

Procurement Impacts on Construction Supply Chains: UK Experiences

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Abstract: SCM has long been advocated as a means of improving the performance of supply chains in construction. SCM can be defined as a network of different organisations, linked upstream and downstream in a chain, aiming to produce quality and value in the services and products for the end consumers through integrated processes and activities. The drive for SCM has frequently come from the public and private sector client base. With one of the purposes being to achieve increased levels of integration of the whole supply chain, the industry has had to respond to drivers embedded in the changed procurement arrangements that have been implemented. This paper reports on an investigation into the impact of changed procurement systems on supply chain firms in the UK. It will discuss different initiatives by clients and by the UK government in order to drive some form of supply chain integration..

Keywords: Construction industry, Procurement driving change, Supply chain integration, Supply chain management

1. Introduction

SCM has long been advocated as a means of improving the performance of supply chains in construction and as a means of making a more effective and more efficient industry. The main reason for the advocacy of this philosophy was the successes within other industry sectors. However, the drive for SCM has frequently come from the public and private sector client base. With one of the purposes being to achieve increased levels of integration of the whole supply chain, the industry has had to respond to drivers embedded in the changed procurement arrangements that have been implemented. This paper reports on an investigation into the impact of changed procurement systems on supply chain firms in the UK.

SCM can be defined as network of different organisations, linked upstream and downstream in a chain, aiming to produce quality and value in the services and products for the end consumers through integrated processes and activities. In order to achieve the optimised level of integration of the whole supply chain, the industry has responded in various forms. This paper will give an overview of what is being done in general and specifically within the construction industry to support the integration of supply chain.

Saad et al. (2002) argue that the construction industry has moved to the adoption of SCM philosophy, without having benefited from earlier philosophies in other industry sectors such as Just-in-time, Total Quality Management, and Concurrent Engineering (Khalfan *et al.*

2001). In other words, features from the above mentioned philosophies have become part of the current practices of the construction industry because of the adoption of SCM which lay the foundation of integrated construction supply chains. One of the features of the integrated construction supply chain is that they are centrally coordinated and the relationship between firms is maintained for the duration of a specific project and beyond. These chains are not only directed towards the minimisation of transaction costs, but also towards the enhancement and transfer of expertise between all the parties (Vrijhoef and Voordijk, 2003). This paper will review the literature related to the construction supply chain integration; efforts in the form of current reports; industrial practices in order to achieve supply chain integration within construction industry; and will also give a brief overview and initial findings of a project undertaken by the authors at the SCRI Research Centre at University of Salford.

2. A brief review of Supply chain management in construction

In the construction industry, an increasing number of construction organisations have started showing a realisation of the importance of SCM concept (Akintoye et al, 2000; Vrijhoef and Koskela, 2000; Dainty et al 2001a). However, unlike the retail and manufacturing sectors, the construction industry has been slow and reluctant to employ the concept of SCM (Love, 2000). According to Ofori (2001) by using a SCM philosophy, various problems associated with the traditional practices in the construction industry can be resolved. These problems may arise due to the presence of win-lose arrangements; uncertainties encountered by various construction processes; lack of exchange of information and knowledge; increasing price competition due to the purchases of supplies from numerous suppliers; and the existence of environment of fear, dishonesty, and frustration (Asad et al., 2005).

Proverbs and Holt (2000) advocate the use of the SCM philosophy as a mean to effectively reduce the overall construction costs. They advocate early involvement of subcontractors and suppliers in a manner similar to the early involvement of the contractor during the procurement process. According to them this would give an opportunity to the concerned parties to offer their expertise which could result into potential cost savings and can become a stepping stone in improving two way communication among the collaborating partners. On the other hand, Dainty et al. (2001b) have stressed the need to facilitate inter-firm relationships, achieve mutual benefits, and build trust among key interfaces in the supply chain. According to them it is crucial to take away the deep-rooted barriers of traditional relationships and the adversarial culture, and instead, introduce a change management framework to facilitate the implementation of supply chain management at the operational level.

Tan (2001) on the other hand has identified the key drivers towards a fully integrated supply chain. According to him, these drivers may include; changes in the corporate culture, trust and communication among all the parties involved, information/knowledge sharing, suppliers' evaluation for supplier development process, and sharing common goals of waste elimination and increased efficiency. Dainty et al. (2001a) have suggested changes which are required to make supply chain integration more effective. These changes include developing trust between parties; ensuring fair payments; early involvement with projects; educating the construction workforce; improving communication skills; knowing the operations of other type of organisations within construction supply chain; knowing the benefits of supply chain integration and partnering; understanding new contractual documents; client and main

contractor organisations accepting that sub-contractors can bring added values to the construction project delivery process; and willingness to share knowledge.

