

Supply Chain Management: A Critique of Supply Chain Architecture

Tennant, S.

School of the Built Environment, Heriot-Watt University
(email: S.Tennant@hw.ac.uk)

Fernie, S.

School of the Built Environment, Heriot-Watt University
(email: S.Fernie@hw.ac.uk)

Abstract

The purpose of this paper is to frame the contextual circumstances that craft the different interpretations of the buyer-supplier relationship in the UK construction industry. Advocates of supply chain management claim that business transactions, particularly those reliant on the outsourcing of services and products will benefit significantly in terms of industry competitiveness. In theory the UK construction industry represents a near perfect model for supply chain protocol, where the commercial exchange of goods and services represent a significant proportion of the overall project expenditure. In reality the uptake of supply chain management has been at best circumspect. Many reasons have been cited; the short-term nature of construction projects, adversarial contractual relationships, fragmentation of the construction industry and the opportunistic behaviour of contractors and suppliers. For an increasing number of construction commentators the error of construction supply chain management is founded on the acontextual nature in which supply chain management has been promoted within the construction community. Lack of success is not necessarily a failure of supply chain management but as a result of insufficient attention being paid to industry circumstances. Incorporation of supply chain management requires careful judgement in terms of definition and practice. This paper argues for a more pluralistic understanding of supply chain management within the confines of the UK construction industry. Building on the notion of a 'horses for courses' approach to the management of contractual relations a conceptual framework is developed to aid in the process of sense making. Research evidence suggests that construction market dynamics is a powerful determinant of supply chain architecture. As a consequence, it could be argued that the unprecedented downturn in construction activity will severely curtail business-related opportunities to foster learning alliances within the construction supply chain. This research paper provides a timely critique of the challenges facing supply chain management in an uncertain and turbulent post-recession construction environment.

Keywords: supply chain management, procurement, context, construction industry

1. Introduction

Supply chain management, learning and knowledge sharing are theoretical concepts that play a significant role within discussions concerning productivity and competitiveness in the UK construction sector. Over a decade ago 'Rethinking Construction' (Egan, 1998) made specific reference and recommendations regarding the adoption of supply chain management principles (Pryke, 2009). Its acceptance within the construction sector is not without its critics. Some commentators believe that the unique character of the construction industry cannot be ignored when attempting to make use of supply chain management (Green et al., 2005, Cox and Ireland, 2002). Supporters of supply chain management stress the potential to accrue project and organisational information, enhance strategic relations and capture a 'learning experience' that can be transferred from project to project (Love et al., 2002, Strategic_Forum, 2002). The receptiveness of a firm's ability to adapt and culturally evolve may be expressed as 'organisational learning' (Kyro, 2003). As a consequence organisational familiarity with supply chain management should promote organisational learning. However, the impact upon theory and practice of the connections between supply chain management and organisational learning remains largely unexplored. This paper argues for a more pluralistic understanding of supply chain management within the confines of the UK construction industry. In doing so a conceptual framework is developed to aid in this process of sense making.

2. The UK construction industry

The Government Department for Business Innovation and Skills (BIS) defines the UK construction sector as; '*construction materials and products; suppliers and producers; building services manufacturers, providers and installers; contractors, sub-contractors, professionals, advisors and construction clients and those organisations that are relevant to the design, build, operation and refurbishment of buildings*' (BERR, 2009). The definition articulates not only the scope but also the diversity of work type and stakeholder involvement with construction activity. The construction industry is an important sector not only in terms of trade and commerce but also has a wider bearing on the socio-economic climate of the UK (Dti, 2002, Strategic_Forum, 2008). As the foremost client for the procurement of construction services and products it is worth noting that the UK Government has significant interest in the commercial welfare of the sector (Dti, 2006). In buoyant economic conditions the construction industry workforce is officially estimated to be in excess of 2.1 million employees, approximately 10% of the UK working population and supports over 250 000 construction companies (BERR, 2009). Recent market conditions for the entire construction sector have witnessed an unprecedented economic downturn ending a prolonged period of stability. Current industry forecasts predict construction output to have dropped from approximately £110 billion in 2008 to £96 billion in 2009, a 12.8% decline in construction activity (Expedia, 2009b). Extrapolating employment figures from the statistics it could be argued that the construction sector will witness over 250000 job losses in the current recession. An underlying trend shows that while construction output has grown steadily in the period up to 2009, the rate of growth has failed to match UK GDP growth over the previous four years indicating that the construction industry share of the UK economy as a whole is also contracting (Expedia, 2009a). Construction output, in terms of monetary value is dominated by a few very large construction companies conversely, construction output measured in

