

# A BUSINESS UNIT APPROACH TO CONSTRUCTION PROCESS RE-ENGINEERING

Christine Allan<sup>1</sup>, James Sommerville<sup>2</sup>, Peter Kennedy<sup>2</sup> and Hamish Robertson<sup>1</sup>

<sup>1</sup>*Morrison Construction Group plc, Melville Street, Edinburgh, EH3 7HL, UK*

<sup>2</sup>*Department of Building and Surveying<sup>2</sup>, Glasgow Caledonian University, Glasgow, G4 0BA, UK*

In business change is not an optional extra it comes as standard. Every business regardless of sector, must look to the future and grasp the opportunities that are found there (Hammer, 1999). In the knowledge driven economy, firms that rely on outdated processes will be left behind. Successful companies will innovate, invest heavily in skills of their people and seek new ways of carrying out work activities. They will create a future that establishes a culture which thrives on change and innovation.

Business Process Re-engineering allows an organisation to model its business activities through the development of a process map, and adapt a strategy of examining every area with the view to improving process and environmental performance, quality and teamwork. In recent years there has been a remarkable growth of interest in environmental issues – sustainability and the better management of development in harmony with the environment (Glasson *et al*, 1994).

As part of a Teaching Company Programme environmental performance improvements were sought through construction process re-engineering of a core business unit (Central Scotland). Re-engineering these processes brings about quality, environmental and business value enhancement. The findings from case reviews within Morrison Construction Limited highlight the development of the underlying paradigms and mechanisms through which to engage in more sustainable development.

Keywords: environmental management system, development, re-engineering, sustainable, process mapping.

## INTRODUCTION

Contemporary industry has the characteristic that it learns quickly, not only from its competitors, but also from other markets sectors. A significant ‘methodology transfer’ into the construction industry is Business Process Re-engineering (Towill, 1998). The industry is renowned for being highly fragmented and subject to cyclical swings (Sommerville *et al*, 1999). Recent reports by Sir Michael Latham (1994) and Sir John Egan (1998) have emphasised the need for the industry to increase its productivity and improve quality. The Egan Report (1998) on Rethinking Construction stresses the need for the industry to develop an understanding of business processes. This report draws upon the experiences of other industries who have successfully adapted organisational cultures, introduced new business processes, achieved significant cost reductions and generated major gains in productivity, quality and environmental performance. The experience of other market sectors points to business flexibility and teamworking as critical success factors in ensuring success in management initiatives and innovations (Rooke, 1995).

The construction industry has been criticised in the past for its less than optimal performance in comparison with other industries, although, in recent years there have

been substantial changes (Love, 1998). The construction industry must continue to look for opportunities to improve its commercial and public image. The management of environmental issues provides a new opportunity for those willing to accept the challenge. Construction sites are often criticised for the damage they cause to the surrounding environment and the adverse affects they have upon their immediate neighbours (CIRIA, 1999). The environmental debate now focuses on much broader aspects of business performance with sustainable construction being an item on the Green Agenda. As far back as 1991 it was shown that 92% of 400 firms agreed with the argument that the environmental challenge is one of the central issues of the 21<sup>st</sup> Century. In view of the fact that all of Morrison's work in construction has an impact on the environment it was recognised at an early stage that the main focus of the process re-engineering would be towards leading the way in helping create a more caring environment.

An essential part of this positive environmental approach was the need for change and the greatest contribution to this was effective management of their construction processes. Increasingly, the changing face of construction suggests that a move towards re-engineering a company's processes will increase its competitiveness within its market, improve its overall efficiency and most importantly reduce its adverse affects on the surrounding environment. Independent studies show that top performing companies are those which demonstrate consistent, measurable positive business results based on the philosophy of continuous improvement and capacity to deal with consistent change (Lascelles and Peacock, 1997).

Morrison Construction Group plc is aware of this situation and pride itself on its innovative approach to construction and development. Continuous improvement appears to be at the heart of Morrison's efforts. Standing still – and satisfaction with present levels of performance – are not options according to Sir Fraser Morrison, Chairman and Chief Executive of the company. The company is of the opinion that any business that is static quickly begins to slip back and so feel it must continue to build on their momentum to keep them ahead of their competitors.

