A review of the progress towards the adoption of supply chain management (SCM) relationships in construction

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Abstract

This paper examines the early progress towards the adoption of supply chain management (SCM) relationships in construction. It is based on a literature review and survey of the views of construction practitioners. We contend that SCM has many of the features associated with a ‘fifth generation innovation’. This paper suggests that although construction practitioners have some knowledge of SCM they need a better conceptual understanding of it and new and more systematic approaches to its implementation.

Keywords: Construction; Supply chain management relationships and innovation

1. Introduction

Following the examples of other sectors of the economy, a small but increasing number of construction organisations are beginning to adopt supply chain management (SCM) to improve their performance and to address their adversarial inter-organisational purchaser-supplier relationships and fragmented processes. This paper considers SCM as an example of ‘fifth generation innovation’ that Rothwell (1992) describes as significantly influenced by the formation of greater integration, networks, collaboration and alliances leading to a variety of external relationships. It is seen as a demanding innovation, which builds on previous changes such as total quality management (TQM) and just-in-time (JIT). Although SCM in construction is still in its infancy, the objective of this paper is to investigate its adoption to date and to examine whether its development corresponds to the key features of such a class of innovation.

The paper consists of five sections. The first section highlights the key features of ‘fifth generation innovation’. The second section examines the extent to which SCM is an innovation of this type. Through a review of changes already introduced in construction, the third section examines how this industry is progressing towards the adoption of SCM and improving relationships. Through a survey, the fourth section examines the early adoption of SCM in construction. In conclusion, the paper brings together the findings from the literature review and the survey to evaluate the initial development of SCM in construction against the key features of ‘fifth generation innovation’. This evaluation suggests that the adoption of SCM in construction is characterised by a significant number of limitations and inconsistencies.

2. Review of the key features of innovation

Innovation is a complex process as it normally involves many different functions, actors and variables. It comprises a whole sequence of events that occur over time and which involves all the activities of developing a new product/service or process. The development of innovation requires time for organisations and individuals to gain capability, experience, knowledge and information. It is a cumulative and evolutionary process (Clarke and Juma, 1987).
Innovation is increasingly defined as the interaction of the dynamics of the process, the firm and the environment in which the firm operates. Its development depends on feedback mechanisms between external environments and technical developments (Freeman, 1987). Innovation is increasingly generated by networks of relationships between firms, subcontractors and government institutions rather than just within organisations (Cooke et al., 2000).

The significance and influence of interactions and feedback mechanisms on the development of innovation are largely explored in the literature, which has shifted the debate from an emphasis on internal structure to external linkages and processes (Tidd et al., 1997; Harland et al., 1999). These external linkages are increasingly being used as a rapid response to fast changing needs through the pooling of resources and the sharing of risk. This type of innovation can be seen as a way to deal with growing uncertainty, complexity and competition, and to facilitate learning and further innovation. It can be described as a collective process which depends on many different interactions and relationships between an organisation and its external environment, and which includes suppliers, customers, training bodies and government agencies (Gann and Salter, 2000). Rothwell (1992) defines this type of innovation as the ‘fifth generation innovation’,1 which is seen as a multi-factor process requiring high levels of integration at both intra- and inter-organisation levels.

The key factors associated with ‘fifth generation innovation’, which will be used to assess the introduction of SCM in construction, include:

- a multi-factor process;
- a long process which is cumulative and evolutionary;
- a process comprising a number of stages including the need to innovate, knowledge awareness, evaluation of alternative innovations, planning and implementation;
- effective intra- and inter-organisational relationships and strong interactions with the external environment;
- a strategic and long-term approach and continuous learning;
- top management commitment and ‘champions’.

3. SCM: a fifth generation innovation

The objective of this section is to explore the concept of SCM and its similarities with the ‘fifth generation innovation’. SCM is a concept that originated in manufacturing industry. It was developed from innovations such as JIT (Vrijhoef and Koskela, 2000) and the field of quality control and TQM (Wong and Fung, 1999).

