Change Management Perspectives in an ERP Implementation

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Abstract

This case study analyses a multiyear ERP (SAP R/3) implementation project in a global company from perspectives of conflicts and problems the project faced. The paper reports on the core of the implementation activities from the start of the project in late 1995 until mid 2000, when most of the originally estimated implementation efforts were finished. The study reveals what pitfalls an inappropriate understanding of the magnitude of changes required for implementation involves and what unidentified consequences can result from this. The main reasons for problems encountered are discussed and analysed. The main lesson of the study is that the fundamental challenge of ERP implementations is not technology but organisational and human changes, which, if not properly understood and addressed, can lead to unidentified consequences causing implementation failures.

Keywords: ERP implementation, change management, SAP R3, project management.
1 INTRODUCTION

This report focuses on change management perspectives and challenges in a multiyear ERP implementation program in a global company with maritime business activities. The emphasis is on analysing and interpreting reasons for conflicts and problems the organisation faced when implementing a global ERP system. The report covers the period of late 1995-early 2000 during which time the system was implemented in the core businesses of the company on a global basis. After five and half years of implementation efforts, the implementation was not yet completely over: there were still few business units using their old systems not integrated with the ERP system intended as global.

Reasons for implementing ERP systems, implementation management approaches and factors critical to successful implementations have been presented and discussed in the literature (e.g. Davenport 1998, Bancroft et al. 1998, Somers and Nelson 2001, Brown and Vessey 2003, Mabert et al. 2003). Bancroft et al. (1998) was among the first who stressed that ERP implementation is a change management process. There are examples of failures to see this: one of them is the notorious case of FoxMeyer Drugs’ bankruptcy in 1996, a major cause of which has been proposed to have been its failed ERP implementation (Scott 1999). Companies have not always assessed carefully at all possible implications of their decisions to implement ERP systems (Bernroider and Koch 1999). Technical, managerial and economical reasons have often been offered as major reasons for implementation problems whereas the importance of the human side has not been much addressed in the context of ERP implementation studies. The report aims at shedding light on origins and reasons of ERP implementation problems rooted in the human side.

2 RESEARCH METHODS

I was employed by the case organisation for five and half years from late 1995 until spring 2000; i.e. from the very beginning of the implementation efforts reported here. In charge of the IT infrastructure of the company and as a member of the core project team, my main duty was to facilitate successful technological implementation of the global ERP system. The role gave me a chance to experience the implementation from a wide perspective over the years. Besides pure interaction, I directly influenced, even decided, on certain directions taken. This is why my level of involvement could be best characterised as that of an insider or a complete member. The report is based on data gathered from project documentation (i.e. project plans, minutes of meetings, memos, email correspondence, etc.), interviews, discussions and field notes I took. As a participant-observer, it is obvious that my interpretations have been influenced by my personal, subjective experiences (i.e. experiential data) in accordance with the generally accepted interpretive, ethnographic research methods used in IS research today (cf. Myers 1999).

3 CASE BACKGROUND

The case organisation, hereafter referred as MarineCargoSpecialist, is a global but relatively small company, which provides certain products and solutions for marine cargo flow handling. Its main customer base consists of shipyards providing newbuilding, modernisation and conversion services for shipowners and shipoperators. The solution base it offers include steel hatch covers, ship onboard cranes, Roll-on/Roll-off (RoRo) equipment, elevators, escalators, refrigeration and cargo securing products. The company is organised into divisions in accordance with the key product types. The after sales business is organised into a service division, which operates globally and is present in key ports around the world. In 1995, MarineCargoSpecialist employed roughly 900 people; today, it employs some 1100 people. Though the scope of its business activities has increased, this has not resulted in considerable increase of personnel.
A specialty in its business model is lack of own manufacturing: everything, except for cargo cranes, is manufactured by third-party subcontractors on an order basis. Its main activities are in design, engineering and project management, including supervision of the subcontractors providing the components and associated services. MarineCargoSpecialist acts as a turnkey supplier for its customers, having the full responsibility of the scope of the supply. One of its greatest concerns is the efficiency of its operations. Margins in this business are not high due to fierce competition why even slight mistakes in the sales phase or during the delivery phase can erode them. The activities are usually organised into projects, which can last from a few months to several years. Therefore project management combined with business control is of particular importance.