terms of volume is carried out by a considerably larger number of small and medium (SME's) sized general and specialist contractors (Cox and Thompson, 1997, Morton, 2002). Fragmentation of construction industry structure is an important and recurring theme (Dainty et al., 2001). A characteristic that encourages a culture of individualism and self-promoting interests at the expense of collaborative, cooperative working practices (Thompson et al., 1998). In response to growing client dissatisfaction, industry reviews have called for greater emphasis on integration, collaboration and partnering with the supply chain (Egan, 1998, NAO, 2001, Strategic_Forum, 2002).

3. Supply chain management

In the field of management studies supply chain management has risen in prominence over the past twenty years (Mentzer et al., 2001). With its origins in manufacturing, supply chain management is argued to play a significant role in the supply of services and goods across industry boundaries (Vrijhoef and Koskela, 2000). With its own dedicated academic journal, supply chain management is fast becoming part of mainstream management thinking. Despite this growth in academic and professional acceptance there continues to be no universally accepted definition of supply chain management. Cox (1997), offers a philosophical viewpoint suggesting that supply chain management is '*a way of thinking*'. The Chartered Institute of Purchasing and Supply (2009) propose two definitions. A strategic definition to capture the corporate intent and need for added value throughout the supply chain and a tactical interpretation to address the more immediate and tangible issues of management (Alder, 2009). Frustrated at the lack of exactness and the inherent potential for widespread misunderstanding, Stock and Boyer (2009) proposed a consensus definition, compiled from over 170 unique literature definitions of the term(s) supply chain management, SCM and supply chain. Whilst The Council of Supply Chain Management Professionals (CSCMP) presents a protracted, all encompassing management definition in which they finally summarise, '*in essence, supply chain management integrates supply and demand management within and across companies*' (CSCMP, 2009). So the debate regarding a universal definition of supply chain management remains unresolved. For practitioners and researchers alike who wish to sanction the supply chain concept, the lack of exactness often represents a dilemma. Too tight a definition may exclude perfectly valid avenues of interest, too loose and it may become another fashion label in contemporary management rhetoric (New, 1997). Given that terminological precision is so elusive, this paper will focus attention on how aspects of the construction industry and corporate environment craft the different interpretations of the buyer-supplier relationship. This is fundamental to the wider conceptual picture of the supply chain and how stakeholders can be managed in the UK construction industry.

3.1 Supply chain management in the construction industry

Advocates of supply chain management claim that commercial transactions, particularly those reliant on the outsourcing of services and products will witness gains in profitability and enhance company competitiveness (Egan, 1998, Briscoe and Dainty, 2005). In theory the UK construction industry represents a near perfect model for supply chain protocol where the commercial exchange of goods and services in a typical construction project account for approximately 80% - 90% of the total project construction cost (BERR, 2004, Holt et al., 1999). In reality the uptake of a supply chain management has been at best, circumspect (Love et al., 2004, Wolstenholme, 2009). Many reasons

