

SUPPLY CHAIN DEVELOPMENT FOR MAJOR PUBLIC SECTOR PROJECTS

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The procurement and implementation of major public sector projects and in particular those focusing upon the regeneration of the former industrial towns of the North of England present one of the main drivers for change and innovation in the construction industry. In a period of reducing economic activity, projects of this nature have become a significant financial driver of the sector. A particular focus of the study is placed upon the procurement processes as they relate to best practice and the achievement of sustainable solutions in the supply chain. Further, the balance between the achievement of project objectives and their social impact are reviewed. The study includes a case study review of the approaches adopted in the education, health and housing sectors. Examples of procurement methods and performance management processes are presented as they relate to the achievement of the project objectives. This review also includes examples of how supply chains can be developed and managed. The outcomes of the study underline the requirement for clear leadership, effective communication and process integration based upon a performance management approach. The study recommends that performance management should be seen as a process of both reporting and learning, wherein activities that address skills gaps, the encouragement of reflective practice and opportunities for innovation are recommended.

Keywords: regeneration, supply chain management, performance management.

INTRODUCTION

The UK construction industry has seen a series of significant milestone changes through the strategic adoption of the design and procurement process to achieve wider benefit. The renewal of the public estate has been a major investment activity which has been tasked to adopt this approach whilst seeking to achieve the regeneration of the former industrial and manufacturing centres across the country. The concept of sustainable communities has led to a fresh view of how the industry can achieve benefit to society at large, by focusing upon the economic, environmental and societal impact of these renewal activities. In particular, publicly funded and public / private initiatives have called for a greater level of openness and access to scrutiny in order to ensure maximum benefit for the use of public funding. This consideration has been referred to as “best value”². The rebuilding of schools, health and housing sector developments, which represent a significant proportion of central public investment in the nation’s infrastructure, have been characterized by the adoption of this initiative.

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² Department of Communities and Local Government. Best Value provides a statutory basis upon which local authorities may plan, review and manage their performance in order to deliver continuous improvement to meet the needs and expectations of service users.

Over the past decade, the focus upon best practice principles has enabled the lessons learned in one sector to be transferred to others in an open and consultative manner (Rowlinson and McDermott, 1999). The wider impact of this activity lies in the encouragement of contractors and their supply chains to develop profiles that meet these objectives, thereby changing practices and methodology in the private sector. The current challenge is to ensure that the positive attributes arising from these initiatives can be continued and developed, so as to ensure innovation can be maintained against the pressure to reduce costs and overhead. It is the objective of this study to review the drivers for the development of supply chain management, by reference to major public sector projects and to summarize the characteristics of their implementation.

SUSTAINABLE DESIGN

A fundamental step in the provision of buildings for the future must relate to the understanding and capability of providing sustainable buildings. Currently, a diverse range of measures and guides are in use across the globe. However, in many cases design standards have been derived from the Building Research Establishment Environmental Assessment Method or BREEAM. The current BREEAM model includes 12 different design guides ranging from domestic buildings to commercial and educational buildings, including the Code for Sustainable Homes or CSH, which is currently the benchmark. Similarly in the United States, the Leadership in Environmental and Energy Design has formed an important tool in providing third party verification in building design as denoted by Gowri (2004). Both systems have similar structures and are influencing global practices (Doggart and Baldwin, 1997). How these standards are met in terms of practice, procurement, supply chain capability and value for money remains a key question.

SUPPLY CHAIN DEVELOPMENT

Traditionally, the construction industry has had a poor track record internationally in terms of achieving successful and efficient supply chain management processes in comparison to other sectors. Vrijhoef and Koskela (2000), reported that even in normal situations problems in management were often evident. Further, the timing of problem identification was often too late to make any impact upon the project.

In the UK, such perceptions have long been recognized, changes in the approach to skills, cultures and communications have been seen as key steps to achieving greater success, (Latham 1994), (Egan1998). Nevertheless, shortcomings have been evident, wherein Akintoye, McIntosh and Fitzgerald (2000) found supply chain management strategies were often mitigated by weaknesses or perceived barriers either at the site level, project leadership and strategic levels. Similarly, Saad, Jones and Jones (2002), reported gaps in culture and systems development. Briscoe, Dainty, Millett and Neale (2004), highlighted the importance of role of the client in successful supply chain management.

In the UK, the regeneration of regional public infrastructure has been characterized by changes in the approach to the management and direction of the construction process. Led by the recommendations of Egan (1998), the public sector is promoted as the exemplar for change, with examples including the development of the education stock

through the Building Schools for the Future programme¹, the National Health Service LIFT programme² and Housing Market Renewal. These initiatives have been encouraged to adopt best practice and to ensure best value is achieved for the public (ODPM, 2006). The concept of Best Value has been promoted at all levels of the public sector encouraging transparency and improvement of services. The Egan study of regeneration (2004), encouraged the development of strategic and executive project management skills and has recommended to public sector leaders to cascade effective project management and review. The study underlined the need for project leaders to understand the wider implications of planning actions as they relate to the environment, transportation, governance and community and thus necessitates the need to be able to not only plan, purchase and control, but also to communicate to all project stakeholders.

