AN ALTERNATIVE FORM OF SUPPLY CHAIN GOVERNANCE: CONSTRUCTION CLANS

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The utility of supply chain management practice within a construction context has over the past two decades fuelled a great deal of debate. Industry commentators have extolled the virtues and underscored the shortcomings of supply chain management in equal measure. Sponsors of construction supply chain management, including Central Government have repeatedly expressed exasperation at the apparent inability of the sector to grasp rudimentary behaviours of the supply chain concept. Critics, on the other hand have highlighted the discernable lack of contextual adaptation as a primary cause of underachievement. Drawing inspiration from Williamson, Powell and Ouchi among other eminent writers specialising on alternative forms of organisational structure, this paper explores the contribution 'construction clans' may have on the performance of supply chain management. Clan forms of organisational structure are described as hybrid mechanism of governance, neither a market nor a hierarchy. Not to be mistaken with other coordinating mechanisms of organisational governance such as networks and fiefs, clans are distinguishable by their highly socialised marketplace, enduring relationships and emergent local culture. The growing legitimacy of construction clans may be emblematic of contemporary construction procurement routes such as Framework Agreements. Aided by multiparty contracts such as PPC 2000 and NEC3, it may be contested that construction supply chains are beginning to display ever-increasing levels of corporate inter-dependency and commercial solidarity. Business expectations within a construction clan cast a shadow of future transactions predisposed to temper traditional behavioural tendencies that have bedevilled the construction industry's public reputation. Mindful of the fine line between collaboration and collusion, this paper draws on extant literature and contemporary industry practice to discuss the opportunities and threats an alternative form of supply chain governance such as construction clans may have on industry comprehension and the future enactment of construction supply chain management.

Keywords: clans, collaboration, organisational structure, supply chain management.

INTRODUCTION

"Construction supply chain management is an emergent area of practice" (O'Brien *et al.*, 2009). Over the past decade numerous best practice initiatives have sought to embed the principles of supply chain management within construction practice (Egan, 1998). Proponents of supply chain management are keen to highlight the potential benefits of collaboration with key suppliers. Stronger commercial ties present opportunities for standardization, coordination and scope for economies of scale both in terms of production and administration. Improved communication channels for knowledge transfer and organizational learning are also thought to promote innovative working and enhance problem-solving. Critics on the other hand have been more

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circumspect in their assessment of the potential benefits. Often their criticism is not directed at the concept of supply chain management ideals per se but largely the failure on the part of the proponents to carefully consider the contextual dimensions associated with supply chain implementation. Context is pivotal to the exploitation of a concept, context evokes a spatial awareness (Jepperson, 1991) that shapes and informs practice beyond the rote interpretations swiped from other industries. Despite growing awareness and increasing popularity of supply chain management practices it is widely acknowledged that construction supply chain management still lags behind other industries (Lonngren *et al.*, 2010, Bankvall *et al.*, 2010), most notably manufacturing.

This paper is organized as follows. An overview of organizational theory is presented. Various mechanisms of organizational governance are reviewed, in particular hybrid forms of structure, namely clans. Building on an intellectual platform of organizational theory, collaboration within the construction sector is investigated and trends in supply chain practice identified. A section outlining research strategy and the adopted method for data collection is explained. The findings and discussion chapter highlights key developments and potential threats to construction supply chain clans. The conclusion indicates that current economic difficulties may result in a polarization of construction stakeholder outlook.

ORGANIZATIONAL THEORY

According to Williamson (1975) “in the beginning there were markets". Free market conditions, where thought to present the most economically cost efficient mechanism for commercial exchange between trading parties. However converse to free-market principles, under certain economic conditions hierarchical organizations could also engage in commercial transactions between corporate subsidiaries at a lower transactional cost than the market could support (Ouchi, 1980). Fluctuating economic circumstances created a duality of market and hierarchy organizational structure. Commercial agents were confronted by an organizational dichotomy, buy from the market or alternatively manufacture in-house. Consequently much of the early literature on organizational theory and mechanism of corporate governance centred on the rationale of a buy or make classification.

