Promoting Innovative thinking within Construction

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Abstract: There has been a realisation within the UK construction industry that the promotion of innovation and innovative thinking across the supply chain can offer, the clients and service providers, key benefits in terms of adaptability, financial growth and improved service delivery. This paper attempts to highlight the benefits of innovation and how organisations can promote innovation and innovative thinking within their own organisation and within their supply chain. It presents one case study based on the measures taken by a leading service provider to promote innovation and innovative thinking with an aim to improve processes and service delivery across the supply chain.

Keywords: Innovation, Learning, Supply Chain

1. Introduction

Recent changes in the UK economy and shifts in business practices brought about by mergers and alliances, partnering, private finance initiatives (PFI) and prime contracting, have increased the importance of innovation within the construction industry. Construction organisations need to innovate in order to adapt continuously to complex and changing conditions. The recent reports (Egan, 1998), and viewpoints from the construction research and innovation strategy panel (nCRISP), and the movement for innovation (M4I) have all helped to improve awareness of the importance of innovation within the sector. Egan (1998), for example, stressed the importance of innovation within the industry, and proposed that service and product improvement and company profitability can only be achieved through innovation. Other benefits include improved leadership, customer focus, integrated processes and teams, quality and commitment to people (Khalfan and McDermott, 2006).

In spite of this growing realization, establishment of systems and processes to promote innovation and innovative thinking within construction organisations is still at embryonic stage. This paper presents one case study showing why and how a leading service provider established the process to promote innovation and innovative thinking. The case study offers learning opportunities to other construction organisations seeking to establish processes to promote innovation and innovative thinking across the supply chain.
2. Construction Innovation

Egbu (2001a, b) defined innovation as ‘successful exploitation of an idea, where the idea is new to the unit of adoption’. Slaughter (1998) attempted to account for the project based nature of the construction industry while defining innovation as ‘the actual use of a nontrivial change and improvement in a process, product, or system that is novel to the institution developing the change’. From construction perspective, the definition given by Ling (2003) could be considered the most comprehensive within the construction industry context. He defined innovation as an implementation of a new idea to a construction project with the intention of deriving additional benefits although there might be some associated risks and uncertainties. The new idea may refer to new design, technology, material component or construction method used in a project (Asad et al. 2005). Innovation can take many forms, it can be radical, in response to crises or pressure from the external environment, or can also be incremental where step-by-step changes are more common (Egbu, 2004). From construction industry perspective, innovation can be broadly classified as either ‘Organisational innovation’ or ‘Technical innovation’. ‘Organisational innovation’ may result by the introduction of changes to the organisational structure, introduction of advanced management techniques, and implementation of new corporate strategic orientations (Anderson and Manseau, 1999). ‘Technical innovation’ can take form of either ‘product’ or ‘process’ innovation. Product innovation refers to where the new product is the outcome. Process innovation denotes innovation where the process by which a product is developed is exposed to new ideas and, therefore, leads to new and often more sophisticated methods of production (Egbu, 2004). The implication is that an idea goes through a process, from its generation to its exploitation and it can therefore be understood in stages or sequences (Egbu, 2004).

3. Importance of Innovation for Construction Organisations

It is widely accepted that promotion of innovation and innovative thinking is a pre-requisite to any competitive advantage. Innovation provides benefit to an individual, an organisation or wider society (West and Farr, 1990) and is directly linked to the economic development of any country (Seaden et al., 2003). Moreover, innovation can lead to the successful development and introduction of new products, processes and/or services, technical and/or organisational change; and successful exploitation of new ideas (Dodgson et al., 2002; Gann, 2004).