SCM can be seen as an example of evolutionary and cumulative innovation, which is often described as emanating from internal programmes aimed at improving overall effectiveness. The focus is now not only limited to increasing the internal efficiency of organisations but has been broadened to include methods of reducing waste and adding value across the entire supply chain (New and Ramsay, 1997; Harland et al., 1999). It is seen as a set of practices aimed at managing and coordinating the whole supply chain from raw material suppliers to end customers (Vollman et al., 1997) and which develop greater synergy through collaboration along the whole supply chain (New and Ramsay, 1997). This more holistic approach is associated with the effective management of the interfaces between all the organisations involved (von Hippel, 1986), and the integration of both upstream and downstream processes (Harland et al., 1999; Christopher and Jüttner, 2000). This significant emphasis on co-ordination and integration is strongly linked to the development of more effective and longer-term relationships between buyers and suppliers (Spekman et al., 1998; Kosela, 1999).

These new types of relationships are increasingly perceived as a means to utilise resources better through the whole supply chain (Dubois and Gadde, 2000). In addition, they can also lead to greater openness and transparency in transactions, and increased trust and commitment (Ali et al., 1997). There are successful examples of where SCM is delivering significant performance improvements and increased competitive advantage (Houlihan, 1985; Burgess, 1998). It can also be an important element in innovation in products, processes and organisation (Holti, 1997). Information can be more readily shared and knowledge identified, captured and disseminated throughout the organisations in the chain (Edum-Fotwe et al., 2001).

However, SCM is a long, complex and dynamic process. Its implementation requires a thorough understanding of the concept (Akintoye et al., 2000; Whipple and Frankel, 2000; Edum-Fotwe et al., 2001). It is also seen as closely dependent upon the ability to create, manage and reshape relationships between individuals, organisations and networks within the supply chain (New and Ramsay, 1997; Spekman et al., 1998; Harland et al., 1999). The shift from an adversarial to a longer term and close relationship is associated with new organisational arrangements (Savage, 1990) leading to greater synergy (Harland et al., 1999), transparency, openness, sharing and trust (Sako, 1992; Whipple and Frankel, 2000). Such an approach, however, requires considerable commitment and resources, and takes time to develop. Further difficulties include a lack of common purpose, multiple and often hidden goals,
power imbalances, different cultures and procedures, incompatible collaborative capability, the tension between autonomy and accountability, over dependence, and continuing lack of openness and opportunistic behaviour (Huxham, 1996; Cox and Townsend, 1998).

As can be seen from the above review, SCM demonstrates the key features of a ‘fifth generation innovation’. It is the outcome of an evolutionary and cumulative process, which started with other innovations such as JIT and TQM. It is a multi-factor process, which involves different functions, stakeholders and variables, and a whole sequence of events. It is a complex, dynamic and long process, which involves actors from within and between organisations. SCM has shifted the emphasis from internal structure to external linkages and processes, and is dependent on the interaction between the organisation and its external environment, with strong feedback linkages and collective learning. Its success is associated with the challenging and difficult development of a new culture based on long-term and closer intra- and inter-organisational relationships, mutual competitive advantage, shared learning, greater transparency and trust.

4. Progress towards the adoption of SCM in construction

The objective of this section is to review the main collaborative changes introduced in construction that can be seen as contributing to the evolutionary and cumulative process leading to the adoption of SCM. This review, summarised in Fig. 1, is based on an investigation of the main procurement approaches that emerged in construction during the period between 1960 and 2000. This timeline is represented by the horizontal axis. The vertical axis represents the type of relationships between clients, consultants, contractors and subcontractors in terms of the degree of collaboration and integration. As can be seen, the traditional single-stage approach to procurement, which was developed in the early nineteenth century, continues to dominate the approach of construction clients and their advisors to procurement. This procurement method still accounts for around 38.4% of construction work by value and 80.7% by numbers of contracts (Davis Langdon and Everest, 2000). This approach is characterised by short-term and adversarial relationships, deliberately fragmented processes, and tightly compartmentalised functions and roles.

A number of alternative procurement approaches and forms of contract have emerged since the 1960s in response to the changing needs of construction’s more informed clients (Edum-Fotwe et al., 2001), and as a growing realisation of the inherent problems of the traditional route (Ball, 1988). These alternative procurement routes, which include ‘two-stage competitive tendering’, ‘Design and Build’, ‘Management Contracting’ and ‘Construction Management’ represent some differences in relationships, roles and power between the design and cost consultants and main contractor, and between the main or managing contractor and the specialist and trade subcontractors. As can be seen in Fig. 1, these new approaches to procurement have resulted in some potential for greater collaboration and integration. However, a number of authors remain critical of construction’s attempts to reshape its procurement approaches. Cox and Townsend (1998) argue that there has been no theoretical framework underpinning the development of these procurement approaches. This suggests that construction lacks a systematic and strategic approach to change which can be seen as impeding the cumulative and evolutionary aspect of SCM relationships—a key aspect of ‘fifth generation innovation’.