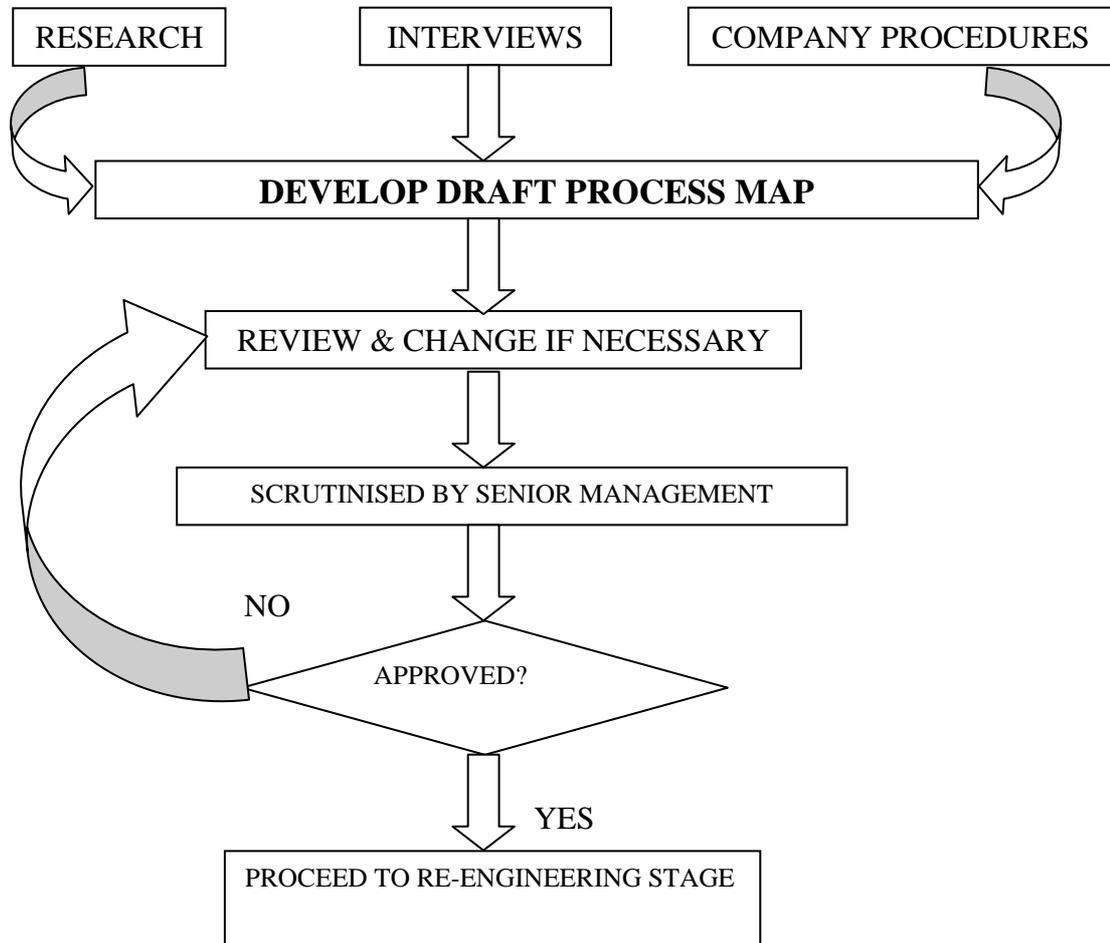
## **METHODOLOGY**

It was for these reasons mentioned above that Morrison wished to engage in a government sponsored Teaching Company Programme under the auspices of the Teaching Company Directorate. Morrison is involved in this programme in conjunction with the Department of Building and Surveying at Glasgow Caledonian University. Morrison Construction Group plc which had a turnover of £414M in the year ending 31st of March 1999, consists of three divisions and is active in Europe, the Middle East and Africa. The programme is aimed at refining the Group's business processes through the implementation of an Environmental Management System (EMS) over a period of three years. The first year of the programme is complete with significant results already being achieved.