From a construction industry perspective it is widely believed that due to the continuously changing conditions, construction innovation may become a fourth performance dimension in the future in addition added to the traditional dimensions of cost, quality and time (Newton, 1999). Innovative thinking has become essential for construction organisations because of increasing pressures from clients to improve quality, reduce costs and speed up construction processes (Gann, 2000). Innovation can also result in increased organisational commitment and higher organisational motivation (Dulaimi et al., 2003). Considering this fact it is important for construction organisations to innovate in order to take advantage of changes in market economy, build long-term relationships with clients, increase organisational motivation and make improvements to the systems and processes.
4. Innovation Management in Construction Organisations

Implementing innovative processes, whether related to new product development or enhanced project delivery, may result in failure of all the hard work without any motivation and efforts from the people actually responsible to carry out those processes. It is very true for the construction industry which is generally considered as slow to adopt new management techniques and information and communication technology. Mitropoulos and Tatum (1999) found that innovation could be only successful if the goal of the innovation is to manage or incorporate technological change, searching for alternatives, evaluating them and justifying the cost implications of the process. Considering this there are range of internal and external drivers which influence innovation within the industry:

- **Clients** (Barlow, 2000; Gann and Slater, 2000; Kumaraswamy and Dulaimi, 2001; Nam and Tatum, 1997; Seaden and Manseau, 2001). They can act as a catalyst to foster innovation by exerting pressure on the supply chain partners to improve overall performance and by helping them to devise strategies to cope with unforeseen changes (Gann and Slater, 2000), by demanding high standards of work (Barlow, 2000), and by identifying specific novel requirements for a project (Seaden and Manseau, 2001).

- **The procurement method** (Tatum 1989; Dulaimi et al 2002; Walker et al 2003). Dulaimi et al (2002) emphasized the importance of design-build contracts and their research work found that the design-build method would enable companies to increase their innovation, compared to design-bid-build, which may result in enhanced supply chain fragmentation. Walker et al, (2003) have emphasized on the presence of a well–integrated team/supply chain as a mean to use procurement as a driver for innovation.

- **Attitudes and processes** (Blayse and Manley, 2004). It is important for construction firms and individuals to have attitudes and processes, which are conducive to innovation (Blayse and Manley, 2004). Research has shown that enhancing construction innovation requires stronger inter-organisational co-operation (Miozzo and Dewick, 2004), supportive organisational policies and priorities (Tatum, 1989), ‘no blame’ culture (Dulaimi et al, 2002), professional working together to find new ways to improve performance (Gann, 2000) and effective leadership (Nam and Tatum, 1997).

It has been suggested that management of innovation can take form of integrative, appropriate and contingency approach:

4.1. Integrative Approach

Integrative approach considers management of innovation by focussing on interdisciplinary and multifunctional resources. Tidd et al. (2001) suggests that it is not sufficient to focus on a single dimension of innovation: technological, market, and organisational change interact. Better management of research and development may improve the efficiency or productivity of technological innovation, but is unlikely to contribute to product effectiveness, and therefore cannot guarantee commercial or financial success. Even the most expensive and sophisticated market research will fail to identify the potential for radically new products and services. Flat organisational structures and streamlined business processes may improve efficiency of delivering today’s products and services, but will not identify or deliver innovative products and services, and may become redundant due to technological or market change.
4.2. Appropriate approach

The appropriate approach stresses on a need to consider different viewpoints of stakeholders in the industry, and to take account of their different drivers. By considering these issues, and planning for the particular project, it is more likely that innovation can be successful. There is no general business case for innovation and each idea must be explored on its own merits. However, it is useful to understand why other innovations have brought benefit in order to learn from them (Cripps 2003).

4.3. Contingency Approach

Contingency approach talks about dealing with different kinds of innovation with particular solutions that different organisations have found to work well under different contingencies. In general most firms will work on a portfolio of innovations, some of which represent incremental developments and improvements on existing and proven products and processes, whilst others will focus on more radical change. One of the key skills in effective innovation management is balancing the composition of this portfolio and matching it to the firm’s competencies and capabilities in technology and markets (Tidd et al. 2001).

