubal (1996) found that partnering between contractors, sub-contractors and the client, can improve project quality.

The notion that the customer can have an input in product composition, delivery, and value, or so-called 'co-creation'/'interaction view' (cf. Echeverri and Skalen, 2011), has been an area of considerable research interest to marketing scholars. The service marketing

literature since the 1970s has emphasised co-creation (Shostack, 1977), continued in the 1980s as 'interactive marketing' (Gummesson, 1987; Gronroos, 1982), and can be found more recently in the service-dominant logic stream of research (Vargo and Lusch, 2008, 2004). Largely neglected by these research streams is the phenomenon of the knowledgeable, and sometimes expert, customer. It is to the topic of knowledgeability that we now turn.

KNOWLEDGEABILITY

Knowledgeability refers to the knowledge individuals have of the circumstances of their actions and the rules they follow (Berends, Boersma, and Weggeman, 2003). However, following such rules does not imply that individuals are slaves or that actions always result in predictable outcomes; individuals have the power to 'act otherwise' (Giddens, 1984) or the 'capacity to make a difference' (Archer, 1995) and thus the interaction of knowledgeable individuals often instigates change. In this respect, human behaviour is seen as intentional and purposive. However, being knowledgeable individuals does not imply that the motives, conditions and the consequences of their actions are readily understood (Berends, Boersma, and Weggeman, 2003). There may be unacknowledged preconditions and unintended consequences of action, which form the bounds of knowledgeability (Giddens, 1984) and which play an important role in the production and reproduction of processes of interaction and knowledge sharing and learning.

According to Giddens (1984), individuals are socially competent and have the capacity to reflect on their situation and the ability to change their situation. Archer (2007:36) maintains that individual differences exercised as personal properties and powers should make a difference to their actions "…on the basis that our personal identities are defined by our 'constellation of ultimate concerns' and that our quests for social identities are deliberative attempts to secure positions (occupational, familial, institutional, voluntary) in social contexts with allow these concerns to be realized." In relation to knowledgeability and action, Pozzebon (2004) highlights the fact that learning and change requires the interaction of competent and reflexive actors.

Knowledge, particularly in the context of managerial action and knowledge management, is often seen as a centralized function in which managers controlled the transfer of knowledge by distributing tasks and resources and then monitoring the execution of those tasks and the use of those resources (Bonifacio, Bouquet and Traverso, 2002). This process assumes that knowledge is separate from the subjectivity of the people that produce it. Ontologically, there is some merit in this assumption, in that knowledge cannot be carried down from the past through to the present in the minds of the knowers alone (Archer, 1995) but is often embedded in material objects such as books or contained in the myths and stories of social life. However, viewing knowledge as something which is separate from the knower does create logical difficulties, as it mirrors the traditional 'marketing as exchange' paradigm which views value as something firms provide to clients (usually through the provision of goods and/or services) and ignores the social nature and intrinsic subjectivity of knowledge gained through the interaction and individuality of clients (cf., Bonifacio, Bouquet and Traverso, 2002).

A more recent shift in the knowledge management literatures recognizes the role of subjectivity by acknowledging that information only becomes knowledge when put into a logical and understandable context that can be verified and recalled from experience (cf., Gunnlaugsdottir, 2003). As Polanyi (1958) observed half a century ago, the processes of tacit

integration is at the very heart of knowledgeability and agency in that tacit knowledge (the hidden experiences and skills we possess) and the human cognitive processes we engage in are the root of what we know and what we do.

Arising from these views are two key themes that capture a more complex and potentially useful notion of knowledgeability. Firstly, knowledge cannot be wholly objectified because theexperience, expertise, values, and interpretive meanings are held in the mind of the knower and are the tangible creation of human intellect (c.f. Ballantyne and Verey, 2006). Secondly, knowledge is contextual, it is a logical and understandable form of problem solving or task completion where knowledge is embedded in the context of a specific system, for a specific purpose and is thus a specific asset (Glazer, 1991). In other words, "…knowledge does indeed require holders/practitioners/believers in order to have a social effect at any given time …" (Archer, 1995:112).

These themes are important in that they represent a shift in our understanding of knowledge management from the managerial control of some 'thing' (such as information) to the development of subjective and contextual intellectual capital. This shift acknowledges the importance of knowledgeability as a key aspect of value co-creation in that the focus for managerial action now moves away from the management of data and information through information storage, dissemination and access, and shifts to a focus on the knowledgeability of employees and clients, and to managerial decision-making.

KNOWLEDGEABLE INDIVIDUALS AND BUSINESS NETWORKS

As La Rocca and Snehota (2011) argue, the interaction behaviours between actors are a reflection of how they interpret each other's behaviours and the identity attributed to the other actor. They state that developing a conceptual framework that explores the critical dimension of an actor's identity in business relationships related to actor roles is necessary to extend our understanding of how business relationships operate. La Rocca and Snehota (2011) contend that the identity attributed to a relationship partner changes from interaction to interaction and thus is continuously emergent. This view follows logically from the IMP notion that: "The identity and attributes of an actor are the outcomes of the way that it is viewed by each of its counterparts. An actor's identity is always multifaceted because any actor is involved in multiple interactions. The identity attributed to it in each interaction is but one facet of what an actor represents in the web of actors to which it is connected. The varying perceived identities of an actor explain the behaviours of different companies towards it and are factors in its evolution." (Håkansson et al., 2009:156).

The position of actors in relation to the larger social group is important because it is through this position that the"…concrete embodied, interest-laden disposition which flows from being formed in a position, individuals become historical actors" (Parker, 2000:44). Thus, subjectivism's view that agency flows from the creative, rational, calculating, self-directing and self-interested individual is rejected, as is the objectivist view of structural mechanisms that function more or less autonomously. Instead, powers of individual agency accrue from being positioned and socialised within historical structures of competing interests, and structures are historically maintained because agents know how to act practically in ever-changing situations (Parker, 2000).

In addition to the position of actors in a social setting, the role that an actor plays allows them to 'make a difference' (Archer, 1995). Unlike positions, roles can be chosen and the way in which roles are enacted and expectations satisfied is framed by social agency but not determined by it (Parker, 2000). Thus according to Archer (1995) knowledgeable actors may be seen as agents acting within social systems in which they assume roles. These roles are related to the knowledgeable individual through their assessment of the costs and benefits of assuming such roles, and therefore they may assume and enact a role and make it central to their social self, or not. Occupancy of a role does not necessarily imply that it is in sync with their personal identity (Parker, 2000).

