A REVIEW of SUPPLY CHAIN MANAGEMENT in UK CONSTRUCTION: A TRIUMPH OF SPIN OVER SUBSTANCE

Abstract

The relevance, impact and benefits arising from the diffusion of supply chain management within the construction sector, particularly in the UK, continue to form a platform for significant debate in the academic literature. Whilst a variety of theories informing and arising from such debates have been espoused, extolled and in some cases considered limited, there remains an underlying criticism regarding a lack of contextual sensitivity. Consequently, widely accepted theories sensitive to the unique characteristics of the construction sector to explain and direct the diffusion of supply chain management and the development of practice remain elusive. A Straussian grounded theory research strategy was therefore adopted as it offered the opportunity to contextualise interpretations of practice for the purpose of developing theory. The process of iteration between data and extant literature provided significantly greater opportunities to draw connections, explore tensions and develop insights specific to construction supply chain management theory and practice. Case studies from the contracting sector are used to explore industry interpretation and enactment. The findings, grounded in the daily realities of construction practice disclose evidence of supply chain management creep. It is concluded, however, supply chain management in UK construction practice remains largely underdeveloped.

Keywords Supply Chain Management, Grounded Theory, Practice, Collaboration, Construction Industry.
INTRODUCTION

The subject of supply chain management continues to grow in popularity and generate significant debate within the construction management community (O'Brien et al., 2009, Meng et al., 2011). Drawing heavily on the language and protocol of the manufacturing sector (Rimmer, 2009), many of these debates are underpinned by a taken for granted assumption concerning the utility of supply chain management theory to construction management practice (HM_Treasury, 2010). Drawing on this assumption, there has been repeated challenges for the construction sector to draw efficiency gains and performance improvements via the implementation of supply chain management (Egan, 1998, Wolstenholme, 2009). Furthermore, adopting supply chain management in operational environments where a sizable percentage of the work is outsourced is considered to provide significant competitive advantage (Briscoe and Dainty, 2005). The UK construction industry with its significant investment in subcontracting (BERR, 2004, Hartmann and Caerteling, 2010) is therefore theoretically well positioned to take full advantage of benefits flowing from the implementation of supply chain management theory to practice. Notably, resultant rewards for performance improvement are argued to be “not solely for any one company but for the whole supply chain network” (Akintoye et al., 2000 p.167).

Consequently, early reviews of the impact of supply chain management theory on construction practice Saad (2002), Akintoye et al (2000) and Vrijhoef and Koskela (2000) sought evidence of benefits and performance improvement. These reviews at best provided insightful commentary regarding the opportunities and barriers to current and future industry adoption of supply chain management. They were less persuasive however regarding substantive early adoption of supply chain management by industry practitioners. More contemporary reviews have however
contended that adoption has led to progressive and multi-dimensional constructs of supply chain management (O'Brien et al., 2009, Pryke, 2009). These are argued to be discernable through three distinct supply chain themes namely; production, organization and information technology (O'Brien et al., 2009). The production theme focused upon lean thinking and production theory which formed the focus of early studies of supply chain management (Holti et al., 1999, Holti et al., 2000, Jorgensen and Emmitt, 2008). The organization theme resonates with the dominance of client-led construction supply chain structures and implementation (King and Pitt, 2009). And, the information technology theme finds resonance with contemporary views of a greater industry capacity for ICT integration (Vaidyanathan, 2009) and the increasing popularity of Building Information Modeling (BIM) technologies (Macdonald, 2011). The existence of such themes in theory is not in doubt but, their impact upon construction supply chain management practice cannot be widely confirmed. What is not in doubt though is that the study of construction supply chain management theory and practice is both complex and diverse (Hughes, 2009).

Providing more circumspect views of implementation, a number of construction management researchers point to context as pivotal to any understanding of supply chain management and its relevance to disparate industry sectors (Green et al., 2005, Fernie and Thorpe, 2007). Reinforcing such arguments, a repeated lack of contextual integrity is considered to misconstrue practitioner understanding and inhibit interpretation (Bresnen, 2009). Similarly, Cox et al’s (2004) arguably pragmatic and critical perspective views construction supply chain management as a chronicle of convenient construction alliances beset by temporarily suppressed antagonism. Such a perspective stands in sharp contrast to those who are acquiescent regarding the utility of supply chain management theory to construction management practice.
Drawing on the diversity of views described above, and after more than a decade of policy development, academic debate and industry engagement, there remains little clarity surrounding construction supply chain management practice or performance improvement. As such, it is considered timely to explore, from the perspective of industry practitioners, how supply chain management theory has been interpreted, developed and used in contemporary construction management practice. Drawing upon the arguments regarding contextual sensitivity, the study develops theory through engagement with practitioners’ perspectives of construction supply chain management practice. The research strategy adopted is grounded theory (Glaser and Strauss, 1967) as it was considered to have a unique attractiveness within socially orientated research communities such as construction management and, it offered greater resonance with the objective to develop theory.