Similarly, English Partnerships (2004), sought to improve the effectiveness of their investment in local and regional regeneration activities and ensure that the planning process was linked to both community and the commissioning of building activity. The study highlighted a skills gap in achieving these aims, wherein deficiencies in leadership, team working and the appropriate technical skills were identified.

Both Egan and English Partnerships have placed emphasis upon the environment. Problems can arise in the interpretation of this term, although it is accepted that this policy concerns the carbon emissions from heating and energy production and that these can be reduced by designing with high levels of energy efficiency developing onsite energy supplies, adopting renewable energy resources and adopting other technologies (DCLG, 2008).

Further, attempts to integrate best practices to procurement and supply chain management can be sourced through the Housing Forum (2009), which promoted the concept of partnering and supply chain management and aims to provide guidance on the procurement process and recommended approaches to a performance management framework (Hones 1997). The Housing Forum approach is characterized by monitoring the management process from the pre-contract phase by establishing a consistent business case, which is linked to policy guidance. The development of clear and auditable internal systems, which form the basis for engagement with external parties both during and following the procurement phase, ensures that processes to develop the wider supply chain and seek wider social and environmental outcomes. These improvement processes inform a performance management approach that includes not only measurement, but review and feedback.

CASE STUDIES

Method

Three sector case studies are reviewed in order to investigate supply chain management and client involvement. Each project represents a major public private partnership investment in the North of England. Information sources used include policy documentation available in the public domain and project information gained by enquiry. Each case study project was reviewed in terms of the implementation of common strategies which seek to develop process improvement. The degree of implementation was assessed by comparison to best practice criteria such as those

¹ The BSF programme commenced in 2003 to rebuild all Schools in England through a mix of public and private investment, encouraging new learning environments and integrating the use of ICT into the learning process.

² The NHS Local Improvement Finance Trust is a scheme to revise the provision of local primary care facilities.

methods cited in the Housing Forum (2009) Tool Kit and Egan's "Skills for Sustainable Communities"(2004).

Building schools for the future

The Building Schools for the Future programme is a major capital investment in the generation of new educational premises and technologies forming part of the reform of education in the country and influencing how premises are to be maintained and operated. The objectives of this investment concern innovation in delivery through the development of strategic partnerships between the public and private sectors. These arrangements have been formed through a procurement process that has underlined the need to protect the public interest by including wider criteria in the tender and selection process. This is seen as a phased process, starting at the preparation and strategic planning phases through to procurement, contracting and operation.

Partnerships for Schools (2008), have emphasized, through awareness events, that the supply chain concept for schools is transferred from a simple outsourcing model to a much closer strategic arrangement that is outcome related. They have emphasized the need to plan and implement a continuous development process with partners. The end outcomes have been seen as being predictability in time management with the need to focus upon maximizing opportunities for regional manufacture and sourcing as a supply chain outcome that can achieve quality buildings and in meeting the BREEAM excellent standard. Effectively, large scale construction with longevity of demand seeks to enable reinvestment in local or regional communities and industries deriving further benefits from the investment. This objective presents a potential conflict relating to the openness of the procurement process. Importantly, clear policy intention is critical and that preparations include the development the local supply chain in readiness for the procurement opportunities. Benchmarking and performance management of the supply chain have also been seen as necessary requirement for project bidding organizations. This view point is applied not only in the construction phase, but in the operation of the educational partnership once the schools become operational. Such demands have placed very specific qualities upon potential partners.

The notion of continuous improvement was seen as a means by which to change expectations and seek better outcomes from the procurement process by measurement and benchmarking. Therefore potential bidders have been expected to address the following concerns: (i) Disruption to teaching and learning (ii) Improvement in design quality, (ii) Reduction in average construction costs (iii) Reduction in construction waste, (iv) Maximizing economies of scale (v) Achieving faster timescales from approval to service commencement. This approach has been seen to enable improvement by reducing public contributions to the project, reducing the differences between forecast and actual costs and maximizing efficiencies in the operation of the schools from financing, bidding, lifecycle maintenance, management, design and construction to insurance.

Interest in the operation of performance management was a required action, including how data would be collected, how value for money would be achieved and adoption of the national benchmarking methodology. This was linked to a best practice approach, wherein the performance of partnerships against others would be encouraged by sharing and other collaborative means. The client would ask a very direct question in terms of effective performance, wherein performance management

and evidence based continuous improvement would form the core of successful delivery. Such developments were to be seen as not simply by the reduction of cost to the expense of quality. Responsible partnerships were seen as good leaders, who would ask a recurring question on how best to take advantage of best practice and how to derive continuous improvement.