In Figure 1, we outline four different types of supplier/client interactions based on their relative level of knowledgeability. This relative level of knowledgeability will influence both the role and the position of the interacting client and supplier. Where knowledgeability by both parties is low, we would expect to see the use of third party intermediaries (i.e. brokers or agents) and/or the use of grey (or unofficial) markets to coordinate exchange. Because knowledgeability is low, such coordination may more easily suffer from poorly specified client needs and poorly understood requirements. For example, IBM recognises the importance of good requirements specification and the difficulties faced in obtaining these in many of their internal reference manuals (cf. Tavassoli, 2008)

Where supplier knowledgeability is high but client knowledgeability is low, we would expect to find what are usually known as high credence products and services. For example, financial services face many challenges in attracting and retaining clientsbecause their offerings are difficult or impossible for the consumer to ascertain both before and after purchase (Howcroft and Beckett, 1996).

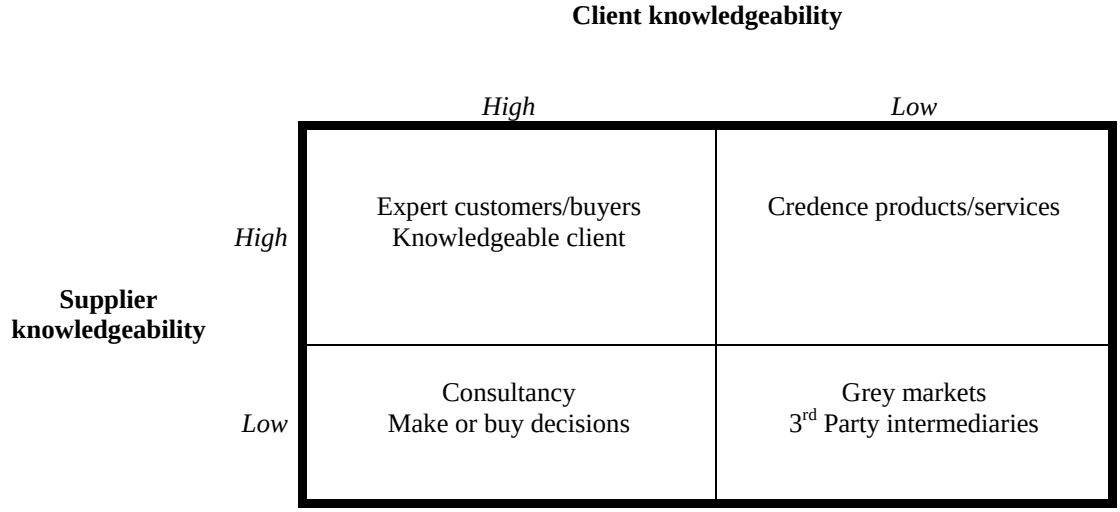
Where supplier knowledgeability is low but client knowledgeability is high, we see the traditional "make or buy" decision on the part of clients. We may also see the classic consulting relationship, where the onus is on the consultant to become more knowledgeable of the client's needs and issues. Examples of this relationship include companies such as Honda and Toyota who actively train their supply chain partners (Fawcett, Magnan and Williams, 2004).

Finally, we have the situation where both the client and the supplier are knowledgeable. Such clients have been referred to in the literature as "expert" customers or buyers. Particular examples of this include using technology to allow virtual client integrationinto the innovation process (Hemetsberger and Godula,2007) and what Ogawa and Piller (2006) term collective customer commitment, in which firms seek both ideas and commitments to purchase from customers before commencing development and manufacturing. These approaches to innovation are part of what von Hippel et al. (2011) call a new innovation paradigm, one in which users develop new products themselves which are then evaluated, rejected, copied or indeed improved by other users, before producers enter the frame and consider adopting and producing the innovation when market potential is then clear.

Von Hippel (2011) contends that firms with a superior knowledge of the pathway from user innovation to commercialization may gain significant benefits in terms of profits and the development of new product and service offerings that may even result in creating new markets. Where high supplier and client knowledgeability leads to long-term relationships between the parties, this knowledgeability may even lead to switching barriers

that help maintain the relationship (Bell, Auh and Smalley, 2005). As Bell et al. (2005:173) note: "Expert clients, despite perceiving increasing switching costs, are less likely to feel trapped and helpless within the relationship. They are more likely to see a deeply embedded relationship as an opportunity to exercise "voice" within the organization (e.g., Hirschman 1970; Ping 1993) and may, in fact, attempt to remove the discomfort of switching costs by taking a more active part in the production of the core service."

Figure 1
A Typology of Knowledgeability Interactions



In this paper we focus our investigation on this latter type of relationship, between highly knowledgeable clients and suppliers. In particular, we explore how such knowledgeability may impact and/or influence client needs and expectations, the knowledgeability of the client in relation to the complexities of the task undertaken, and the competencies and capabilities needed to enhance client participation in innovation processes.

RESEARCH METHOD

The study uses a qualitative case study method which allowed the researchers to gain an in-depth, and situated, appreciation of complex and inter-related behaviours and attitudes related to how and why clients are involved with other project network members.The data collected for this study consists primarily of 45 in-depth semi-structured interviews and two focus groups conducted with managers of two UK construction projects over a period of twenty four months. In addition, 14 design team progress meetings were attended.

Sampling of the two construction projects examined was theoretical (Yin, 1994), and based on the opportunities they provided to observe network learning processes. In both instances, the knowledgeability of construction project work and processes by both the client and the suppliers was high. Case study one (*OfficeProject*: approximately £8.5 million) was a project creating office space and conference and training facilities. The second case (*PowerProject*: approximately £8 million) related to the construction of a combined heat and power plant (CHP) for a large-scale institutional user. In Table 1 we summarise the key

features of each case. The management teams (consisting of the client representatives, architect, design team, and contractor representatives) were of approximately equal size on each project, and details are provided in Table 2.

