

ACHIEVING SUPPLY CHAIN INTEGRATION THROUGH DEMAND AND SUPPLY MANAGEMENT

Malik M A Khalfan¹, Peter McDermott² and Tayyab Maqsood³

¹*Salford Centre for Research and Innovation (SCRI) in the Built and Human Environment, University of Salford, Bridgewater Building, Salford, Manchester, M7 1NU, UK*

²*Centre for Construction Innovation, Manchester, UK*

³*RMIT University, Melbourne, Australia*

One of the major issues while integrating the supply chains within the construction industry is to capture the thoughts, and views about the changing practices from the parties involved. At the end of the day, it is all about human nature, which by default is often reluctant for to and resists the change. The integration of the supply chain not only brings the changes in the processes such as procurement process, design and management process, but also encourages some softer aspects such as more trust and more collaboration among all parties involved, etc. As mentioned in a paper, part of last year's proceedings (Khalfan et al., 2004a), SCRI Research Centre is undertaking a research project which will look into the responses and change in behaviours of the different parties involved in a supply chain due to the changes in the current practices within the construction industry mainly due to innovative procurement routes. This paper will mainly focus on the management of supply and demand within the UK construction industry practices. The concept of aggregation is now being introduced not only to manage the supply of the construction services by the downstream supply chain participants, but at the same time, the concept of aggregating the demand is being adopted by leading clients to make most out of service providers and suppliers in terms of value. One of the elements which contributed towards the aggregation is the integration of the supply chain participants to adopt and respond to the current market situation. This paper will not only discuss the concept of aggregation but will also talk briefly about the other supply chain integration related concepts including client led supply chain, knowledge about the whole supply chain, effects of procurement on integration of supply chain, etc. The paper will also include examples from the UK construction industry on bundling the supply and demand.

Key words – Supply Chain Integration, New Procurement Initiatives, Aggregation.

INTRODUCTION

The researchers on the supply chain integration project will be looking for the responses to change in the procurement route – responses of the downstream supply chain participants i.e. sub-contractors, material suppliers on one hand, and on the other hand, the responses of the clients and their contribution in bringing those changes in the new procurement routes. Now the question is; What sort of changes? Changes in the business strategy to respond to aggregated demand and the new procurement routes; etc. These changes could be evident from the annual reports of the companies, change in business strategies of an organisation, internal changes in the organisation (corporate changes), through project documentation, through analyst reports on construction sector, etc. One can highlight the changes by looking at different activities of an organisation such as new forms of agreements, new cultural programmes, new training programmes in the company, etc. Some of such changes are observed by some researchers and reported, already in the literature. On the other hand, the supply chain integration project will also identify some of these changes during the interviews and case studies.

¹ Author for correspondence; E-mail: m.m.a.khalfan@salford.ac.uk

The paper will also include the recommendations/suggestions for aggregation in the light of some reports published in the UK. The paper also argues that lean practices could be adopted in managing demand and supply of services and products within the construction industry but trust, integration and collaboration among the supply chain participants are pre-requisite.

AGGREGATION

The Office of Government Commerce (OGC) works with the UK Government to improve procurement and project/programme management. They also work with suppliers to make the government marketplace more efficient and attractive to business. Another Government department, The Department of Trade and Industry (DTI) drives the UK Government's ambition of 'prosperity for all' by working to create the best environment for business success in the UK. They help people and companies become more productive by promoting enterprise, innovation and creativity. The next sub-sections will give a brief on some of the recent reports published by the above mentioned organisations, which has already started impacting the integration within the construction supply chain, as these reports are now forming the shape of the new public procurement policies. The purpose of this OGC guide (2002) is look at the three areas of procurement:

- Analysing demand information both within a government organisation and across different organisation;
- Taking decisions on whether to seek aggregated deals, i.e. to engage in collaborative deals between departments; and
- Taking decisions on whether to bundle good and services together into a single contract.

The report discusses both, the aggregation or coordination of demand and the aggregation or consolidation of supply (see Figure 1).