have been cited, the more common include; the short-term nature of construction projects, adversarial contractual relationships, the lack of project continuity, the fragmentation of the construction industry, the intensity of competition, the uniqueness of each project, client involvement, economic uncertainty, history and the opportunistic behaviour of contractors, sub-contractors and suppliers. For an increasing number of construction commentators the error of construction supply chain management is founded on the acontextual nature in which supply chain management has been promoted within the construction community (Green et al., 2005, Cox and Ireland, 2002). Lack of success is not necessarily a failure of supply chain management but as a result of insufficient attention being paid to the industry circumstances. To present a contextually rooted perspective of learning within construction supply chains, a malleable working definition may be beneficial. Better able to reflect an ever-changing contextual, contractual and construction landscape. For the UK construction industry incorporation of supply chain management requires careful judgement in terms of definition and practice. This pragmatic approach accommodates the earlier assertion that there is no definitive model; supply chain management in construction will always be representative of its situational factors and thus advocates a ‘horses for courses’ approach and ‘fit-for-purpose’ relationship (Cox and Thompson, 1997, Thompson et al., 1998). One of the most influential contributors to supply chain ‘architecture’ is the management of the contractual relationships. The multiplicity of construction procurement strategies employed to administer construction relations implies that for supply chain management to function, supply chain form must be representative of its contextual setting.

4. A Continuum of supply chain ‘architecture’ in the construction industry

To aid in this process of sense making a continuum of supply chain ‘architecture’ has been proposed. Supply chain architecture represents a blue-print of interconnecting, multi-variant contextual demands, presented in an orderly arrangement of parts to produce a spectrum of construction supply chain architecture in practice. At one end of the continuum the supply chain architecture may be expressed as ‘open’. The working relationships are constructed around the notion of a free market environment, where each firm competes for work on a project by project basis with no pre-existing or future agreements in place. At the other end of the supply chain continuum, the architecture of the supply chain may be termed ‘closed’. Under those conditions a commercial ‘monopoly’ has evolved. In other words, a consortium of independent organisations has been formed, via transparent competition rules, to control the production and distribution of building services and goods for a specific client over an unspecified period of time. ‘Closed’ architecture would exist where the client, main contractor, sub-contractors and suppliers act in accordance with a ‘Solidarity Agreement’. This bond would cascade through the supply chain tiers to create a consistent and coherent coalition of disparate project stakeholders - a virtual organisation. Once formed there would be little or no market competition because the buyer-supplier relationship would be bound by an exclusivity arrangement. Bridging the binary model of open and closed supply chain architecture is selective / restrictive supply chain architecture. Architecture of this classification would incorporate assorted elements of both competition and qualified practice; see Figure 1 - A continuum of supply chain ‘architecture’ in the UK construction industry.

a single project, strategic partnering extends the relationship over a number of projects (NAO, 2001). It has also been argued that the formation of a partnership, in particular a strategic relationship between customer and supplier can achieve competitive advantage in the market environment (Cheng et al., 2000, NAO, 2001). Somewhat understandably, the parallel interests in construction partnering and construction supply chain management coupled with a lack of definition and terminological misguidance has often resulted in the two expressions being frequently used synonymously (Fernie and Thorpe, 2007). In terms of construction procurement, a partnering arrangement may be best facilitated by selective supply chain architecture.

4.3 Restricted architecture: framework agreements

Framework Agreements are not contracts in themselves but ‘frame’ the terms and conditions of subsequent awards. Thus reducing cost and time factors associated with conventional tendering protocol (Morledge et al., 2006). British Airport Authorities (BAA) initially developed the concept of the framework agreement in 1993-1994 and embarked on a ‘Framework Programme’ to work cooperatively with a number of preferred suppliers over a five year period. Similarly a number of retail clients also began to adopt framework-like procedures. The second generation of BAA Framework Agreements, set up in 2002 extended the potential private sector partnerships for up to ten years (Potts, 2009). Public sector Framework Agreements typically ‘partner’ over a tenure period of four years with the option of an additional two years under exceptional circumstances (commonly referred to as 4 + 2). This is strictly governed by European procurement rules (OGC, 2008). It is important to note that each framework may differ slightly to accommodate the distinctiveness associated with individual project needs. For example, where a framework has been set-up with several preferred and capable suppliers a mini-competition may be performed at the call-off stage (OGC, 2008). Over the past decade Framework Agreements have witnessed considerable client support especially for high-risk, high-spend construction programmes such as schools, hospitals, roads and other significant public capital expenditure programmes (Constructing Excellence, 2005). A literature review of public capital spending programmes employing Framework principles has valued construction activity to run in to thousands of millions of pounds each year. In terms of procurement, Framework Agreements may be best facilitated by restrictive supply chain architecture.