Table 1
Case Summaries

	Case 1: *OfficeProject*	**Case 2: *PowerProject***
Value	£8.5 million	£8 million
Purpose	Office accommodation and conference/training facilities	Combined heat and power generation
Supplier	A leading construction, development and services group in the UK. The Group employs 11,400 people worldwide and has annual revenue of £2.1bn.	A leading construction and regeneration group in the UK. The Group employs over 8,500 people and has annual revenue of over £2.5 bn.
Client	Training and Education Provider	Large-scale site with district heating system to approximately 30 buildings.
Level of Risk	Medium, new variant of energy efficient construction technology previously used by this client in other buildings.	High, if successful this will be the first working CHP plant utilising this form of energy production technology in the UK.
Planning time frame	9 months in planning, this data was collected over the 24 month construction period.	3 years in planning, this data was collected over the 24 month construction period.

Table 2
Respondent Demographics

	Client Team (e.g. Project Director, Project administrator	**Client Team Representatives** (e.g. Project Managers and their Quantity Surveyor)	**Design Team** (e.g. Architect, Mechanical and Electrical Engineers, Structural Engineers)	**Other Specialists** (e.g. Clerk of Works, Landscape Specialists, Acoustic Specialists)	**Contractor Team** (e.g. Project Managers, and their Quantity Surveyor)
OfficeProject*	3	3	4	5	3
PowerProject	3	1	5	5	4

* As both projects were in the same geographic region of the UK, some team members were present on both projects.

While the role of other members in the wider network (e.g. sub-contractors and other supply chain partners, and external stakeholders such as planning authorities and local council officials) are no doubt important, we chose to focus our data collection and observations on the client, middle managerial and administrative, and design team and other specialist network members. This provided a useful boundary in terms of learning processes as these are the network members who will be meeting on a regular and frequent basis, both formally and informally, and who will be dealing directly with the practical issues and problems that arise in relation to the project design and construction. Due to an anonymity agreement between researchers and informants, we can provide only general information for the nature of each project.

The data collected for this study consists primarily of 45 in-depth semi-structured interviews and two focus group conducted with managers of two UK construction projects over a period of twenty four months. In addition, 14 design team progress meetings were attended (eight for *OfficeProject* and six for *PowerProject*). In each meeting official progress

documents were collected and field notes were made. Together with the interview data these meeting observations allowed for a deeper understanding of the data and provided evidence of validity through triangulation. The interviews were conducted at the offices of the respondents and at the construction sites with respondents. The interviews lasted on average 90 minutes and the focus groups lasted two hours or more; all were digitally recorded, resulting in some fifty seven hours' of interview evidence. This data were transcribed and coded using AtlasTI v6 software, following the coding procedure outlined by Strauss and Corbin (1998). The theme of the discussions focused on new knowledge exposure and the acquisition, interpretation, dissemination and utilisation of knowledge within the network, following the work of Cohen and Levinthal (1990) and Todorova and Durisin (2007). A coding scheme was constructed based on these key aspects of learning in organizations. Open coding was used to identify data relating to client and supplier interaction within the two teams.

RESEARCH FINDINGS

Anderson and Cook (2004) and Miozzo and Ivory (2000) explored the diffusion of new technologies in the construction industry. Both claim that diffusion of new technologies and practices has been slow because of adversarial business environments, where a focus on operational management issues rather than long-term benefits predominates. Ling (2003) found that several factors significantly affect the extent to which innovation will benefit a construction project and its team members. These include the level of interest of project team members, the working environment, and the capabilities of the people involved in the innovation. Social factors, such as the distance between construction project participants and final end users, are also an issue. Where network intermediaries are driven by the economics of the project rather than innovation possibilities, and where clients and their end users may have limited knowledge of the feasibility and pay-offs of innovation, decision-making may remain conservative (Anderson et al., 2004). From our data we identify and discuss three key aspects of client-supplier collaboration in innovation processes:

- Client needs and expectations;
- The knowledgeability of the client in relation to the complexities of the task undertaken; and
- The competencies and capabilities needed to enhance client participation in innovation processes.

CLIENT NEEDS AND EXPECTATIONS

Our data uncovered four key aspects in relation to client needs and expectations. First, how both respect for the client by the supplier, and resistance on the part of the client to supplier needs, can help and/or hinder client collaboration. Secondly, how cost and benefit trade-offs can complicate collaboration efforts. Thirdly, how efforts in negotiation may mitigate these cost/benefit complexities. Finally, how limitations in a client's ability to visualise the project outcome and understand the relevant project processes influences their expectations of the project.

Client resistance and respect

Attempting to set appropriate expectations for both the client and the supplier was a recognised problem, raising issues of client resistance and the need for respect of the client by

the supplier. In fact, in many ways these appeared to be two sides of the same coin. Clients may well abdicate their interests and responsibilities, thus losing the respect of the supplier and making collaboration difficult. As one supplier put it, some customers feel that they should *"…go away and build it and then I'll tell you what the problems are afterwards"*.Suppliers also became frustrated at a lack of forethought on the part of the client, which made planning and implementing the project difficult: "*So I think that's the frustrating bit. You would have thought that they would have been further down their line of where they were doing it. I suppose in hindsight or looking back at that a lesson learned from it would be that they should have done all the engineering first."*In addition, changes to the original brief from the client damaged the relationship between the client and the contractor: "*The other side to it as well is that having a good, clear brief as to exactly what's being required and what's not required. A lot of clients you'll start off with a brief. And by 2 or 3 months' time it's totally changed. But your fee doesn't change."*

Suppliers also recognised, however, that they had a duty to help educate and mould client expectations: "*The client have expectations that they can do what they want to do within a certain budget and we then say that they can't do it within their budget, so I don't know if that's a downside, I would say that's possibly an upside isn't it, because we can bring them down to earth."* Not only could such proactive educating help set client expectations, but it also contributed to a longer-term aim of loyalty and relationship building: *"But I think the majority of it is loyalty with the client. You try and build a relationship with them on a long term basis. Because clients are, the important thing about a client is that once a job's handed over, that job doesn't just disappear."*This required a much more proactive approach to client interactions than many suppliers were used to: *"We are almost meant to be pre-empting that question and looking for the answers ourselves. That is how they have worked in the past and how they work now."* This led to some real soul-searching on the part of one supplier, who may have underestimated how a highly knowledgeable client would expect to work with them: *"We can go into a process, and as this one, we thought we was doing fine, we thought we was doing well, we thought we was doing what was expected. We were certainly doing what we was contracted to do. But the client had a different opinion, and it weren't until he aired his views did we think that perhaps there's a different way and we done it a different way."*Thus helping to overcome client resistances to collaboration and proactively educating them in relation to project outcomes and processes, while at the same time respecting client knowledgeability, helps match client needs and expectations with project outcomes.

