ACIS 2007 Proceedings

Australasian (ACIS)

2007

ERP Success Factors: The Impact of Knowledge, Organizational Context and Institutional Forces

Thomas Kalling
Lund University, thomas.kalling@ics.lu.se

Lisen Selander
Lund University, lisen.selander@ics.lu.se

Follow this and additional works at: http://aisel.aisnet.org/acis2007

ERP Success Factors: The Impact of Knowledge, Organizational Context and Institutional Forces

Thomas Kalling & Lisen Selander
Institute of Economic Research, Lund University
PO Box 7080, SE-220 07 Lund, Sweden
Email: {thomas.kalling, lisen.selander}@ics.lu.se

Abstract

Organizational learning could be considered both a general and specific theory of interest to the research of ERP implementations. This article explores how organizational learning can be used to study ERP change. We study two ERP projects in two European MNC's, including ten embedded cases and 196 interviews. Findings support that managing organizational and institutional forces as well as structuring the division of labour beyond mere implementation and education is very much required yet often overseen in theory. Such change efforts may include consultants' tool-box type solutions but it also requires character, decisiveness, organisational changes, incentives, corporate involvement, endurance over long time-periods and an ability to execute potentially stressful decisions such as making staff redundant. We argue that fundamental matters, such as the will, the structure and the ability to change, are important to focus on in order to successfully implement ERP systems.

Keywords

ERP, organisational learning, technological change, strategy, customer service

Introduction

Investing in and using so-called Enterprise Resource Planning (ERP) systems is becoming increasingly common. The Enterprise Resource Planning Spending Report, 2006-2007 found that U.S. companies will increase their ERP budgets by 12.3% in 2007 (AMR Research). Yet the failure rate of all ERP implementations is still estimated to be as high as 50% (Muscatello & Parente, 2006). Implementing a system such as an ERP is not easy. And once implementation is done, companies normally expect to generate some return on investment (ROI) in the form of cost reductions or sales increases. However, much of the business research into ERP focuses on technical matters, including functionality, choice of modules, data base infrastructure and configuration (cf. Kirchmer, 1998), on implementation (cf. Holland, Light & Gibson., 1999; Markus, Petrie & Axline, 2000; Parr, Shanks & Darke, 1999) on links with other systems (Davenport, 2000) or on organizational performance effects of ERP usage (Nicolaou and Bhattacharya, 2006).

Here we argue that implementing an ERP, and organising to utilise its potential, is an organisational learning process (Andreu & Ciborra, 1996; Cotran et al, 2005; Tchoquè et al, 2005), other than what is required in terms of formal training on systems usage and so on. Deciding on software solution, training and implementing, and changing organisation and work tasks, are instances that demand a significant amount of individual and organisational learning. In this paper we focus on the learning processes organisations go through as they aspire to achieve financial benefits and returns from their ERP investments. It is assumed that the link between ERP and financial performance is not deterministic (Markus et al, 2000; Robey et al, 2002; Robey & Boudreau, 1999), but that change efforts are required to stimulate *use* of systems, to make sure that usage leads to *improved work processes*, and that work improvements lead to *financial improvements*. These are questions that focus on later stages of ERP ventures, stages so "late" that much of the research actually neglects it. From a business strategy perspective, what counts is improved performance over time: an ERP can be seen as a resource acquired at a certain price aimed at improving activities in order that costs are cut and/or price or sales volume increases without affecting each other (cf. the resource-based view, Barney, 1991; Peteraf, 1993; and Porter, 1980; 1985). An ERP system that fails to generate a payback on the investment over its life cycle will be a loss and an economically irrational investment (this is obviously difficult to calculate taking into account spinoffs and opportunity costs, but the principle and belief that a payback is required is often the main argument behind the investment and hence its existence). Few IT investments pass the capex routine if it lacks an idea about how to be financially beneficial. Obviously, we are well aware that not all ERP investments have the explicit ambition to generate a financial payback, but could be a response to fend off ad hoc opportunity costs (e.g. the Y2K bug).

The purpose is to increase the understanding of how ERP is or could be managed in order to improve financial performance; that is, the *strategic* implications of ERP. The paper starts with a review of literature on

knowledge and learning. Then two studies of ERP projects within two European manufacturing MNCs are reported, focusing the knowledge and learning challenges in conjunction with the changes implemented to reap financial benefits. All the ERP implementations concern customer service centres or call centre functions within the two industries.