Barratt (2004) proposed a 'collaborative culture' for enhancing integration and improving collaboration among the supply chain partners within the construction industry. He opined that the collaborative culture is made up of number of elements including; external and internal trust; mutual pain and gain, information exchange in the supply chain, transparency and quality of information flow, communication and understanding, effective cross-functional activities and process alignment; joint decision making; use of measures to assess the performance of the whole supply chain, commit resources at the early stages of project development process, intra- and inter-organisational support, corporate focus on SCM, demonstration of a business case for collaboration, and a notion that collaboration does not need to be based on technology. One of the ways to bring collaboration and integration within the industry is through aggregating the supply and demand, which would result into enhancing the collaboration among the construction firms. This will be discussed during one of the later sections.

3. The impact of changing procurement systems on supply chains

This Section describes a research project, that seeks to explore and explain the impact of the changing procurement systems, of both public and private sector clients, on the behaviours of firms in the construction supply chain.

In the UK the NAO (NAO report, 2001) has endorsed the public sector moves away from lowest cost and adversarial approaches towards the newer forms of procurement. In particular, it calls for the entire supply chain, including clients, to be integrated. Through *Achieving Excellence* (HM Treasury, 1999), the Government had already committed all government departments to:

- To work with industry to reduce waste in all aspects of construction procurement and management;
- To enter co-operative relationships with their suppliers to ensure an open and mutually productive environment, and
- To ensure an integrated supply chain.

Building Down Barriers (Holti et al., 2000) has investigated the Ministry of Defence *Prime Contracting* procurement policy. While concerned with project specific partnering, it suggested that there was some anecdotal evidence that the members of the successful project teams had kept together and moved on to other projects with other clients. Building Down Barriers (BDB) was unable to follow this through to examine the form of relationships and the exact benefits that were flowing. However, BDB suggested that the effective configuration of long-term supply chains might be different for different kinds of construction. Further, this would suggest that appropriate models of supplier development, commercial relationships and agreements are needed for the different circumstances. This demands a contingency view of supply chain integration.

The conflict between the process of market liberalisation and the development of effective and efficient industries is a common phenomenon. Many researchers have argued that procurement systems should be appropriate to the circumstances - not only to the client's circumstances but also to the circumstances of the industry. For example, Martins and Taylor

(1996) in the context of the New South Africa, argued that they should encourage appropriate, people intensive technology and processes, and also open the way for learning and skill development. In these circumstances the procurement process assumes a greater status than it is normally afforded. This overseas example serves to emphasise the need in the U.K. context, not only "to consider current procurement and contractual relationships".... but also"to examine the structure of the industry" - which was actually the original brief referred to by Sir Michael Latham (Latham, 1993).

This project was timed to investigate the changes that are occurring in the supply of consultancy and contracting services in response to client procurement initiatives.

3.1 Aims and objectives of the project

The main aim of this research proposal was to determine if there are ways of integrating the supply chain that will ensure service and product quality whilst still supporting the government and client initiatives, aimed at increasing the competitiveness of the construction sector. Specifically this project had the following objectives:-

- Identify current international and national best practice in supply chain integration;
- Reveal the *critical success factors* for the establishment of effective and efficient supply chain integration – the behaviours/ responses to the new means of procurement made by successful firms in innovative supply chains. How successful firms are coping – through individual and corporate responses – (change programmes/change agents, training, alliancing, merging, new ventures etc. will be revealed);
- Test the proposition that the effective configuration of long-term supply chains will be different for different kinds of construction;
- Produce a contingency model of supply chain integration (which would lead to appropriate models of supplier development, commercial relationships and agreements for different circumstances); and
- Best practice guidelines for supply chain members to determine appropriate forms of relationships in response to the needs of different clients and produce best practice guidelines for clients and other members of the supply chain to determine appropriate forms of relationships in response to the needs of different clients.

3.2 Methodology

Literature reviews and semi-structured interviews have been completed that explore the changes that are occurring throughout the supply chain. The immediacy of the need for information to feed the client, firm and institutional policy development only serves to emphasise this. Four case studies of construction projects have been conducted.