Costs and benefits

Understanding the trade-offs involved for knowledgeable clients led suppliers into surprisingly positive territory, with some welcome outcomes for them. Suppliers understood that clients wanted a lot from the project: *"From the client themselves, they're the natural occupier of a building, I mean that is part of it, you know, that they want to get the biggest, best whatever for the money."* However, this was not just a simple money vs. specification trade-off for many clients: *"Now cost now is starting to not just be influenced by pure money but by environmental issues like carbon now is starting to have a value. And, you know, reputation is having a value that addresses that."* And therefore understanding the criteria for success on a project was complex. Nevertheless, the positive outcomes of addressing this complexity were recognised by suppliers, in particular a greater transparency regarding profit from the job: *"But normally if you develop with a client and you maintain with that client … he understands that you want to make an element of profit. You're not there to rip them off."* and a more conciliatory relationship: *"There is a lot of pressure and a lot of things in it,*

deadlines and that. But there's not this claim conscious culture." Thus an appreciation of the complexity of cost/benefit trade-offs made by knowledgeable customers may pay dividends for suppliers in terms of working relationships and profit maximization.

Negotiation

One of the most common ways to mitigate cost/benefit complexities of through negotiation. The act of negotiation itself brings about a deeper understanding of needs and expectations: *"I think the hardest thing was learning what they expected. There was quite a bit of criticism early on in that'We thought you would do that' and we were 'Well we wouldn't normally.' 'Well in our relationship that we have we would expect you to sort these problems out or we wouldn't necessarily want to ask you to sort them out, we would expect you to just go and do them'* [but] *'We didn't realise you were expecting that."* In addition, negotiation is often expected by knowledgeable clients, as one client explained: *"But don't just go and do something different to what I'm saying here without discussing because then I really will get pissed off you know this is what I expect. If there's something better and you can do it, come back and argue and we'll change it."*

This need for negotiation also related to the nature of the industry, and the sometimes adversarial approach to goal setting and task completion: *"… it is almost immediately breaking down that barrier so there isn't an us and them. Because normally you go into it and there is the client and his team and it is almost like you are fighting against the contractor and his team and we are going to build it and our team is here and their team is there and we are building the building in the middle and that is the battle zone."* Industry norms of goal setting often frustrated the suppliers we interviewed, who felt it left them out of the equation: *"Well I think the construction industry has put too much pressure on timescale. So the timescales are being set by a project manager who's reviewing what he sees in front of him and saying to a client "They can build this in 60 weeks." There's been no consultation to a contractor, there's been no review or a contracting element."* Where being excluded from decision making threatened to undermine progress on the project however, suppliers were clear that they had a responsibility to clients to speak up: *"Having said that, we're not that weak. And if we know that it's going to go over budget, because of that, then we will be making very strong representations to the architect and the client. To say, "If you continue with this decision, you will be over budget. And as hard as we try, we can't carry out our role for you."* Thus negotiation was seen as a powerful way to overcome complexity, deepen understanding, engage with knowledgeable clients in a meaningful way, and counter difficult industry norms.

Visualization

One important aspect in understanding the needs and expectations of clients is the client's ability to visualise the project outcome and to understand the relevant project processes.Even where client knowledgeability is high, visualising the finished project and understanding the process of building design was often problematical for both client and supplier. The process, as described by one supplier, could be visualised in two distinct ways: *"There is two aspects of it, you take what the client ultimately gets which is a space, a building that is useable that is the basic design process, it is that aspiration I have just described of your client has a desire, team interprets it and fine tunes it and fine tunes it, contractor takes over that fine tuning and delivers ultimately what the space that the client wants. The other thing which is a parallel to that process going on is how do they want to build it? Clearly the way you build is clearly from the bottom up. The way you tend to design is top down. Not always the case but from a structural perspective, particularly it is top down. Then you build bottom up."* It is

understanding this need to design from the top down (from broad requirements to finer detail) yet build from the bottom up (from specific tasks to the completed project) that eluded many clients, and fostered the kind of client resistance we noted in an earlier section.

In part, this is because the ability to read and interpret technical drawings, something which engineers and architects are trained to do, is not a skill that knowledgeable clients necessarily possess: *"… people can't see from a plan what they're actually getting until it's physically there. They can't see the 3D image of what they're going to get until it's built, until they're standing in a room saying 'Oh, well I thought…'"* and this can frustrate suppliers: *"Yes, that's previously we've done a lot of work in schools, and that's one of the biggest hurdles we find of working with Head teachers and such like. Is we'll sit around a meeting and we'll be talking about this detail and this detail and that goes together like that. And these very academically clever sort of teachers and that sort of thing, they're sitting there and they just don't know how to read drawings, because they just don't know how to do it."*

To help with visualisation one supplier suggested more use be made of 3D computer technology, not just for clients but for other supply chain members on site: *"I do, because I think from us who are looking at it every day, the guys out on site who actually build these things, I think again if they could see something in 3D."* These technologies, where made available on site and to the client, could prove enormously helpful in aligning client needs and expectations with project planning.

CLIENT KNOWLEDGEABILITY

Our data uncovered four key aspects in relation to client knowledgeability. First, the knowledge a client has of both people and processes will impact their role in the project. Secondly, how early exposure to project requirements can help suppliers meet client needs more successfully. Thirdly, how exposure to new knowledge through 'doing' helps extend client knowledgeability. Finally, how habit and the reluctance to abandon already held knowledge can inhibit client knowledgeability.