Theory

Enterprise systems are the all-embracing name for systems such as ERP, CRM and supply chain management (SCM) systems. While CRM mainly concerns front office functions such as customer contacts and interaction, ERP systems also support back office functions within the organization, including human resources, manufacturing and logistics (Brown & Vessey, 2003; Seddon, Shanks, Willcocks, 2004). There are several texts that try to capture the success and failure factors of ERP implementations (see e.g. Sheu et al, 2004, Cotran et al, 2005, Sun et al, 2005, Scott, 2005, Zhang et al, 2005). We shall not discuss all of them here, but instead divide factors into knowledge, organisational and institutional categories. Closely aligned with intentions of cutting costs and increase efficiency, many organizations are expecting fundamental organizational changes when implementing ERP systems (Robey and Boudreau, 2000). In consequence, the organisational learning field often considers organisational change as a learning process, and is occupied with understanding the factors that drive or hamper change. We are inspired, particularly, by the suggestion by Fiol and Lyles (1985) that strategy, environment, culture and structure form the basis of learning. In consequence, we suggest that strategy, environment and culture equate institutional forces, whereas structure equates organisational factors. To discuss learning and the dynamics of knowledge itself, we include knowledge-related factors as a separate category.

Knowledge-related Factors

Within knowledge management and organisational learning literature, knowledge-related factors concern aspects of the character of knowledge managed, the character of the knowledge of people, the ability to balance cognitive variety and commonalty as well as the transformation between tacit and explicit (see Cohen and Levinthal, 1990; Grant, 1996; McEvily and Chakravarthy, 2002; Nonaka, 1994; Sanchez, 2001; Simonin, 1999; Spender; 1996; Swift, 2002; Szulanski, 1996; Szulanski, 2000). There are many prospective explanations to why learning occurs in conjunction with the introduction of new information systems (IS). Although the discussion of knowledge and learning, with a few exceptions (see Cotran et al. 2005; Robey et al. 2002; Tchoquè et al. 2005), has been rather absent in ERP research, factors such as management support and training as well as the organizational ability to respond to changes have been discussed intensively (see Somers and Nelson, 2001; Wixom and Watson, 2001).

Robey et al (2002) claim that in order to succeed with ERP implementations firms need to manage two types of knowledge barriers; the configuration of the system and the assimilation of new business processes. This can be in either of two ways, i.e. with a piecemeal approach whereby things are done step-by-step or in a concerted approach whereby both the configuration and the process changes are done simultaneously. This is ultimately a question related to learning on the organisational level: in terms of overcoming assimilation knowledge barriers related to new work processes, Robey et al claim that user training both on new processes, but also on more abstract matters such as "organisational change" is needed. But other than that, the implementation approach often needs to be incremental rather than radical. Giving time to units to get used to the system, using experienced project teams to assist in the rollout, appointing "super users" are incremental means to make sure knowledge barriers associated with assimilation of new business processes. However, as indicated, Robey et al remain fairly close to the system implementation, and their framework covers activities leading up to the assimilation of new work processes – there is no extended discussion about what it takes to make sure that new processes result in cost reductions or quality improvements.

Yet, a technology implementation might not only disrupt routines it might also reinforce them and lead to new learning processes (Edmonson, Bohmer & Pisano 2001). Important factors in such a learning process concern the ability of the employees to accept new work routines. This, in turn, is dependent on factors such as authority structures, team stability and psychological safety of individuals and groups within the organization. Project competence, teams that are balanced skills-wise (Somers & Nelson, 2001), "best people full-time" and the use of system champions (Parr et al, 1999) are other cognitive factors often referred to among ERP studies.

The Organizational Context

Within recent ERP research organizational factors such as how to manage cultural and structural change (see Al-Mashari et al. 2003; Bancroft et al. 1998; Dowlatshahi; 2005; Motwani et al. 2005; Nah et al. 2001) is often put forth. Like many others, consultants included, Robey et al (2002) suggest that one important organizational issue concerns business process reengineering and conscious efforts to match the organization to the new system functionality. Markus and Tanis's (1999) work on transformation processes touch upon several organisational

challenges. They stress the importance of metrics for both the technical process, the changing of work processes and changes to the business processes (see also Ross & Vitale, 1999).