4. Case studies

The case studies attempted to uncover the perceptions of firms within the construction industry with regard to the existing partnering arrangements they currently undertake. The research used multiple methods to collect qualitative and quantitative data. Basic quantitative data and company documentation were used to provide research context while qualitative data, collected in the form of a number of unstructured interviews, sought to understand how innovative procurement was viewed by different supply chain partners. The case study

approach followed the protocol developed by Yin (1994) in order to improve the validity of the research. As a result, the research included a number of key elements such as clear and concise research objectives, research propositions, case study selection criteria, unit of analysis, a structured questionnaire, unstructured questionnaire for interview, a predetermined case study procedure, and an interview guide (Yin, 1994). The study involved multiple visits to each organization involved, including an average of three interviews with the Managing Directors of these companies and other staff and a few other interviews with their supply chain members in North West of England. All interviews lasted for at least 1 hour. An assumed name for each company has been adopted for the purpose of confidentiality, when reporting the case studies. Since, all four case studies are being analysed when this paper is written; therefore, the conclusions present here are based on findings to-date.

The senior management of each of the above-mentioned organisations was interviewed. Soft System Methodology (SSM), along with case study research method, was used to analyse the interviews, used for organisational analysis. For the social and organisational aspects, the research draws on contextually rich modelling techniques of SSM (Checkland, 1981) with its emphasis on a stream of cultural analysis within construction organisations, and the industry overall. The SSM is selected because the research is dealing with the softer social issues and phenomena such as changes in the behaviour of people and companies in response to the changed in procurement routes. The whole idea to adopt soft system methodology to carry out this qualitative research revolves around the advantages of using SSM. Once the interviews were carried out, the rich pictures were developed and these pictures helped the researchers to identify the issues and areas which have been affected by the change in procurement strategies. The root definitions and CATWOEs were then developed from the rich pictures which helped us to understand the transformation of past situations and circumstances to the present scenarios. Some of the results are reported in this paper as observations of changes due to the innovative procurement, and motivational issues affecting the adoption of innovative ways of working.

5. Findings

Only two of the four case studies are reported here as data analysis was still under way at the time of writing. Therefore, the conclusions presented here are based on findings to-date. The first case study explores the initiatives taken by a public sector client to motivate main contractors and their supply chain participants to adopt innovative ways of working within a project team. The second case study examines how a group of Local Authorities (LAs) and Registered Social Landlords (RSLs) aggregated their demands, under a motivated leadership, which resulted in cost savings and economic growth of the region where it is based.

5.1 Case study 1

The first case study was involved a public client - a local council, that had developed a Framework Agreement to construct educational buildings (primary school in the first phase) in the value range £500,000 to £5 m. For this client-led innovative and new way of developing educational infrastructure, three Constructor Partners were appointed in 2004 for three years initially. Since the appointment, a number of educational projects have already been delivered, some recently started, and some of them are in the early stages of design.

Benefits from the Innovative Framework

The core values of the framework agreement, that are based on the partnering concept, agreed by the client and all other participants, include: Trust; Honesty; Openness; Commitment; Co-operation; and Respect. The council's vision is that this framework agreement will deliver good quality school buildings that will lead to:

- Better educational results;
- Greater inclusion within the community;
- Better safety and environmental performance; and
- Reduced demand on future school budgets by addressing whole life cycle costing at the inception of the projects (Khalfan and McDermott, 2006).

The major benefits are being and would be achieved in the following broad area by adopting the strategic partnering framework for the development of Primary Schools:

- Improved design;
- Less waste and duplication;
- Improved delivery;
- Greater quality;
- Greater certainty of cost;
- Better whole life cycle costing;
- Building of trusting relationships; and
- Bringing of all "project knowledge" together at the inception of a project.

Examples

The council has changed the mechanism of selection for contractors and sub-contractors. It used to be the case that small companies were rejected based on their turnover. Now the turnover figure is not used as part of the selection criteria and is considered afterwards when the percentage of the work is being allocated. Therefore, those companies, which used to be left out (specially the SMEs) because of their small turnover, are now able to pass through the initial two-stage selection process of the council, and then they are awarded work which is equivalent of 25 % of their turnover (irrespective of how much it is!). On the other hand, the selection is now moved from traditional to Quality-Price Mechanism. The council uses 70% - 30% respectively for the selection. The council also uses a specific quality and performance criteria to select the companies for the framework agreement during the selection process.

5.2 Case study 2

In the North West of England, an initiative by a group of local authorities and Registered Social Landlords has resulted in the formation of an organisation which procures on behalf of the partners involved for social housing renewal within the region. The initiative has adopted the idea of bundling/aggregating the present and future demands of different client organisations, as mentioned earlier in this paper, and putting them forward into the market to get the best price from the sub-contractors and suppliers in return for certainty of continuous workflow. The organisation operates in such a way that it has two separate agreements, one with the contractors and installers to supply labour only and the other with the suppliers and manufacturers to supply products and material only. They are also involved in skill

development of the local labour with an agenda of the economic and social sustainability of the region in parallel with achieving hard environmental targets.