Client knowledge of people and processes

Making allowances for individual differences and ways of working was one factor that suppliers felt clients needed to understand: *"So there's that aspect and then there's interaction with the teams. It's all about people and personalities and if you can't gel with those types of peoples then - and so far it's working there but every now and then if you have a conflict then you've got to be able to deal with it and go forward."*One successful interaction between the client and the design team was a special workshop which was organised by the project administrator and which included the client: " … *theissue of heat loss or heat gain through windows and we did have a workshop, oh we even had the window manufacturer in, we all sat around the table and* [the client] *knew what he needed and we had to find a way to give it to him. But also maintain the architect's perception of what he wanted to see as a window and how as to how that could be produced to achieve the U-values. So that was quite a good workshop because like I say,* [the client] *was involved with* [the project administrator] *sort of acting as the Chair."*

Involving the client in learning opportunities included for one supplier the notion that clients themselves needed to be trained in how to be clients – particularly if they had prior

industry experience on the supply side: *"… previously working somewhere as architects or engineers and that - so they aren't a client. But when they come to an organisation where they are a client they're not being retrained as a client which is what they should be. They should be going on courses to say that as a client this is what you've got to look at. This is what you've got to provide. These are your duties you've got to do."* Again, such training could mitigate any tendency for a client to abdicate their interests and responsibilities, as noted earlier.

Where clients were knowledgeable of people and processes, this was regarded as a clear advantage for everyone: *"…* [this client] *tends to attract a better class of consultant, better class of contractor. ….. They are an intelligent client, they know what they want which is important. They also are a very important client in terms of prestige."*

Early Exposure

Allowing clients and suppliers, in particular the contractor, to work together early in the design process was seen to be a clear advantage on both of these two projects. *"The beauty of this job really is that we have been involved early so, as soon as someone starts talking about 'Oh I think we can do it like this.' You can say 'Yes, you know that could be done that way, but in our experience, we've tried that before and this happened, so could we not consider doing this?'And you know maybe it's more expensive, but ultimately it could be a better job. You know a far better job for just a few pounds more. Or you could say 'Yes, that's a brilliant design, it's a brilliant solution, but we could offer you this or we could consider this, as a not quite as good, but you'll save yourself half the money.'Type of thing. And when they need to save quite a lot of money they embrace those sort of conversations a lot."*

This early involvement not only builds confidence in the project outcomes - *"And to get that confidence they bring you in early. Then at the end of the day they know that that is the figure they are going to pay now and that will be the figure they will be paying in a year's time if they don't ask for anything different."* But also leads to less hierarchical structuring in the team working: *"…. because the constructors were brought in earlier than after tender, so brought in pre-tender, I would say that they are, and myself included, are part of the design team. We're helping the process, so in effect what I'm suggesting is that this is a very flat structure, everybody's part of the same team really. Even the client, although the client's got to have his hat on 'I want the best for the* [business]*', he's also in there in the mix. I think this process that they've got here with bringing a contractor on early actually helps flatten the structure and avoids, you know, them and us situation."*

However, this early involvement in not only the architectural design, but in the engineering design as well, was not something that current construction industry practice and client knowledgeability was often able to support: *"I think in the past the tradition has always been you get the architect on board and you do it. But I think more and more now engineering and its innovation is a key element to buildings. But clients don't understand that yet. Clients aren't quite to that point of, the payment structure hasn't been geared enough to bring the engineers on early enough to do the job."*

Clearly some clients have been considering challenging the traditional ways of contracting in the industry, even suggesting some radical alterations to the traditional design and build practices:*"But you have to be quite a knowledgeable client to be able to work in that way, wouldn't you? ... if you get in bed with a contractor who is a contract manager and you work with them all the way through, to say 'Well how can you shape, work better, more*

effective, more efficient?'You could work things out quite well. The thing is, is how you get the design in there as well. ... I mean, one thing I've toyed with is actually putting output specifications. Not to do with building or anything. Just output specification [i.e. a building that does this, for this purpose].... Over to you - if you want innovation, you put in what you want. If you want this amount of kilowatt hours per square metre, or something, as an energy standard. And it could be - it could be a management consultant who turns up and says 'We can do that for you.' And they put a consortium together and produce it." On the whole, respondents felt that early involvement in the project was an important and positive influence in supporting project success, particularly where innovation was involved.

Knowing through doing

Acquiring knowledge through actual experience was a powerful learning tool on the projects. In particular on *PowerProject*, where the technology was very innovative and the unknowns in making the project work were great. At one point the design team and the client made a trip to see a similar project at another location in the UK: *"So, yes, that was useful because then, you know, they could see it, we obviously at that state were a fair bit more informed, understanding of, you know, the concept of the kit inside but it was useful taking more people of the design team to really see it to help them, you know, and have discussions with them, not just, you know, formally but, you know, "Yes, remember we saw that," and 'Right how about this?'"*Having visited the site, the team immediately sketched out revision to the design which were later incorporated into their building design, with some success: *"And it was quite useful because literally we came out and we went to a café down to the sea front and we literally it was napkins and going 'But yes, but they've got it that way round.' You know, and I think it was the architect, I can't remember, but anyway we came up with the 'Well they've got it wrong, haven't they?'"* The act of visiting another site, and then immediately activating that new knowledge in an impromptu design session in a local café, proved fruitful for both client and suppliers.

Knowing through doing was also one way of capturing the more tacit aspects of the project and its features, as well as attracting the input of other knowledgeable people to the project: *"So, you know, learning by that experience and then putting that experience forward is always useful. And lots of those little things, you never really document down. You know, if you actually were going to do a report of the project you wouldn't document down all those little minor issues that you learnt along the line that you would - and that's where, you know, lots and lots of people came and chatted me about the low energy buildings, yes I can impart a certain amount, you know, as the guide things come to me ..."*

Knowledge abandonment

Changes in knowledgeability on both the client and supplier side held some interesting implications for innovation and learning in the industry. From the supplier's point of view, in particular the architect, knowledge and training practices in their profession has seen some important changes with implications in particular for their role in relation to the client: *"I think the architect knows where he was king before, he was the lead consultant before has kind of waned a bit. Their overall criteria now is they kind of say 'Well we do our architecture bit and the services guy is doing more overall with his specialists bits.' Whereas previously architects used to do that. So I think their overall control, and some of the older generation architects don't like that because they can see it changing is they are trying to bring it back and have more control. And that's fine by the services guys because we want to go and act as a team. But I think the younger architects, the training in that has changed from how it used to be."*Thus limiting the breadth of knowledge included in the training of

architecture specialists refocuses their attention on the design rather than the engineering elements of a build, and leads to a more limited role in the project team.