Markus and Tanis (1999) also claim the ERP process holds four phases: "chartering", "configuration/rollout", "shakedown" and "onward/upward". The shakedown and onward/upward phases refer to post-implementation steps, from "going live" through "normal operation" (shakedown) and until "business benefits" have been realised (onward/upward). Shakedown includes technical issues such as bug fixing, system performance tuning and adding hardware capacity, but also management issues such as process changes and training. The performance metrics used are downtime, response time, calls missed, labour costs, order fulfilment cycle times and error rates. Onward/upward activities include post-implementation investment audits, continuous business improvements, technology upgrading and end-user training. Performance metrics are not usually measured, according to Markus and Tanis, but possible indicators include business performance improvement and end-user skills assessments. Markus and Tanis claim that relevant goals, plans, project execution and resolution abilities are key success factors. In their empirical study of the onward and upward phase, Markus et al (2000a) found relatively technical success factors, such as fragile human ERP capital (lack of ERP and IT experts) and migration problems. In summarising the organisational factors behind success, a lack of results orientation, resistance to change and a lack of top management buy-in were seen as the main obstacles. Organisational fit (Hong & Kim, 2002) is another typical organisational context feature impacting ERP success.

It is true that many organizational change efforts face resistance.. In a work environment such as a bureaucratic organization (e.g. a call center) – as opposed to one governed by ideology (Alvesson, 2000) – other kinds of factors may surface as well. There are more features to take into account when examining the interplay between a new technology and organizational change. In effect, organizational learning theory stipulates factors such as controlling the feedback to the organization, forming the meaning of concepts (Argote and Ingram, 2000) stimulating and influencing the individual interpretation (Daft and Weick, 1984) understanding communities of practice (Brown and Duguid, 1991) as well as managing the interface to the environment and the organizational structures (Cohen and Levinthal, 1990).

Institutional Factors

The institutional field is concerned with the underlying factors behind human and organised activities, i.e. what institutions that govern behaviour (Meyer & Rowan, 1977; Powell & DiMaggio, 1991; Scott, 1995). Here, we focus in particular on the underlying norms and values ('culture' to some people), and the will and preparedness to act of individuals and managers. A well known goal of management is creating an environment where employees are motivated by a strong identification with company norms and values and that act in the best interest of the organization (Willmott, 1993). Institutional factors concerns managing such norms and values among employees as well as handling the firm strategy and environmental pressure (Fiol and Lyles, 1985; Gupta and Govindarajan 2000).

At the micro level commitment, fluctuation and intention could be considered as examples of such factors (Nonaka, 1994). More so, institutional factors stresses the role of structure in shaping organizational reality such as taken for granted beliefs, rules and routines as templates for organizing. In the end individuals are marked by the institutions of which they participate. So, in as much that one could talk about one uniform organizational culture; one often refers to "shared norms, values and assumptions" (Schein, 1996 p.229) but also to behaviour patterns, rituals, and traditions.

Institutional perspectives have started to surface also in the literature on and in studies of ERP implementations. These include Nikerson and Muehlen, 2006, Orlikowski and Barley, 2001, Swanson and Ramiller, 2004, and Teo, Wei and Benbasat, 2003. Andreu and Ciborra (1996) suggested, along time ago, an increased orientation towards learning when it comes to IS implementation in general. The social institutional force behind individual and organisational use of IT and IS was also highlighted by e.g. Agarwal (2000). Ross and Vitale (2000) have also covered factors that are institutional, e.g. they identify four types of pitfalls, subject to management efforts: failure to establish metrics and targets, inadequate resourcing of the post-implementation phases, ignoring management reporting requirements and failure to address resistance to change.

One of the most frequently cited features 'top management support' (e.g. Somers & Nelson, 2001), and the likewise well-cited feature 'user resistance' (e.g. Fichman, 2000), are examples of the role of the will and intention of organisational members to act in a way that supports the strategy of the organisation. They are typical examples of institutional factors. Yet they are often taken for granted, and their occasional absence is the cause of surprise among many researchers. The direct effects of norms and values include the amount of resources and support – including moral – available for ERP projects. One area that has been particularly neglected is the role of managers and organisational members post implementation (these instances figure more often in research on earlier phases).

To conclude, there are several success factors in the ERP literature, with a high degree of overlap. We have tried to group them into three: 1) knowledge, meaning the ability to *accept* and *adopt* new technology and functionality, and the ability to master different implementation phases, including shifting between internalisation and externalisation; 2) organizational context, referring to the structure of projects and work, responsibilities, control, metrics and the ways in which firms organise to get the most of their system investment; 3) institutional factors, by which we mean the *will and intention* among managers and users to invest and use new technology.

Method

This case study includes two companies and ten embedded sub-cases. The framework contents described above are used as 'sensitising categories' (Glaser & Strauss, 1967) and to be tested deductively to allow for inductive interpretations and pattern-matching by means of analytical generalisation (Yin, 2003). Hence it is not a purely inductive study: *a priori* theory is used to stimulate interpretation and to position the study. We argue that a framework enables both deduction but also induction by serving as a set of 'sensitising categories'.