A further weakness associated with these procurement approaches is that the culture of construction remains essentially adversarial with continuing reliance on price competition and firm contractual arrangements. Most relationships are still largely arms-length and short-term (Cox and Thompson, 1997; Dubois and Gadde, 2000), with a strong tendency towards the use of litigation to resolve disputes (Latham, 1994). Indeed in the case of some new approaches to procurement, such as ‘Management Contracting’, contractual relations have often become even more complex than in the traditional approach and provide further potential for conflict.

It was only with the emergence of project-specific partnering in the late 1980s that there appears to have been a significant move towards the more collaborative relationships and integrated processes associated with SCM. The Construction Task Force report (Egan, 1998, p. 12) ‘Rethinking Construction’ defines partnering as follows:

“Partnering involves two or more organisations working together to improve performance through agreeing mutual objectives, deriving a way of resolving any disputes and committing themselves to continuous improvement, measuring progress and sharing the gains”.

The early ideas on partnering in construction revolved around three key principles: agreeing mutual objectives; making decisions openly and resolving problems in a way that was jointly agreed at the beginning of the project; and aiming to achieve measurable improvements in performance through incentives. The progression towards the adoption of the principles associated with SCM is more evident with the emergence in the late 1990s of the ‘second generation’ style of partnering which includes a strategic decision to cooperate by the key project partners (Bennett and Jayes, 1998). This more developed form of partnering often places greater
emphasis on a more holistic approach based on a wider range of performance criteria in addition to time, quality and cost and acknowledges the strategic importance of such longer-term business relationships. It also incorporates some of the key features of the ‘fifth generation innovation’ such as developing stronger external linkages and inter-organisational relationships throughout the design and construction process. It is increasingly being seen as a way to develop a culture based on greater cooperation in longer-term and more stable relationships (Barlow et al., 1997; Bresnen and Marshall, 2000), and as a way of addressing the industry’s fragmentation and lack of integration (Bennett and Jayes, 1998).

However, partnering is still largely misunderstood throughout much of the industry and is therefore not as unified a concept as many of the other forms of procuring facilities in construction (Cox and Thompson, 1997). There are a number of different perceptions of partnering and, as in the case of earlier innovations in procurement approaches, it appears to have evolved rather than being a deliberate and systematic implementation of an innovation. In addition, it is often used to describe the negotiation that takes place in other
forms of procurement, such as two-stage competitive tendering, which again causes misunderstandings, further devalues the concept and has engendered a cynical view of it in much of the industry. Whilst partnering has been used to considerable effect by regular, frequent and more informed clients in more routine and repetitive projects, its impact in the case of infrequent clients and unique, one-off projects is clearly more limited. Most partnering has, to date, focused on developing collaboration in upstream relationships between regular and frequent clients, consultants and main contractors (Bresnen and Marshall, 2000; Edum-Fotwe et al., 2001), with less involvement of organisations such as specialist and trade subcontractors downstream in the process (Jones and Saad, 1998). These early experiences are revealing that there are also considerable barriers to the implementation of partnering. These barriers, such as lack of common purpose and openness, hidden goals and opportunistic behaviour have already been identified earlier in this paper as impeding the adoption of SCM relationships. Thus, partnering has not yet led to a widespread change of culture needed for such a type of innovation. The culture for much of construction remains essentially adversarial, as demonstrated by the continued and significant use of traditional procurement approaches based on rigid contracts and competitive, fixed-price tendering and the failure of a number of partnering approaches. If much of construction is having significant difficulties in implementing partnering, this raises serious questions about its preparedness to adopt SCM as ‘fifth generation innovation’.