On the other hand, suppliers also had to renegotiate their role and abandon some of the more traditional views of their place in project teams: *"So there's that sort of changes to it that do it. The other thing then, for knowledge wise, particularly on these types of projects, you have to learn more than just your profession because the client plus these types of projects which are unusual type projects always test your boundaries for something new."*Thus, brokering becomes a vital skill for suppliers which is just as important as their own expertise: *"And we're not necessarily the be all and end all specialists in it. We're more like the doctor, the GP. We know all the specialists and we can feed that info in and we can get you a concept. But we still rely on the specialists to do it."*

From the client's side, frustration could result from their perception that the design team was sticking to familiar territory and was unwilling to abandon the tried and tested ways of doing things: *"Well, I think, you know, perhaps I'm being incorrect here but, you know, is it just easier for them? You know, they've done it that way back in the past, oh well yes, we've got one of these, we'll just - don't need to question, rush, rush, rush, push it out. You know, 90% of the customers don't complaint because they don't really look into it. ....Perhaps I'm being unfair to them, but it seems that I'm dragging them reluctantly to provide the* [business] *with a good standard and performance when they want to do standard … So no I think the consultants haven't necessarily worked to provide the best basically because they haven't been driven to provide the best. We're an oddity that we do have, you know, a certain amount in-house expertise that we can question things and they're all a bit surprised."*

When asked what the design team could do to help improve the ability of clients to participate in the build process more fully and take on a more proactive role, one client replied: *"Understand more what's out there and what the state of the art and how other people are doing it and what is best practice. I don't think we have a great deal of upfront thinking at a very early stage of other options, other people, what other things are doing and, you know, really trying to get their side of what can be delivered to the customer. It always seems that we get our artistic design before we really have thought about options and what's out there in the outside world."*Thus, abandoning tradition and prior knowledge could help facilitate innovation and more satisfactory project outcomes, but might also limit the role that some specialists might play in the project.

CLIENT COMPETENCIES AND CAPABILITIES

Our data uncovered three key aspects in relation to client competencies and capabilities. First, a tacit knowledge on the part of the customer of the project and project processes was an important factor in its success. Secondly, the client's ability to question project parameters, and the client's openness to new ideas were important elements, particularly in relation to innovative elements of the build. Finally, trust between the client and the suppliers was an important ingredient in facilitating interaction.

Tacit knowledge

For suppliers, the level of tacit knowledge of the client made a significant difference to the process of the build. It eased tensions and offered more flexibility to the suppliers in terms of meeting issues as they arose or dealing with the unpredictable side of innovation on such

builds. As one contractor put it: *"We managed to work round it, yes. And because the* [client firm] *are reasonably, I call them user friendly, they're quite a good company to work for, you know, they can put pressure on, or if they think we're justifiably entitled to some additional time for it, we would normally get it so that worked quite well from that side."*

Such tensions do not simply arise between the client and the contractor however, but also between the design team members. As one contractor noted: *"I think they need, I think a lot of the clients need to live the life we live on a building site. If I say live in the real world. Lots of these concept architects just don't have a clue, you know, they can draw things, they can make things look absolutely brilliant but to actually build it, you know, they can't, it can't be done. And I think they really need to grasp the parameters that we can work to out there. You know, they expect more than what we can actually deliver."* In such scenarios, the ability of the client – thought their own tacit knowledge of living the life as experienced on the building site – is an important factor in managing tensions in the design team and setting and agreeing realistic parameters for the project.

Clients themselves recognised that their tacit knowledge was an important feature of the project, as one commented: *"And so I started thinking "Well there actually is something here that we could sort of… The trouble is nothing, you can't sort of patent it or you know because it's relatively free, it's just our experience of building one after the other. And identifying what does work and what doesn't and saying well you know 'Crike…'"* Therefore tacit knowledge on the part of the client helps enhance innovation in such projects in particular because it allows more flexibility, and offers some basis for clients to manage realistic project parameters and objectives.

Ability to question and openness to new ideas

We have already noted, in relation to client respect, that for suppliers demonstrating such respect meant that they needed to take a more pro-active approach to their interactions with clients, and that this led some to question their own traditional methods of interaction with clients. On the other hand, from the client's perspective the ability to raise questions and challenge practices was seen as an important and distinctive attribute on these projects. As one client commented: *"It is getting it you know …. the acceptance that we do and we can ask these questions. A lot of clients don't. A lot of design teams build buildings - that's it they don't really have a client who is an informed client, who is you know has got building professionals in the team that can question these things. So often they just put up buildings and get away with it, you know some of these buildings you know are built extremely poorly. I mean services consultants they are notorious you know they put in things that are just plainly wrong just absolutely."*Such client competencies also needed to be matched by the capability to assert their views and exert influence in the face of the specialist knowledge of the suppliers:*"You've got to be as knowledgeable but as open as possible to undertake and understand new ideas and concepts but you've got to be communicable enough and forceful enough or assertive enough to actually say 'No, you know, you're not convincing me, keeping going, you know, because at the moment I'm going that way and you seem to want to take me that way but, you know, you haven't convinced me and at the moment I'm going to recommend this unless you can do better.'"*

Educating clients in new and innovative solutions were seen as an important role of the design team specialists, even though doing so could bring problems or raise issues with the client: *"So there is friction when you suggest something new but you have to make every client aware of it, it's part of your role in the future of M&E* [mechanical and electrical

engineering].*"* However the main stumbling block to educating clients in this way is the fact that costing's for the build are often done prior to the details of the build being known, and so when suppliers suggest new ideas, these cannot be accommodated within the established build budget.

Encouraging clients to be open to new ideas and to be able to make informed choices seemed to appeal to the suppliers, who suggested that holding meetings and workshops to facilitate this would be worthwhile, as one contractor noted: *"Well again, I suppose we can have, it could all be done in a meeting format, you know, involving them in, or we involve them in value engineering anyway because at the end of the day they're the ultimate end user so they need to know what they're going to be getting but I think workshops with people like this is very useful."* and not difficult to achieve, according to one supplier: *"And sometimes it is having a workshop with people. And I don't think it would cost a lot of money. A lot of it is just having two day work shop saying "This is the project. This is what we're going to look at. And let's go through and these are all the items we want to look at."*

