The effect of procurement on the integration of the supply chain within the construction industry

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Abstract

As time goes by, more and more companies within construction industry are moving away from traditional procurement route towards innovative procurement methods. In the UK, partnering framework, prime contracting, PFI or PPP, etc. are some examples of procuring the construction work differently than it used to be in the past years. One of the key elements in all these procurement methods is the management of the supply chain. Key questions discussed around this area are how to make partnering and other methods successful; how to select and appoint suppliers; how to manage the integrated supply chain; how to build trust; who will lead the whole process; etc. This paper will look into the different questions mentioned above by explaining the basic rules of supply chain integration including: understanding the brief; understanding the whole process of construction by each trader involved; early involvement of suppliers and sub-contractors; effective management and leadership for integrated supply chain; effective communication and feedback on performance; etc. This paper will define supply chain integration within the construction industry and incorporate some findings from an industrial case study on above issues discussed with emphasis of the effect of the adopted procurement method on the integration of the supply chain. The paper is part of the Supply Chain Integration Project undertaken by researchers of the SCRI Research Centre at the University of Salford.

Keywords: supply chain integration, construction clients, procurement, power, roles.

1. Introduction

If we look at, generally, why there are many initiatives to improve the performance of the construction industry; a few responses are obvious. The most obvious one is the bad reputation of construction industry for not delivering the projects: in time, within budget, and with desired quality. On the other hand, these initiatives for change are somewhat responses to gain the confidence of dissatisfied client/customers/end users. What does the client want, has also become
an area of research on its own, identifying the requirements and needs of the clients, specific to a project and overall from the construction activities, which includes: reduction in cost; improvements in profits; expenditure is kept within the budget limits; achievement of sustainable outcomes; predictability of construction programme, price, and quality; faster delivery than the competitors; development of a safe environment; etc. In reality, the above-mentioned client’s wants are the aim and objectives (and if not then should be the aim and objectives) for all the participants involved in a construction project supply chain. But, on the other hand, these objectives cannot be realised if involved participants do not do any efforts to achieve them. And one of the ways to accomplish and get succeeded is to adopt integration and collaborative values and behaviour (mentioned here) as advocated by the research team here at Salford [1], and also by others within the construction industry such as Collaborative Working Centre of be (www.cwcltd.biz): FUSION; Fairness, Unity, Seamless, Initiative, Openness, and No blame. This paper will look into what sort of changes the new procurement methods and relevant initiatives have brought and are bringing within the construction industry with respect to achieving integration and collaboration within the involved organisations in the supply chain.

2. Supply chain integration through procurement

It is evident that the construction industry is becoming increasingly aware of the necessity to change current working practices and the attitudes they represent. Similarly, a number of organisations and individuals within the construction industry are already moving towards supply chain management through the use of partnering, framework agreements and techniques to rationalise their supplier base [2].

Hall et al. [3] advocate that the one of the enablers of supply chain integration is the chosen procurement route (which could be either PFI, partnering, or design-build-finance-operate). This is because it provides the formal links within which supply chain integration is attained and sustained. In their view, any consideration of any formal contractual terms is not only a legal tie but also a way in which knowledge and activity flow between organisations involved within a construction project. Akintoye et al. [4] support the above discussion by saying that when SCM in construction is adopted along with partnering and TQM concepts, it would successfully address the major current problems faced by construction industry overall and its clients specifically. Benheim and Birchall [5] also consider new procurement methods as a tool to integrate the construction supply chain, because it provides openness, trust, cooperation, harmony of decisions, sharing of benefits, intangible and long term investment, collective working routine, and a fair allocation of risk.

More than ten years have now passed since the publication of Sir Michael Latham’s report ‘Constructing the Team’ [6] and seven years since ‘Rethinking Construction’ [7]. Many organisations have taken up the challenge to introduce new procurement initiatives such as Partnering into their organisations. There have been varying degrees of success and failure. There is also an opportunity to gain from this experience by capturing the lessons learned to avoid
duplicating mistakes and allowing organisations to replicate success. The objectives of involved organisations should be to:

- Prepare themselves for the change in culture;
- Learn from examples what goes right and how it could go wrong;
- Define the key elements of new procurement initiatives;
- Get the right people involved to define objectives;
- Design a fair and auditable procurement process, and last by not the least is;
- Be equipped to set up effective cost controls.

There are other issues, which the organisations involved should take care, including:

- Will these new procurement initiatives work for the organisation?
- What things go right and how it could go wrong?
- When things go wrong, how to correct them?

