LEARNING TO INNOVATE IN CONSTRUCTION: A CASE STUDY

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In the UK, recent changes in the economy, procurement routes and supply chain mechanisms have rendered it crucial for the UK construction industry to find new more efficient ways to deliver its services. There has been a realisation 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. It presents a 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. This case exemplar offers transferable learning opportunities for other construction firms seeking to promote innovation throughout their supply chains.

Keywords: Innovation, construction innovation, learning to innovate, supply chain.

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, has 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.

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 a 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

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organisations seeking to establish processes to promote innovation and innovative thinking across the supply chain.

WHAT IS INNOVATION?

Rogers (1995) defined innovation as 'an idea, practice, or object that is perceived as new by an individual or other unit of adoption'. From the construction industry perspective, Egbu (2001a, b) defined innovation as 'successful exploitation of 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'. In contrast to these definitions where innovation is termed as something which can bring 'success' and 'improvements', it has also been argued that innovation can be time dependent (Trott, 2002) and might not always lead to improvement all the time (Sexton and Barrett, 2003). Due to its multi-faced nature it is hard to pin down what innovation success is (Dodgson et al, 2002), and there is always an element of risk and uncertainties associated with any innovation (Sexton and Barrett, 2003). Considering this fact from construction perspective, the definition given by Ling (2003) could be considered the most comprehensive within the construction industry context. He defined innovation as 'a new idea that is implemented in a construction project with the intention of deriving additional benefits although there might have been associated risks and uncertainties. The new idea may refer to new design, technology, material component or construction method deployed in a project'.

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 describes that 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). Different researchers have different ideas about the number of stages see (Shepard, 1967; Thompson, 1965; Zaltman et al, 1973 and Rothwell, 1992), but in essence there is a general agreement that innovation can be viewed as a process of inter-linking sequences from idea generation to idea exploitation and that the process is subject to change (Egbu, 2004).

WHY SHOULD THE CONSTRUCTION ORGANISATIONS INNOVATE?

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 the 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.

HOW CAN THE CONSTRUCTION ORGANISATIONS INNOVATE?

There has been a considerable research on how innovation could be implemented in construction projects (Slaughter, 1993a, b, 1998, 1999, 2000; Winch, 1998). 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. However, a range of other internal and external drivers influence innovation within the industry:

- The client (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 standard 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 design-build method would enable companies to increase their innovation, compared to deign-bid-build, which may result in enhanced supply chain fragmentation. Walker et al, 2003 have emphasized on the presence of 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) .

Developing the appropriate climate for innovation takes place through a combination of all of the factors described above represents a considerable challenge for construction firms. The existing literature, whilst providing evidence about the importance of innovation and guidance as to how construction organisations can innovate, fails to highlight any specific case that can demonstrate practical working of construction organisations in the UK. Accordingly, this paper provides a tangible demonstration of how these conditions can be brought together to provide a context within which innovation thrives.

RESEARCH METHODOLOGY

This research is based on an in-depth study of 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 this case study is AmeyMouchel, a strategic alliance of two support service organisations aimed to bring excellence to the development of integrated services for Highway Agency and its customers by ensuring safe, reliable and efficient road environments. The case study explores the factors, which acted drivers for the organisation to promote innovation, process put in place to promote innovation and the practical advantages of the implementation of innovation process. The authors1, 2 of this paper as part of their job roles have played an important role in the establishment and development of the innovation process within the company. The innovation process (Figure 1) was developed by the authors1, 2 and data presented in the paper is based on observations and empirical evidence collected during the establishment and development of the process.

CASE STUDY

Key Driver for the establishment of Innovation Regime

The role of Highway agency (client) and the new procurement route played an important role in the establishment of 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.