A central criticisms of transactional cost economics is the overly simplistic arrangement of a market or hierarchy dichotomy (Richardson, 1996). Academics have found it problematic to explain business relationships where participating organizations have incurred high transaction costs and yet elected not to vertically integrate (Vrijhoef and London, 2009). Alternative explanations sought to counter the duality of market and hierarchical forms of governance by asserting that the ‘middle ground’ is populated by hybrid configurations of organisational structure. A point conceded by Williamson (1985). A major contribution to the organizational market and hierarchy debate was provided by Powell’s (1990) publication ‘Neither Market nor Hierarchy: Network Forms of Organization’. Powell (1990) contested that companies frequently blur their customary boundaries by entering in to forms of collaborative working practice that resemble neither arm's length market contracting nor aggregated vertical integration. An alternative mode of organizational governance was presented, namely network forms of commercial transaction. The network is a far more flexible form of organizational governance (Miles and Snow, 1986), structurally agile and with a capacity to respond quickly (Powell, 1990). Organizational networks encapsulate both the asocial dimensions of the price mechanism and the market as

well as the social customs representative of hierarchical governance. Nowadays, management literature readily acknowledge hybrid forms of organizational structure as viable mechanisms of governance (Price, 1996).

Not to be mistaken with other coordinating mechanisms of organisational governance such as networks, clan forms of organizational governance are also thought to bridge the market, hierarchy dichotomy. In many respects clan's echo the network structure in that it occupies the 'middle ground'. Clans are similar to networks in their hybrid classification but are also readily distinguishable by their highly socialised marketplace, enduring relationships (Ouchi, 1980) and emergent local culture. The management of clan forms of governance "requires the greatest amount of work to develop a locally shared social knowledge, or culture" (Wilkins and Ouchi, 1983).Within the context presented in this paper, it may be contested that clan forms of organizational structure display enhanced levels of economic and social embeddedness between the commercial participants. The clan is the obverse of the market, "since is achieves efficiency under the opposite conditions: high performance ambiguity and low opportunism" (Ouchi, 1980).

Building on a model of organizational theory, disparity in the economic market will translate to variations in adopted forms of organizational governance (Orru *et al.*, 1989). Accepting the premise that "organizational structures vary in the degree to which they are loosely or tightly coupled" (Ouchi, 1979) it is therefore rational to suggest that within the contextual parameters of the construction industry, supply chain management will also mirror variations in adopted structural form. The organizational framework of market, networks, clans and hierarchies provides an intellectual platform for the subsequent analysis of supply chain management and in particular construction clan as an alternative form of supply chain governance.

ORGANIZATIONAL STRUCTURE IN CONSTRUCTION

The disaggregation of corporate structures (see Zenger and Hesterly, 1997) witnessed in multinational organizations during the 1980's and 1990's may be reflected upon as a catalyst for large construction organizations to re-engineered their portfolio of business interests. In response to the changing market, "new organizational forms arose to cope with new environmental conditions" (Miles and Snow, 1986). As international and national contractors began to restructure principally as service and management providers, the practice of construction sub-contracting and the employment of casual labour became more pronounced (ILO, 2001). A characteristic that Green and May (2003) refer to as the 'hollowed-out firm'. In the aftermath of the dissaggregation of construction hierarchies, the governance of construction buyer and supplier relationships was transformed and it may be argued the spectre of supply chain management in construction became increasingly pertinent. The pressing challenge for newly constituted construction organizations was to vertically integrate the complex network of construction service and product providers. Even for the simplest construction projects, project delivery and ultimately corporate success became intertwined with the actions, interaction and commercial transaction of third party participants.