Traditionally, each of the product divisions had a lot of autonomy. Their own organisations were built upon the need to manage their own activities more or less by themselves. The board of management consisted of CEO, CFO, head of legal and business administration services and the divisional general managers. The group provided a few shared, common services for the divisions; most importantly communication, legal and IT services. However, the global email system was the only common system for the whole group delivered, maintained and supported by the group personnel. All operational IT systems were based on local solutions delivered, maintained and supported by local IT responsibilities and local suppliers. Also no common standards for such systems had been established. The decentralised information systems architecture and the high number of regional and local systems made it difficult to share information on a global basis. This often caused severe delays in the conduct of global business activities due to unavailability of timely information in operations and low quality and inaccuracy of information available. Usually such information was delivered in forms of documents only. Accurate and timely financial controlling of the business operations was also perceived problematic. To overcome these problems, a decision to invest in a global ERP system was made by the board. Several ERP system candidates were evaluated. There were no clear criteria defined for comparing and evaluating them. Rather, the final selection was based on “gut feelings” gained from demonstrations of important functionalities by vendors and feedback received from reference visits to and interviews held in end user organisations chosen for benchmarking. Finally SAP R/3 was chosen, mainly because of its perceived comprehensiveness, scalability and suitability for the global operations of the company. Especially the PS (Project System) module of SAP R/3 was seen critical. The targets for implementing the global system can be summarised as follows:

- To harmonise existing, different business processes by implementing a common process framework through the introduction of the ERP system,
- To establish a common, global information system for project management activities, along with integrated business control and financial reporting,
- To establish a common core information system platform for the group, to be used as a means of generating further efficiency and effectiveness of the global operations.

These targets were to be met by running a “Big Bang” ERP system implementation in two years. The target of the implementation was to cover over 80% of the total business transactions (from new sales to after sales) of the whole group. The project activities were to be divided into four main phases: selection (as described above), analysis and configuration, implementation and rollout.

4 IMPLEMENTATION EFFORTS

The selection of SAP R/3 was followed by a contract made with a consulting company, which was to deliver the majority of the necessary configuration and implementation services for the implementation of the new system. Few experienced key resources were recruited from outside of the company to cater for the internal preparation and project management activities due to the lack of such expertise in-house, especially within IT. The core project team was established, consisting of the project manager and teams for IT, finance and control, project management and after sales specific analysis and configuration activities. The teams were each to set up corresponding reference teams, which were to be used as the source of information in their corresponding fields and the validators of
the solutions offered. No other particular implementation methodology besides the SAP’s proprietary, SAP R/3 Procedure Model, was followed. An analysis of the existing processes was commenced with the goal of redefining and establishing the new ideal processes for the basis of the system configuration and implementation. The focus of efforts was very much on the technical aspects of the conceived implementation efforts. The major challenges were identified as follows:

- Establishment of and support for the required IT infrastructure,
- Securing access to the required business knowledge and resources for establishing and validating requirements and the proper scope,
- Appropriate configuration of the system,
- Appropriate and adequate training of the key and end users.

At first, there was a lot of enthusiasm about the capabilities of the system especially within the project team. Many of the project team members felt excited about the perceived capabilities and potential of the system: from the functional point of view, the new system seemed to be able to cater for almost anything. This was reflected in a comment given by the person in charge of configuring the SD (Sales & Distribution) module: “This system can do much more than we will ever need”. It was felt that setting up and configuring the system appropriately was a challenge but nobody seemed to doubt the success once all the technical pieces of that puzzle would have been covered, analysed and put in place.