Innovation management is about learning to find the most appropriate solution to the problem of consistently managing this process, and doing so in the ways best suited to the particular circumstances in which the organisation finds itself. Successful innovation depends on being able to look widely and ahead and develop strategic approaches based on an understanding of the knowledge aspects (Tidd et al. 2001). The case study discussed below helps to demonstrate that how innovation and innovative thinking has helped to improve processes and service delivery across supply chain.

5. Case Study

The case study is done with a construction support service joint venture and is aimed to reveal how the joint venture made efforts to promote innovation and used it as a tool to improve service delivery. The organisation presented in the case study is a strategic alliance of two support service organisations aimed to bring excellence to the development of integrated services for the Highway Agency in the UK and its customers by ensuring safe, reliable and efficient road environments. The case study explores the factors, which are put in place to promote innovation that acted as drivers for the organisation to promote innovation processes.
5.1. Key Driver for the establishment of Innovation Regime

The role of the Highway agency (client) and the new procurement route played an important role in the establishment of the innovation process. The client in line with Egan report (1998, 2002) developed a new procurement approach, which was aimed at delivering best value through partnering, early contractor involvement, openness and collaboration rather than priced-based competition. Innovation became encapsulated within the contract with specific references to its management that went beyond the standard intellectual property clauses that are generally used in contracts of this type.

52. Innovation Process

Figure 1 shows the process flowchart of the AmeyMouchel innovation process. In order to develop a culture of innovative thinking all employees are encouraged to raise innovative ideas through watchman forms (standard way adopted within the company for recording and progressing observations raised by people about the network issues). If the idea is considered suitable then it is passed for validation to innovation group comprising of company and client representatives who holds monthly meeting to validate whether or not idea is innovative. Once decided that the idea is innovative then a sponsor is appointed who reviews the idea and prepares an outline implementation plan. This also includes assessing of the resource requirements, potential benefits and overall value for money aspects of the idea raised.

If the idea has a potential benefit and requires fewer resources then the sponsor assists the responsible person for immediate implementation of the idea. On the other hand if idea is beneficial but costs higher and requires more resources then the sponsor allocated along with the originator/responsible Manager prepares and submits business case to Innovation Forum.

The Innovation Forum comprises of company (two) and client (two) representatives and independent experts (two) plus a facilitator & dedicated secretariat. This forum assesses the practical application and cost-value benefit aspects of the business case. Once approved the idea is submitted for approval to the Network Board meeting (this mirrors private sector company Board meetings), which comprises of company and client senior management and holds the meeting on quarterly basis. The Network board assess the overall benefits and financial implications to the Commission. If approved the idea is added to continuous improvement programme and immediate measures are taken for the implementation of the idea.
Suggest any innovative idea through Watchman Form

Registration of idea into Watchman Register

Idea reviewed by company senior management and senior client representative

Is the idea an innovation or improvement?

Appropriate team validates the improvement

Passed to Innovation Group to validate Innovation

Inform Originator and no further action required

Appoint the sponsor to review the idea and prepare an implementation plan

Is substantial resource required? And what are the potential

Prepare Business

Develop a Quick win

Submit Business Case to Innovation Forum

Implement idea

Is the Business Case Approved?

Inform Originator and no further action required

Present Business Case to Network Board for approval

Park idea for future reference

Network Board Approval

Add to Continuous Improvement Programme

Implementation of the idea

Inform Originator

Figure 1: Innovation Process
5.3. Innovation Process in Practice

To promote innovative thinking various notice board messages, newsletter and intranet articles were published to improve awareness among employees’ about the process. Innovation clinics for both innovators and sponsors during lunch breaks were introduced to improve further awareness. This has all resulted in improved awareness and people are raising innovative ideas in a range of disciplines including suggestions related to improvements to the existing maintenance regime, quality, health and safety and environment.