Working Collaboratively in Construction

Building a collaborative working relationship in the construction sector has been a cornerstone of the Rethinking Construction (Egan, 1998) agenda. Consequently it is difficult to divorce evidence of the increasing popularity for collaborative working

and multiparty forms of contract from the influences of Government sponsored best practice initiatives. An emergent form of strategic alliance, with specific reference to construction procurement over the past decade has been both construction partnership arrangements and construction framework agreements. For example, statistics published in the lasted edition of the RICS 'Contracts in use: A Survey of Building Contracts in Use during 2007 (RICS, 2010) cite construction framework agreements for the first time. RICS industry figures for construction activity in 2007 illustrate 4.5% of the survey sample was procured via framework protocols, representing 2.9% of project value. Figures for the uptake of partnering forms of contract were first published in 2001 (RICS, 2006). The 2004 survey recorded an increase on the initial 2001 data set, however data for 2007 illustrates no substantive increase in project partnering numbers but does record an increase in project value (RICS, 2010).

Construction Supply Chain Management

Supply chain management in construction is fragmented, diverse and typically short (King and Pitt, 2009). Two discrete supply chains predominate, the project supply chain and the organizational supply chain (Male and Mitrovic, 2005) . The organizational supply chain is managed by the main contracting organization and has no specific project orientation. Conversely, the project supply chain is driven by the construction client and is specific to the client's project needs. Central to the success of strategic alliances such as construction framework agreements is the scale of integration and level of corporate interdependency within the project supply chain. The project centric orientation of project supply chains coupled with the prospect for repeat working builds an environment conducive to enduring commercial relationships and a budding local culture. Establishing structural processes, values, expectations and traditions are argued to promote a cross-organizational 'taken for grantedness'. Increasingly porous organizational boundaries facilitate enhanced supply chain communication and create operational efficiencies that are difficult to replicate via market or hierarchical forms of organizational governance. Over the past decade increasing numbers of strategic alliances aided by multiparty contracts such as PPC2000 and NEC3 have sanctioned a commercial solidarity uncharacteristic of construction supply chain management.

RESEARCH STRATEGY

A research strategy of 'grounded theory' was followed for this exploration of supply chain governance namely, construction clans. The procedures for grounded theory originate from the work of Barney Glaser and Anselm Strauss (Thomas and James, 2006). 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 objective of this approach is not to hypothesize and test a theory but to interrogate practitioner understanding and expose substantive social processes that bridge the gap between management theory and industry reality (Orton, 1997). Research emphasis is on behavioural patterns (Goulding, 1998) therefore positivism paradigms of cause and effect do not conveniently align with the interpretative context of the research programme (Jeon, 2004). Grounded theory is "best suited to the study of behaviour" (Goulding, 1998) and "to understand the process by which actors construct meaning out of intersubjective experience" (Suddaby, 2006).

Data Collection

Data collection focuses on case studies from the UK construction industry. A number of key data sources were selected for the empirical exploration of contemporary collaborative working practices. The research findings and subsequent discussion rely principally upon interview transcripts taken from tape recorded semi-structured interviews. Alternative sources of narrative data in the form of notes taken from meetings not recorded, personal recollections documented after meetings and comments cited prior or immediately after the semi-structured interviews are also drawn upon to supplement the primary data source.

In total twenty eight interviews were recorded and transcribed verbatim and analysed through 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 framework for codification was derived from the interview template.

FINDINGS AND DISCUSSION

The current economic climate presents many research opportunities. Exposing the construction industry to the harshest economic climate in recent memory serves to emphasize the motives of the principal players. The decade between 1998 and 2008 was "arguably a golden age for the UK economy and for construction" (Wolstenholme, 2009). In swift response to the recession of 2008 many construction stakeholders have sought to re-evaluate their corporate procurement strategy (Gardiner, 2009). This potential reconfiguration of construction alliances has led some industry commentators to suggest closer collaborative working practices and by extension the notion of 'construction clans' are a product of buoyant economic conditions (Chevin, 2009, Wright, 2010). The findings and discussion section explores industry practice within strategic alliances and comments on the potential polarization of procurement practice as a consequence of the recent economic correction.