The approach adopted was to select a core business unit (in Central Scotland) and develop an Environmental Management System that would act as a driver for Business Process Re-engineering. This approach is intended to assist the company in its aim to achieve business excellence through incorporating the best ideas into distinctly local solutions. The system is based on the structure and process of ISO 14001, the International Standard for Environmental Management Systems. It is predicted that the targeted business unit will benefit from the changes implemented as

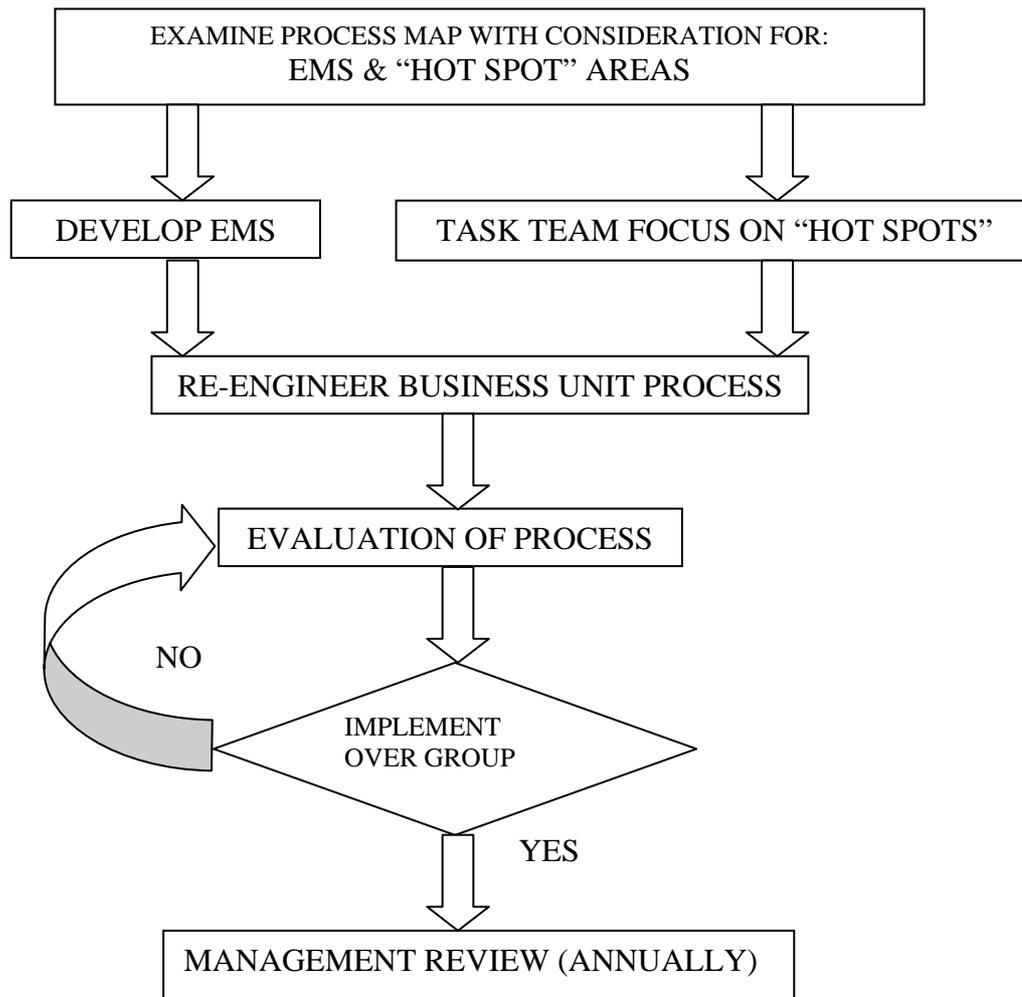
a result of the programme and it is expected that the composite group will see enhanced performance as a result of the implemented system.