The paper is structured as follows. A review of supply chain management literature discloses a plethora of definitions and perspectives. In the absence of a universally recognized definition, a pluralist interpretation of construction supply chain management is advocated. The following section reviews supply chain management in a construction context. Emphasis is placed on key characteristics emblematic of the construction process. A grounded theory research strategy is adopted. Methods of data collection include semi-structured interviews, supplemented with alternative forms of narrative data. Case study information is provided including participants, sample sizes and predesigned interview protocol. The findings and discussion section draws upon an iterative-inductive approach to practitioner understanding and practice of supply chain management. In conclusion, the contrast between construction supply chain management rhetoric and reality is highlighted. Mindful of the inherent limitations, recommendations are suggested for future research.
SUPPLY CHAIN MANAGEMENT

Despite growing awareness, the definition of supply chain management in organizational studies remains shrouded in a fog of semantic ambiguity (Mentzer et al., 2001). Consequently the term “supply chain management is likely to mean different things to different people” (Skitmore and Smyth, 2009 p.93). The exact origins of the term ‘supply chain management’ remain unclear (Croom et al., 2000) however initial supply chain models are thought to draw largely on a logistics and purchasing / operations perspective (New, 1997, Brown and Cousins, 2004, Kampstra and Ashayeri, 2006).

According to Spekman et al (1998) the original premise of supply chain management was to leverage the best possible price from the market whilst ensuring an adequate supply to meet consumer demand. Cox et al (2006 p.34) arguably extend the supply chain principle to advocate a procurement strategy that “involves the buyer undertaking proactive supplier development work, not only at the first tier of the supply chain, but also at all the stages in the supply chain from first-tier through to raw material supply”.

In contrast to the operational efficiency of the supply chain, Cooper and Ellram (1993) favour a philosophical outlook. Re-calibrating supply chain management as a conceptual framework represents “a new way of managing the business and relationships with other members of the supply chain” (Lambert and Cooper, 2000 p.65). Alternatively, supply chain management may be perceived as a business metaphor. According to New (1997) a metaphorical interpretation raises the commercial awareness of supply chain management to a strategic status (Ramsay and Croom, 2008). Supply chain visionaries on the other hand anticipate a competitive environment where supply chains compete, rather than individual firms
These broader abstract views provide significant challenges to established organisational theory and management concepts such as power, trust and ethics.

The Council for Supply Chain Management Professionals (CSCMP) arguably in search of a compromise sponsor a generic definition. Subsequently, the CSCMP (2009) definition not only captures the functionality of supply chain management practice but also reinforces integration, collaboration and the notion of porous organizational boundaries. A consensus definition however is unlikely to appease supply chain enthusiasts or provide any comfort to practitioners looking to embed supply chain management in their practice to gain the benefits professed to accrue from adoption.

Embracing diversity (Agapiou et al., 1998) and competing supply chain management definitions (Tommelein et al., 2009) the endorsement of a pluralistic interpretation of supply chain management arguably makes sense. Defining supply chain management grounded in practice would evoke an industrial awareness (Jepperson, 1991) that could temper supply chain management philosophy with a construction sector fit-for-purpose functionality. Challenging the idea of consensus, pluralism encourages creativity, provokes critical inquiry (Ramsay and Croom, 2008) and stimulates multiple opportunities to construct meaningful understanding from the daily realities witnessed in construction practice.

The Emergence of Supply Chain Management in Construction

The disaggregation of corporate structures witnessed in multinational organizations during the 1980’s and 1990’s (see Zenger and Hesterly, 1997) may be reflected upon as a catalyst for large construction organizations to re-engineer their portfolio of business interests. In response to the rapidly changing market, according to Miles
and Snow (1986 p.64) “new organizational forms arose to cope with new environmental conditions”. In the aftermath of the dissaggregation of construction hierarchies and the subsequent demise of the general construction contractor, the governance of commercial relationships was transformed. It may be argued the spectre of supply chain management in construction became increasingly pertinent. The pressing challenge for newly constituted ‘hollowed out’ (Green and May, 2003 p.102) construction organizations was to vertically integrate the diverse and complex network of construction subcontractors and suppliers. Even for the simplest construction projects, project delivery and ultimately organizational success became intertwined with the actions, interaction and commercial transaction of third party participants.

The guiding principles of supply chain management theory and practice arguably provide an alternative framework for the appraisal of commercial transactions between clients and construction industry service and product providers. However, for construction to replicate the performance achievements often associated with supply chain management in manufacturing and retail demanded “careful translation” (Skitmore and Smyth, 2009 p. 97). The concern for many critics is that the practice of supply chain management has on the contrary been ‘lost in translation’.

**Supply Chain Management in Construction**

Bridging the gap between the theory of supply chain management and practice, Vrijhoef and Koskela (2000) identified five discrete supply chain roles; the operational interface, the operational capacity, onsite construction processes, fully integrated management and the role of the serial construction client. The fifth role, client-led construction supply chain management has arguably dominated interest in
supply chain management for the preceding decade (King and Pitt, 2009). Reflecting upon and reinforcing the fifth role has consistently highlighted the pivotal position construction clients play in driving continuous improvement in supply chain management practice (Egan, 1998, Strategic_Forum, 2002, Briscoe et al., 2004).

Although difficult to divorce from the influence of ‘partnering’, the volume of construction activity procured via construction alliances and by extension client-led supply chain management has increased significantly (Ingirige and Sexton, 2006, RICS, 2010). Construction clients seeking a strategic alliance with contracting organizations are typically repeat customers with a significant capital spend programme (Constructing_Excellence, 2005). The formation of a strategic alliance replaces countless commercial exchanges with an unitary long-standing relationship (Tommelein et al., 2009). This has, according to proponents of construction supply chain management created significantly improved opportunities for end-to-end service delivery (Rimmer, 2009).

Strategic alliances have a restricted appeal. The number of construction clients with the financial and operational capacity to procure an ongoing and significant volume of projects is limited. Critics also note that contrary to notions of end-to-end service delivery, strategic alliances and their client-led supply chains are limited in that they rarely extend beyond the first tier (Saad et al., 2002, Briscoe and Dainty, 2005, Skitmore and Smyth, 2009).