Factors Considered While Developing Innovation Process

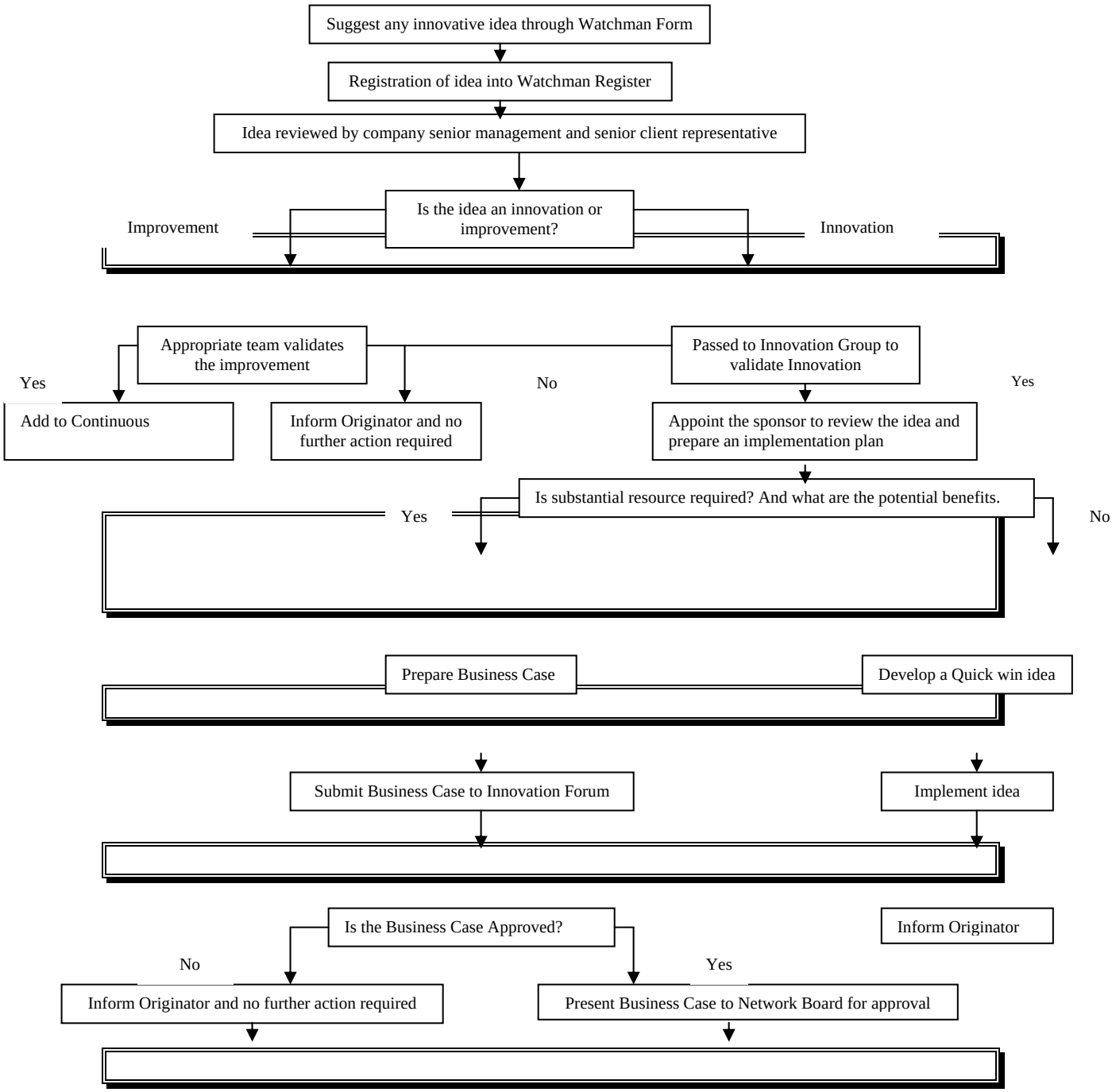
The client-led initiative resulted in the start of the innovation process within the joint venture with an aim to develop an infrastructure that would promote a culture of openness and collaboration and innovative thinking within the organisation and across the supply chain. The following factors were considered before developing the innovation process:

- Improving the management of innovation without increasing bureaucracy or undermining existing management decision-making process.
- Considering current best practices and raising the profile of innovation by involving client, supply chain partners and independent experts from outside the business, provision of a dedicated facilitator & secretariat to produce high quality documentation.

- Developing a culture of innovation by reducing the reliance on the handful of 'natural' innovators (i.e. those with an inbuilt inclination towards being Innovative) and encouraging all the employees to express their thoughts and opinion.
- Implementing an enhanced communications & feedback approach to encourage, recognise & celebrate Innovative ideas presented by any person.
- Transparency of decision making through a governance structure by involvement of senior management and client representative.