Supply Chain Bilateral Dependency

Bilateral dependency is defined as an ongoing reliance between a buyer and a supplier were either party or both parties have undertaken medium to long term investment, usually of a specialized nature in support of their commercial exchange (Williamson, 1996). Case study informants expressed a growing commitment to closer commercial ties between construction supply chain members. Recent experience within strategic alliances such as construction framework agreements appears to demonstrate a substantive shift towards collaborative working practice. Within designated public sector framework agreements client representatives have capitalized on the newfound enthusiasm for collaborative working to pro-actively promote innovation and knowledge sharing. Learning sets have been established not only to encourage adoption of best practice initiatives within supply chains but also framework forums have been established to facilitate the transfer of developments and efficiencies with other principal supply chain partners. Examples of cross-party collaboration include feasibility studies for design standardization, product standardization and collaborative purchasing.

A very interesting development within a select few strategic alliances is the formation of competing supply chain or squads. Each principal supply chain partner selects their project supply chain for a particular project from a pre-qualified resource pool of supply chain members. Under the terms of the alliance, squad members cannot swap sides. For example, contractor 'A' may select any supply chain member from their squad but contractor 'A' cannot select a supply chain member if they already have an framework allegiance with an alternative framework contractor. Consequently, each principal supply chain partner bidding for a project has a discrete project supply chain, each supply member having without contingency a commercial interest in the success of the tender. Within each squad there would be at least three supply chain members per service or product specialization. If the supply chain is too lean it may create a degree of risk if a key member was to experience financial problems. For example insolvency, acquisition or merger would result in probable exclusion from the supply squad. This form of construction framework governance creates a bilateral dependency between the principal supply chain partner and their supply chain members. Supply chain success is therefore mutually bound.

Prefabrication and an assembly, off-site approach to construction is beginning to influence the build process and subsequently shape supply chain governance. Construction organizations can capitalize on project efficiencies via vertical integration through the supply chains supported by investment and adoption of manufacturing based approaches to construction. While the interview companies displayed a diversity of supply chain sophistication, proactive communication systems were observed. Organizations working within strategic alliances are beginning to develop considerable ICT capability. In particular, a few informants cited the introduction of Building Information Modelling and Management (BIMM) technology. BIMM coupled with integration between CAD/CAM software permits virtual integration of building components and service provision prior to build. Demonstrating an emergent capacity for enhanced supply chain collaboration (Vaidyanathan, 2009).

Building Information Modelling and Management (BIMM) is a process that many argue brings a more efficient way of working. Pooling project information from multiple sources reduces the margin of errors and promotes greater certainty of built performance. For supply chain members the integration of BIMM within their organizational skill set is becoming a high priority (Knutt, 2011). By connecting ICT with manufacturing the quality, precision, continuity and speed of design will be improved (Macdonald, 2011). Other benefits of adapting BIMM include better integrated supply chains, clash detection, reducing the cost of changes, clearer scheduling and swifter fabrication using data from the project model. The adoption of BIMM also promotes a bilateral dependency between the supply chain members. This will not only improve project information exchange but depending on the sophistication of the software systems, the prerequisite for capital investment may act as a barrier to strategic alliance membership for those organisations unable or unwilling to make the financial commitment (Powell, 1990). For those construction clans bound by technology, governance and socialization it may be feasible to secure a competitive advantage.

Construction Clans

Working collaboratively is not new (Gruneberg and Hughes, 2004). What appears to be emerging from the data analysis is a collaborative interdependency that extends

beyond the traditional construction networks. Patterns of traditional competitive practice would create commercial and social networks that were constantly being rewired (Owen-Smith and Powell, 2008). Over the past decade repeat construction clients have employed first, second and on occasion third generation configurations of strategic alliances with preferred construction organizations. Informants cited supply chain memberships that had been working collaboratively for over six years. Repeat patterns of working relations have cultivated a social empathy and commercial commitment that also fosters a sense of tradition. "A long history and stable relationship" (Wilkins and Ouchi, 1983) are recognised prerequisites for clan forms of governance. Alternative forms of governance such as clans are a product of predictable transaction patterns between organizational members (Jones, 1983).