Strategic relationships are not only confined to the construction client and the project orientated supply chain. The importance of subcontracting is readily acknowledged within supply chain management research (Vrijhoef and Koskela, 2000, Dainty et al., 2001). In an study predating contemporary interest in construction supply chain management, Eccles (1981) noted that main construction contractors who
subcontract frequently only work with a few carefully selected specialist subcontractors. This according to Lambert and Cooper (2000), is the first recognized step towards organizational supply chain management integration. At the very least, this usually takes the form of establishing ‘partnerships’ and instigating control mechanisms to continuously monitor supplier performance (Stuart, 1997). Whilst the relationships encountered by Eccles (1981) were largely tacit, the enduring, ‘quasifirm’, neither market nor hierarchy (Powell, 1990) is nowadays arguably representative of the characteristically short (King and Pitt, 2009) contractor driven organizational supply chain (Male and Mitrovic, 2005).

Cox et al (2006) calls into question many of the underlying assumptions of construction supply chain management. Central to the argument is the dominant pro-market transactional relationship, typical within UK construction (Korczynski, 1996, Beach et al., 2005). An inherent tension between competition and collaboration undermine largely fanciful notions of a construction supply chain management win-win scenarios (Cox et al., 2004). Consequently, supply chain management in construction is not solely about collaboration, it is about adopting the best sourcing strategy to appropriate best value (Cox and Thompson, 1997, Cox, 1999). Challenging many of the prevailing collaborative construction supply chain management strategies, power and commercial leverage remain pivotal to supply chain kinetics (Cox et al., 2004). Drawing attention to the fragile transactional and social symmetry between trading organizations, Tommelein et al (2009) suggests that continuing predominance of localized decision making in construction supply networks will compromise supply chain performance.

To date, there have been numerous studies undertaken to explore supply chain management in UK construction. Whilst the theoretical foundations and subsequent
findings often appear contradictory, two discrete forms of construction supply chain structure are unequivocal. First the organizational supply chain driven by the construction contractor and second the client-led supply chain with its well-defined project orientation. Both supply chains are typically short (King and Pitt, 2009, Skitmore and Smyth, 2009) and remain largely exclusive (Vrijhoef and de Ridder, 2005). Engaging with supply chain practice, “guided by the daily realities made by those who participate in them” (Suddaby, 2006 p.634) the research seeks to evaluate evidence of substantive practice and emergent theory building through a lens of grounded theory.

RESEARCH STRATEGY

A research strategy guided by the principles of a Straussian or evolved grounded theory was followed for this exploration of construction supply chain management. Grounded theory is described as the discovery of theory systematically acquired via social inquiry ‘grounded’ in data collection (Goulding, 1998, Fellows and Liu, 2003). The selection of a grounded theory research strategy was largely dictated by the nature of the overriding research ambition; to explore the reality of construction supply chain management practice in contrast to construction supply chain management rhetoric. The chosen research strategy is not designed to hypothesize and test a theory. Contrary to the positivist paradigms favoured within construction management research, grounded theory is envisaged to interrogation practitioner understanding and expose substantive social processes that bridge the gap between management rhetoric and industry reality (Orton, 1997).

Research interest is focused on behavioural patterns (Goulding, 1998). Consequently, positivism paradigms of cause and effect do not conveniently align with the interpretative context of the research methodology (Jeon, 2004). Whilst all
research is acknowledged as interpretative (Gummesson, 2003) grounded theory is “particularly suited to the study of behaviour” (Goulding, 1998, p.56) and “to understand the process by which actors construct meaning out of intersubjective experience” (Suddaby, 2006, p.634).

The concept of grounded theory is not without criticism (Jeon, 2004). Since publication of ‘The Discovery of Grounded Theory: Strategies for Qualitative Research’ (Glaser and Strauss, 1967) various sections of the research community have repeatedly challenged the underlying principles (Bryant and Charmaz, 2010). Arguably a product of the time (Thomas and James, 2006), grounded theory was a reaction to the dominant positivist research paradigms of the period (Glaser and Strauss, 1967, Kennedy and Lingard, 2006). Since publication of ‘The Discovery of Grounded Theory’ (Glaser and Strauss, 1967) critical debate has raised concerns regarding the legitimacy of grounded theory’s epistemological standpoint.

Reservations of grounded theory’s epistemological integrity dwell primarily on the iterative-inductive nature of knowledge creation. Principally on the grounds that a grounded theory research methodology presupposes that reality is only exposed via empirical observation and ensuing induction (Haig, 1995). For research purists, the iterative-inductive approach to generating so-called ‘scientific’ data is largely regarded as ill-considered and highly questionable. Often judged as ‘unscientific’ by research conformists, they contest grounded theory methodology deviates beyond acceptable boundaries of research validity, reliability and objectivity (Goulding, 1998, Jeon, 2004).

Proponents of grounded theory such as Kennedy and Lingard (2006 p.102) counter that the systematic and meticulous approach embedded within grounded theory methodology does “live up to the standards of ‘rigour’ imposed by the quantitative
"paradigm". However, riding two theoretical horses (Thomas and James, 2006) do little to allay the detractors. According to Thomas and James (2006) conflating the expectation of one theoretical paradigm with another remains highly problematical. Squeezing a reluctant post-positivist narrative into a positivist canon of verification is arguably unscientific. Whilst they are mutually exclusive; you can have expectations of both.