In one district authority in the North West of England, the BSF programme has involved three phases with an overall budget of £700 million. The first phase of this work involved the construction of three schools over a two year building programme following an 18 month procurement process. The quality of project and supply chain management formed part of the procurement assessment criteria, these requirements were also weighed alongside service delivery criteria. The emphasis thereby transferred to the wider view point of the quality of the service provision to the client educational authority. The winning partner highlighted the emphasis upon the creation of local jobs and skills and aimed to develop local supply chain partners as part of the construction of the project. This later aspect called for formative development processes to ensure that local partners were able to understand the demands of the project.

Within the BSF scheme, the placement of low carbon or sustainable design was for some time to be more clearly defined. In 2007, the Secretary of State for Education made a direct challenge and called for all new schools to be zero carbon by 2016. A best practice example in the public domain has been the Kingsmead Primary School in Northwich Cheshire. Innovations have included the adoption of solar PV and rainwater collection with displays made easily observable for pupils and other school users. Within the school, the adoption of this technology has been used to create a learning tool for pupils to understand more about the environment. Such developments included ventilation, day lighting and solar PV. Whilst the project demonstrates the adoption of low carbon technologies, it has been widely accepted in the public domain that the project partners freely admitted that the procurement aspects could have been improved, (BISRIA, 2006).

Health service LIFT

The investment in health care infrastructure was implemented to address the low quality of primary care facilities in England, wherein only 40% of services were located in purpose built structures and yet over 90% of all patient contact with the health services was via the primary care services. The scheme has sought to regenerate patient services and also contribute to the regeneration of local communities, particularly those in the inner cities where the indicators of deprivation are at their highest. Since the announcement of the NHS LIFT scheme, 49 projects have been approved.

In the North West of England, one of the second phase projects serving 635,000 patients has been cited as a best practice example. The initial phase involved the formation of a project team and a project board, who were tasked to find a private sector partner. This partner would work with the local services to deliver and maintain the physical building stock serving the area for the next 25 years. The procurement process was commenced in 2003. Bidders were scored and interviewed following presentations. A short list of three were then asked to design three schemes with the opportunity to work with relevant project stakeholders. From these schemes, the winning partner was selected. In 2004, a public private partnership was formed. A strategic partnering board was also formed to represent the public sector. The

building programme featured a supply chain partner committing to local employment and training, in addition to the focus upon developing the sustainability of the provision through workshops and continuous improvement.

Innovation in low carbon design has been an aspiration for many, in an attempt to promote innovation and test the practical implications of this approach, an exemplar project involving a national contractor has been initiated at the BRE Innovation Park in Watford, where in 2009 the park was supplemented by a three storey health care building. The project is an attempt to progress innovation in building design and to show how this can be implemented in practical terms. The building includes insulated floors, ceilings, recyclable walls, low energy lighting and a ventilation system working from a renewable energy source. The project is also mapped against renewed targets to reduce national carbon emissions by 2020 by 34%.

Housing market renewal

The third sector case study concerns the housing market. For some time the UK government has targeting the housing market as a prime area dictating the quality of lives in the country and a market that has distinct impact upon the regional economies. It is also notable that over the past 60 years the housing supply has never fully met demand. Now critical problems in terms of the quality and quantity of the housing stock exist in many areas (Jacob Rowntree Trust 2008 and 2009). The Jacob Rowntree studies underlines the issues of economic disconnection in many urban areas, the disconnection with the jobs market and wider social problems ranging from education, worklessness to crime and poor life style qualities. In the five-year plan, *Sustainable Communities: Homes for All* produced by the ODPM (2005), reported actions to improve existing building standards. In order to fund this development the local authorities were allowed to raise additional investment by stock transfer, creating management companies or by public / private partnership arrangements with government funding. In all cases, actions to develop local and regional supply chains to meet these needs have been promoted. Typical supply chain development issues have related to linking the housing investment to a range of procurement performance targets. In the same manner as BSF and NHS LIFT, the selection phases for developer partners and supply chain companies have included specific performance targets. Stock transfer arrangements through social enterprises and public interest organizations such as the Registered Social Landlords and partnerships of public and private organizations under the Housing Market renewal pathfinders, have been put in place to address these problems as reported by Platten, Dobrashian and Dickinson (2006). The pathfinder activities have included physical housing works, including refurbishment, replacement and new build, which have been linked to other actions to achieve economic regeneration, including actions to tackle social problems, as reported by MacFarlane (2002). Various performance management processes have been developed and put into operation based upon tangible and measurable performance indicators. Examples have included design standards to reduce carbon emissions, using the Code for Sustainable Homes, DCLG (2008), setting contract requirements to develop local supply chains and promote local employment and skills. Such processes have required a range of awareness and training programmes, which have been necessary to enable all stakeholders to fully understand the implications of the measured data and how it can be used.

