A Vision For the Future of Construction: Supply Chain Management and Integration

1.0 – Introduction

1.1 - Why Supply Chain Management?
Supply chain management is extremely current due to its success in other industries and therefore considered to be the future of construction by some academics. According to Constructing Excellence (2004), products and services provided by external businesses typically account for 80% of the total cost of projects, this means that main contractors have an ever-expanding supply chain as more packages are let to subcontractors rather than being done in-house. The Latham and Egan reports highlighted the requirement of outsourcing causing more emphasis on developing relationships within supply chains; as a result an explosion of research has gone in to SCM. However, as Briscoe and Dainty (2005, p.319) discussed, the construction industry ‘remains characterised by adversarial practices and disjointed supply relationships’ so where are we going wrong? This essay discusses whether SCM is the future of the construction industry or whether its traditional roots will restrict its ability to improve.

1.2 - Supply Chain Management – What is it?
Supply chain management is considered an ‘umbrella term’ encapsulating topics such as partnering and lean manufacturing (Kelly et al., 2002, p.202) this could be considered a contributing factor to why this subject is still shrouded in confusion. To make this intangible subject more understandable a sound definition of supply chain management is required: (Lambert et al., See Pryke, 2009, P.183):

‘Supply Chain Management is the integration of key business processes from end user through to original suppliers that provide products, services, and information that add value for customers and other stakeholders.’
Therefore if you are in the construction industry either as a client, main contractor or any other service provider you are in a supply chain. The idea of supply chain management is to take those organisations in a supply chain and develop integration by, establishing trust, reducing the distance between firms by improving communications, engaging early collaborative engagement and finally by alignment of systems and processes (Ross, 2011). This is best represented using a diagram:

Figure 1 shows that although the contractual relationship remains the same as a traditional supply chain, there is transferring of information and knowledge that wouldn’t be present traditionally. This is supply chain integration. This means the client and the main contractor build relationships with multiple
tier suppliers and act as a unified team to give the client better value (Davis and Love, 2010). All the knowledge gained is then contained within the supply chain and is transferable to the next project with the client. (Khalfan and McDermott, 2007). Pryke (2009) explains, members of the supply chain are continually linking and disconnecting depending on the project function to be performed.

1.3 - Background of Supply Chain Management

Supply chain management has been in use before the recent hype in the construction industry. According to Womack et al. (1990) the SCM way of thinking has originated from attempts to understand the phenomenal success of the Japanese automotive industry in the 1970’s and 1980’s. In the Western automotive industry the main objective was ‘obtaining the necessary goods and services at the lowest price possible’ (Maylor, 2005, p.297) - rather than looking at the short-term needs of the business, the Japanese manufacturing industry invested trust and time in to long-term relationships (Cox, 1999).

What these relationships created was “lean thinking”, allowing the Japanese manufacturing industry ‘much higher level performance of the supply chain – shorter development times for new products, much lower levels of inventory and higher levels of quality’ (Maylor, 2005, p.297). This model has been replicated by the western manufacturers, not just in the production of cars but also in supermarket retailing (Cox, 1999 and Kelly et al., 2002). Pryke, (2009, p.7) makes the point that ‘SCM is inextricably linked with partnering but whether partnering creates the need for SCM or vice versa is a debatable point’. However, due to the reoccurring problems of adversarial behaviour involved with partnering a requirement for SCM was created (Pryke, 2009).
1.4 - Why Supply Chain Management in Construction?

The construction sector is renowned for being traditional and lagging behind in areas such as IT and discrimination; supply chain management is no exception (CBPP, 1998, see Kelly et al, 2002). The construction industries reaction to the idea of supply chain management was slow and perhaps even reluctant (Love et al, 2004). This is understandable, during the 80’s and early 90’s construction industries were concentrating on surviving a recession, creating happy relations with already ‘adversarial contractual relationships’ (Love et al, p.43, 2004) was the least of construction professionals concerns.

As pointed out by Khalfan and McDermott (2007) the drive to change and promotion of innovation in the construction sector was provided by government-supported reports by Egan and Latham. The Egan report produced Movement for Innovation (M4I), which helped companies find innovative ways to procure. What the Egan report (see Khalfan and McDermott, 2007, p.4) proposed was that ‘continuous service, product improvement and company profitability can only be achieved through innovation.’