Every organisation will have unique wants and needs in making the effort to implement the initiatives. There is a clear need for:

- An understanding of best practice in procurement methods;
- A process for applying EU procurement rules to meet legal requirements and still get what you want;
- Designing a best value evaluation model;
- Setting up effective controls and managing budget with open book accounting; this may include questions such as Why is an open book approach important? What are the key elements of implementing and operating financial controls? And How to get what an organisation wants and making it work?
- Developing relational capabilities and leadership skills as an organisation and among individuals in the organisation, beyond the level related to traditional procurement.
3. Construction clients’ role and power in integration

Clients have played a central role in construction, and has been studied since long time [8], including with regards to supply chain integration [9]. Some authors have criticised and called for change in clients’ procurement strategies and tendering procedures [10, 11]. Briscoe et al. [12] argue 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. This, in turn, influences the degree of supply chain integration and ultimately the overall success of the project. Therefore, they concluded that the client is the most significant factor in the success of supply chain integration through adoption of new procurement routes and the client must develop practices that facilitate such integration if the construction process is to be improved. Another conclusion, which they drew, was if the long-term relationships in the supply chain are to be nurtured. Changes in the client’s traditional approach will often be necessary and a clear change programme will need to be established specially in the realm of procurement to turn from adversaries into partners [13].

London and Kenley [14] also concluded the similar statements from their research by stating that clients can impact on construction supply chain and their organisations, through the initial procurement decision and demand system. The client firms need to understand their supply chain, their own role in proactive management of a project supply chain, and the importance of new procurement initiatives. They also argue that often being the initiators of the supply chain, client firms have integral part within the whole chain and they potentially can have the greatest impact on the supply chain through their procurement decisions. From this position clients can exercise their authority upon the supply chain to achieve better value [15]. Clients also need to understand that these new procurement initiatives have potential to result in:

- Flexible and adaptable facilities;
- Maximise use of what they’ve already got;
- Start immediately, move fast and finish early;
- Minimise capital cost;
- Minimise whole life cost;
- Greater predictability;
- Think long term against short term pressures;
- Committed and involved supply chain participants.
3.1 Typology of construction clients

But now we should ask a question: are all clients ready to take up this role? According to Cox and Ireland [16], 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.

First the possibilities and extent to develop supply chain integration from a client perspective depend on the specific construction sector. In some sectors, clients have a position that enables them to take up supply chain integration, and in some sectors not, for instance:

- Housing: Clients are customer, and do normally have no influence on the supply chain;
- Commercial building: Clients are operator and/or co-developer of buildings, and thus can play an active role in the supply chain if they want;
- Infrastructure: Clients are service providers to the public, and often has extensive influence on these services and on other service providers, so this kind of clients is often able to exercise considerable authority upon the supply chain.

Second the possibilities and extent to develop supply chain integration depend on the characteristics of a client, including:

- Buildings portfolio owner or singe building owner;
- Experienced client or not;
- Professional client or not;
- Institutional or individual client;
- Public or private organisation;
- Local or international organisation.

3.2 Factors influencing construction clients’ roles and power

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 chains, 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 suppliers.

Based on the above notions, including the type of sector and clients, and external factors, clients that are able to play a dominant role can exercise power upon the supply chain, and develop procurement strategy aimed at supply chain integration. In this paper, such a client is observed to play a dominant role and enforce integration upon the supply chain; or even mobilise own integrated supply chain, e.g. through framework agreements with contractors, specialists, suppliers, architects, structural engineer etc., such as BAA’s framework agreements.

4. Achieving effective integration through procurement

Proverbs and Holt [17] advocate that supply chain downstream (including principle contractor, subcontractors, material suppliers, etc.) should be targeted as a mean of effectively reduced overall construction costs. They refer it as ‘downstream strategic alliances’ (DSAs). They also advocate early involvement of subcontractors and suppliers in the similar manner as of early contractor involvement. This would give an opportunity to downstream participants to offer their expertise, which could result into potential cost savings. Such integration would come through introduction of new procurement policies and also help converting suppliers from providers of product to providers of services. Often such new procurement methods have a long-term strategic perspective and relational aspects to it [18, 19]. Many of these clients create multi-project environments implying multi-project procurement and repetitive tendering arrangements with contractors [20]. In this perspective contractors are observed as partners adding value to the client’s business instead of merely doing projects for the client [21].

4.1 The ‘aspirational’ move

The historical or traditional procurement process (see Figure 1) was the only acceptable process in the construction industry until around a decade ago. The process had made a specific culture within the construction industry which contributed towards the inefficiency of the construction process overall. The reliance was only on the lowest cost tenders. Other concepts included were; designers should design, constructors construct, and maintainers maintain; no formal collaboration and no formal flow of information; a free market would drive efficiency; suppliers won’t offer what they can’t afford; etc. The big issue, which prevailed, was that winners of the project either misunderstand project, or make mistakes. The phrase that can best summaries the whole process could be ‘You don’t know what is excluded until too late!’
Now here comes a period where new procurement processes are being initiated within an organisation and the process can be considered as a transitional process (see Figure 2). This process includes 2 Stage Selection/Tier 1 Partnering concepts. These concepts results in following:

- Implementers have early chance to understand needs of the client/customers;
- Designers and implementers can discuss options together, which could include Implementers providing “constructability”, critique; etc.