The research expectations of grounded theory methodology represent a notable departure from the dominant research methodologies largely rooted within the positivist tradition. Not only do grounded theorists challenge conventional wisdom regarding epistemological thinking, the methodology also questions the issue of silent authorship. The nature of grounded theory with emphasis on iterative-inductive research has many parallels with ethnographic study (O'Reilly, 2005) and "brings to the fore the notion of the researcher as author" (Mills et al., 2006). Charmaz, a former student of Glaser and Strauss, advocates a style of writing that contrasts with traditional scientific report writing. Suggesting instead to adopt a more literary style (Mills et al., 2006). This style of writing is gaining considerable momentum within quantitative data analysis and academic publication. According to Stern "qualitative researchers needs to be something of a storyteller" (Stern, 2010 p.122), and storytelling should be a distinctive feature of the research outcome (Holt, 2003).

Criticism of grounded theory methodology is not solely confined to supporters of positivist research methodologies. Campaigners of ‘mainstream’ interpretivism and qualitative data analysis (QDA) also express qualified misgivings. Within the QDA research community; ‘objectivity’ especially in the pursuit of research accuracy continues to be a highly regarded characteristic of the researcher. However, the
‘worrisome accuracy’ expressed by the QDA research community is misconstrued according to proponents of grounded theory. Glaser (2002a) clearly states that the grounded theory researcher, contrary to QDA misgivings, is not compelled to maintain objectivity or ‘personal distance’ in order to accurately depict social events. The ideological tension evident between the various schools of research thinking is further compounded by the emergence of two distinct variants of grounded theory methodology. Following in the wake of their collaborative research, the personal relationship between Glaser and Strauss became increasingly antagonistic (Kennedy and Lingard, 2006, Kelle, 2010). In subsequent publications, Strauss working in collaboration with Juliet Corbin is argued to depart from the original ethos of grounded theory research (Jeon, 2004, Glaser and Holton, 2004). Glaser, on the other hand is seen by many to have remained faithful to the original concept (Heath and Cowley, 2004, Goulding, 1998). Nowadays grounded theory is widely recognized to have two distinct avenues of practice; a Glaserian (classic / traditional) orientation or alternatively a Straussian (evolved) adaptation (Jeon, 2004, Mills et al., 2006, Heath and Cowley, 2004).

Comparison of the two variants of grounded theory exposes several subtle methodological differences (Mills et al., 2006). However it is the relationship between extant literature and the role of the researcher that creates most friction (Heath and Cowley, 2004). In principle, a Glaserian or classic grounded theory methodology addresses issues of data verification only subsequent to the discovery of theory. Researchers engaging with this variant of grounded theory methodology would typically commence data collection prior to any literature review. The primary objective for the Glaserian grounded theory researcher is to maintain theoretical sensitivity during the data collection phase. Once the data collection phase is well
developed extant literature can be drawn upon to substantiate emergent theory grounded in practice.

Alternatively, Staussonian or evolved grounded theory methodology engages with data verification as an ongoing process (Jeon, 2004). For Strauss, “the use of self and literature are early influences” (Heath and Cowley, 2004 p.143). Critics of a Straussian orientation argue that the constant iteration between data collection and extant literature may lead to the ‘forcing of data’ (Glaser, 2002a, Glaser, 2002b). On the other hand proponents of a Straussian approach highlight the idealistic ‘Glaserian’ notion that researchers approach grounded theory methodology with an ‘empty head’. Kelle (2005 p.3) writes that “qualitative researchers who investigate a different form of social life always bring with them their own lenses and conceptual networks”. A researcher’s standpoint regarding the ‘forcing of data’ debate will ultimately determine the grounded theory methodology adopted.

While remaining theoretically sensitive to the pitfalls of the chosen research strategy, grounded theory offers an alternative and highly contextualized research perspective (Green et al., 2010). Notwithstanding the scholarly debates, grounded theory “continues to be used within a wide range of research settings” (Thomas and James, 2006 p.768). Over the years grounded theory has developed a positive reputation especially within the social science disciplines of education and health (Mills et al., 2006). If carefully structured, managed and audited with a research discipline and rigour characteristic of the traditional positivist doctrine, grounded research may illuminate a contextualized interpretation and a richness of practice beyond the scope of more established research strategies. Mindful of the limitations and assumptions of a grounded theory methodology as well as the dualistic tension between the
founders Glaser and Strauss, this research strategy draws upon the legitimacy of a Straussian (evolved) approach to grounded theory.

RESEARCH METHODS

Data Collection

Data collection focuses on case studies from the UK construction industry, conducted between December 2009 and October 2010. A number of key data sources were selected for the empirical exploration of contemporary construction supply chain management theory and practice. The research findings and subsequent discussion rely principally upon interview transcripts taken from tape-recorded semi-structured interviews. However, alternative sources of narrative data in the form of notes taken from meetings not recorded, personal recollections documented after meetings and comments cited prior to or immediately after the semi-structured interviews are also drawn upon. Where appropriate the auxiliary field observations either augment or mitigate iterative deductions derived from the interview transcripts.

The objective of the research data collection phase was two-fold. The first objective required harvesting evidence of supply chain management theory and practice from multiple sources. Sources included supply chain management literature, meetings with industry practitioners and formal interview data. Each source would contribute to the formation of a contextually rooted interpretation of construction supply chain management theory and practice. The second aim was to simultaneously reduce a subjective bias that may arise from looking at a single client, a single project, a specific construction supply chain or a particular form of contractual governance.