4.1 Problems surface

Problems started surfacing soon when the overwhelming complexity of the system was gradually discovered. This quickly resulted in slippages from the challenging schedules as those in charge of configuring the system for demonstration and validation purposes were struggling with configuration options, data and resulting integration issues. Once schedules started shifting, it was painful to get the necessary business resources for repetitive validation and approval tasks. Certain business representatives were confused by the process-centric approach as they were used to work in very functional organisations. They discovered that the actual implementation of the system and especially its use would require a lot of inter-organisational communication and collaboration over the well-established departmental and divisional borders. This was a surprise although they had been aware that one of the reasons for implementing the ERP system was to eliminate double or redundant work in the operations of the whole group. Fundamental issues were discovered in the area of master data management: As the chosen architecture was based on implementing one global system only, it was logically impossible to let different divisions to decide upon creation, maintenance and deletion of master data – such as customers, vendors and materials – in isolation from the others. Due to the shared nature of such data, it was necessary to figure out how to perform these activities in ways that would neither result in creation of double data nor in deletion of data critical to others. Such issues had neither been specifically identified nor addressed by the project in the beginning. At first, the project team did not put much attention to them as these problems were considered secondary and therefore not critical – to have the proper configuration in place was the most important issue. But for businesses questions of ownership and coordination like these were fundamental because they needed to understand how they could maintain control of data critical to their operations without causing unwanted delays resulting from coordination. After some time, the enthusiasm shared by the project team and the reference teams started gradually turning into frustration.

Gradually the number of unaddressed and unsolved issues like these was increasing, which created mistrust and frustration among those trying to raise them. This in turn had an impact on the work to be carried out by the project team and the reference teams: it got actually harder to get approvals for crucial design decisions because reference teams were hesitant to make such decisions due to unsolved issues. This resulted in further delays, which in turn caused more loss of commitment among the business representatives due to continuously changing timetables. When business managers gradually started to understand that they were also about to lose some of their independency, autonomy and
control of data and processes they once had had, they started showing signs of reluctance to get involved. Instead, they were sometimes merely holding back or trying to play time. When the budgets were overrun and it became evident that realising the expected benefits would take much longer than planned, bitter comments were often made about the actual need to have a global ERP system at all.

4.2 Crisis stage

By late 1996, the project was in crisis. The system configuration was not completed due to the lack of quality data, missing decisions and inadequate resources for configuration and validation of the system. It had also become evident that a true understanding and knowledge of the system, especially from the integration point of view, were missing among the consultants used. This resulted in change of the implementation approach: the majority of external consultants were decided to be kicked out after handing over their tasks to the core team members. The first rollout was finally performed almost a year behind the planned schedule. The rollout entity was a relatively small after sales business unit with two offices; one in Rotterdam, the Netherlands and another in Antwerp, Belgium. The rollout could not be considered successful due to low readiness of the organisation and the implemented solutions. According to the user feedback, the system was “too rigid and too difficult to learn and use”, the screen contents were “poorly organised” and there were far “too many screens and fields”. Further, the users could not understand why they needed to input data they could not see relevant for them or their business at all. Almost the whole project team ended up spending its time on these two sites for two months after the go-live date, fully tied up in end user support.

Because of such difficulties, it was difficult to negotiate with businesses for further rollouts and gain commitment to them. In spring 1997, the second rollout was decided to take place in the cargo securing unit in Germany. The business had already been suffering a lot from heavy competition from suppliers of substitutes in China. The business was not profitable and a restructuring and cost savings program had been launched and was undergoing when the decision about the rollout was made. Consequently, people were laid off, and the resulting circumstances and atmosphere in the unit were both somewhat chaotic and tensed in general. Whilst most of the employees and managers in the business unit were literally struggling for keeping their jobs and were busy with managing day-to-day activities, the project team members were flying every week forth and back, stayed in hotels and were consuming resources (e.g. meeting rooms and beverages etc.) of the business unit. The employees were often seeking for intensive support from the project team, which they felt they did not receive due to “other, more important activities and commitments” some project team members claimed they had. This caused a lot of tension and mistrust between certain business representatives and project team members. As a result, the employees did not always bother to attend to scheduled project activities, which generated further delays. Some saw the members of the project team having too many liberties and privileges, and in their view the project was only losing money at the expense of the true business. For example, due to the lack of in-depth SAP R/3 knowledge and the decision to transfer knowledge from the consultants to the project team members, certain project team members received a lot of SAP R/3 training. In the circumstances, this was disliked by the genuine, hard-working business managers and employees: “We are working hard only to see you to spend the money we need to make. This is not fair”.