The two companies, ABC and XYZ (anonymous) are multinational industrial companies primarily operating in Europe, with annual sales turnovers of 15 and 5 BEUR respectively. ABC includes two embedded sub-cases, ABC1 and ABC2, both being call centres in relation to private customers. Both implemented an ERP system particularly focusing on customer relationship management, with the purpose of improving customer interaction (e.g. faster response to customer enquiries re invoices, prices, current offerings etc), cutting costs and improving performance. The ambition was to receive ROI from day one and to have the entire investment paid back in three years. The system has approx. 400 users, 200 at each site and was bought 'off the shelf' from a leading global ERP vendor. The planned effects of the system were to speed up working processes, to standardise work processes, to allow for re-organising into more efficient work organisation structures, and to provide access to better and more reliable data. The system had been used for two years at the time of study.

XYZ has some 20.000 employees and 250 production units across Europe. The study here includes eight embedded sub-cases, where each sub-case is a production unit with profit centre status and some 200 employees including approx. 50 users of the ERP system. The system was developed partly internally partly in cooperation with an external software developer. The system supported and integrated customer interaction, costing and pricing, production planning, invoicing, and transport planning. Like ABC, XYZ planned for a three year investment payback, with returns from day one in terms of cost reductions and more reliable downstream supply chain performance. The system was implemented in 40 units, of which we have singled out eight for this study.

All ten embedded cases were categorised as being either success or failure cases depending on whether they had reached their goals in terms of performance improvements. Four of them turned out to be success cases; six were classified as failure cases. The method applied to classify was to ask respondents whether their cost objectives had been met, and then to validate it by means of examining the profit and loss statements. We then conducted a series of interviews at each sub-case, in total including some 199 interviews in total (47 at ABC, 152 at XYZ). We interviewed users, other employees, sub-case managers, IT staff and top management at both companies. The purpose was to enquire about the role and possible importance of the theoretical constructs of the framework, i.e. knowledge, organisational and institutional factors. Interviews typically were initiated inductively with open questions about what had been important, in a negative or positive way, to result of the implementation. Interviews then gradually became more directed towards asking about the role and importance of specific factors given by theory. Interviews lasted between half an hour and three hours. We also combined the interviews with observation (usage in action) and archival data (profit and loss analyses, project descriptions, objectives etc). We have attempted to resolve reliability and validity through frequent respondent validation and cross-comparison of accounts (we have not accepted a single account of a core event, but checked it with parallel sources), as well as inter-rating (between researchers) of accounts (Van de Ven & Poole, 1990).

Findings

We highlight and present the findings in relation to the three categories of knowledge, organisational and institutional factors. It should be noted that we only profile key findings in relation to each category.

Institutional Factors

Initially the organizations that successfully implemented ERP worked intensively and carefully with handling changes in the organizational structure and culture. The norms and values embedded in the organizations were taken into consideration and management support was considered high. We could also see a difference between the more successful and the less successful organizations when it came to the expectations of the system. In cases where the system implementation disrupted or changed beliefs, rules and routines amongst the employees or middle management the system was met with user resistance.

In terms of institutional factors, the system, in the ABC cases, was bought to decrease the gap between back and front office, creating a more flexible organization but maybe even more important, to support adaptation for future structural changes such as economic and reorganization measures. In combination with high operational, maintenance and support costs, the decision to change systems was forced forth. One major implication being that one of ABC's competing company had implemented the system only one year ago. Due to this ABC was not forced to be a first-mover in terms of technology. Yet the ERP implementation was, quite early on, considered a failure. It did not respond to the needs or the expectations of the employees or the management. The system that had brought promises of faster work processes as well as improved quality in work yet more than half a year after implementation almost every process had doubled in time consumption leaving ABC to increase their workforce with 100 %. At that time the customer service centres had more than one hour cues on the telephone and more than 90 000 unsolved errands. More so, even though head office staff emphasized on the call centres as the organization's most important unit, call centre personnel expressed being overrun by the head office.