Aggregating demand means:

- Analysing historical purchasing data to provide the management information necessary to assess purchasing practices and trends;
- Drawing together information on common or similar current or future requirements, either within an organisation and/or with other organisations; and
- Assessing the potential for collaborating with other business units within an organisation or with other organisations and agreeing to present these requirements in a coordinated way to the market.

Sometimes, instead of grouping together information on common or similar requirement, we include diverse but related requirements then we refer to this as bundling.

Aggregation of supply:

When the aggregated demand is presented in a consolidated way to the market, a single supplier or fewer suppliers may respond and contract with us. This is a likely market response to aggregated demand presented in a consolidated way to the market.

Aggregation issues should be considered as early as possible in any project that involves procurement.

The potential advantages of aggregation are:

- Better management information through aggregation of demand;
- Greater leverage;
- Lower prices through reduced production costs;
- Lower transaction costs;
- Better management of the market; and
- Better management of the supply chain.

On the other hand, there are some potential drawbacks of aggregation:

- Need for highly skilled procurers and contract managers;
- Distorting the market and missing out on innovation; and
- Invisible supply chain.

The aggregation report also presents a checklist of questions to be considered in reaching decisions about aggregation.

The basic aim of another report of the OGC, the Kelly Report (2003), was to advise OGC on what further steps can be taken in order to increase competition and encourage better long-term capacity

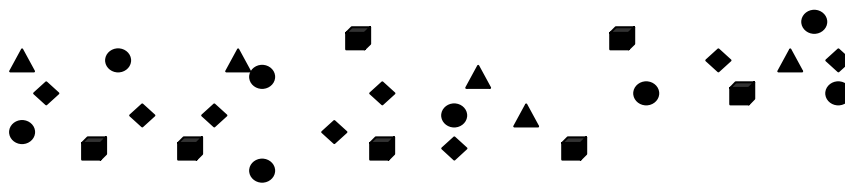
planning in markets (including the construction industry), where the Government possesses significant purchasing power.

The report suggests that all Government departments should work towards providing the information on their future needs (e.g. for a specific area, say construction), in order to correspond with industry lead times, engage early with key suppliers throughout the supply chain and take supplier's needs into account in their business planning. This will also result into a better understanding of the public sector's likely demands on the industry and the nature of the market to meet those demands.

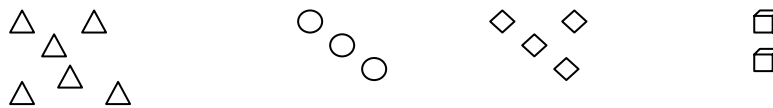
The Government as a Client, needs to develop those markets in order to improve their capacity, on the other hand needs to improve its own capability. Specially, improvement within the procurement system is crucial. This may include development of a guideline on how to engage in early dialogue with suppliers while adhering to the principles of open competition and work on better ways of sharing information between departments about the performance of individual suppliers. This is also believed that if the public sector (Government) and the industry work together and help each other, they both could bring about lots of improvement within the construction sector.

Demand-side aggregation

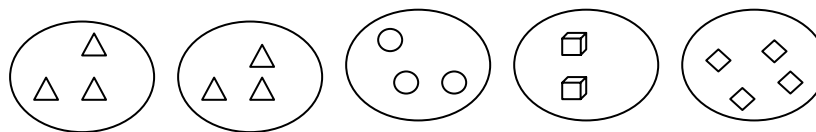
a. Gathering historical spend data



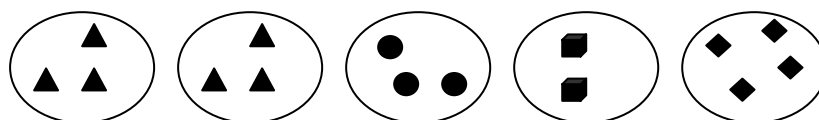
b. Identifying options for rationalising current/future demand



c. Deciding to consolidate requirements to present them to the market



d. Market provides a response to the aggregated demand



Aggregation of supply

Figure 1: An illustration of the aggregation process (OGC Report, 2002)