When the key users and end users realised how much their existing tasks and roles would differ from the ones imposed by new the system, they often felt first confused and then stunned. They often discovered that the new system required a lot more than their quite simple legacy systems in terms of data input and reporting, because the new system was much more explicit, structured and richer in functionality.
As the project had run into troubles, the level of commitment and support for it had been degrading on higher levels, too. For example, the CFO, who had been the true sponsor of the ERP implementation project, was seemingly trying to move away from the project. By the time of the ownership change in 1997, there was nobody among the top management actively supporting and sponsoring the project. As a result of the ownership change, a new board of directors, along with a new CEO, was appointed. To plan necessary restructuring activities, the new CEO carefully evaluated all ongoing projects and initiatives. He first appointed an external consultant who started delving into IT – the staff, processes, projects and systems – and from that person the project team members could learn that the CEO did not necessarily believe in the “Big Bang” implementation approach chosen in the beginning. It was obvious that prior to making his mind up about next steps, he wanted to understand where the root problems resided. He also made it clear that he was prepared to perform radical changes if necessary: “There have been far too many projects. We cannot run them all at once”. After five months, he finally came back to the project team and provided his conclusions. In his view, the company had not been ready for so big changes in such a short time. He did not question the need for implementing a global ERP system per se, but he saw it as a necessary long term investment. It had to be part of long term development plans and to be integrated with them as part of strategy. He also saw it necessary to strengthen both the business and IT leaderships and the IT governance systems within the company. To demonstrate this, he first introduced a new CIO role within the group management and established an IT steering committee, chaired by himself, to start steering the troubled ERP implementation project.

Slowly these actions started bringing substantial improvements. The new CEO had clearly demonstrated his commitment to the ERP implementation, and because of that, the project was back on the senior management agendas and not to be wiped out as an unnecessary nuisance. Though there was still a lot of resistance and concernedness, the new CEO made it clear that he wanted to have a more integrated group with common and shared values, culture and business systems. He also initiated a new management development program, which was especially designed to address and confront openly cultural and trust related problems resulting from the traumatic historical events; i.e. mergers, acquisitions and divestments. The implementation methodology was also adjusted to better match the changed circumstances. The quality of implementation was now primary, meeting the schedules secondary. Thanks to a phased, less tight rollout schedule, a much higher degree of user participation was achieved in all project activities. Finally in spring 2002, one of the original aims set for the ERP system – 80 % coverage of the total business transactions of the group – was reached. The emerging perception was that the system had slowly but gradually started providing tangible benefits to the business. It could also be seen that the implementation of a common ERP system had actually functioned as a means of getting a more integrated group – an important intangible, yet hardly originally expected benefit. Amazingly after all the struggle, the implementation was now considered successful – not only internally but also by many external parties, such as SAP and consulting companies providing implementation services. A demonstration of this was a high number of reference visits and benchmarking requests from other companies planning to implement or already implementing SAP R/3.