5. SCM in construction

Despite the barriers to the implementation of partnering in construction, parts of the industry have started moving toward the adoption of SCM relationships. This is being led by more informed private-sector clients who were early adopters of partnering in the early 1990s, as they attempt to both increase the degree of collaboration that exists between their preferred consultants and contractors and to extend this approach downstream to include key subcontractors and suppliers. Some public-sector clients are also leading the way in building the purchaser-supplier relationships associated with SCM. For instance, the Defence Estates, an agency of the UK’s Ministry of Defence, is adopting Prime Contracting which includes many of the key elements of partnering, TQM and SCM. Its aim is to promote collaboration through leadership, facilitation, training and incentives, and replace short-term contractually driven project-by-project adversarial relationships with long-term, multiple-project relationships based on trust and co-operation. It includes the restructuring and integration of project processes and supply networks with fewer strategic supplier partners. These new relationships incorporate continuous improvement targets to reduce costs, enhance quality, and focus on the whole-life cost and functional performance of buildings (Holti et al., 1999).

5.1. The survey

This section outlines a postal survey undertaken to investigate the early adoption of SCM relationships in construction. It also attempts to assess the industry’s level of understanding of SCM and its degree of preparedness for its successful adoption and implementation.

5.2. Methodology

The choice of the methodology was determined by the need to capture the views of practitioners including clients and their advisors, design consultants, main contractors and specialist and trade subcontractors, on the adoption of SCM.

A four-page questionnaire and accompanying letter were sent to a sample of 800 construction organisations. The questionnaire addressed the following issues related to SCM:

- the key features;
- the benefits and problems;
- the project participants championing its introduction;
- the state of inter-organisational relationships including the type, frequency of communication, and the main issues at the interface between the organisations involved;
- the choice of procurement method;
- the factors in the selection of partners;
- the measures to increase the effectiveness of SCM and;
- the main sources of learning support.

Each section of the questionnaire contained a composite question normally requiring between 10 and 12 responses and so provided over 140 inputs in total from each individual respondent. For most of the sections, those surveyed were invited to score their responses using a Likert-style rating scale, with a score of 5 indicating ‘very important’ or ‘very effective’ and a score of 1 indicating ‘unimportant’ or ‘ineffective’. Other sections required the ticking of boxes or the stating of percentages.

5.3. Sample design

Given the large number and range of construction firms in terms of size and type of work undertaken, and
the constraints of time and resources, a probabilistic sample was considered to be too difficult to obtain and therefore, impractical. A further complication is the widening gap between organisations and projects in terms of their approach to procurement and contracting strategies, and the degree of collaboration in their purchaser-supplier relationships. In order to manage these difficulties, it was decided to restrict the size of the overall sample by focusing on those firms that were members of the organisations acknowledged as being at the forefront of organisational innovation in the UK construction industry. These included the Construction Clients Forum, the Construction Productivity Network and the Movement for Innovation. Stratified random sampling was used to construct a non-probabilistic sample from the members of these groups. This involved dividing the population into a number of groups, in which members shared a particular characteristic—in this case their role within construction projects. Four main groups were identified: clients and their advisors design consultants, main contractors and specialist and trade subcontractors.

The questionnaire was sent to 800 potential respondents and the 118 replies were drawn from all parts of the construction sector in the UK, and represented all the main regions in the UK. The actual sample obtained is shown in Table 1.

### Table 1
**Actual sample by type of organisation**

<table>
<thead>
<tr>
<th>Type of organisation</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>13.5</td>
</tr>
<tr>
<td>Architect</td>
<td>2.5</td>
</tr>
<tr>
<td>Engineer</td>
<td>5.9</td>
</tr>
<tr>
<td>Main Contractor</td>
<td>42.4</td>
</tr>
<tr>
<td>Specialist/Trade subcontractor</td>
<td>21.2</td>
</tr>
<tr>
<td>Other</td>
<td>14.4</td>
</tr>
</tbody>
</table>

*Number of respondents = 118.