Examples

In the North West of England, an initiative by the local government and the social housing landlords (RSLs) has resulted into FUSION 21 (<http://www.fusion21.co.uk/>). The initiative has adopted the whole idea of bundling the present and future demands of different client organisations and putting them forward into the market to get the best price from the sub-contractors and suppliers in return of certainty of continuous workflow. The organisation is also involved in skill development of the local labour and the details can be found on the website provided above. Another project with the same region, called Elevate (<http://www.elevate-eastlancs.co.uk>) is also trying to introduce the ideas and lessons learnt from FUSION 21. 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. Prime contracting, a type of construction contract, is becoming popular among the local government because the prime contractor comes with the integrated supply chain to offer the supply of services and products in response to the demands of client organisations. Ministry of Defence (MoD) is the main player in getting benefited from prime contracting. Research and consultancy work is also being done with Manchester City Council by the authors, who is taking lead in the North West of the England to bundle their demands for educational facilities in different packages and in response they have awarded prime contracts to three contractors who have come forward to supply products and services in the integrated manner (Khalfan et al., 2005b).

THE SUPPLY CHAIN INTEGRATION PROJECT

As part of the investigation into drivers of supply chain integration, the authors are conducting a series of case studies as part of their research project with different companies including the public sector. FUSION 21 and Elevate, both projects are part of the case studies. These case studies are generating the propositions around the concepts, theories and policies presented earlier in the last section. Some of theories will be discussed in the later sections as well. The project is now intend to test both theory and policy implementation within the companies in order to influence supply chain integration and will also investigate the extent to which the above mentioned concepts are being implemented with the construction industry. The original aim of the research proposal is 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 (Khalfan et al., 2004a). Literature reviews has already been carried out and semi-structured interviews are being conducted as part of the project which will explore the changes that are occurring throughout the supply chain. The project has already looked at some of the concepts that are important within supply and demand management context and affect the overall supply chain integration within the construction industry, which are being discussed in sub-sections now. This includes knowledge of suppliers' capacity, clients role in demand aggregation, etc.

When this paper is being written, the researchers have identified the projects and companies represented on the steering committee based on the unit of analysis and selection criteria to go and carry out the in-depth and small case studies. At this stage, the findings from the first round of interviews are being analysed by using Soft System Methodology (SSM), which researchers are intending to use for the rest of the case studies as well.

Soft System Methodology

The analysis for the interviews (which will be carried out throughout the project) will be based on Soft Systems Methodology (SSM), 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, involving reflection on the social system, the political system and the intervention itself. The SSM is selected because the research will be 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, etc.

The whole idea to adopt soft system methodology to carry out this qualitative research revolves around the advantages of using SSM. Once the interviews are carried out, the rich pictures would be developed and these pictures will help us to identify the issues and areas which have affected by the change in procurement strategies. The root definitions and CATWOEs could be then developed from the rich pictures which would help us to understand the transformation of past situations and circumstances to

the present scenarios. The results can then be reported as the observations of changes due to the procurement, carried out within the construction industry.

Therefore, a project will be selected for the case study, based on the selection criteria. A number of organisations/participants will be then selected for each case study, keeping in mind to have a wide range of organisations from the client to the sub-contractor and suppliers. Then the interviews will be carried out with the people involved in the project from those organisations and rich picture will be then developed. The next step will be to develop rich pictures out of those interviews.

Once the rich pictures are developed, the root definition and CATWOEs can be developed out of those by identifying the issues faced by the companies and changes experienced due to change in procurement strategies. An oval mapping exercise can be done to identify the changes, as adopted in the C-SanD project (Khalfan et al., 2004b).

From the root definition and CATWOEs, conclusions can be drawn. Since, the basic purpose of the research is to find out the changes and effects of the new procurement route, therefore, the use of SSM could be then used up till this stage and results would be made public through different dissemination channels.