Through the action of the Registered Social Landlords (RSL), measures have been enacted by grouping neighbouring RSLs together, to seek efficiencies of scale by group purchase and providing the opportunity to share best practices. The

development of such groups has enabled the reinvestment of savings into innovation and employment schemes. More recently, a regional consortium of RSLs have looked at the issues of waste management and how best to develop the supply chain to support low carbon technology. The process in this case involved scoping a range of practices and project examples on how best to operate the model. Due to the scarcity of resource, it was decided that existing solutions should not be emulated, but gaps identified and exploited. The development process involved a facilitated workshop to develop ideas and strategies across the partner members. Key issues arising from the consultation related to knowledge development, stakeholder understanding and strategic leadership to carry the project ahead. The model saw the generic principles of supply chain development applied to a participative model, where goals and process could be shaped for mutual benefit.

Comparative analysis

From the case studies presented above, each study was reviewed in terms of evidenced programmes or initiatives that sought to meet the relative aspirations of each initiative. This review was quite simple where in the assessment was based upon three criteria, these being A, that no evidence of development was in place and that the objective was to be progressed; B, that there was evidence of development but a final outcomes was yet to be fully realized or C, that the objective was met and that there was evidence to support the observation.

The outcomes of this analysis show well developed and mature partnering process are in place in the studies subject to review. Often the process has been recorded an in the public domain. The focus upon supply chain development is different with more recent projects showing evidence of company development projects and measurement of a wide range of measure, record, act processes relating to employment and skills development objectives. In terms of low carbon design, this objective remains to be fully realized in all sectors and sets a particular development objective in view of forthcoming targets for low and zero carbon design.

Table 1: Comparative review of regeneration projects and supply chain development

Case Study	BSF NW	NHS NW	HMR NW	RSL
Partnering Processes in place	C	C	C	C
Commitment to second tier engagement	B	B	C	C
Commitment to local employment	B	A	C	C
Commitment to skills development	B	A	C	C
Commitment to low carbon design	B	B	B	B

DISCUSSION AND CONCLUSIONS

General

The development of supply chains for construction projects is not new, but represents an on going challenge for all project stakeholders. It is widely acknowledged that client involvement and a strong sense of leadership is critical for success. The requirements for success relate to the development of a clear strategic goal that can then be transferred to the various participants of the procurement and implementation processes. As acknowledged in a number of studies, the sense of purpose and

continued evaluation is critical, otherwise a loss of direction and project overruns become evident. In regeneration projects undertaken in the United Kingdom, the development of public private partnerships as a means of generating additional investment highlights the importance of openness and shared vision and to ensure value for money for all project stakeholders. This consideration places importance upon how best to measure and achieve the objectives of the project. Processes based upon best practice have been used in the development of achievable systems in often very complex investment activities. Often such activities, whether these are in the sectors of education, health service development or housing have raised the additional need and opportunity to address wider social concerns.

The social agenda has included the need to widen the term sustainability and thus develop a “triple bottom line” approach to project performance addressing environmental, social and economic needs. The recent change in the economic stability of the industry has underlined the need to address all three aspects with equal importance. In particular, this is critical when focusing upon the stimulation of business activity.

Practical implications

It can be concluded that workable processes invariably follow a set pattern, wherein ensuring strategic leadership and focus at the outset and to link this activity with a public interest steering group. The development of procurement pathways, particularly for major projects is invariably guided by a transparent process. Processes such as OJEU provide scope for openness, which is important to the ongoing management of projects and provides a means of addressing the risk elements, which have historically been evident in the sector.

The project objectives should be defined and set at the initial stages and for these to be used as a benchmark for the ongoing management of performance by the adoption of benchmark indicators. Such activities should not be seen as simple numerical based tasks, they are, in good examples, seen as development activities and should be coupled with opportunities that can address skills gaps, reflective practice or indeed offer opportunities to encourage product innovation or business improvement.

The above observations provide a clear guide for future guidance for project clients and partners. In terms of supply chain management the practical implications infer that all major projects require a process of team development and clear communication. Practical supply chain involvement must be at all levels and the needs of small to medium sized companies will infer an ongoing company development process involving awareness and development activities.

Recommendations for further research

From this study, further investigations are recommended, this should relate to the evaluation of company growth initiatives and the impact of skills development both at the trades and management or professional levels. Also linked to this area it is recommended that the supply chain development process and its impact upon the carbon reduction agenda is a natural development of the work. At the current time, it is also of interest to monitor the resilience of the process in general, in light of economic recession and a public sector policy of economic austerity.

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