Innovation Process Explained

Figure 1 shows the process flowchart of the AmeyMouchel innovation process.



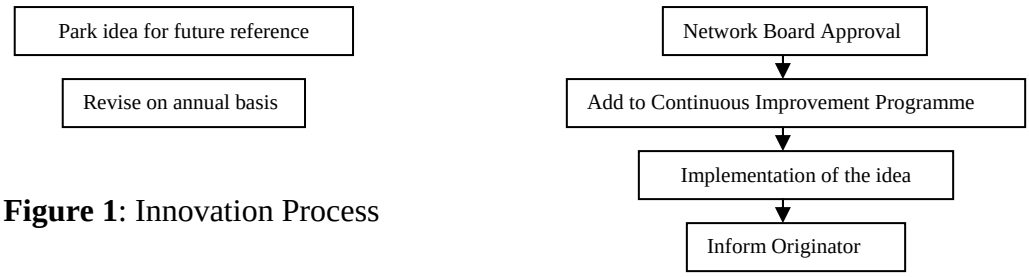


Figure 1: Innovation Process

Ideas that require few resources are immediately implemented assisted by the sponsor and the responsible manager. If the idea is beneficial but costs are higher and it requires more resources then the sponsor is allocated, along with the originator/responsible Manager, who prepares and submits a business case to Innovation Forum. 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 made part of the continuous improvement programme and immediate measures are taken for the implementation of the idea. The originator of the idea is kept informed about the progress during the entire process to promote culture of innovative thinking and to encourage everyone to raise issues and ideas. To reward the originators and recognise their contributions company has introduced a new awards process for the best innovations. The client is closely involved in all the above activities including participation at the awards ceremony.

Innovation Process in Practice

To ensure consistency in the evaluation of ideas training was provided to sponsors. 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 of the 'innovators' and 'sponsors'. This has all resulted in improved awareness and people are raising innovative ideas in range of disciplines including suggestions related to improvements to the existing maintenance regime, quality, health and safety and environment.

Although the revitalised innovation process was put into practice only one year ago it has started to show useful benefits for the organisation, client and supply chain. So far various people have put over a hundred ideas forward (see Table 1 for examples).

Table 1: Examples of Innovative Ideas put forward

Idea	Quick Win Y/N	Business Case Y/N	Alignment with Client Aims			Area of Operations Improved			Overall Benefits
			Informed Travellers	Safer Roads	Reliable Journeys	Quality	Env	H & S	
CAT 1 marker Flags	Y	N			✔	✔		✔	Faster rectification of defects

Suzy Safety	Y	N	✔	✔				✔	Children educated in dangers during construction
Major Incident Text messaging	Y	N		✔	✔	✔	✔	✔	Faster deployment of resources & reduced incident times
ISU Communications Vehicle	N	Y	✔	✔	✔	✔	✔	✔	Reduced incident times
Depot Green Award	Y	N					✔		Improved environmental condition & awareness
Table 1 continued									
Folding Road Closure sign	Y	N	✔						Reduction in disruption & more satisfied road users
Cathodic Protection	N	Y			✔	✔			Reduced costs & disruption
Emergency spill kits	N	Y		✔	✔		✔	✔	Faster deployment, reduced impact & reduced incident times

Every effort has been made to keep the originator of the idea informed about the progress during the entire process. New awards process has been started for best innovations to reward the originators and recognise their 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.

Way Forward

Further promotion of the approach is planned through registration of the process as a Constructing Excellence Best Practice Demonstration project. It is intended that this will be used as an enabler to develop an approach to measure & benchmark the benefits of Innovation. It is also intended to promote local ownership of Innovation through the development of the existing Best Practice Forums i.e. roads, structures, environment etc. Moreover, as the process has proved a success in the joint venture therefore it is intended to promote the culture of innovative thinking in the parent companies and among the supply chain partners.

DISCUSSION

This case study reveals the role that the client and procurement route plays 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, this 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 to that objectives are met and that the methodology for capturing innovations in continuously improved. Similarly as the process is still at embryonic stage therefore it is essential to evaluate the material benefits gained because of this process and benchmark it against the best practices.

CONCLUSIONS

The company has spent the last year successfully learning to innovate. While doing so, steps have been taken to establish an innovation process which is sustainable, and which promotes a culture of collaborative working. The findings indicate 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 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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