### Table 2
**Features associated with SCM**

<table>
<thead>
<tr>
<th>Variable number</th>
<th>Variable description</th>
<th>Number</th>
<th>Mean value</th>
<th>Percentage scoring more than 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1,1</td>
<td>Linking processes by breaking down barriers</td>
<td>117</td>
<td>4.00</td>
<td>72.1</td>
</tr>
<tr>
<td>V1,2</td>
<td>Long term and stable relationships</td>
<td>118</td>
<td>4.48</td>
<td>92.4</td>
</tr>
<tr>
<td>V1,3</td>
<td>Reduction of the number of suppliers and customers</td>
<td>117</td>
<td>3.50</td>
<td>46.6</td>
</tr>
<tr>
<td>V1,4</td>
<td>Open exchange of data and information</td>
<td>118</td>
<td>3.90</td>
<td>76.2</td>
</tr>
<tr>
<td>V1,5</td>
<td>Earlier involvement</td>
<td>118</td>
<td>4.32</td>
<td>87.3</td>
</tr>
<tr>
<td>V1,6</td>
<td>Strong leadership in co-ordinating interfaces</td>
<td>116</td>
<td>3.78</td>
<td>63.6</td>
</tr>
<tr>
<td>V1,7</td>
<td>Clearer negotiation of common objectives</td>
<td>117</td>
<td>3.82</td>
<td>66.1</td>
</tr>
<tr>
<td>V1,8</td>
<td>Sharing learning and innovation</td>
<td>118</td>
<td>3.92</td>
<td>69.5</td>
</tr>
<tr>
<td>V1,9</td>
<td>Continuous improvement measured against clear targets</td>
<td>117</td>
<td>3.98</td>
<td>69.5</td>
</tr>
</tbody>
</table>

Cronbach’s alpha is 0.7342.

### 5.4. Reliability

The variables were checked for internal reliability and consistency by calculating the Cronbach alphas/reliability alphas for each measure. The responses to the variables were divided into two groups and the respondents’ answers across these groups were compared and correlated.

For question one, Cronbach’s alpha for the nine variables is 0.7342. For the second question, the figure for the 13 variables is 0.7238. The Cronbach’s alpha for the nine, twelve and thirteen variables of questions 3, 10 and 11, respectively, are 0.7101, 0.7684 and 0.8026, all of which are above the value of 0.7 which indicates an internally reliable set of variables (Nunnally, 1978).

### 5.5. Analysis of results

The analysis is structured around the following six key features of SCM as a ‘fifth generation innovation’ which are:

- a multi-factor process;
- built around intra-and inter-organisational relationships;
- requiring a strategic and long-term approach;
- dependent upon links with and support from the external environment;
- necessitating continuous learning, and
- commitment from top management.

#### 5.5.1. SCM: a multi-factor process

In Section 1, the respondents were asked to use a Likert scale to rate the importance of the nine key features of SCM. Almost two thirds of respondents (64%) gave a value greater than 2 for the importance of all nine variables. Over 80% of respondents believed at least five of the nine variables to be ‘important’ or ‘very important’. As can be seen in Table 2, a majority of respondents gave a value of four or five for all but one of
the variables in question 1. This suggests that most respondents perceive SCM as a multi-factor process.

5.5.2. SCM built around intra- and inter-organisational relationships

The variables listed in Table 3 have been grouped together as they relate to aspects of relationships within and between organisations.

Over 70% of respondents believed at least five of the seven variables relating to intra- and inter-organisational relationships to be ‘important’ or ‘very important’ to SCM. However, only 21.2% of respondents gave values of over 3 for importance across all seven variables relating to relationships. This indicates that SCM is seen by the respondents as being linked to the establishment of intra- as well as inter- organisational relationships, with over 92% of the respondents believing that ‘long term and stable relationships’ are ‘important’ or ‘very important’ features of SCM. However, the four variables receiving the lowest mean scores (reduction of the number of suppliers and customers; clearer negotiation of common objectives; open exchange of data and information; and sharing of learning and innovation) can be interpreted as a reluctance to rationalize supplier and customer bases, restructure supply chains and to fully embrace the culture needed for an effective implementation of SCM relationships.

5.5.3. SCM requiring a strategic and long-term approach

A Spearman’s Rho correlation analysis was also carried out on the variables used in question 5 of the survey—“What proportion of the following relationships do you have with your suppliers and customers?”, and two variables in question 9—“What proportion of your work is undertaken in the following procurement systems?” This was carried out to ascertain whether respondents were taking a strategic and long-term approach by developing longer-term relationships with the same partners (see Tables 4 and 5).

The type of relationships that a firm has with its customer has significant correlations with those it has with its suppliers. This would imply that the type of relationships a firm has with its suppliers mirrors that which it has with its customers, albeit adversarial, co-operative, close, short or long term. There are also correlations between relationships which are short in nature and those which are arms length. Adversarial relationships are also correlated positively to both arms-length and short relationships. This confirms the findings of the review of procurement in Section 4 of this paper, which also suggests that relationships in construction are mainly short-term and adversarial.