In XYZ, institutional factors were important on several levels. Among the successful ones, the system implementation was regarded by management and users as a strategic investment that should help drive cost and improve delivery performance. They took the ROI capital expenditure application (capex) and internalised the ideas about payback streams, formed project groups, and made individuals responsible for improving their work tasks. And there was a clear idea about exactly what sort of cost cuts that had to be made. Potentially distressing decisions involving making staff redundant were dealt with up front. In short, the successful ones saw the ROI as their own responsibility and did what they could to make it happen. The less successful ones had little relation to the capex and the ROI, and installed the system without caring much about the ROI. Few things happened in terms of job changes or process improvements, partly because no one was responsible, partly because few cared. The system was not, in effect, internalised to any strategy of the units. Another interesting observation was that the successful units in XYZ tended to have poorer financial performance than the less successful ones, indicating that incentives such as awareness of under-performance, true desires for improvement, crisis even play a part in relation to ERP investments. This also relates to structure and general control mechanisms. In the successful cases, site managers had a dialogue with employees about the performance situation and the role of individual investments in improving the situation. Staff, from directors down to operators, were well aware of the strategic intentions and the overarching meaning of the system.

Organizational Factors

From theory we know that call centers offer an environment largely built on routine work regulated by technology and managerial scripts (Taylor and Bain, 2003). In terms of organizational factors, the organizations that perceived problems with their implementation process more or less approached the same problems. Firstly they all had an apparent problem with the organizational structure and the work routines. This affected not only the possibilities to change but also the information flows in the organization. Secondly, they faced problems concerning supply chain management, and being in the hands of larger ERP vendors they also lacked in-house knowledge of the system implementation.

In the ABC cases, the first structural problem was related to a lack of interaction between the two centres, and the fact the company had no real ideas about how to share labour between the units. This resulted in animosity and arduous relationships. Should they share labour blankly or should there be specialisation? Secondly, the two customer service offices considered themselves a low status part of the organization – partly because they felt there were no ideas about what kind of competencies were required, thanks to the lack of vision about structure. At each site, the old structure with back and front office personnel created an inflexible organization with a lack of interaction and learning. Yet the site organisation became specialised into different work tasks. To approach the problem associated with limited flexibility and hence higher costs per job, a reorganization was conducted in order to merge the two functions of back and front into one, creating a more "flexible and knowledgeable" call centre worker. This change in work was initiated a year after the ERP implementation in a difficult work period where the system did not correspond to the employees expectations. This resulted in frustration particularly among staff that had worked in the so-called back office function, which was more analytical and dealt with more complex issues and where the more experienced staff were working. The recent the generalist structure did not lead to improved performance. The system and the new routines were still perceived as complicating.

In XYZ, organisational challenges were related to both control and structure. Relating to control, and as indicated above, those plants that internalised the investment into their strategy agenda also were the ones who allocated responsibilities through local middle managers, supervisors and individual users. Clear goals were set and group supervisors were forced to plan and report progress annually and quarterly. In terms of specialisation, certain work tasks required specialist knowledge and so there could not be a fully fledged generalist, flexible organisation. However, in order to make sure there were synergy and efficiency of communication, the different functions using the system were brought together physically, and what is even more important is that they were

integrated structurally into one unit, a supply chain management function, with the same manager. So instead of having a distribution of functions across the site function-wise, a strong integrated function was created. This also helped resolve some of the problems related to lower status among the users of the system, a problem similar to the ABC cases. However, this is the situation at the successful XYZ sites. In the less successful ones, there were no changes to structure or control, naturally, since the investment had been considered important or strategic in the first place. Things just went on like they always had. Users had limited possibilities to improve their work tasks because they were not required to, and the structure and immediate environment did not support them.

Knowledge-related Factors

Important knowledge related factors included, in all of the sub-cases, aspects of training and preparing for system change. Another problem was related to managing the balance between tacit and explicit knowledge, typically emphasising the latter. Furthermore, which became evident after studies of units that succeeded was that they had a relevant mixture and levels of both technical, work process and strategic knowledge and awareness.

In the ABC cases, management failed in understanding the need of tacit knowledge, emphasizing instead on making all the work processes explicit and as a consequence become less vulnerable to labour turnover. In accordance, the organization failed in sharing knowledge in combination with misguided practice. In terms of knowledge, ABC was initially perceived as strong in its "core" areas such as support back office functions i.e. financials and distribution logistics as well as front office functions such as customer contacts and billing. The personnel were generally young academics, over-qualified for their work tasks. Hence there were no problems with the knowledge base, rather with its fragmentation. This group of highly educated call centre workers affected the system implementation in several ways. Even though critical towards how the implementation was managed and the system per se they were positive towards the organizational changes that the system brought. To some degree one could argue that the ABC cases failed in exploring the knowledge of their employees during the though implementation period – both the rapid and very explicit knowledge used in the front office and the more tacit, problem-orientated knowledge of the back office were important. Yet ABC did not manage to merge the two in a way that secured both creativity and flexibility and generalism. Rather, in terms of practical knowledge, the knowledge base was considered as highly transactional such as answering simple and repetitive questions. As a consequence the work tasks were perceived as non-creative and unsatisfying, and several employees, particularly in the back office, quit their jobs.