4.4 Closed architecture: monopoly

The initial perception of a business-related monopoly is largely negative although not altogether alien to the construction industry. Defined as *‘the exclusive possession or control of the supply of a commodity or service’* (AskOxford.com, 2009). Supply chain ‘monopoly’ in this context represents a utopian model of supply chain management in the UK construction industry. The supply chain configuration is fixed without time, once selected each participant has exclusivity within their specific tier of the buyer – supplier franchise. Relationships are permanent; co-operation is underpinned by a vested interest in client satisfaction as well as inter-organisational success, tendering and procurement costs are all but eliminated. Supply chain monopolies as a hypothesis address many of the ills that have plagued the construction industry. It proffers cohesion, security, continuity, trust, co-operation and an ideal platform on which to capture and disseminate knowledge from lessons learnt. Creating supply chain relationships bounded by the values of exclusivity and solidarity elevates the fiercely

competitive client / contractor / supplier landscape towards an inter-supply chain competition (Tan, 2001). In other words, *'supply chains compete, not companies'* (Christopher and Juttner, 2000). It should be noted that EU/UK legislation may challenge controlled competitive practices, for example, pressurising suppliers not to trade with industry competitors (OFT, 2007). In terms of procurement route, supply chain monopolies within this context remain hypothetical.

5. Discussion

It is evident from the literature review that construction supply chain management cannot be all things, to all companies, all of the time (Ireland, 2004). Whilst procurement strategies govern the contractual relations of the supply chain classification, contextual factors dictate preference. Discussion reflects on the environmental conditions and cultural disposition of the UK construction industry, drawing particular attention to irregular workloads, project timescales, market dynamics and industry competitiveness. The temporary nature of project work-loads coupled with erratic consumer behaviour has ingrained an underlying management philosophy for achieving short-term gains at the probable expense of other longer-lasting benefits (Green and May, 2005). Lack of work-load certainty diminishes the opportunity to develop business strategies that extend beyond the interim. Relationships that represent the supply chain are extremely transient. For example, second and third tier subcontractor and suppliers may only have a fleeting involvement with the project, their individual contribution to project success is crucial but their presence as a percentage of the overall construction programme is minimal. As a victim of their 'transitory' circumstances, many construction contractors employ an overtly opportunistic outlook. Seizing work whenever and wherever it becomes available makes good financial sense and feeds an all-important positive cash-flow criteria. Opportunistic behaviour is symptomatic of a company that perceives its business interests to be vulnerable (Ngowi and Pienaar, 2005). It could be argued that in a construction industry nurtured on the dogma of 'survival of the fittest' (Green et al., 2008), opportunistic behaviour is a sagacious business strategy. Project timescale will also influence the attitude and spirit of all the participants involved.

Much has been written about the working relationships that pervade and persist in the construction sector, much of it unfavourable. Three key factors inter-play; competition, vulnerability and opportunistic behaviour (Ngowi and Pienaar, 2005). Addressing these issues within the management of the supply chain has the potential to temper the overtly confrontational default position of project members. A client–contractor alliance reduces vulnerability for the supplier and secures provision of products and services for the buyer creating a more stable project and business environment on which to build a working relationship. The challenge for construction industry stakeholders is how to cultivate a collaborative / co-operative relationship that supports a programme of continuous value for money improvement in a project-based industry that by its very nature is discontinuous. The marked growth in non-traditional procurement arrangements would appear to be a consequence of government discourse coupled with a confident market environment. The fluctuating nature of construction supply and demand is a powerful determinant of supply chain architecture. The highly contract-specific characteristics of the construction market will sway where influence and power resides within the buyer-supplier relationship (Cox and Ireland, 2002). In a buoyant economic environment demand for services and products is likely to outstrip supply, inflating consumer costs.