The initial development of the Environmental Management System framework hinged upon the mapping of the business processes. The process for the mapping can be seen in Figure 1.



**Figure 1:** Development of Process Map

In order to establish the precise picture of the processes being executed a wide range of data was gathered from a variety of sources to ensure accuracy of data. These sources included research of site diaries, interviews and random/fixed sampling. From the assembly of primary and secondary data the development of the company's business process was constructed. This data was analysed and displayed through the use of Pertmaster, a computer planning software package. The draft process map was then submitted to senior managers of the selected business unit for their comments and approval. Any areas within the process map that were inaccurate or not displayed were then revised and submitted for final approval. The developed process map indicated the way activities were undertaken and how employees and technology worked together, in order to produce end products with which clients were satisfied. In order to progress from the position the company was in to a more satisfactory level of performance it was required to carry out a proper analysis of the existing process undertaken, otherwise the company would simply be confirming existing processes. This procedure allowed opportunities for real improvement and potential bottomline savings.

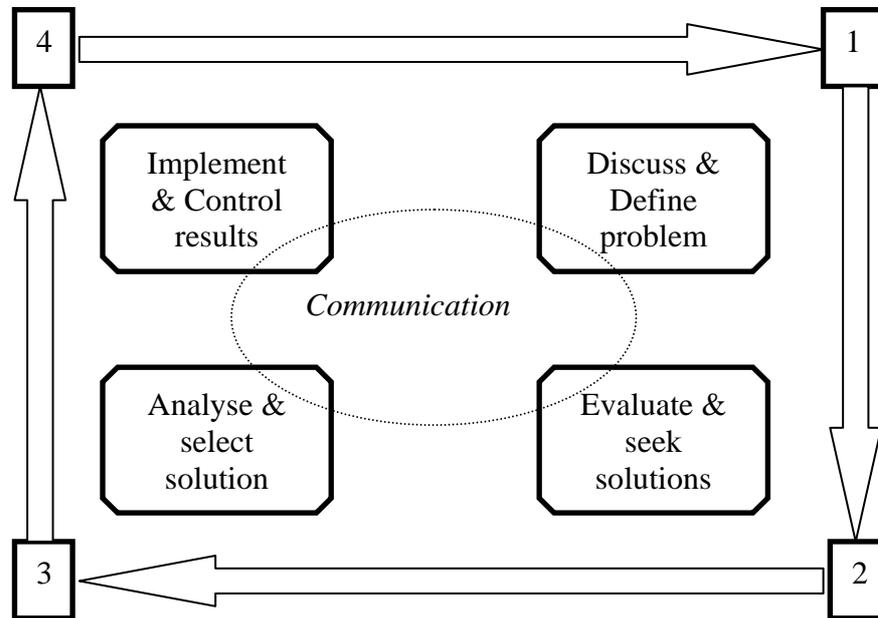


**Figure 2:** Re-engineering Process

At the Re-engineering stage “Hot Spot” areas were identified as elements that stood out from the rest of the process, highlighting areas of waste, and the need for the process to be revised so that it could achieve its goals in an environmentally benign way. Task Teams were set up through volunteers within the business unit who wished to assist with the re-engineering process. This method was selected to encourage teamwork between individuals and departments. The Task Team process can be seen below in Figure 3.