Although, one or two case studies can be taken further to look at issues and changes in depth, and an action research could be carried out by following the rest of the steps within SSM. An example of root definition and CATWOE is presented here, taken from the first round of the case studies of the current project (see Figure 2).

A selection process for supply chain participants to enable the best value for client rather than lowest price in order to bring more value for money and better quality facilities for the client and end users.

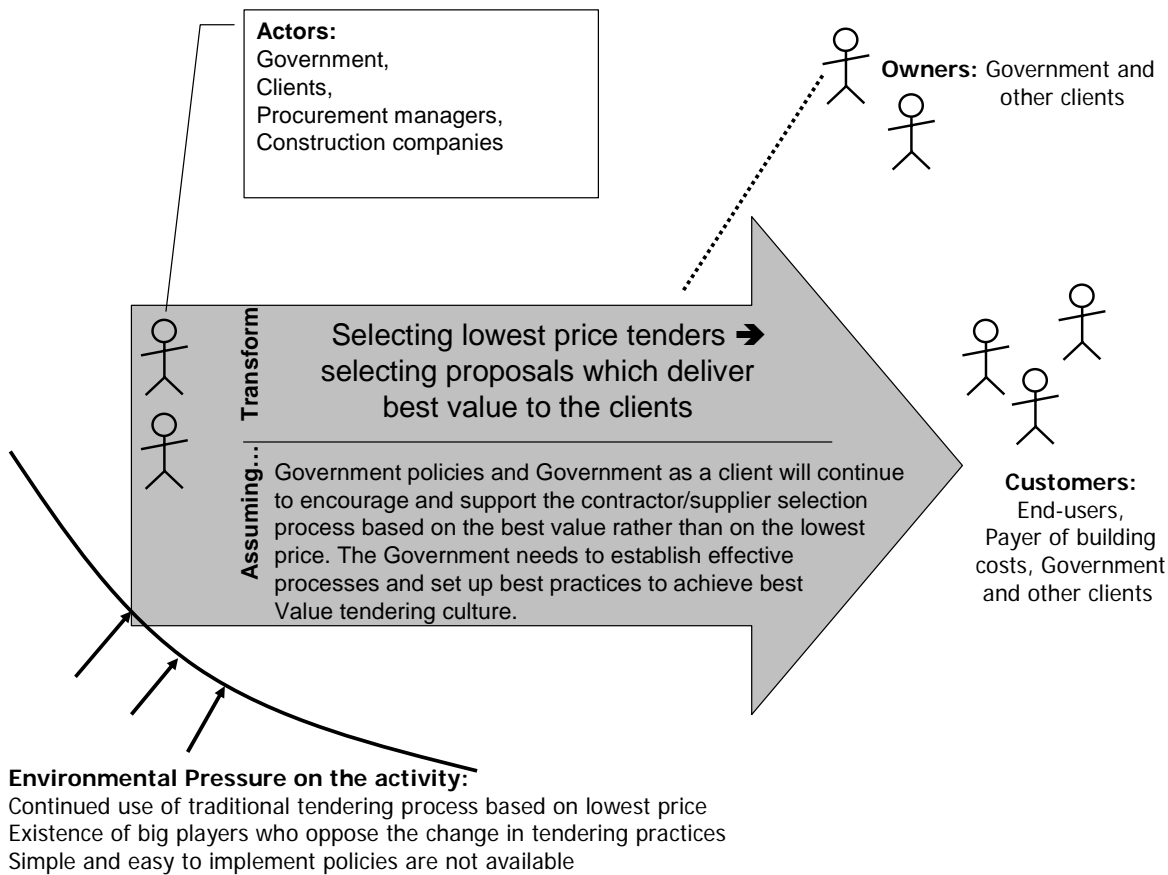


FIGURE 2: TRANSITION FROM LOWEST PRICE SELECTION TO SELECTION OF BEST VALUE PROPOSALS

Fragmentation

Fragmentation issue within the construction industry came out clearly during the first phase of interviews. The problem is how to manage the fragmentation and also how to reduce that fragmentation. This is fact that we can not eliminate fragmentation! And in order to manage this fragmentation, we need some management mechanism, including concurrent engineering, lean thinking, supply chain philosophy etc. Fragmentation is classified as the number of participants working on one project. If it is a complex project then there is likelihood that there would be more participants involved in that project, resulting into more fragmented project.