For some, the formation of construction clans is a dubious development. Over the past two decades proponents of collaborative working practice have also cautioned against 'cozy' relationships (Latham, 1994). The construction industry unfortunately has a recent history of unethical practice. Within EU and UK procurement legislation there is a fine line between collaboration and collusion (OFT, 2006). For construction supply chains and project procurement in general there is an organizational tension to be both competitive and collaborative. Organizational modes of governance such as construction clans tackle this dichotomy by reducing transactional cost via enhance vertical integration. Where bilateral interests overlap, "opportunism (a frequently cited frustration of the construction sector) is unlikely and equity in rewards can be achieved at a relatively low transactions cost" (Ouchi, 1980). Creating an economic advantage that will benefit the consumer.

Many factors within the commercial arena of construction conspire to undermine commercial relationships. This is particularly pertinent for small and medium sized enterprises. Informants within this study where keen to highlight good working 'partnerships' with preferred sub-contractors and suppliers however the tender price remained pivotal to the decision-making process. It was suggested that being identified as a 'contractor of choice' should ultimately be reflected in a more competitive bid from the product or service provider. A narrow business portfolio may also expose SME's to greater financial risk, given that their commercial viability and would-be vulnerability is defined by workloads from a select few main contractors. Commercial failure or a change in procurement strategy may signal potentially devastating consequences for a supplier or sub-contractor operating within the sheltered confines of a construction clan. Changes in the economic climate will undoubtedly affect the balance of demand and supply. This may also challenge construction clan organizations to revisit their procurement strategy. Fluctuations in construction demand, a frequently cited Achilles' heel of construction supply chain management (Hartmann and Caerteling, 2010) has the potential to reconfigure the relationship symmetry within the construction clan. In other words without the promise of work, collaborative relationships will ultimately falter.

CONCLUSIONS

Strategic alliances in construction create working environments that extend beyond the parameters of one project. Whilst it is widely recognised that arm's length procurement strategies may be appropriate for many forms of transactional exchange (Cox and Thompson, 1997), collaboration over numerous projects is argued to facilitate innovation, learning and fosters a social dimension largely absent from traditional contracting (Egan, 1998). Supporting the relationship with a steady stream

of work and financial commitment for physical resources and technological investment may permit supply chain members to transcend the doctrine of the free market and become commercially and socially embedded. In other words, construction clans.

Construction clans are distinguishable from other forms of supply chain governance. Their formation is gradual and dependent on the duality of reciprocity and community. Repeat working sustains a bilateral dependency, promotes full-disclosure information exchange and engenders a local culture. Buoyant economic conditions and by extension predictable and sustainable project workloads have fostered opportunities for greater supply chain integration. Coupled with the increasing popularity of strategic alliances such as construction framework agreements and the introduction of BIMM processes, supply chain relationships have shown signs of emergent clan behaviour.

The current economic climate allied with growing client confidence in the free-market has the potential to derail the behavioural model of procurement. The construction industry can support several competitive strategies (Miles and Snow, 1986). However, it may be contested that workload, certainly in the longer term is the lifeblood of construction clans. The continuation of construction clans as an alternative form of supply chain governance is currently in jeopardy. Failure on behalf of private and public sector clients to commission new projects via strategic alliances will undoubtedly undermine the extant foundations of the most robust commercial relationships. The construction industry is driven by economic forces (Wolstenholme, 2009). Industry analysts predict a bleak economic outlook (Experian, 2011). Only time will tell if construction clans succumb to the brutal reality of free market forces (Adler, 2001) or whether construction supply chain solidarity prevails.

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