Research participants were initially identified by requesting companies to register their interest in the research programme. Once contact was established and company
suitability evaluated, interview dates were arranged. The interview process was utilised to request interviewees to suggest potential candidates suitable for inclusion within the research programme. This ‘snowballing technique’ (Green et al., 2010 p.120) proved to be very successful and resulted in further research contacts being established not only within the informants organization but also with other construction companies. As the data collection phase gathered momentum it became apparent that there was a significant degree of both organizational and personal familiarity within the construction community.

Data Sources

The iterative nature of the research methodology had a significant impact upon the composition of construction research data sources. Initial conversations with construction contracting organizations not only disclosed an enthusiasm for construction supply chain management but also an organizational priority. Construction contractor interest in construction supply chain management was not confined to public sector partnerships; however it was evident from ongoing discussions that many client-led public sector projects were raising the spectre of supply chain management in UK construction. Following this line of research inquiry many of the construction organizations contacted displayed considerable commercial investment in a range of local and national public sector strategic alliances. Within the UK construction sector, many of these strategic alliances are known as construction framework agreements. Construction framework agreements are not exclusive to the Public Sector, however over the past decade and as exemplified by the research demographics the popularity in construction framework agreements has grown significantly (RICS, 2010). Industry estimates currently
suggest over two hundred operational framework agreements within the UK public sector (Chevin, 2011).

Seven large construction contracting organizations contributed to the research programme. Four of the seven contracting organizations participated in the semi-structured interviews. All four construction contracting companies have a diverse operational portfolio and are listed within the top thirty UK housebuilder and contractors by turnover. Two companies occupy a position within the top ten. The cumulative turnover for the four construction contracting organizations exceeded £17 billion for year ending 2009 (Rogers, 2010). Fourteen semi-structured interviews were tape recorded and transcribed. The occupational status of case study informants include Construction Health Director, Commercial Manager, Commercial Director, Chief Buyer, Project Manager, Senior Project Surveyor, Design Manager, Health Lead, Health Project Director, Regional Manager, Operations Director, Procurement Director and two Divisional Supply Chain Managers.

Three organizations representing specialist first tier service and product providers contributed to the research and participated in the semi-structured interviews. Participating organizations included an Architectural Design Practice, Mechanical and Electrical Specialist contractor and a Structural Engineering Group. Eight semi-structured interviews were undertaken with representatives from across the three specialist first tier construction organizations. The occupational status of case study informants includes Associate Directors, Technical Directors, Divisional Directors, Design Consultant and Director.

Three public sector client organizations participated in the research. All three organizations were engaged in the administration and management of construction framework agreements. Two of the organizations facilitated the management of
construction framework agreements within the UK National Health Service (NHS). The third client organization was a Local Authority. The Local Authority was currently managing a multi-million pound construction framework agreement to modernize local school facilities. Six semi-structured interviews with representatives from the three organizations were tape-recorded and subsequently transcribed. The occupational status of public sector client representatives included Framework Managers, Assistant Director, Deputy Director, Capital Projects Advisor and Contract Strategy Manager.

In total twenty eight semi-structured interviews, representing ten independent construction-related organizations were tape-recorded and transcribed verbatim. All research participants had a significant interest in the practice and implementation of construction supply chain management. In addition to the twenty eight semi-structure interviews there was a further eleven meetings with various interested parties from both the construction industry and academia not tape-recorded. In compliance with grounded theory methodology, notes taken at these meetings have been coded and where appropriate analysed to augment the primary data source.

A number of limitations to the research are readily acknowledged. All case study informants work within the UK construction sector for either a large construction contracting organization, a specialist first tier service and / or product provider or alternatively work as a client representative in the public sector. Notable exclusions from the research profile were overseas construction supply chain management case studies, UK housebuilding companies and small and medium sized contractors (SME’s). Several of the participating companies however manage a diverse portfolio of commercial interests. Auxiliary business operations include overseas construction
activity and organizational subsidiaries operating within the UK housebuilding market.

Methods and Data Analysis

Prior to setting up the semi-structured interviews, four industry headings each with six sub-headings were identified. The four industry headings were selected to accommodate a pluralistic interpretation of supply chain management namely; company background / context, supply chain management, framework agreements and general issues. Within each of the four headings, six sub-headings were listed. Each designed to encapsulate and capture various facets of the interviewee’s status, experience, understanding and interpretation of the construction environment in which they participate.

Three pilot study semi-structured interviews were carried out in preparation for the data collection phase. Whilst the semi-structured format of the interview remained unchanged, a few minor amendments were made to the management of the interview process. The most notable change was the refinement of an interview template. This was to promote a research robustness that would provide confidence, consistency and a degree of reproducibility in the data gathering exercise. Whilst the interviews remained semi-structured in format there was a necessity for an underlying discipline that would facilitate meaningful interpretation (Green et al., 2010). In recognition of the largely successful pilot study, data gathered has been included in the final analysis.

Each semi-structured interview was conducted on a one-to-one basis. Care was taken to encourage the interviewee to talk freely with only minimum intervention. To assist with the ongoing management of the interview process and to ensure a high degree of interview consistency during the data gathering phase the interview
template doubled as an aide memoir. Although each interview was guided according to the headings and sub-headings listed on the interview template, interviewer discretion was on occasion used to pursue ‘avenues of research interest’ or ‘diversions’ judged to provide additional insights and pragmatic understanding of construction supply chain management theory and practice.