The question arises; why there is a fragmentation? Since, there are no barriers in place for people to enter into the construction business, therefore, there are many SMEs and one-man companies involved in the business, some with literally no skill at all! Secondly, all project participants coming from different background and have different goals related to their current work on a specific project. Unless we have got common understanding and common goals to achieve in a supply chain, it is difficult to manage everybody involved in the project supply chain. One of the solutions is to integrating all the participants at different level, which could help in resolving this problem, i.e. by integrating them, by bringing common understanding at different level within a supply chain.

Integration of supply chain means knowing the supply chain

It is very important for the each member or participant of an integrated supply chain to know first of all the whole process of the construction and secondly and the important thing is to know the businesses of the other participants/members of the supply chain. People come together as a team, and work for a

number of years and then disperse; this trend is now out of fashion due to new procurement methods adopted by different companies within the construction industry. It is now becoming necessary to know more about the people, personally and professionally, with whom we work within a team because the concept of construction project team is now moving from temporary to virtually permanent team (Vrijhoef and Voordijk, 2003). Knowing the people and their businesses will not only bring new culture within the industry but will also bring benefits which will be enjoyed by everybody within an integrated supply chain (Khalfan et al., 2005a).

CONSTRUCTION CLIENTS' ROLE AND POWER IN INTEGRATION

Clients have played a central role in construction, and this has been studied for a long time (Cherns and Bryant, 1984), including with regards to supply chain integration (Khalfan and McDermott, 2005). Some authors have criticised and called for change in clients' procurement strategies and tendering procedures (Millett et al., 2001; Wong et al., 2000). It has been argued that clients have a critical role for integration of the supply chain because it is the client that makes the initial decision to procure construction works and the way in which procurement takes place (Briscoe et al., 2004). However the majority of clients within the construction industry are not in a position of dominance over the supply chain because of the nature of their ad-hoc construction profile combined with their misunderstanding of the marketplace. Only the regular clients are in the better position to be able to leverage the supply chain effectively and implement integrated supply chain management concept successfully through introducing new procurement strategies such as partnering, strategic alliances etc. In addition to the type and position of clients within the construction sector they are in, various external factors are affecting clients' roles and power vis-à-vis their supply bases, including size of the suppliers market, global or local suppliers market, influence of regulations on clients (public or private), and market share of the client, e.g. large clients dominating other smaller clients in particular client markets, having major influence on suppliers, and thus the ability to exercise power on the supply chain, or even mobilise own integrated supply chain, e.g. through framework agreements with contractors, specialists, suppliers, architects, structural engineer etc.

CONCLUSIONS

Integrated procurement approaches and supply and demand management are often associated with conditions of mutual dependency, integration, collaboration, goal sharing, and trust. This notion is largely reflecting what most previous authors have been arguing with regards to the above mentioned concept. This paper briefly described the concept of demand and supply management which are in the literature and are being practiced currently within the construction industry due to the publication of different reports, including aggregation, clusters, etc. It can also be concluded that trust, integration and collaboration among the supply chain participants are pre-requisite for supply chain integration. The paper also gave an update on the supply chain integration project, being carried out at the SCRI Research Centre. It is being investigated by the researchers that the impact of the discussed concepts are beginning to be felt by construction practitioners through the UK Government construction procurement policies.

The basic aim of conducting case studies is to observe an organisation working on a specific project and observe integration of the supply chain on that project. The prospective company is expected to give researcher the access to one of their projects. The research would be conducted through using several tools including tools for observation, semi-structured interviews and a structured questionnaire;

and would involve the contacted organisation and their supply chain participants. At the time, when this paper will be presented, the researchers would have conducted a few case studies and would be able to share their experience and analysis during the presentation.

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