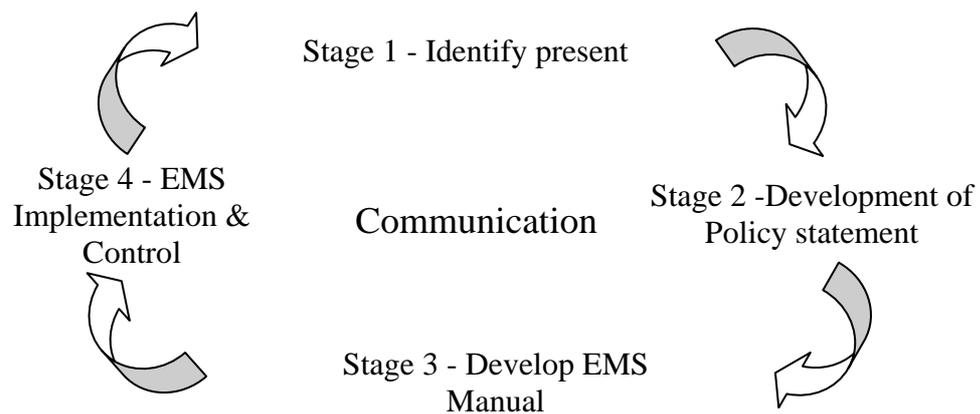
These teams were assigned an individual “Hot Spot” and allocated time and resources to formulate and implement a solution. The Task Teams consist of four to five members who meet for a maximum of one hour every two weeks during their working day. Stage one in the process involves the team discussing and defining the problem and developing an issue statement of what they intend to achieve in a stated period of time. This is dependent upon the size of the ‘hot spot’. The next stage for the team is evaluating and seeking a solution. This requires them to carrying out research on the problem and consult internal and external sources for possible solutions. With all the information readily available they then analyse and seek the best solution. Working together a unanimous decision is made and the director for the business unit is presented with their solution. Approval is given provided that it is realistic and financially viable. With this approval the Task Team implement the solution using the resources made available, monitor and control the results. After a reasonable period of implementation the results are gathered and the information then fed back into the

process map indicating the re-engineered process and allowing continuous improvement.



**Figure 3:** Task Team Process

The data required for the development of the Environmental Management System was gathered through a further series of interviews with key members of staff and surveys carried out on site and within the business unit's office. The Environmental Management System process can be seen below in Figure 4.



**Figure 4:** Environmental Management System Process

At Stage one, the data was analysed, to give an accurate picture of the company's environmental position. Stage two, determined the Environmental Policy which was to be used to manage the company's environmental system. Stage three was recognised as being where the documentation was compiled, and Stage 4 where the implementation and control of the proposed system would be initiated. Due to the length of the programme the implementation and control of the system will be carried

out at a later date. When this methodology has been evaluated within the business unit it will (if successful) be disseminated throughout the Group.

## **FINDINGS**

An innovative composite model of the business unit's process was constructed and approved by senior management. This process in itself required the commitment of all parties involved and broke down one of the biggest obstacles of Business Process Re-engineering - lack of management commitment. This approach was vital as management commitment affects staff motivation and job satisfaction, sense of commitment, performance and productivity, which, in turn affects the success of the programme. Communication was essential for the functioning of the business process re-engineering.

Within the "Hot Spots" environmental areas requiring review and processes were categorised, described and re-designed. From the areas identified it was clear that effective communication between employees involved on the Task Teams would be vital in order for re-engineering to be successful. Without employee involvement it was foreseen that all attempts to achieve successful improvements would fail. Some changes were implemented via Task Teams. Task Teams were not new to Morrison who has used such procedures for a number of years under its Total Quality Morrison philosophy. This innovative approach gave ownership of the identified areas to employees and also assisted in identifying the best possible solution to the problem. This clearly shows that although there is increasing demand from external sources to make environmental improvements within the company, there are also high demands internally. The process allows employee involvement in the continuous improvement of the company and in the long-term encourages employees and increases motivation and commitment to work towards common goals.

An initial stage of the Environmental Management System development was to review the present position and performance of the business unit. This was accomplished by the collection and analysis of data gathered from interviews with key members of staff and from the results of an Environmental Survey which highlighted areas where improvements could be achieved and waste reduced. The Environmental Survey is a systematic process that examines the environmental consequences of the company before they actually happen focusing on prevention rather than rectification. This procedure allowed the results to be recorded, used to gauge continuous improvement, and also involved the employees as the process developed. Office and Site surveys were developed and carried out over a fixed period of time with results compiled and analysed. From these, areas were identified where potential savings could be achieved through more careful energy and material usage. For example, an under usage of skips on sites was identified. This demonstrated that by using these resources more effectively the annual savings would be significant and welcomed by senior management.