However, Table 4 shows that over 40% of respondents consider their relationships with both suppliers and customers to be close, co-operative and long term. A further investigation of Table 4 indicates that only 9% of respondents are involved in strategic partnering and 2% in Prime Contracting which are the

### Table 3
The dependence of SCM on intra- and inter-organisational relationships

<table>
<thead>
<tr>
<th>Variable number</th>
<th>Variable description</th>
<th>Number of respondents</th>
<th>Mean value</th>
<th>Percentage scoring more than 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>VL2</td>
<td>Long term and stable relationships</td>
<td>118</td>
<td>4.48</td>
<td>92.4</td>
</tr>
<tr>
<td>VL3</td>
<td>Reduction of the number of suppliers and customers</td>
<td>117</td>
<td>3.50</td>
<td>46.6</td>
</tr>
<tr>
<td>VL4</td>
<td>Open exchange of data and information</td>
<td>118</td>
<td>3.90</td>
<td>76.2</td>
</tr>
<tr>
<td>VL5</td>
<td>Earlier involvement</td>
<td>118</td>
<td>4.32</td>
<td>87.3</td>
</tr>
<tr>
<td>VL7</td>
<td>Clearer negotiation of common objectives</td>
<td>117</td>
<td>3.82</td>
<td>66.1</td>
</tr>
<tr>
<td>VL8</td>
<td>Sharing learning and innovation</td>
<td>118</td>
<td>3.92</td>
<td>69.5</td>
</tr>
<tr>
<td>V2,9</td>
<td>Greater trust in relationships</td>
<td>116</td>
<td>4.22</td>
<td>78.8</td>
</tr>
</tbody>
</table>

Cronbach alpha = 0.6882.

### Table 4
Variable names and numbers used in correlation analysis

<table>
<thead>
<tr>
<th>Variable number</th>
<th>Variable name: type of relationship</th>
<th>Number of respondents</th>
<th>Average percentage given</th>
</tr>
</thead>
<tbody>
<tr>
<td>V5,1a</td>
<td>Adversarial (with suppliers)</td>
<td>108</td>
<td>12</td>
</tr>
<tr>
<td>V5,1b</td>
<td>Adversarial (with customers)</td>
<td>105</td>
<td>11</td>
</tr>
<tr>
<td>V5,2a</td>
<td>Arms length (with suppliers)</td>
<td>109</td>
<td>26</td>
</tr>
<tr>
<td>V5,2b</td>
<td>Arms length (with customers)</td>
<td>105</td>
<td>17</td>
</tr>
<tr>
<td>V5,3a</td>
<td>Close and co-operative (with suppliers)</td>
<td>109</td>
<td>42</td>
</tr>
<tr>
<td>V5,3b</td>
<td>Close and co-operative (with customers)</td>
<td>106</td>
<td>48</td>
</tr>
<tr>
<td>V5,4a</td>
<td>Short (with suppliers)</td>
<td>108</td>
<td>22</td>
</tr>
<tr>
<td>V5,4b</td>
<td>Short (with customers)</td>
<td>105</td>
<td>25</td>
</tr>
<tr>
<td>V5,5a</td>
<td>Long term (with suppliers)</td>
<td>109</td>
<td>44</td>
</tr>
<tr>
<td>V5,5b</td>
<td>Long term (with customers)</td>
<td>106</td>
<td>43</td>
</tr>
<tr>
<td>V9,4</td>
<td>Strategic partnering</td>
<td>113</td>
<td>9</td>
</tr>
<tr>
<td>V9,5</td>
<td>Prime Contracting</td>
<td>113</td>
<td>2</td>
</tr>
</tbody>
</table>
only procurement approaches allowing formal and long-term relationships. This may suggest a lack of clear understanding of the type of relationships associated with SCM.

5.5.4. Significant links between SCM and support from the external environment

Table 6 shows no significant link between the adoption of SCM and support from the external environment.
On responding to the question ‘How is your company/supply chain increasing the effectiveness of SCM?’ the majority believes that the external actors are either ‘ineffective’ or ‘very ineffective’. This can be interpreted either as a lack of awareness about the need for external support required for the development of such a complex innovation or the inadequacy of the external support available (Table 7).

