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Farshad Salimi

Saxion Hogescholen-Greenwich MBA Office

Ben Dankbaar

Radboud University Nijmegen

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Strategic Approaches to ERP Implementation

Farshad Salimi
Reprocess Limited, U.K.
Saxion Hogescholen-Greenwich MBA Office
Deventer, Netherlands

Ben Dankbaar
Radboud University Nijmegen
Netherlands

ABSTRACT

Strategic reasoning behind ERP triggers a specific path to ERP implementation. In this article we present a simple typology of ERP implementation approaches based on literature review and an empirical research for both manufacturing and services. We distinguish between bottom-up and top-down approaches and between process-oriented and technology-oriented approaches and we discuss the differences between the four resulting types of implementation approaches.

INTRODUCTION

During the 1980's and 1990's, many organizations were growing through mergers and acquisitions resulting in ever higher levels of systems incompatibility (involving different legacy-type mainframe systems). At the multinational level such issues only multiplied several-fold (Ives & Jarvenpaa, 1993). The challenges of increasing competition and expanding markets, the search for business solutions in the face of the changes resulting from mergers, acquisitions, take-over and restructuring processes, and rising customer expectations increased the pressure on firms to manage total costs in the supply chain, to shorten throughput times, reduce inventories, expand product variety, provide more reliable delivery dates and better customer service, improve quality, and efficiently coordinate global demand, supply, and production (Shankarnarayanan, 2000; Umble, 2003). ERP systems were offered with the promise that they would meet many if not all of these challenges simultaneously.

On the other hand, the demand for ERP software packages was also driven by frustration with information system departments' inability to cope with systems integration (Holland & Light, 1999), the year 2000 problem, and the consolidation of currencies in Europe (Chung & Snyder, 1999). Developments in large, globalized companies were subsequently followed by smaller, local firms equipping themselves with custom-designed and/or industry designed packages primarily to lower their costs and add value in their services to their clients (e.g., local ERP suppliers: Acto, Exact, Caseware, etc).

ERP implementation enables the convergence of organizational knowledge throughout the firm (Baskerville, 2000). This convergence may draw together functional areas within the organization such as manufacturing, purchasing, inventory management, and transportation, and generate synergies that lead to more efficient product flows throughout the enterprise (Davenport, 1998). ERP software packages strive to support essentially all the processes in a firm's value chain. Most IT managers responsible for managing their organizations' ERP project viewed the ERP systems as their organizations' most strategic planning platform (Sweat, 1998). Yet despite the scope of offerings, most customers inevitably found that at least 20% of their needed functionality was missing from the package they had selected (Scott & Kaindall, 2000).

The early literature on ERP implementation reflects the fact that ERP started mainly with larger companies and was then taken up by smaller ones. It tends to describe the needs and opportunities of small companies as a subset of those facing large companies. (Markus, 2001) To a large extent, the development of ERP packages and accompanying implementation routines were based on the same assumptions. In the course of time, however, it has

become clear that there is a wide variety of motives for ERP adoption, even among large corporations, but also between large and small firms and between firms from different sectors. These differences in motive have an impact on the implementation approach and the subsequent implementation process. Some companies have largely technical reasons, mainly replacement of legacy systems and Y2K problems, for investing in enterprise systems. Other companies focus largely on business reasons for adopting enterprise systems. They expect to derive a competitive advantage from the adoption of such systems. Where the focus is on technical reasons, ERP implementation tends to be treated as a one-off project; where the focus is on the improvement of business processes, ERP implementation is more often considered from a process perspective, in which the goals of the process are constantly under review. Many companies, of course, have both technical and business reasons for adopting enterprise software and actual implementation processes may differ as a result. In some companies, the implementation of ERP systems is driven by top management, whereas in other companies, the push for ERP systems comes from the IT department. Furthermore, there are event-driven differences between implementation processes, for instance, if the goals of the project change due to the acquisition of an important new customer.

