Realizing the Potential of ERP Systems: The Strategic Implications of Implementing an ERP Strategy: The Case of Global Petroleum

INTRODUCTION

ERP systems are integrated software packages that automate core corporate activities such as finance, human resources and logistics. The dramatic shift toward standard software can be attributed to several factors. First, the historical preference has been to purchase or develop and implement software locally, but in the advent of globalization, global systems and strategies have become the imperative (Davenport 1998). Second, as many systems have evolved, they have become characterized by high levels of entropy and degradation leading to year 2000 compliance problems (Taylor 1998). Third, many information systems were developed to support business process maps embedded in functional organizational structures. These systems could not accommodate the concept of the process-oriented organization as typified by the work of Davenport and Short (1990) and Hammer (1990). Finally, the rapid and pervasive emergence of electronic commerce requires organizations to have business and IT infrastructures capable of supporting web-based strategies. A recent survey reports that 64% of companies intend to integrate their ERP systems with e-commerce initiatives (Cambridge Information Network 1999). ERP systems are viewed as providing organizations with a common global business and IT infrastructure capable of supporting a process orientation and emergent modes of business such as e-commerce.

Although there is a growing body of ERP literature (Appleton 1997; Bingi et al. 1999, Dolmetsch et al. 1998; Holland and Light 1999), the gap between the potential for ERP projects and what they deliver in practice has received scant attention yet the issue has serious financial and strategic implications for organizations. This paper contributes to this important area through the analysis of an ERP project in a global conglomerate. It is shown that to realize the full benefits from the heavy investments associated with ERP implementation, organizations must consider how the system is viewed and used. The case analysis indicates ERP systems are unlikely to provide competitive advantage alone. Rather, they should be used to underpin and augment further innovative business and IT projects in areas such as e-commerce, customer relationship management and business intelligence.

Abstract

Enterprise Resource Planning (ERP) systems have been implemented by many organizations. Although there is a growing body of ERP literature, the gap between the potential for ERP projects and what they deliver in practice has received scant attention yet the issue has serious financial and strategic implications for organizations. This paper contributes to this important area through the analysis of an ERP project in a global conglomerate. It is shown that to realize the full benefits from the heavy investments associated with ERP implementation, organizations must consider how the system is viewed and used. The case analysis indicates ERP systems are unlikely to provide competitive advantage alone. Rather, they should be used to underpin and augment further innovative business and IT projects in areas such as e-commerce, customer relationship management and business intelligence.

Author

Ben Light [b.light@salford.ac.uk] is Lecturer in Information Systems at the Information Systems Institute, University of Salford, United Kingdom. His research interest is information systems strategy and implementation. His current focus is on enterprise systems and also how organizations manage consumer and business-to-business relationships using distributed information.
Global Petroleum was facing major competitive pressures. The market offered little scope for differentiation due to the nature of the product, prices were low due to global competition and availability was a prerequisite due to a number of alternative suppliers. Although the company could source raw materials at competitive prices throughout the conglomerate, there was still the need to improve operational efficiencies. The profit target for the business was an 10% return on assets and it was achieving a 5% return. The company identified that it needed to reduce its overheads and improve the management of its global operations.

THE LEGACY SYSTEMS

The division was comprised of what were two separate businesses. Originally a US business, Global Petroleum acquired a further business, which extended their operations into Europe and Asia. The acquisition had two major impacts. First, a review of human resource requirements was conducted and many redundancies occurred. This left the organization with a culture of fear and a dramatic reduction in knowledge and expertise. Second, several systems were in operation but were described by a senior manager as ‘creaking at the seams’. The European headquarters had been working towards overcoming this problem via a standard package implementation. However, the project was halted due to the need for a global system following the acquisition activity. This had left the European division with a process-oriented organization structure and functionally based custom systems. Consequently, there was a major misalignment of business and IT strategies. The US operations were in a similar position. Their systems were based on ageing custom developments. Neither set of systems was well understood or integrated throughout the businesses. Also, they were not year 2000 compliant and a strategic review identified that they could not be renovated (Figure 1).

THE ERP STRATEGY

Global Petroleum decided to implement a global ERP system in an attempt to overcome the regional legacy problems. The project aimed to bring about organizational change and introduce a new IT/IS infrastructure suitable for a global business. Other IT strategies were considered and rejected as the board felt, that due to the scale and complexity of the task, a standard package approach was the most appropriate. One manager commented: ‘We did not want to reinvent the wheel. We did not want to expend resources on writing our own system when one that met our requirements already existed.’ Common with early ERP implementations, Global Petroleum decided to configure the system’s full functionality rather than opt for a simpler skeleton implementation followed by the addition of other functions at a later date (Holland and Light 1999). Management believed that they could enact this high level of change due to the competitive pressure the company was facing and because the European operations were already process oriented.