Twenty eight interviews were recorded, transcribed and analysed through the use of qualitative analysis software package NVivo version 8. In addition to the semi-structured interviews, notes from a further eleven meetings were also coded and analysed via NVivo. NVivo software is a popular and well-used qualitative data analysis tool developed by Qualitative Solutions and Research International (QSR) (Walsh, 2003, Crowley et al., 2002). NVivo software permits data to be coded under the initial conceptual headings (or nodes) as outlined in the interview template. The responses could then be organised in order and retrieved to produce a comparisons of comprehension between the various participants within specific contexts. The analytical framework for codification was derived from the template of twenty four interview sub-headings used during the interview sessions. New issues and headings that emerged inductively from the data were added to the coding structure. The analysis continued until the data had been reduced sufficiently to enable conclusions to be drawn from the coded data.

The approach to data sampling and data analysis took the viewpoint that responses should not only convey individual understanding of construction supply chain management practice but also provide insight in to how individual practitioners adjust and make sense of their surroundings. Careful analysis of the interview data would chart an informant’s response to many different environmental stimuli and also how they act and react in ways that are consistent with personal analysis,
professional expectation and workplace legitimacy. The litmus test “of true grounded theory is that it makes sense” (Stern, 2010 p.114) especially to those familiar with supply chain management rooted in construction practice.

FINDINGS AND DISCUSSION

The Contagion of Supply Chain Rhetoric

From a review of the case study data is it evident that many construction industry informants draw little or no distinction between supply chain management and alternative forms of collaborative practice. A representative selection of comments from case study transcripts includes:

Informant A: “as we got more and more into design and build and more into two stage tendering we became more than just the builder, we became the principal supply chain member / partner - that sort of philosophy.”

Informant B: “you are in a partnership with your engineers and your M&E installer as they are your principal supply chain member.”

Informant C: “the whole philosophy is that there is collaboration.”

Informant D: “we had to set up a system of collaborative working; we had to have integrated supply chains.”

Informant E: “5 years ago we made the decision to...change the whole philosophy of the business and operate on a partnering supply chain model basis. Our key philosophy is still maintaining partnering philosophy.”

The resultant linguistic framing conveys a practitioner perspective not necessarily unique to the UK construction industry. Previous studies undertaken in manufacturing have also observed practitioner emphasise on collaboration (Fawcett and Magnan, 2002). The empirical evidence grounded in construction practitioner
understanding of supply chain management in UK construction also validates findings from previous supply chain management studies (Green and May, 2005).

The ‘fog of ambiguity’ is arguably compounded by the introduction of client-led construction alliance’s that combine expressions of supply chain management and partnering. Strategic alliances popular in UK construction such as framework agreements employ standard terms such as principal supply chain partner (PSCP) and principal supply chain member (PSCM). The PSCP is a first-tier lead organization, typically a construction contractor working directly for the client body. The PSCM’s are generally first tier construction service and product providers working in collaboration with the PSCP. Regardless of the various commercial configurations currently evident within UK construction practice, the largely homogeneous language of construction framework agreements has undoubtedly raised industry receptiveness. All research participants were familiar or had experience of construction framework arrangements. Although there was little evidence to suggest any clear differentiation between the terms supply chain management, collaboration and partnering.

Supply chain semantics and the issue of differentiation however was a key issue for one notable case study participant. With a background in manufacturing and extensive experience in supply chain management, one informant now working for a major construction contractor was very keen to navigate the principles of construction supply chain management away from the largely unconstructive associations with ‘partnering’. The uptake of supply chain management practice, according to the informant was inhibited by its near universal association with construction partnering. It was claimed many stakeholders within the construction community hold a jaundice view of partnering. Not only was partnering disputed
(Beach et al., 2005) the organizational legitimacy of partnering and by close association supply chain management was also challenged.

To address industry misconceptions it was proposed that supply chain management executed within a construction context should be re-branded. The informant argued that ‘responsible risk management’ may be a more accurate expression for the management of diverse, complex and challenging supplier networks. Incorporating the term ‘risk’ implied potential operational consequences if left neglected and unsupervised. Corporate executives and key decision-makers best placed to initiate organizational change would find ‘risk’ difficult to ignore, simply because the concept of risk management resonated closely with indicators of business success. Corporate re-branding of the supply chain term was therefore calculated to raise senior management awareness, challenge industry misconception and simultaneously remove the ‘partnering baggage’.

The linguistic framing of supply chain management in UK construction is a notable and interesting development. The employment of language may be extended to represent symbols, values, rituals and ultimately legitimacy (Deephouse and Suchman, 2008) in the diffusion of supply chain practice in UK construction. The ‘taken for grantedness’ displayed by the informants certainly demonstrates strong cognitive legitimacy with the supply chain management concept. Previous commentators have described construction as lagging behind other industries (Lonngren et al., 2010, Bankvall et al., 2010). However, a review of the case study evidence would suggest the discourse of supply chain management is now arguably rooted in dimensions of organizational institutionalism. An inability to communicate supply chain credibility may have serious consequences for a construction organization. As DiMaggio and Powell (1983. p.148) explain “as innovation
spreads, a threshold is reached beyond which adoption provides legitimacy rather
than improves performance”. To achieve supply chain management recognition and
legitimacy, construction organizations also adopt the symbols, values and language
necessary to persuade industry stakeholders of their business credentials. The
contagion of supply chain rhetoric is arguably a necessary and welcome
development in support of future substantive change.