DIFFERENCES IN REASONS FOR ERP ADOPTION

Under reasons for ERP adoption, we distinguished technology-oriented reasons and business process oriented reasons. Markus (2000) identified 26 reasons for the adoption of ERP and discussed them in terms of differences between large and small firms. In table 1, we classified these items into technology-oriented reasons and process-oriented reasons. We also added some additional reasons that we identified in the course of this research study. It should be noted that technology-oriented reasons could sometimes also be or become process-oriented reasons and vice versa. For example, the intention to “reduce the software maintenance burden” is not always realized by the acquisition of an ERP package. For instance, we encountered a company that reduced its software maintenance, development and implementation costs through a continuous improvement process by building-up ERP implementation knowledge in house.

Table 1: Strategic reasoning for ERP adoption (adapted from Markus, 2000).

| <i>Technology Oriented Reasons for ERP adoption</i> | <i>Process Oriented Reasons for ERP adoption</i> |
|---|---|
| Solve Y2K and similar problems. | Customer focus |
| Integrate applications cross-functionality. | Enhance functionality through collaboration with supplier and clients |
| Replace hardware to maintain interfaces. | Standardization of processes |
| Reduce software maintenance burden | Process optimization |
| Eliminate redundant data entry and concomitant errors and difficulty analyzing data. | Decision making tools |
| Improve IT architecture | Accommodate business growth |
| Ease technology capacity constraints | Acquire Multilanguage and multi-currency |
| Decrease computer operating costs | IT support |
| Consolidate multiple different systems of the same type (e.g., general ledger packages) | Improve informal and/or inefficient business processes. |
| | Clean up data and records through standardization |
| | Reduce business operating and administrative expenses. |
| | Reduce inventory carrying costs and stockouts. |
| | Eliminate delays and errors in filling customers' orders for merged businesses. |
| | Provide integrated IT support |
| | Standardize different numbering, naming, and coding schemes. |
| | Standardize procedures across different locations. |
| | Present a single face to the customer. |

| | |
|--|--|
| | Acquire worldwide “available to promise “capability. |
| | Streamline financial consolidations. |
| | Improve company wide decision support. |
| | Clear implementation strategy |

A STRATEGIC APPROACH TO DIFFERENCES IN REASONS FOR ERP ADOPTION

In our analysis of strategic approaches in ERP adoption, we differentiate not only between technology-oriented and process oriented approaches, but also between top-down and bottom-up approaches. A top-down approach is concerned with management driven changes and it involves (major) changes in the organization, while the bottom-up approach is usually concerned with development-oriented tasks and management is not fully involved in the changes. Most of the literature on ERP implementation takes a management perspective and assumes that (top) management is driving the process. In reality, IT departments and software developers, but also other functional departments like marketing often play a leading role. This clearly has an impact on the process of implementation.

In this research we have paid special attention to ERP implementation in the service sector and we find that bottom-up approaches appear to be more common in services than in manufacturing companies. In the service sector, more emphasis is generally given to processes at the interface with clients’ business processes. This suggests the necessity for a tighter link between business processes and the clients and a clear understanding of the clients’ needs in the service sector. We observed these unique characteristics in both tailor-made system and ERP off-the shelf package systems in the service sector. Table 2 is the result of integrating literature review and empirical findings. It presents characteristics of the four strategic approaches for ERP implementation. Letters S and M denote the characteristics that appear to be more specific for either services or manufacturing.

Four ERP Implementation Approaches

Earlier researchers looked at the ERP-related changes mainly from the management perspective (i.e., top-down), both in the technology-oriented and in the process-oriented approaches. In contrast, our empirical results suggest that significant results are achieved based on bottom-up drivers in both technology-oriented and process-oriented implementation approaches. The importance of this section is that it takes a different approach in empirical research concerning the differences in reasons for ERP adoption and differences in KCSFs in ERP implementation between the two sectors.