### 5.5.5. Continuous learning

Nearly 70% believe that sharing learning and innovation is either an ‘important’ or a ‘very important’ feature of SCM. However, when asked about forms of learning, only ‘in-house training’ and ‘external workshops’ were considered ‘effective’ or ‘very effective’ ways of increasing SCM effectiveness through learning. The two main types of learning mechanisms identified by the respondents can be seen as appropriate for awareness raising but not sufficient to generate the shared learning required for an effective implementation of SCM. It can also be argued that most construction in-house training may not be appropriate to address the complexity of such an innovation (Table 7).

### 5.5.6. Champions of SCM

The respondents consider the main champions of SCM to be clients (both public and private) and main contractors (see Table 8). Other notable champions (who all ‘polled’ less than 30% of respondents) are the client’s project manager, specialist trade subcontractor and suppliers. When the client’s project manager is considered as a ‘client’, the percentage that chose at least one of the three variables rises to over 87%. [43% of the
sample chose two of these three actors whilst 11% chose all three as SCM drivers]. This would reinforce the view that the respondents consider clients in general to be the most significant champions of SCM.

Although 44% of the respondents considered the championing of SCM in construction as either ‘important’ or ‘very important’, nearly 64% of the respondents, when choosing a partner, fail to consider the ability to champion SCM as ‘important’ (Tables 9 and 10). This may again indicate a lack of understanding of the scope of such an innovation and the need for effective championing of change if SCM is to be cascaded down the supply chain.

### 6. Conclusion

This paper has shown that there is significant awareness of the importance of SCM and its main benefits in construction. It is seen as a multi-factor innovation, which can help construction overcome its fragmentation and adversarial culture, improve its relationships and better integrate its processes. Its effective implementation is also perceived as dependent upon continuous and shared learning and strong commitment from key partners such as clients.

However, the literature review and the results of the survey have identified some inconsistencies that raise the two following fundamental issues related to the effective implementation of SCM as a ‘fifth generation innovation’:

(i) the degree of preparedness of the industry in effectively adopting SCM and,

(ii) the understanding of this concept and the prerequisites associated with its successful implementation.

This paper has demonstrated that construction is moving to the adoption of SCM without having benefited from earlier innovations, such as JIT and TQM. It is only, relatively recently, with the emergence of partnering that the industry has started moving towards the more collaborative relationships and integrated processes that can be interpreted as laying the foundations for successful SCM. Even where partnering has been adopted, it is largely misunderstood and has not yet led to a widespread change of culture in construction, which remains essentially adversarial with arms-length relationships and a significant use of price-competitive procurement approaches and rigid contracts. In addition, partnering is mainly being adopted upstream and essentially between clients, consultants and main contractors and has yet to be extended to those parts of the supply chains downstream of the main contractor.

Although the practitioners surveyed scored long-term and close relationships as being an important factor in the adoption of SCM, most respondents showed some inconsistencies by indicating their unwillingness to rationalise their supplier and customer bases, establish a clear common purpose, exchange information openly and share learning. This can be interpreted as a further indication of their reluctance to embrace a new culture associated with SCM relationships.

The survey also indicates an additional inconsistency in that although learning is perceived as important, the type of learning being undertaken does not match the competencies and the cultural changes needed for such a complex, multi-factor and dynamic innovation.

The results of the survey confirm the role of clients and their advisors in leading and championing change in construction. They also view the role of the champion as important but again reveal some inconsistencies in their understanding of SCM by not scoring it as a significant factor in partner selection.

A further indication of the limited understanding of the scope and complexity of this type of innovation is demonstrated by the low importance attached by the respondents to external support. There was limited formal and planned interaction with the external environment until the formation of the Construction Industry Board following the publication of the government-sponsored Latham Report in 1994. However, this interaction with the external environment has intensified since the publication of the Egan Report in 1998 through, for example, the work of the Movement...
for Innovation and the Construction Best Practice Programme.

This paper has demonstrated a number of weaknesses in the progress of construction towards the adoption of SCM relationships when evaluated against the key features of ‘fifth generation innovation’. Both the literature review and the results of the survey suggest that much of the industry have yet to acquire a thorough understanding of this type of innovation, and the key pre-requisites for its successful implementation.

References