In the event of an economic downturn, the supply of goods and services is likely to be in excess of demand, giving the client purchasing power. This has far-reaching consequences for supply chain management and typology of approach. In an economic downturn where competition is fierce, margins are cut and company survival is vulnerable, i.e. model for opportunistic behaviour, the client may favour an overtly competitive standpoint with less emphasis on collaborative supply chain management, (Green et al., 2005). Confident that in a contracting construction market traditional procurement and open supply chain architecture offer superior business opportunities. Reviewing the current economic data, market leverage arguably resides with the procurer. Only time will tell if they use their consumer power responsibly or regress to type (Wolstenholme, 2009). Otherwise, *“if there is no meaning full way to balance demand and supply in the construction industry, the death of partnering could be imminent”* (Oyegoke et al., 2009). Competitiveness – popularised as an expression of intent in the 1980’s, see Michael Porter – Competitive Strategy (1980) and Competitive Advantage (1985), has become a fundamental tenet of business parlance, (Flanagan et al., 2007). The topic of intra-supply chain co-operation and industry competitiveness introduces a curious dilemma. Government support for the free market is somewhat tempered by its endorsement of lasting, collaborative, trusting and closer working relationships. ‘Competition is good’ has been the guiding mantra for UK public policy since the election of Margaret Thatcher’s Conservative Government in 1979 (Green et al., 2008). The enterprise culture was born and according to Green et al (2008) has had a *‘lasting effect on the structure of the UK construction sector, and the managerial rhetoric that is mobilised in the cause of improvement’*. The potential discord for supply chain stakeholders is the belief that operating in a free market encourages competition, increases operational efficiencies, stimulates innovation and lowers costs. As championed by the Government Office of Fair Trading, *‘Markets work well for consumers when there is vigorous competition between firms that trade fairly. Being pro-consumer therefore goes hand-in-hand with being pro-market’* (OFT, 2001). Pro-consumer confidence in ‘competition is good’ is to some extent contested by recent Government discourse that advocate partnering, framework agreements, strategic alliances and other forms of collaborative union as they also promise operational efficiencies and cost benefits to the consumer (Egan, 1998). Sir Michael Latham alluded to this tension of competition versus accord in his report ‘Constructing the Team’. Proclaiming that *‘some main contractors have developed long term relationships...that is welcome, quickly stating ‘they should not become cosy’* (Latham, 1994). Given the contradictory nature of competitive relations, value for money and current government discourse it is likely that in a Western capitalist driven economy the resolution probably resides with the persuasive appeal of free market forces. As a consequence, it could be argued that the unprecedented downturn in construction activity will severely curtail business-related opportunities to foster learning alliances within the construction supply chain.

6. Conclusion

The essence of supply chain management is to recognise the buyer-supplier interdependency and thereby improve the supply chain configuration (Vrijhoef and Koskela, 2000). In stark contrast with other commentaries, this paper is not advocating a ‘construction best practice’ approach to supply chain management. The initial challenge is to chart the situational factors that fashion the wide-ranging interpretations of supply chain management in construction. Establishing a benchmark of common understanding is a pivotal step in the evolution of a pragmatic and coherent supply chain

learning agenda, otherwise future innovation and development may be futile (Cox, 1999). Aligning the continuum of supply chain architecture with a 'horses-for-courses' analogy as advocated by Cox and Thompson (1997) serves as a 'dichotomous contrast' for the various forms of supply chain management configurations. Characterising supply chain management in a variety of architectural guises endorses the notion that a one-size fits all imitation is unlikely to be feasible let alone successful. Symptomatic of the 'hazy' definition, supply chain management in the UK construction industry is continuously renegotiated within highly localised contexts, (Green and May, 2003). Developing a supply chain learning agenda therefore has numerous challenges notwithstanding the myriad of interpretations. That said, exciting research opportunities do exist within the management of knowledge and organisational learning spectrum to develop learning chains that span the buyer-supplier relationship (Maqsood and Finegan, 2009). After fifteen years of prosperity and sustained growth the construction industry is in the midst of a difficult economic correction that will test construction practices new and old. This research paper provides a timely impetus to explore the scope and challenges for supply chain management in an uncertain and turbulent construction environment.

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