Latham’s 1994 report was more focussed on the relationships that we have with supply chain promoting the importance of good communication and information sharing (Briscoe and Dainty, 2005). The reports conducted by Egan and Latham were influential and resulted in the release of new initiatives such as building down barriers and ProCure21 (Khalfan and McDermott, 2007). This urged the construction industry to take on supply chain management to be able to fit in to the innovative procurement approaches of the UK’s biggest client - the public sector.

Supply chain management has become more popular due to implementation of SCM orientated contracts. The ‘JCT Constructing Excellence’ contract has a document that supports ‘collaborative working’ and the formation of ‘integrated teams within the supply chain’ to eradicate waste and deliver a
project successfully (see King, 2011, p.9). Elements of SCM are visible through other contracts such as the NEC, in fact the first clause in this contract, 10.1, requests acting ‘in the spirit of mutual trust and co-operation’ (NEC3 Option B, 2005, p.3) - screaming out the Latham ideologies. However, it has to be recognised, after the considerable exposure since the Latham and Egan reports, 18 years later the industry still hasn’t fully established a strong SCM ethic. It is questionable at this point if SCM has a place in the future of construction.

2.0 - Key Issues

2.1 - Integration vs. Fragmentation

The main element of SCM is integration. Integration should be approached from two perspectives:

1. Those who design and those who construct/deliver need to be brought together.
2. The supply chain needs to be kept together over time, project to project.

The above two perspectives were created by Holti et al (See Kelly et al, 2002) for the ‘Building Down Barriers’ procurement approach. According to Ross (2011, p.5) supply chain management has been unsuccessful because the construction ‘industry is still predominantly fragmented’. This essentially reflects Holti’s second perspective, whereby a supply chain can only be integrated if a long lasting relationship is in place. This entails keeping the team together as they are moved on to the next project for the client. It has to be considered though that this is achievable for Toyota because the automotive industry requires a steady supply of parts and services (Cox, 1999) however, as Briscoe and Dainty (2005, p.325) found, the construction industry is ‘characterised by one-off projects, wide geographical dispersal, many small firms and cyclical demand for its products and services may never be able to realise the full fruits of supply chain integration’. What Briscoe is
saying is, why bother investing in a supply chain and building relationships if they are not transferable to future work, as clients do not have limitless work. An additional issue, (Akintoye, See Love et al., 2004) is that the one-off nature of construction causes vulnerability of relationships between parties in the supply chain, as a result construction companies generally adapt to where the work lies especially during a time of economic uncertainty both geographically and in the type of work they carry out. However, where supply chain management would work exceptionally well is on maintenance contracts because the supply chain can remain in tact for the existence of the building and is static (Briscoe and Dainty, 2005), this indicates that there is potential for SCM to be the future of construction providing contracts undertaken or of similar nature, implying that for SCM to be successful projects should be monogamous in their design using procurement routes such as off the shelf package design and build. It would seem for SCM to be successful the nation would have to sacrifice the potential architectural diversity of the future built environment.

2.2 - Win-Win?

It was Egan (See Khalfan and McDermott, 2007, p.4) who stated ‘continuous service and product improvement and company profitability can only be achieved through innovation.’ In addition to this other benefits for contractors have been cited in previous reports including:

- Savings in time and cost (Khalfan and McDermott, 2007)
- Prompt problem resolution (Briscoe and Dainty, 2005)
- Agreed profit margin (Khalfan and McDermott, 2007)
- Incentive to remove waste from the process (Constructing Excellence, 2004)

Sounds appealing, doesn’t it? But is it really win-win for both client and contractor? It could be argued this is what Egan wanted you to think, he was
employed by the public sector, the largest UK client and created for them increased value and a lower cost, of course he will try to make it look appealing to the contractor. How can a contractors main concern be the clients? The client is not interested in the contractor’s main goal, which according to economic theory is profit maximisation; this is shown in figure 2.