5 ANALYSIS OF PROBLEMS

The core issue of ERP implementations is to gain a proper understanding of the implementation efforts in terms of scope, required actions and the proper timing of actions. The main challenge of ERP implementations is to manage the elements of change in the organisation so that the intended, desired changes are implemented successfully and the unintended surprises that could lead to failures are avoided. ERP systems impose their own logic on organisations (Davenport 1998) and this may be a source of cultural conflicts. Cultural changes are probably the most difficult kinds of changes to
identify and manage because culture is something quite difficult to grasp. In a company, its culture often reflects the implicit beliefs, assumptions and values about what behaviours are believed to lead to success and as tacit, they are hard to identify and change (Schein 1999). In ERP implementations, the prevailing culture may be in contradiction with the desired forms of control and organisational structures required for implementing the optimal processes. It is likely that ERP systems enforce more management power and control rather than bring about organisational empowerment (Sia et al. 2002). Systems that alter internal power structures in an organisation are resisted by those losing power and accepted by those gaining power (Markus 1983). Thus information systems can be used as change agents and as means of advancing certain political purposes in the organisation. Such culture and power oriented changes had a big role in the reported case. The top management had identified the implementation of an integrated ERP system as a means of introducing and imposing common practices, even a common culture, within the group. However, there were many strong stakeholders and stakeholder groups who had completely different interests and priorities. Thus the implementation became a political act, and the battles for power complicated and delayed the process.

Timing and mode of performing changes can have a great effect on the results. Radical changes will require more time and different types of interventions than simpler. Hyu (2001) has identified four ideal types of planned change processes: commanding, engineering, teaching and socialising. Commanding is appropriate for changing formal structures episodically, whereas engineering is appropriate for changing work processes on a more continuous basis. Teaching can be used for changing beliefs episodically, whereas social relationships are best changed through socialising which usually requires longer time. Large-scale changes require alterations of multiple organisational elements, thus calling for the use of several ideal intervention types. In the case, both bad timing of change and the inadequate use of different intervention types can be identified. The decision to roll out the system to the cargo securing unit in the middle of a restructuring program is an example of bad timing. Obviously also more time should have been put in performing work process changes. On the other hand, the management development program initiated by the CEO certainly helped change both beliefs and social relationships by teaching and gathering together people from different organisational entities and cultures.

Operations and organisational forms that once were geographically limited were to be dispersed over several continents and time zones, and the ERP system was to facilitate this. Consequently, the users’ job tasks were being handled more and more within the frames of the ERP system. Thus the ERP system had an increasingly critical role in the business. However, such increase of criticality was not always welcomed by those who needed to use more information systems in their daily job tasks. Many employees only felt forced to use the ERP system, and saw the value of their personal qualities and professional competencies gradually diminishing: the main content of work seemed to become a mere clerical activity behind the screen. In the reported case, the importance of this matter was understood and learned only gradually but never really addressed. It was extremely difficult to justify the need to use the system because it did not always bring direct benefits to those needing to fill in data although the benefits were visible later and elsewhere, especially at the group level.

The implementation of the ERP system acted as a catalyst for changes in the established roles in the organisation. The degree of such changes was implicated to a certain extent by the chosen implementation strategy: in “Big Bang” implementation approaches, combined with fundamental Business Process Re-engineering (BPR) activities, radical changes are more likely to occur. BPR by the very definition is about performing organisational changes: tasks and activities scattered around the organisation and performed by several different groups or functions are to be gathered into one or a few locations only where they are to be performed fully by the very same people only (Hammer and Champy 1993). As part of ERP implementation, BPR will most likely result in centralisation of some administrative functions, like accounting, financial reporting and financial control. This was exactly what was attempted at the MarineCargoSpecialist. The covert target was to rationalise and streamline processes whilst achieving improved results with fewer people who needed to do more. Existing roles changed; for example, some earlier roles (also jobs) were completely lost from small service units.
whilst new ones were introduced at the group level. This caused a lot of conflicts. Although organisational and role changes were covered to a certain extent as part of the rollout, the fundamental problem was the lack of pre-established goals for the new desired organisational forms and way of working.