**Emergent Patterns of Supply Chain Management**

Making sense of supply chain management in UK construction may adopt numerous
and often competing viewpoints. Drawing on grounded theory methodology and “the
daily realities” (Suddaby, 2006 p.634) of practitioner experience, it may be posited
that prolonged industry investment in strategic alliances has resulted in an emergent
form of supply chain governance namely, construction clans. Clan forms of
organizational governance is defined by Ouchi (1980) as a hybrid structure,
characterized by enduring commercial relationships, a highly socialised marketplace
and local culture. Early evidence of this emergent practice became apparent during
the data collecting phase. The “snowballing technique” (Green et al., 2010 p.120)
employed to generate interest in the research programme revealed a surprisingly
close-knit community of construction practice that many traditionalist may perceive
as atypical. As an outcome, all case study organizations and their participants have
significant commercial interest in strategic alliances and client-led supply chains.
The informants displayed not only a familiarity with other supply chain participants
but also with the activities and status of competing supply chain companies.
Although structural protocols of the various strategic alliances differed slightly, the
over-riding premise for greater collaboration remained a constant theme. Case study
construction clients and client representatives were keen to engender trust and
greater integration however they remained mindful of overly cozy relationships (Latham, 1994). To preserve competitive tension within the strategic alliance, a number of construction contractors would be selected as a principal supply chain partner (PSCP). Although the construction client usually reserves the right to procure construction services outside the alliance, the PSCP complete with designated principle supply chain members (PSCM) would compete under the terms of the framework agreement with other principal supply chain partners on a project by project basis. The collegiality of the supply chain relationship however remains sophisticated (Cox et al., 2006) with the constant interplay between price and trust frequently offset by prevailing market conditions.

Safeguarding competitive tension was not only a recurrent priority for construction clients and client-led project supply chains. Organizational supply chains, driven by the construction contractor displayed similar characteristics. Informants often described sourcing criteria sympathetic to non-cost elements of a tender, such as financial stability, health and safety, environment policy and performance. However, lowest cost as previously highlighted by Eccles (1981) was still regarded as the ultimate priority for selection. According to the Head of Procurement for a major international construction contractor, their current configuration of construction supply chain management “is competitive tendering but within a restricted market.”

Evidence from the case studies also reveals an emergent pattern of organizational supply chain management. The majority of construction contractors within the data set had developed corporate-wide supply chain policy and procedures for the identification, selection and company endorsement of construction sub-contractors and suppliers.
Careful review of the research transcripts illustrates four construction contractors from a possible seven introducing a formal accreditation process, referred to as category supply chain management. An ambition of the category management approach was to pro-actively manage the supplier inventory by removing redundant supplier information via “data hygiene cleansing” and identify key suppliers of services and products crucial to business success. Arguably the first tangible step towards creating an integrated supply chain practice (Cooper and Ellram, 1993, Stuart, 1997).

For the majority of the contracting organizations embracing the principles of category management, a trichotomy of sub-contractor and supplier status was loosely identified as follows:

Label One: Category 1 Supplier / Preferred Supplier or Full Partner

This classification of supplier would typically have an established portfolio of projects. Undertaken to a superior standard, suppliers will have demonstrated their capability and capacity via consistently satisfactory key performance indicator (KPI) results.

Label Two: Category 2 Supplier / Approved Supplier or Provisional Partner

This classification of supplier will have met the selection criteria set out in the supplier prequalification questionnaire (PQQ). The supplier will either be used less frequently because of the type of service / product provided or still has to demonstrate superior levels of performance via a combination of experience and KPI results.
Label Three: Category 3 Supplier / Pre-approved Supplier or Probationary Supplier

This classification of supplier is not yet certified and depending on company discipline and supply chain management rigour cannot be employed. Their status will only be reviewed once they have undergone and satisfied the PQQ criterion set out in the prescribed accreditation process.

The labels listed bear a striking resemblance to recent construction supply chain management case studies. In a study of UK housebuilding, Gosling et al (2010) refers to a trichotomy of Approved Suppliers, Preferred Supplier and Framework Suppliers. Gosling et al (2010) suggests the distinct categories of supply chain relationship provide the housebuilder with a structurally agile supply chain. The supply network has an inherent operational capacity to response quickly to fluctuating levels of construction demand and supply. This emergent and dynamic network of loosely and tightly coupled organizational relationships is largely reflected in the work of Miles and Snow’s publication ‘new concepts for new forms’ (1986). The report cites changing and increasingly complex trading conditions as a catalyst for new mechanisms of organizational governance. Organizational relationships are argued to require the agility and flexibility to assemble and reassemble in response to changing circumstances. An organizational supply chain management characteristic that both Gosling et al (2010) and the cases study data have clearly identified.

Drawing on case study examples of organizational supply chain management, it is evident that four construction companies adhere to a generic blueprint of category management. Given that companies often conform to “rationalized myths in society about what constitutes a proper organization” (Boxenbaum and Jonsson, 2008.
p.78), category management may provide future motivation for improving both supply chain performance and operational legitimacy (Meyer and Rowan, 1977).

**A Triumph of Spin over Substance**

Many industry and organizational barriers continue to impede the adaptation and exploitation of supply chain management in UK construction (Briscoe and Dainty, 2005). Whilst management of the supply chain places considerable emphasis on competitive tensions and fluctuating supply and demand, key stakeholder reservations also require careful consideration.