![Dual Concern Model](image)

**Figure 2 - Dual Concern Model. (Pryke, 2009)**

In Egan's report he argued that that the industry needs to integrate its processes and products to ensure better value could be delivered to the client. But just how likely is it to release these benefits from a supply chain that appears to be orientated around client benefit? After research it would appear the SCM machine has been developed to benefit the client only, in particular the public sector; not the win-win ideology that Public Accounts Committee discuss. Borsh and Philips (2003) agree, they believe it is the contractor's economic advantage to treat each project as a one off. This is echoed and taken further by Cox (1999, p.173) quoting that by trying to gain a win-win relationship ‘is likely to be a waste of time or potentially a recipe disaster’. The most prominent reason given for supply chain management not being successful is because Western (as opposed to Japanese) suppliers are mainly opportunistic and don’t see any incentive in committing to relationships (Cox, 1999), (Zamina and Pasquire, 2011).

If like Cox you are sceptical about it all, Love *et al* (2004, p.54) found ‘SCM may significantly improve the performance and productivity of the construction industry, its services to construction clients and its contribution to gross domestic product’. Effectively it is considered that supply chain
management could improve our sector and make it a better environment to work in and more reputable. In that respect it puts the onerous on the industry to compromise profit for the greater good of our industry, as Winch (See Zimina and Pasquire, 2011) found, profit maximisation is incompatible with attempts to improve the overall built environment. To summarise SCM might be considered to be client beneficial but unfortunately we are not in times where we can be picky with our clients, SCM could win us work even if it means reducing our margin. Effectively, due to the buying power of construction clients, SCM will be the future of construction... whether contractors like it or not!

2.3 - Supply Chain Management and Subcontractors

Latham’s 1994 report focussed on the relationships that we have with suppliers and subcontractors promoting the importance of good communication and information sharing (Briscoe and Dainty, 2005), however, the work of Thorpe et al. (see Briscoe and Dainty, 2005, p.321) states ‘subsequent empirical studies have suggested that the industry has a long way to go in engendering that trust within the supply chain.’ Traditionally there has always been an adversarial; arms length approach taken with subcontractors and suppliers, however, there is little research on how SCM affects the subcontractor when intertwined with these long lasting relationships, in particular Small to Medium Enterprises (SME’s).

The research that has been conducted found that there are significant difficulties facing SME’s when attempting to play a fuller role in supply chains (Briscoe and Dainty, 2005). Ross (2011, p.7) found that larger firms normally have greater access to resources ‘which enables them to dominate the production and market environments and occupy more favourable positions along the industry value chains’. The problem that SME’s have is their lack of capital and skills required to compete in modern construction procurement so they are limited to traditional price competition and cost reduction; not the SCM way. (Hillbrandt et al, 1995). The way that public procurement is moving
forwards is looking like the practice of aggregated single sourcing and long term contracts creating huge dependency on a small number of larger organisations, as a result this increases the barriers for small enterprises to gain access to the biggest construction client in the country; the public sector (Ross, 2011). Dainty and Briscoe (2005) believe that there is potential for radical improvement of SCM but such change is dependant on the lower tiers of the network, not just the client and the main contractor. To summarise it is most definitely not win-win for the supplier and subcontractor; but then again, they are not in a position to be picky and as a result subcontractors are going to have to adapt in the future to allow them to be involved in projects.

3.0 – Conclusion

3.1 – Is Supply Chain Management The Future of Construction

Despite all of the influence from government-funded reports, contract elements and successes in other sectors SCM has not been as successful as anticipated in the construction industry. According to Pearson (See Love et al, 2004, p.44) ‘only a few clients (BAA, the MOD and Tesco) and contractors (Balfour Beatty, and Tarmac) use SCM as an integrative part of their business strategy for procuring projects. Equally, following what we found with only larger subcontractors and suppliers being awarded positions on supply chains, potentially this could be the same with contractors; will all future construction projects available be dominated by billion pound contractors such as Balfour Beatty leaving no room for other contractors? It would appear that this is the vision of the future of construction unless this value adding system creates benefits for the other players in the supply chain as well as the client. Therefore, contracts such as the JCT need to create incentives for contractors and subcontractors to change their current adversarial profit oriented business strategy to the collaborative SCM way.
4.0 - References