Trust

In relation to client needs and expectations, we previously noted that industry norms sometimes fostered an adversarial approach to goal setting and task completion. Trust then is an issue recognised by both clients and suppliers in the industry. In working closely with a highly knowledgeable client, one supplier noted that transparency was important: "*When we have priced it, everything has been seen by the client and their team. If we are saying £100 to put a window in like that everybody knows that that is what we want. Similarly then that gives somebody the opportunity to come back and say 'Actually we have just done that and it cost us £50.'For it to be scrutinised if you see what I mean. So I think it then does open up and you have probably got to be a bit more I wouldn't say honest, it has got to be a bit clearer."*

But what are the competencies and capabilities that suppliers look for in a client in order to foster this trust? One obvious capability was the ability to meet their financial obligations: *"Certainly one of the criteria is the client has got to be stable client ... Yes, financially, yes. We would not tender for any work if it's not from a reputable client source. Government backed contracts like … Education, we do a lot of that. Government work. You know you're guaranteed, they are not going to go pop as it was.*" In addition, long-term commitment to the relationship and learning opportunities were also criteria that suppliers used to judge client suitability: *"So I think looking for clients is that loyalty aspect. Both from them as well as from you back to it as well. Long term commitment, that you're trying to build something there and get some work out of them. You don't need all their work but you want a percentage of their work as with anything. And I suppose as well diversity of workload. Because you don't necessarily want the same* [type of] *jobs on at the same time because that's not necessarily a good thing."*

Finally, trust was important because it fostered collaborative working. As one client stated: *"Well, I think trying to work collaboratively. Because you know, working collaboratively with a knowledgeable group of people who want to make a difference, makes a difference. So it's to do with getting the right mixture of people together, but then working in a collaborative way. And knowing, that you'll get a good result from that. Knowing the contractor, or whoever produces this thing, has to make a living, and you're not trying to screw them, or get one over. There's got to be that attached to it. And I think, knowing what's out there, in the industry. Because the industry is changing. Modern methods of construction - all these things that can make a difference. But it goes back to Money and Trust, a lot of the*

time." The ability to work collaboratively and to allow the customer a real role in the team was one of the main considerations in the choice of contractor for this client: *"I wanted to bring them on board, because I must admit, I was quite impressed with their management approach and their customer focus. I mean, it's not one of those contractors where you say "Customer focus" and "Customer relations" and they don't, sort of, go 'What?' ….. No, I checked it out. And I thought "They're the right sort of people to do business with.'*

CONCLUSION

Noting the call by Blazevic and Lievens (2008) for further research in client-supplier collaborations, and the benefit to IMP related research of a more explicit focus on the interaction between clients and suppliers, our research builds a better understanding of specific company-client collaborations – in particular where knowledgeability is high - and the need for client and supplier education in the co-creation of value process. Our contribution to research in understanding how network interactions foster successful project interactions and outcomes comes from investigating how the inclusion of highly knowledgeable clients in business networks alters current assumptions and practices. Even highly knowledgeable clients may lack formal training or specific expertise, yet their input is significant. There is as yet little understanding of how to co-create value with such clients. Thus businesses may lose important opportunities to learn and innovate, and value for the client and the firms in the network that results will be far from optimal. This may be particularly acute in project-based settings (and so-called temporary organizations), as examined in the present study, where collaborations can be short-lived and thus the time frame in which actors can learn is often limited and pressured.

The findings in the present study raise new questions in relation to client inclusion in innovation, their position in the wider project network, and their role in understanding project processes and setting achievable project parameters and outcomes. To what extent is client training and education desirable in innovative project situations? How might early involvement of clients and suppliers be fostered in the face of uncertain project requirements? Does early involvement always lead to enhanced project outcomes? What role might suppliers play in brokering knowledge and innovation with knowledgeable clients? How might that role be rewarded? How might client and supplier knowledgeability carry over from one project setting to another?

Our main contribution is the development of new theoretical insights into the feasibility and legitimacy of client involvement in business-to-business networks and how this may lead to greater client satisfaction, value creation in networks, enhanced innovation, and greater organizational learning.

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REFERENCES

Anderson, P. and Cook, N. (2004). Dynamic innovation strategies and stable networks in the construction industry: implanting solar energy in the Sydney Olympic Village,*Journal of Business Research* 57: 351-360.

Araujo, L. (1998). Knowing and learning as networking. *Management Learning,* 29 (3), 317-336.

Archer, M.S. (1995). *Realist Social Theory: A Morphogenetic Approach*. Cambridge University Press,Cambridge.

Archer, M.S. (2007). *Making our way through the world: human reflectivity and social mobility*. Cambridge University Press, Cambridge.

Bangens, L., & Araujo, L. (2002). The structures and processes of learning: a case study. *Journal of Business Research,* 55 (7), 571– 581.

Beach, R., Webster, M., Campbell, K.M., (2005). An evaluation of partnership development in the construction industry. *International Journal of Project Management, 23*, 611–621.

Bechky, B. A. (2006). Gaffers, Gofers, and Grips: Role-Based Coordination in Temporary Organizations. *Organization Science*, 17(1), 3-21.

Bell, S., Auh, S. and Smalley, K. (2005). Customer Relationship Dynamics: Service Quality and Customer Loyalty in the Context of Varying Levels of Customer Expertise and Switching Costs, *Journal of the Academy of Marketing Science*, 33, 169-183.

Blazevic, V. and Lievens, A. (2008). Managing innovation through client coproduced knowledge in electronic services: An exploratory study. *Journal of the Academy of Marketing Science, 36*, 138-151.

Brandes, O. and Brehme, P. (2001) Core Relations and the Intermediates-The Case of Prestige Cars, *17th IMP-conference*, Oslo.

Bygballe, L. E., Jahre, M., and Sward, A., (2010). Partnering relationships in construction: a literature review, *Journal of Purchasing and Supply Management, 16*, 239-253.

Cohen, D. M., and Levinthal, D.A. (1990). Absorptive Capacity: a new perspective on learning and innovation. *Administrative Science Quarterly, 35*, 128-152.

Construction Industry Institute (1991). *In Search of Partnering Excellence*. CII Special Publication, Construction Industry Institute, Austin, Texas

Dubois, A. & Gadde, L. (2002). The construction industry as a loosely coupled system: implications for productivity and innovation. *Construction Management and Economics*, 20: 621-631.

Dyer, J. H., and Singh, H., (1998). The Relational View: Cooperative Strategy and Sources of Interorganisational Competitive Advantage. *Academy of Management Review 23*, (4), 660-679.