The concept of task-technology fit (Goodhue and Thompson 1995) can be identified as one possible measure for assessing the suitability of a system for a user’s job tasks. This measure describes the correspondence between task requirements and functionality of the technical solution. If the correspondence is perceived high, a user of such a technical solution should be relatively satisfied with the solution (and vice versa). Information systems involve different logic and ways of achieving certain goals. ERP systems are rich in functionality for managing functionally different sorts of tasks and activities almost in all kinds of businesses (Davenport 1998). Thus it is very likely that the functionality of a legacy or any in-house developed system differs from that available in an ERP system. Differences of such origin represented a major issue in the reported project: the system was perceived too difficult to use for typical activities; the system was too complicated, etc. Task-technology compatibility considerations were clearly omitted in the implementation methodology applied. It is also an open question to what degree and detail such issues really can be covered and when, because it is very hard for users to see and evaluate any differences until there is some working – a prototype or a test – system available. It is challenging to arrange a test ERP system available for the purpose in the early phases of implementation as setting up such a system requires a working configuration based on data, structures and rules from the implementing organisation. These deliverables will usually be made available in the later phases of the project only.

On an individual level, an information system can represent a fundamental change not only in terms of changing work practices and routines but also in terms of knowledge. Let us consider a male service engineer at MarineCargoSpecialist who had worked in the same business for two decades with the primary responsibility to service onboard ship cranes. Before the implementation of the ERP system, all he had needed to do was to identify the equipment onboard, identify and order required spare parts, perform service operations and report back to his superior the hours and material spent. He had not used at all any information system in his tasks but instead collected all necessary information from various catalogues and colleagues. Mostly he had been relying on the knowledge gained during his years in the job, i.e. tacit knowledge. As a result of the ERP implementation, the service engineer was put in charge of the order fulfilment process from the creation of a service order until the delivery of the ordered services. He needed to use the ERP system to identify all materials and goods to be delivered. Unfortunately the system did not have records of all past installations. A new standardised coding system was implemented to code uniquely materials from different sources and origins, but, unfortunately, information on old codes had been preserved only to limited extent in the system. Earlier, this information had been available to the service engineer in the form of printed spare part catalogues. The consequences can be considered catastrophic for the service engineer from his individual perspective. His once useful tacit knowledge was no longer useful at all in identification of vessels, equipment, materials and goods. In addition to learning to use the new system and managing new processes and practices, he now needed to learn new coding standards and re-establish the cut-off cognitive links between new, but meaningless codes describing equipment on the vessels and the actual equipment on the vessels. Consequently, he felt that his performance had decreased until he had again re-learned the changed job and repaired the bits and pieces of his lost knowledge. What this real-life example points out is that it is far too simple to regard knowledge as mere structured data as pointed out by Boland (1987) already. Making information explicit in the form of information systems is not enough to turn it into knowledge but a cognitive agent (i.e. a human being) is required. It seems justified to suspect that many ERP implementations may be based on too optimistic views on using structured information as the main source of knowledge.
CONCLUSIONS

The case has shown that the main reasons for conflicts and problems encountered were of organisational and human origins. On the organisational level, there were two major change drivers: political problems, which resulted from changes in structures and distribution of power and organisational changes, which resulted from process changes and re-organisation of work within the group. On the individual level, changes in work roles and tasks, the required increased use of the ERP system in job tasks and the resulting knowledge changes were the main change drivers. As the implementation methodology and the approach taken to manage the implementation process were lacking from a realistic understanding of such human-oriented issues, the problems encountered appeared as unexpected consequences. The lesson of the case is that a global company considering to perform a radical, large-scale ERP implementation should carefully assess its culture and capabilities. Such assessment provides the basis for understanding the scope and magnitude of the expected changes, and helps planning an appropriate approach to managing the implementation efforts as a change process. The lack of understanding of the ERP implementation as a fundamental, strategic change process, the lack of leadership and commitment within the top management were the key reasons for all the troubles the project faced until the new CEO took over and initiated recovery.

References