The strategy of developing closer commercial ties with a few preferred subcontractors and suppliers was argued to be difficult, especially for senior industry executives experienced and ultimately very successful in the execution of traditional industry practices. For an industry widely recognised for its conformist and conservative outlook, supply chain management principles may be perceived by some key industry players to undermine the foundations upon which corporate success was initially built. It is undoubtedly a truism that many construction organisations have flourished under the adversarial, arms-length approach to commercial relations. Due in large part to a carefully crafted skill set that promotes industry competitiveness, self-interest and opportunism. Changing industry behaviour that has a proven track record of accomplishment and is often financially rewarding is likely to prove very difficult. Stakeholder resistance to change not only impacts on company policy, it is also likely to be reflected in future transactional relationships with subcontractors and suppliers.

The opportunity for enhanced end-to-end construction service and product delivery alluded to by Rimmer (2009) has simply failed to materialize. Construction supply chain management is not the first, nor is it likely to be the last management initiative
to succumb to the triumph of spin over substance. Government reports dating back to 1944 (see Murray and Langford, 2003) and more recently the best practice initiatives of the Egan agenda have consistently underwhelmed. Sir John Egan candidly reflected on ten years of progress since the publication of ‘Rethinking Construction’ (1998) stating that he would award the construction industry four out of ten (Egan, 2008). Hardly a rousing endorsement given the considerable resources and industry commitment invested to make substantive change happen.

Drawing upon the research findings ‘grounded’ in practice and “guided by the daily realities” (Suddaby, 2006 p.634) there exists an industry-wide receptiveness and emergence patterns of supply chain practice that continues to fuel industry expectation. A UK Government sponsored report reflecting on industry performance (Wolstenholme, 2009) recently challenged construction suppliers to take the lead. After a decade largely dominated by client-led initiatives the sudden suggestion that construction suppliers provide the impetus for industry change and innovation may be met with a considerable degree of scepticism. However it would short-sighted to underestimate the potential contribution construction suppliers and in particular construction contractors may proffer. At present two distinct structures, the client-led project supply chain and the contractor driven organizational supply chain in construction remain stubbornly fragmented and largely exclusive. Given that the construction contractor is a strategic participant in both the client-led project supply chain and the organizational supply chain, a contractor-led proposition may have considerable potential.

The ‘supply chain broker’ (Male, 2002 p.285) with the capacity and organizational capability to connect the two albeit short supply chain structures is the construction contractor. Motivating construction contractors to embrace and facilitate their unique
status as the ‘supply chain broker’ between an upstream quasifirm and a downstream construction clan would arguably establish, for the first time a coherent, robust and unified construction supply chain management structure. Drawing on the structural comparability, the newly extended form of construction supply chain management would have a theoretical foundation firmly rooted within the intellectually established domain of organizational studies.

**CONCLUSION AND RECOMMENDATIONS**

Notwithstanding the “enduring impediments” (Briscoe and Dainty, 2005 p.324) case study findings demonstrate supply chain management ‘creep’ in UK construction. Empirical evidence suggests notable developments in three distinctive areas. Drawing on the language of the manufacturing industries (Rimmer, 2009), supply chain management terminology in UK construction is arguably widespread, refined and may be argued to symbolize an industry readiness previously unacknowledged. The client-led supply chain complete with lexicon of supply chain expressions has provided an alternative mode of supply chain governance. Strategic construction alliances including framework agreements arguably buoyed by favourable economic conditions have engendered a commercial and social symmetry unfamiliar a decade earlier. Finally, the contractor driven organizational supply chain is now beginning to interrogate procurement strategy with a newfound discipline and proactively manage their preferred sub-contractors and suppliers. The tacit procurement systems of the construction quasifirm previously observed by Eccles (1981) have largely been supplanted by widespread use of formal pre-qualification questionnaires, accreditation processes and category management procedures. The language, relational procurement and emergent category management are undoubted. Individually they may represent progress; collectively however they do
not represent supply chain management. Supply chain management as practiced in UK construction continues to be fragmented (Male and Mitrovic, 2005) and short (King and Pitt, 2009). Recognizing the institutional correlation between symbolism and legitimacy, it remains difficult to ascertain if ‘modification of practice’ is driven by an ideological conviction in the perceived benefits of supply chain management or simply an instrumentally rational adjustment in response to achieving operational legitimacy.

Construction activity is very often distinctly different and highly complex. Whilst the commercial uptake of supply chain management in UK construction is laudable and the associated potential benefits persuasive, the fulfilment of a proactive, industry-wide culture of integrated supply chain management appear distant. It may be conceded that too many factors conspire, individually and collectively to undermine the ambitions of a supply chain management ideology rooted in the traditions of manufacturing.

Therein rests a deep-seated predicament for supply chain management in UK construction. The notion that construction can be analytically compared with other forms of industry is potentially unhelpful. Repeated analogy with the rhetoric and custom of a manufacturing supply chain, whilst convenient for casual comparison has according to Groak (1994) only served to confound industry stakeholders. Construction practitioners require a “better conceptual understanding” of supply chain management (Saad et al., 2002 p.1). In UK construction, the supply chain concept continues simply to be the obverse of pro-market competitive procurement. Notwithstanding the past decade of considerable industry investment, construction supply chain management is only at the start of a potentially long and arduous process of assimilation, modification and ultimately theory building. The future
The development of construction supply chain is likely to be a captivating story of both predictable and unpredictable events offset by a train of consecutive changes. Drawing inspiration from the concept of the quasifirm and construction clan, the future challenge for the construction community is to further develop these theories into a coherent, robust and intellectually persuasive articulation of supply chain management firmly rooted in the daily realities of construction practice.

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