At this stage that it became clear that there was a direct relationship between business processes, the environment, cost and communication. It accentuated that with every process the company was involved in there is an impact on the environment which, if managed correctly employing effective good communication between employees, would in turn secure financial and environmental savings.

Following the results of the first stage, the company moved onto the second where it was able to develop an Environmental Policy which was dynamic, proactive, efficient

and adaptable, allowing changes to be made as the business develops. The policy established a framework for setting and reviewing the organisation's objectives and targets. Within these targets, timescales were identified and responsibility was assigned ensuring everyone's commitment to achieving these targets. It was anticipated that this approach would encourage employee participation and ultimately, through them, the success of re-engineering.

The third stage in development of the Environmental Management System was the compilation of documentation. The development of the documentation was carried out, as well as identifying control procedures, and ensuring the process map was kept up-to-date. This was an extensive process that ensured that the system was user friendly and accurate in accordance with ISO 14001. Stage 4 was seen as the implementation and control stage. Although this stage has not yet been developed it is understood that the implementation of the system is both lengthy and complex and careful consideration of this stage is being given before the company embarks on the implementation and control of the Environmental Management System.

Implementation is a people process and success depends upon the company's employees' commitment towards the system. All staff will receive briefing on the intentions of the system and will be notified of their contribution towards the company's goal of improving environmental efficacy.

## **CONCLUSIONS**

Meeting the challenges that the construction industry is now facing is no easy task. In recent years, with the industry's business environment constantly changing these challenges have increased. Organisations are now being forced to be innovative and proactive in many areas in order to stay competitive and financially secure in the market. Morrison Construction Group plc is aware of the need to maintain competitive advantage over those who are seen to be direct and indirect competitors, and also seek to mitigate any adverse affects on their business activities. The company appears well equipped to face this challenge and ready to play a substantial and leading role.

Business Process Re-engineering is not a new concept. However many companies embarking on it fail due to a variety of reasons, one which is the resistance to change. The company took a positive approach to change management, with senior management commitment to the re-engineering being visible from the start. It was the attitude of management which played a key role in employees of the organisation supporting the change necessary. Business Process Re-engineering and Environmental Management Systems require an interdisciplinary and collaborative approach as no one person can make them succeed. Management stimulated the change necessary by their own action, and encouraged employees to see their roles in the continuous improvement of the company. Employee involvement was seen as the key to success. Sharing and the exchange of information willingly is an important part of these strategic initiatives.

The mapping of the business units processes was a very lengthy procedure although one of the most important within the early days of the programme. At this stage employee commitment to the development of the process map was crucial. This was mainly due to the fact that individual employees could see their roles in the overall process and were asked to verify their input, ensuring the map was accurate. It was an absolute necessity that a precise and clear exchange of information was practiced.

This appeared to reduce the 'fear factor' among employees, which is so often the case when critically examining what happens on a day-to-day basis.

The Task Team process also takes an extensive amount of time. However, it was and still is felt that it allows the company control over their identified problems. It gives room for co-ordination of interconnected tasks in a way that maximises efficiency and effectiveness in both the short and long term. This encouraged flexibility and teamwork, which are obligatory when dealing with consistent change.

Environmental Management Systems are now seen as high priority in many forward-looking organisations. They are proactive in nature and dynamic in their evolution, the objectives set within them demonstrate organisational commitment to continual improvement and development, which in turn, it is claimed, leads to improved business opportunities. The interaction of the process map, task teams and employees was co-ordinated carefully to ensure the Environmental Management System supported the business unit's procedures accurately and it is anticipated that it will reduce the company's environmental impact. The system is designed to improve the company's environmental performance through the achievement of set objectives and targets. As the programme develops and implementation occurs, process mapping will be update. This will be accompanied by quality information, which will allow Morrison to report and verify performance as the programme advances. The key to success so far has been through the reduction of communication barriers and the willingness of participating individuals to achieve common goals. It is foreseen that this approach will be continued for the remainder of the programme and beyond.

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