Echeverri, P., and Skalen, P., (2011). Co-creation and co-destruction: a practice-based study of interactive value formation, *Marketing Theory, 11*(3), 351-373.

Fawcett, S., Magnan, G. and Williams, A. (2004). Supply Chain Trust Is Within Your Grasp. *Supply Chain Management Review*, March.

Ford, D. and Håkansson, H. (2006), "The Idea of Business Interaction" *The IMP Journal* 1(1): 4-27.

Grabher, G. (2002). Cool Projects, Boring Institutions: Temporary Collaboration in Social Context.*Regional Studies*, 36(3), 205-214.

Gronroos, C., (1982). An applied service marketing theory, *European Journal of Marketing, 16*(7), 30-41.

Gummesson, E., (1987). The new marketing: developing long-term interactive relationships, *Long Range Planning, 5*(5), 5-20.

Håkansson, H., and Ingemansson, M., (2011). Construction companies and how they acquire knowledge through business interaction, *The IMP Journal*, *5*(2), 67-78.

Håkansson, H., Ford, D., Gadde, L., Snehota, I. and Waluszewski, A. (2009) *Business in Networks*. Chichester: Wiley.

Håkansson, H., and Johanson, J., (2001)Business Network Learning – basic considerations, in Håkansson, H., and Johanson, J., (eds). *Business Network Learning*, Amsterdam: Pergamon.

Håkansson, H., Havila, V. & Pedersen, A-C., 1999, Learning in Networks, *Industrial Marketing Management, 28*, 443-452.

Hamm, S. (2007). Radical Innovation: Lessons from IBM's Innovation Factory.*Bloomberg Businessweek*, August 30.

Howcroft, B. and Beckett, A. (1996). Branch networks and the retailing of high credence products, *International Journal of Bank Marketing*, 14 (4), 3 – 11.

Hurley, R. and Hult, T. (1998). Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination.*The Journal of Marketing*, 62 (3), 42-54

Hemetsberger, A. and Godula, G. (2007). Integrating expert customers in new product development in industrial business – virtual routes to success. *Innovative Marketing*, 3 (3), 28-39.

Jones, C. Hesterly, W. S. & Borgatti, S. P (1997). A General Theory of Network Governance: Exchange Conditions and Social Mechanisms. Academy of Management Review, 22, 911-945.

Johnsen, T. and Ford, D. (2000). Managing collaborative innovation in complex networks: findings from exploratory interviews. *16th IMP-conference in Bath*

Johnston, W. J., Peters, L. D. and Gassenheimer, J. B., (2006). Questions about network dynamics: Characteristics, structures, and interactions. *Journal of Business Research, 59*, 945-954.

Lado, A. and Wilson, M. (1994). Human Resource Systems and Sustained Competitive Advantage: A Competency-based Perspective. *Academy of Management Review*, 19 (4): 699-727.

Kubal, M.T., (1996). The future of engineered quality. *Journal of Management in Engineering*, *12*(5), 45-52.

La Rocca A., Snehota I. (2011). Knowledge in use when actors interact in business relationships. IMP Journal, 5 (2), 79-93.

Lambe, C. J., Spekman, R. E., & Hunt, S. D. (2000). Interimistic relational exchange: Conceptualization and propositional development.*Journal of the Academy of Marketing Science*, 28(2), 212-225.

Ling, F. (2003) Managing the implementation of construction innovations, *Construction Management and Economics*, 21: 635-649.

Lundin, R. A. & Soderholm, A. (1995). A Theory of the Temporary Organization.*Scandinavian Journal of Management*, 11(4), 437-455.

Lusch, R. F., Vargo, S. L., and Tanniru, M. (2010). Service, value networks and learning. *Journal of the Academy of Marketing Science, 38*, 19-31.

Macdonald, E. and Uncles, M. (2007). Consumer Savvy: Conceptualisation and Measurement, Journal of Marketing Management, 23 (5-6): 497-517.

March, J. G. (1995). The Future, Disposable Organizations and the Rigidities of Imagination.*Organization*, 2(3/4), 427-440.

Martin, C. R., Horne, D. A., and Schultz, A. (1999). The business-to-business client in the service innovation process. *European Journal of Innovation Management, 2*(2), 55-62.

Miozzo, Marcela, and Ivory, Chris (2000) Restructuring in the British construction industry: implications of recent changes in project management and technology, *Technology Analysis & Strategic Management*, 12 (1): 513-531.

Nataraajan, R., and Angur, M. G., (1997). A quest for the "industrial maven", *Industrial Marketing Management*, *26*, 353-362.

Natti, S. and Hanttu, N. (2003) Knowledge transfer through key account management systems in expert organizations, *19th IMP Conference*, Lugano.

Ogawa, S. and Piller, F. (2006). Reducing the Risks of New Product Development, *MIT Sloan Management Review*, Winter, 65-71.

Pozzebon, M. (2004), The Influence of a Structurationist View on Strategic Management Research,*Journal of Management Studies*,41 (March): 247-272.

Robinson, H, Carrillo, P., Anumba, C., Al-Ghassani, A., (2005). Knowledge management practices in large construction organizations. *Engineering, Construction and Architectural Management, 12*(5), 431-445.

Shostack, G. L., (1977). Breaking free from product marketing, *Journal of Marketing*, *41*(2), 73-80.

Tavassoli, D. (2008). Ten Steps to Better Requirements Management, IBM White Paper, accessed 6/3/2012 at: ftp://ftp.boulder.ibm.com/software/uk/pdf/RAW14059-USEN-00-1.pdf

Teece, D. J. (1986). Profiting from technological innovation: implications for integration, collaboration, licensing, and public policy. *Research Policy*, 15, 285-305.

Vargo, S. L., and Lusch, R. F., (2008). Service-dominant logic: continuing the evolution, *Journal of the Academy of Marketing Science*, *36*(1), 1-10.

Vargo, S. L., and Lusch, R. F., (2004). Evolving to a new dominant logic for marketing, *Journal of Marketing*, *68*(1)1-17.

Von Hippel, E., Schroll, R. and Füller, J., (2011) Costless Creation of Strong Brands by User Communities: A Potential Challenge to Producer Profits (February 7, 2011). Available at SSRN: http://ssrn.com/abstract=1756941

Von Hippel, E., (2011). Users Rule, *Technology Review*, 114 (2), 14-15.