THE IMPLEMENTATION PROCESS

The project team included internal staff representative of the core supply chain functions and external consultants to aid software configuration and change management. The implementation process began in April 1995 with the development of global business process concepts. Each concept outlined the requirements for business processes in terms of resource and information requirements. External consultants were used to manage this exercise. A gap analysis was then performed to assess the differences between the business requirements and what the system could deliver. This led to decisions regarding business process change and software configuration. The company based their actions upon two criteria: Can we configure this process within the ERP system, if not do we want to change the system, or can we develop a manual solution? In general, the company has adapted its business model to that of the software, and during the implementation has made only two changes to the source code. The first modules of the system, financials and most of the logistics

Figure 1. The legacy systems
suite, went live throughout Europe in January 1996. The same core was complete in the US by the first quarter of 1997. The final modules of the system, Engineering and Maintenance, Fixed Assets and Project Management were implemented throughout the US in January 1998 and throughout Europe by May 1998. The original aim was for a common global system based upon one database. However, the US operations were not process oriented and to have implemented one database would have delayed the project due to the additional reengineering that was required. Furthermore, it was intended that the regional businesses would continue to serve their respective markets and therefore, real-time global operations information was not of importance. Consequently, Global Petroleum implemented two separate ERP systems, from the same vendor, and established a link between the financial modules. This change allowed the implementation to be staggered which gave the US region additional time to focus on reengineering the business. The experience gained from the Europe/Asia implementation was used to facilitate the US effort and thereby synchronize the overall project schedules.

The company realizes that although they have a strong global IT and business process infrastructure, so do their competitors. As the majority of the industry have implemented ERP strategies, their infrastructures are remarkably similar, meaning that, from a business-process perspective, they have broadly the same basis for the development of distinctive capabilities (Porter 1996). Subsequently, the company is developing systems to clothe the ERP package to add functionality and generate opportunities for competitive advantage. It is intended that this strategy will enable a continuous alignment of business and IT strategies. That is, the additional applications may be amended or replaced as the company’s requirements change. One of the first applications is a global market intelligence system based upon a Lotus Notes database. This contains sales profiles for the whole conglomerate’s customer base and allows the global sales force to act in a cohesive manner. There are also plans to improve supply-chain links with economic partners via e-commerce systems. Essentially, Global Petroleum aims to conduct organizational transformation at a much higher level than that commonly associated with ERP projects. They are aiming to reengineer the ways that they interact with other organizations in their supply chain and also the way that they are perceived by their customers. In a sense they are trying to reengineer their corporate identity and it is clear that if they are successful, this is likely to impact upon the structure and nature of their industry. This is akin to business network redesign and business scope redefinition (Venkatraman 1994). The change would have been very difficult, if not impossible, if the company did not have the ERP infrastructure in place. This finding concurs with that of a

THE POST-IMPLEMENTATION REVIEW

Although the project was driven by senior management and involved users, the Project Manager stated that: ‘Until we went live, we viewed it [the project] as a systems development effort.’ Until then, senior management wanted to implement the system and realize the promised operational efficiencies. For example, inventory accuracy is now 90% in contrast to pre-implementation figure of 40%. However, the project had seen significant investment in the form of finance, human resources and organizational upheaval, and the full pay off had yet to be realized. This was evident in a general reluctance to use the system. The project manager stated that one staff group was still using spreadsheets for planning purposes. These provided a 12-month forecast based on fragmented and incomplete data. In contrast, the ERP system offered an accurate forecasting capability based on the common dataset. From June 1998 therefore, the strategic and operational value of the system has been promoted, further reengineering of business processes has taken place and a spirit of continuous improvement has developed. Global Petroleum are now innovating beyond the ERP system in order to remain competitive in an industry where their competitors are also adopting ERP strategies (Figure 2).

Figure 2. A schematic of the new infrastructure
recent study into BPR and the effects of IT infrastructure (Broadbent et al. 1999).

CONCLUSIONS

Global Petroleum was a set of regional business groupings, with commensurate outlooks and IT infrastructures. It is becoming a global business, with a global outlook that is supported by an ERP infrastructure and innovative systems. As is the case in most ERP implementations, the initial plan was to standardize on a common platform and improve operational efficiency. However, the ERP implementation process requires organizations to align their business model with that of the package. This factor, combined with the popularity of ERP systems, significantly reduces the potential for the generation of distinctive capabilities. Furthermore, the large investments that organizations make in these systems cannot be justified in terms of the value they generate when used in isolation. Consequently, organizations such as Global Petroleum are re-thinking the way they view the ERP infrastructure. Global Petroleum has standardized its business process and IT infrastructures across its US and Europe/Asia operations, but it is not supported by one database. The company felt that having an infrastructure that could support global strategies was more important than having a global database of information. Therefore separate databases were implemented in the US and Europe/Asia regions to increase the momentum of the implementation process. Global Petroleum did feel it was important to have the capability to obtain a global picture of the business that would facilitate relationships with customers and suppliers on a world-wide basis and hence the deployment of innovative systems. Simply put, the company recognized the strategic importance of managing global relationships in addition to improving regional operations. ERP systems are therefore becoming the enabler of operational improvement and, perhaps more significantly, the core business platform to facilitate more dynamic innovative developments. These developments aim to provide companies with an individual IT capability that supports competitive strategies and facilitates the continuous process of the alignment of business and IT strategies. The Global Petroleum case also highlights the more general findings in the literature, which are that ERP systems bring about huge levels of change within organizations but that often the outcomes may not meet expectations. Senior managers, therefore, need to be involved in the project in order to recognize and promote the operational and strategic potential of the investment.

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