But there are still issues that prevent the process to be carried out in its full spirit. These include:

- People don’t share ideas within the project development team;
- Ongoing supplier relationships could be undermined while new initiatives are introduced
- Contractors’ supply chain is not involved at the outset of the project. In fact, the contractor does not have an integrated supply chain; etc.

In order to define how effective this process is, not much could be commented except ‘Good ideas undermined by lack of commitment’.
The most desirable next step is to move towards the aspirational process (see Figure 3), which is based on the whole concept of Integration and collaborative working within the whole supply chain. The concept propagates:

- Pre-selection and appointment of long term supply chains partners;
- Early formation of project teams - involvement and commitment of all principal partners at the outset of a project;
- Shared goals, objectives, and outcomes of all the supply chain partners; etc.

Since, the whole process is like a ‘culture shock’ for the construction industry, a few issues are

- No common understanding of these new procurement initiatives;
- People don’t realise how radical and different it is from the traditional and transitional processes;
- Requires faith and trust, leadership, awareness by client to positively and proactively exercise his/her authority in order to achieve the full benefits of the process; etc.

The bottom line is that only a small number of companies are ready and willing to take such process on board.
4.2 The ‘real-world’ move

Various examples of strategic thinking and long-term structured action by clients in terms of their procurement policies and methods have shown positive effects on value and efficiency levels of construction work. In this paper the case of the integrated procurement of the upgrading of railway crossings in the Netherlands is presented as an example:

Around 2000 the Ministry of Transport, Public Works and Water Management took decision to increase safety of all railway crossings in the country dramatically, and reduce number of casualties to a minimum. This particularly applied to those crossings guarded without barriers, but only warning lights, particularly in rural areas. The decision implied that all 600 crossings without barriers throughout the country would need barriers within 10 years time. When the ministry was preparing the tender specificities of the crossings were discussed, general parts identified, and uniformity increased. In the tender one approach for all projects was defined based on a performance concept, which was standardised as much as possible. Criteria to bidders did apply to time and cost guarantees for delivery, and general specifications and safety conditions to the crossings only. Because of public building regulations, a solution was found to put the tender to the market by asking the complete market of contractors and suppliers for railway crossing for a bid, which came down to five certified firms. After discussion with all parties the entire project was assigned to the entire market. In order to keep the planned schedule and gains the condition was that the firms had to create a combined firm to execute the work. The firms did start a joint firm on one location with a single management. The work started in 2002, and still needed to be ready by 2010; implying the reconstruction of about 80 crossings per year. The Ministry had a fixed maximum annual budget. Payment was based on the actually delivered number of crossings per year. At the end of each year the progress was measured and evaluated against open book cost calculations followed by price negotiations. Due to the learning curve the first three years the number of crossings delivered rose from 40 to 80 to120, and the cost efficiency gain amounted to 30% over three year, which was used for annual price reductions and moderate increase profits for firms.

In this particular case, by revising its procurement strategy, the client organisation did not only manage to integrate the supply chain and achieve the planned cost levels and additional efficiency
gains, but did actually integrate the complete suppliers market and all demand in this particular case on a national scale.

5. Discussion and conclusion

Green et al. [22] support the idea and make a concluding remark that ‘within the context of integrated procurement approaches in construction, the conditions of mutual dependency will prevail across integrated supply chains. This will provide a significant break with the rump of construction industry. Clients may benefit through a more integrated services. Integrated supply chains potentially stand to benefit by competing primarily on the basis of innovation and expertise rather than cost. Construction firms are currently investing in new skills and the development of integrated supply chains for the purpose of competitive positioning. However, such trends are highly dependent upon a continuous flow of work of this nature’. This kind of interdependent co-development of integrated supply chains by clients and contractors (and specialists, suppliers etc) who are more or less equally powerful and dependent on each other is one path of supply chain integration in which issues such as trust and partnering, and sustaining multi-project procurement and repetitive contracting play a major role to achieve supply chain integration. This path is largely reflecting what most previous authors have been arguing on this matter. However, besides this bilateral path of interdependent co-development towards supply chain integration, for certain construction sectors, unilateral paths towards supply chain integration must not be disregarded, such as in housing, where contractors teaming up with specialists and suppliers, or groups of specialists, or suppliers who also install pre-installed houses through supply chain integration business models. And from the client’s perspective, certain powerful clients develop their own supply chains without being dependent on existing supplying parties in the construction market. These differentiated views on development paths towards supply chain integration, including differentiated view on construction clients and construction sectors will lead to a more balanced and realistic view on and discussion about what supply chain integration in construction actually is and could be, and the role of new procurement initiatives in order to achieve the supply chain integration.

References


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