A second problem among low-performers was the timing and content of education and training. Firstly, in ABC, training was done far too early before go live, and when the system was implemented, the users were quite unaware of the functionality. Although the early training helped "sell" the system, it created a cognitive problem later on. In XYZ, which timed their education sessions better, the successful units also had a much lower level of formal training. Instead they focused on hands on experience – at least the successful ones did. The perception was that formal, classroom system education can only take you so far. It is not until you are in a sharp situation where things can go wrong that you are forced to learn and take ownership.

Another key feature of the successful sites in XYZ was that all involved embodied knowledge about the work processes, the technical system and the overarching strategy, objective – meaning – of the system. Typically, a manager embodies primarily the strategic awareness, the technical personnel embody primarily the technical skills, and the users embody primarily the knowledge of work processes. In a fragmented organisation where stakeholders stick to their area, problems related to communication, joint objectives, joint efforts will arise. This was not the case in successful units. Instead, those who succeeded also managed, intentionally or unintentionally, to make sure all individuals also internalised a bit of the knowledge and awareness of the other two stakeholder groups. Training, joint meetings, broad selling in activities, broad participation in systems design and the design of the implementation, as well as setting the business and strategy objectives, were all examples of factors that helped broaden the individual span of attention and awareness.

Discussion

Below we discuss only those findings that are interesting in relation to theory. The two cases indicate that theories on ERP processes (intent on generating a financial payback) should not distinguish only between IT *installation* (and everything before it) and *usage* or the installation of new processes, but also between usage and the *conversion of operational improvements into performance improvements*. The analytical extension is important if one is interested in the financial implications of ERP systems. Consequently, in order to improve financial performance, more managerial and organisational effort is needed than the technical implementation and training that leads to usage. *Usage does not have an automatic link with improved financial performance*. As indicated by the two cases, business change initiatives need to be implemented and executed well in order to generate inbound cash-flow.

Adding to the list of managerial issues required for successful implementation, the two cases indicate that theory should also acknowledge *managerial issues in relation to performance improvements*. The study showed the significance of the following management features *ex post implementation* (not ex ante, this is important):

Business change management: The analytical abilities to make changes must be in place. This requires knowledge of consulting "tool-boxes", such as business process reengineering, total quality management, shared service centres and so forth. But it also requires the allocation of resources.

Decisiveness: Success also appears to require decisiveness in the later stages of ERP projects. Being able to demonstrate to customers that responsiveness, cycle times and service quality has improved is important. Making sure that capital bases (stock levels, surplus facilities) are divested also requires effort. Another important issue, if one is keen on receiving a cost reduction, is to deal with the potentially stressful task of making staff redundant – staff that perhaps has been instrumental throughout the project. There are also cognitive and resource risks: competent staff may be lost, and future volume increases might put the leaner enterprise at risk. Labour cost reduction is easy to address in the beginning of projects and include in payback plans. Actually capitalising them after the implementation is less easy, and requires character and energy.

Organisational change: ERP requires profound changes of organisational structure, both vertically and horizontally, in order to convert enabling operational improvements in to cost cuts and financial improvements. Organizational changes can differ sometimes a process-orientated structure is required to utilise fully the advantages provided. In other instances, organizations are dependent upon a large-scale integration of dispersed departments to capitalise on scale.

Aspiration and incentives: The cases indicate that performance improves if organisational units and managers have incentives to improve. This can be created for instance by being in a hazardous position performance-wise, by control metrics, by active corporate management or by having clear project targets up front, not just for the project budget costs and milestones, but also for the payback streams from cost reductions and sales increases. The best thing, however, is to have units and managers with high aspiration levels. This is a cultural and cognitive issue that requires that corporate managers cleverly market the strategic purpose of the system in order that there is one coherent logic to the project.

Corporate involvement: Corporate management plays an important part providing incentives through the normal control mechanisms, project targets and the like. Hence managerial support is not just an issue for local and middle management. A certain degree of centralisation appears inescapable, not just to orchestrate communication and standardisation of technology and processes, but also in order to make sure sub-units go the extra mile to secure improved performance.