Innovation process has started to show useful benefits for the organisation, client and supply chain. So far various people have put approximately two hundred ideas forward. The ideas raised have helped to improve existing processes (see Table 1 for examples). Every effort has been made to keep the originator of the idea informed about the progress during the entire process. Two annual awards functions have been held to reward best innovations and to recognise originator contributions. The client is involved at all levels of the decision making process, which has not only resulted in quick processing of the decisions but has also promoted collaborative culture and establishment of mutual trust and relationships between the client and joint venture. As part of the cycle of continuous improvement the process is reviewed regularly and a report given to the Network Board with recommendations for improvement plus an outline programme of activities for the next year.

5.4. Discussion

This case study reveals the role which the client and procurement route play in promoting innovation within construction. The findings are consistent with previous research (see Tatum 1989; Barlow, 2000; Nam and Tatum, 1997; Gann and Slater, 2000; Kumaraswamy and Dulaimi, 2001; Seaden and Manseau, 2001; Dulaimi et al 2002; Walker et al 2003). Additionally it also suggests that contractor-client co-operation can act as a catalyst to promote innovative thinking and collaborative culture. The benefits demonstrated through the case study are consistent with previous research findings (Rothwell and Gardiner, 1985; Dodgson et al, 2002; Gann, 2004), namely that innovation can lead to the successful exploitation of new ideas and can be used to introduce small-scale organisational changes. The innovative process in the joint venture has resulted in the improvement of existing processes and development of innovative solutions to different problems along with successful exploitation of ideas including suggestions related to improvements to the existing maintenance regime, quality, health and safety and environment.

The findings suggest that reducing bureaucratic hurdles, feedback to the originators about the progress of the idea, identification of owners who can take the process forward and by rewarding people who have originated the idea, can facilitate management of the process and encourage people to raise innovative ideas. The company has also taken measures to establish a sustainable process by closely monitoring the situation so that objectives are met and that the methodology for capturing innovations is continuously improved. Similarly as the process is still at embryonic stage it is essential to evaluate the material benefits gained because of this process and benchmark it against the best practices (Asad et al., 2005).
Table 1: Examples of Innovative Ideas put forward

<table>
<thead>
<tr>
<th>Idea</th>
<th>Quick Win Y/N</th>
<th>Business Case Y/N</th>
<th>Alignment with Client Aims</th>
<th>Area of Operations Improved</th>
<th>Overall Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT 1 marker Flags</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Faster rectification of defects</td>
</tr>
<tr>
<td>Suzy Safety</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Children educated in dangers during construction</td>
</tr>
<tr>
<td>Major Incident Text messaging</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Faster deployment of resources &amp; reduced incident times</td>
</tr>
<tr>
<td>ISU Communications Vehicle</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
<td>Reduced incident times</td>
</tr>
<tr>
<td>Depot Green Award</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Improved environmental condition &amp; awareness</td>
</tr>
<tr>
<td>Folding Road Closure sign</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Reduction in disruption &amp; more satisfied road users</td>
</tr>
<tr>
<td>Cathodic Protection</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
<td>Reduced costs &amp; disruption</td>
</tr>
<tr>
<td>Emergency spill kits</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
<td>Faster deployment, reduced impact &amp; reduced incident times</td>
</tr>
</tbody>
</table>

6. Conclusions

This paper attempted to highlight through literature, the benefits of innovation and how organisations can promote innovation and innovative thinking within their own organisation and within their supply chain. It presented one case study based on the measures taken by a leading service provider to promote innovation and innovative thinking with an aim to improve processes and service delivery across the supply chain. The findings from the case study indicated that the role of client and innovative procurement route can help to promote the culture of innovation. Management of innovation can also be improved by reducing bureaucratic hurdles, feedback to the originators about the progress of the idea, identification of owners who can take the process forward and by rewarding those who have originated the idea. Although the company’s innovation process is at an embryonic stage of development and needs to be benchmarked against best practices from other organisations, it still provides useful insight into how other support service providers can establish ‘innovation process’ within their organisations to make improvements to their existing systems and process. It clearly demonstrates how the right conditions necessary for innovation to flourish can be fostered within a contemporary construction organisation.
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