The model of “Four Strategic Implementation Approaches“ that we constructed from the literature and empirical data in table (2) provided us with a number of results that correspond to the objectives of this research study. We constructed the model on the basis of four scenarios; (a) top-down technology-oriented, (b) bottom-up technology-oriented, (c) top-down process-oriented, and (d) bottom-up process-oriented. In building the model, we introduced the top-down scenario as consisting of management driven changes, while the bottom-up scenario is concerned with the technology development-oriented changes, where management did not initiate these changes. The integrated theoretical and empirical models (Table 2) suggested a number of common characteristics and drivers in ERP implementation for most firms in manufacturing and services.

Top- down

Table 2: Four strategic implementation approaches.

| | |
|---|--|
| <p>Characteristics</p> <p>Y2k (Fokker Services) (S) Business Development (Orange-Altran) (S) Business Objectives (General Electric) (M) Business Objectives (Orange Marketing Department, application of data warehousing) (S)</p> | <p>Characteristics</p> <p>Customer focus Enhancing functionality through collaboration with supplier and clients Standardisation-through the whole functional systems (DSM) (M) Centralization of functional areas-and/or sharing services, e.g. HR & Finance (CMG-Logica) (S) Process Optimisation, e.g. Cost Savings, (CMG-Logica) (S) Maintenance Management (DSM) (M) Process Standardization (Start -CMG Logica) (S) Cost savings Flexible Production (Lamb Weston / DSM) (M) Better Supply chain Management (Lamb Weston) (M) Future growth, expansion, in business (Lamb Weston) (M) Cost savings (Lamb Weston) (M)</p> |
| <p>Characteristics</p> <p>Data warehousing (Orange marketing dept.) (S) Technical Developments (Orange-Altran) (S) Building networks (Orange-Altran) (S) New Applications (Orange-Altran) (S) Trouble shooting (Orange-Altran) (S) Transition to new version of database (Mn Services) (S) Transition to new version of operating system. Separate storage application network. Cluster technology Updated real time Information system's structure</p> | <p>Characteristics</p> <p>Clear implementation strategy Constant watchdog on budget Contact management (Rabo Bank -CRM related initiative) (S) Maintenance management (Fokker Services) (S) Order control, pre-calculation and technical work preparation (Lamb Weston) (M) Maintenance Management (DSM) (M)</p> |

Bottom-up

(Technology -Oriented)

(Process-Oriented)

M: Manufacturing sector, S: Service sector

The Technology-Oriented Strategic Approaches

In the top-down technology-oriented strategic approach, Y2K (prior to millennium) followed by (new) business development and business objectives were the most common drivers. Other motives were integrating IT with business strategy; reducing the IT maintenance costs, facilitating business expansion by centralization of the IT systems, and updating the legacy system with the new IT infrastructure. Regarding the technology-oriented strategic approach, there were very few findings in the literature concerning bottom-up drivers of ERP implementation, but in our empirical results we came across a considerable number of such initiatives.

The Process-Oriented Strategic Approaches

In the top-down process-oriented strategic approach, standardization, customer focus, cost savings and integration with suppliers and clients were the most common drivers followed with other initiatives such as process optimization, inventory rationalization and centralization. Again, regarding the process-oriented strategic approach, there were very few findings in the literature concerning bottom-up drivers of ERP implementation, but in our empirical results we came across a considerable number of innovative bottom-up initiatives.

CONCLUSIONS

Earlier researchers looked at the ERP-related changes mainly from the management perspective (i.e., top-down), both in the technology-oriented and in the process-oriented approaches. In contrast, our empirical results suggest that significant results are achieved based on bottom-up drivers in both technology-oriented and process-oriented implementation approaches.

The typology of “Four Strategic Implementation Approaches” that we constructed from the literature and empirical data has provided us with a number of results. In building the model, we introduced the top-down scenario as management driven changes, while the bottom-up scenario is concerned with technology or process-oriented changes, where management has not initiated these changes. Applying these distinctions to our empirical material suggests that ERP implementation in services tends to be more bottom-up than in manufacturing. Moreover, purely technology-oriented approaches appear to be diminishing in importance, but more so in manufacturing than in services. However, this may also result from the fact that manufacturing had a head-start in the implementation of ERP. These tentative results show that the proposed distinctions can serve as a useful heuristic for further research.

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