The five factors listed above all contain matters related to knowledge, organizational and institutional forces. Business change requires both analytical skills and judgment, but also clearly declared will and organizational arrangements related to quality management, resource allocation. Decisiveness too requires analytical skills and knowledge, but it also requires norms and values that back the strategy and strategic actions. It is based on responsibility and courage. Organisational change requires all three groups of factors, i.e. will, ability and a supportive immediate environment Aspiration and incentives as well as corporate involvement include all three areas, but particularly so institutional forces.

Conclusion

We argue that a organisational learning perspective on knowledge factors, organisational context, and institutional factors related to norms and values at the individual, group, and company level, are essential to the success of an ERP investment. What distinguishes this statement from previous research on said investments is that we are dealing with more fundamental matters than implementation stages, technology, functionality, top management support and other reported success factors. The payback and economic rationality of ERP (and any IS) investments have not been clear in previous studies, and we believe that partly has to do with the fact that research has not taken a deeper look into what causes variation in institutional, organisational and cognitive factors – at least not jointly or at the latter stages of the investment cycle attached to ERP investments. This paper contributes by proposing that the typical factors reported in past research can cause all sorts of effects – there is no clear message for instance if training is positively correlated with improved performance and financial payback. We argue that more fundamental matters, such as *the will*, the *structure* and the *ability* to change, are more important to focus on. So rather than putting all energy and motivation into selecting and acquiring a solution, overdoing the specification, instructing users, designing training and education, planning the implementation, and so on, successful companies work with managing the will, the understanding of the strategic meaning of investment, and managing the ability of users, managers and technical staff to communicate and create joint objectives and ambitions. And they do not stop a year or so after go-live, but continues until the ROI is in positive figures,

We suggest that ERP researchers start to use the theories of organizational learning and institutional theory to a higher extent. The current supply of checklists and factors are not being extended: the current frameworks cannot improve our ability to discover new aspects of ERP implementations, and hence cannot help improve our understanding of the ways in which organizations take on new ERP – with financial results. The organisation and learning field provide a detailed and deep view of cognitive individual and organisational issues that impact choice and learning and our repeating them. Institutional theory complements by its focus on norms and values and the importance of the amount and direction of will – across the entire organization.

The factors we address here are true strategic factors. Managing institutional forces, managing the learning and the knowledge of organisations, as well as structuring the division of labour and controlling progress in relation to objectives, together assemble what strategic management is about at micro level. And of course, any company that aims for or assumes returns from its IS and ERP investments is likely to address these questions before they dive into investments in the first place. ERP returns are complex matters and require a strategic context and framework, and until companies and researchers realise this, investments will remain in the red.

References

Alvesson, M, 2000, 'Social Identity And The Problem of Loyalty In Knowledge-Intensive Companies' *Journal of Management Studies*, vol. 37, no. 8, pp. 1101-25.

Agarwal, R. 2000, 'Individual acceptance of information technology'. In Zmud, R.W. (ed). *Framing the domains of IT management: Projecting the future through the past*. Pinnaflex, Cincinnati.

Al-Mashari, M, 2003, 'Enterprise resource planning (ERP) systems: a research agenda', *Industrial Management and Data Systems,* vol. 102, no. 3, pp. 165-70.

Andreu, R, & Ciborra, C, 1996, 'Organizational learning and core capabilities development: the role of IT', *The Journal of Strategic Information Systems*, vol 5, no. 2, pp. 111-27.

Barney, J, 1991, 'Firm resources and sustained competitive advantage*, Journal of Management*, vol. 17, no. 1, pp. 99-120.

Brown, J.S, & Duguid, P, 1998, 'Organizing Knowledge', *California Management Rewiew, vol. 40*, no. 3, pp. 90-111.

Cohen, W.M, & Levinthal, D.A, 1990, 'Absorptive Capacity: A New Perspective on Learning and Innovation', *Administrative Science Quartely.* no. 3,. pp. 128-52.

Cotran, K. Buchmeiser, Seguin, J-L, & Pelster, B, 2005, 'HR's role in Implementing JTI's Global System',. *Strategic HR Review*, jul/aug, pp. 24-27.

Davenport, T.H, 1998, 'Putting the enterprise into the enterprise system', *Harvard Business Review*, vol. 76, no. 4, pp. 121-131.

Davenport, T.H, 2000, 'The future of enterprise system-enabled organizations', *Information Systems Frontiers*, vol. 2, pp. 163-180.

Dowlatshahi, S, 2005, 'Strategic success factors in enterprise resource-planning design and implementation: a case study approach', *International journal of Production Research*, vol. 43, no. 18, pp. 3745-71.

Eisenhardt, K.M, 1989, 'Building theory from case study research', *Academy of Management Review,* vol. 14, no. 4, pp. 532-550.