Benefits from aggregation

As discussed above, the bundling of demands by the local government and initiatives by central government departments have raised awareness and now more and more companies, especially SMEs are collaborating and offering their services as a package, as a supply in response to the demands. Other benefits seen within the case study, which are in addition to the benefits highlighted through aggregation earlier, include

- Direct and continuous employment, and subcontracting opportunities offered by the contractors to the local labour because of continuous work load for both, their own employees and other subcontractors.
- Skills development within the local community through Apprenticeship and Training schemes. Contractors have to take on board trainee and give them both on the job training and flexibility for attending colleges.

Examples

This section reports some of the examples from the best practices being implemented by the supply chain involved:

- Even for subcontractors (self employed people hired for labour only by main contractor), continuity of work is given. Other attractions include prompt payment (one week); PAYE (Pay as You Earn) paper work done by the contractors; they do not have to incur tender costs because they get to know upcoming work around 12 months in advance.
- The people working on site (both direct employees and subcontractors) are trained in the underpinning concepts of the working arrangements. This includes the understanding about the partnership among the local authorities and Registered Social Landlords and their initiatives to encourage apprenticeships.
- One of the supply chain partners describes the relationship; ‘The relationship of suppliers and contractors is changed because there is no money involved between them!’ This is because the whole procurement is open book.
- Another supply chain partner sheds light on the benefits as; ‘Since RSLs are working together in one area, therefore, there are no conflicts and no problems in getting the material. If they were working against each other, then contractors would be fighting among and with suppliers for material supplies.’
- Work-force smoothing - a simple management concept is now being practised within the supply chains associated with the framework, for upcoming years.
- The power to select the product and allocate the profit margin is shifted from contractors and moved to clients. But on the other hand, there is also a guaranteed profit to all the involved supply chain partners for a longer period of time.

6. General Conclusion

To-date, the results from both case studies are showing savings in time and cost. To maintain the momentum of these gains there must be a continuation of the positive attitude amongst the partners in sharing their knowledge and experiences on future projects. By this approach, further benefits will be passed onto the client and end users. At this point, there is a positive approach by all partners to take the unthought and innovative approaches forward to achieve its targets. All the partners in the supply chain are committed to the innovative ways of solving problems, and new methods of working with each other as an integrated team. The supply chain partners in both case studies are highly motivated to the framework agreement because of the continuity of work, agreed profit margin, long-term relationship with client and other supply chain members, and recognition of their quality services in response to the invitation to work with the clients, fully subscribed to innovate the processes related to procurement and supply chain integration within the construction industry. Money saving through reducing cost is another motivating factor for being part of such framework agreements especially for main contractors and subcontractors. One of the biggest cost reductions is achieved through not incurring cost in tendering for jobs for the same client for a period of say 3 – 5 years.

7. Summary

This paper presented two case studies, showing how different organisations established their procurement processes on innovation, and innovative thinking in management and integration of their supply chain, once unthought within the construction industry. The case studies reveal the role of the client organisations in introducing the innovation procurement and role of these unthought initiatives to integrate the supply chain participants within the construction industry.

The findings have also revealed some of the factors underpinning the motivation of those companies working within the new procurement environment, including both the client and contractors. This includes the continuity of work for both the contracting companies and their supply chain partners; transparent and open book accounting system which give added value to the clients; long term relationship among all the supply chain partners; definite profit margin for a longer term period for the contracting organizations; visibility of the future work with the existing clients; over all growth of companies involved in terms of turn over and profit margin; job security for directly employed people by sub-contractors; recognition as forward thinking contractors and clients within the UK construction community through news and presentations; training for staff employed by these companies as part of their skill enhancement programme; and self – satisfaction from the quality work done and services provided.

Teams play an important role in the success of any project, and the consideration of teamwork, resulted because of innovative procurement initiatives was seen as a significant motivating factor by all the companies interviewed as part of the case studies presented. It can be suggested that effective teams resulting from innovative procurement strategies can lead to increased output, greater creativity, increased work quality, and higher morale among the group members (Schermerhorn et al., 1994; Vecchio, 1995). The case studies also offer learning opportunities for other construction organisations seeking to establish innovative

procurement strategies in order to integrate the supply chain and would be able to gain courage to introduce unthought innovations within their activities. There is also a need to report on the findings from all the cases at the end of the project, which would reveal the in-depth and holistic view about the changes occurring in general due to innovative procurement within the industry on one hand, and would also give perspectives of different participants involved within the construction supply chain.

8. References

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