Esteves, J, & Pastor, J, 2001, 'Enterprise Resource Planning Systems Research: An Annotated Bibliography', *Communications of AIS*, vol. 7, no. 8.

Fichman, R.G. 2000, 'The diffusion and assimilation of information technology innovations'. In Zmud, R.W. (ed). *Framing the domains of IT management: Projecting the future through the past*. Pinnaflex, Cincinnati.

Fiol, M & Lyles, M, 1985, 'Organizational learning' *Academy of Management Review*, vol. 10, no. 4, pp. 803-813.

Glaser, B.G, & Strauss, A.L, (1967), *The discovery of grounded theory: Strategies for qualitative research.* Aldine, Chicago.

Grant, R, 1996, 'Toward a knowledge-based theory of the firm'. *Strategic Management Journal,* vol 17, Special Issue, pp. 109-122.

Hong, K. & Kim, Y, 2002, 'The critical success factors for ERP implementation: an organizational fit perspective', *Information & Management*, vol. 40, no. 1, pp. 25-40.

Holland, C.P., Light, B., & Gibson, N, 1999, 'A critical success factors model for enterprise resource planning implementation', Paper presented at the 7th European Conference on Information Systems (ECIS).

Kirchmer, M, 1998, *Business process oriented implementation of standard software. How to achieve competitive advantage quickly and efficiently,* Springer, Berlin.

March, J. & Simon, H, 1958, *Organizations*, John Wiley, New York.

Markus, M.L. & Robey, D, 1988, 'Information technology and organizational change: causal structure in theory and research', *Management Science*, vol. 34, no. 5, pp. 583- 598.

Markus, M.L. & Tanis, C. 1999, 'The enterprise systems experience – from adoption to success'. In R.W. Zmud (Ed.), *Framing the domains of IT research: Glimpsing the future through the past.* Cincinnati, OH: Pinnaflex Educational Resources, Inc.

Markus, M.L., Petrie, D. & Axline, S, 2000, 'Bucking the trends: what the future may hold for ERP packages', *Information Systems Frontiers*, vol. 2, pp. 181-193.

Markus, M.L., Axline, S., Petrie, D. & Tanis, C, 2000, 'Learning from adopters' experience with ERP: problems encountered and success achieved', *Journal of Information Technology*, vol. 15, pp. 245-265.

McEvily, S. & Chakravarthy, B, 2002, 'The persistence of knowledge-based advantage: an empirical test for product performance and technological knowledge', *Strategic Management Journal*, vol 23, pp. 285-305.

Meyer, J.W. & Rowan, B, 1977, 'Institutionalized organizations: Formal structure as myth and ceremony', *American Journal of Sociology,* vol 83, no 2, 340-363.

Miles, M.B, 1979, 'Qualitative data as an attractive nuisance: The problem of analysis', *Administrative Science Quarterly,* vol. 24, pp. 590-601.

Muscatello J. R & Parente D. H, 2006, 'Enterprise Resource Planning (ERP): A Postimplementation Cross-Case Analysis', *Information Resources Management Journal,* vol. 19, no. 3, pp. 61-80.

Nicolaou, A.I. & Bhattacharya, S, 2006, 'Organizational performance effects of ERP systems usage: The impact of post-implementation changes, *International Journal of Accounting Information Systems*, vol. 7, no. 1, 18-35

Nikerson & Muehlen 2006, "The ecology of standard processes: Insights from Internet standard making" MIS Quarterly Volume**:** 30 Pages**:** 467-488

Nonaka, I, (1994), 'A dynamic theory of organizational knowledge creation', *Organization Science, vol.* 5.

Orlikovski & Barley. 2001 "Technology and Institutions: What can research on information technology and research on organizations learn from each other?", MIS Quarterly, 25, 2, s. 145-165.

Parr, A.N., Shanks, G., & Darke, P. 1999, 'Identification of necessary factors for successful implementation of ERP systems'. In O. Ngwenyama, L.D. Introna, M.D. Myers, & J.I. DeGross (Eds.). *New information technologies in organisational processes: Field studies and theoretcal reflections on the future of work.* Kluwer Academic Publishers, Boston.

Peteraf, M.A, 1993, 'The cornerstones of competitive advantage: A resource-based view', *Strategic Management Journal,* vol. 14, no. 3, pp. 179-191.

Porter, M.E. 1980, *Competitive strategy,* Free Press, New York.

Porter, M.E. 1985, *Competitive advantage,* Free Press, New York.

Powell, W.W and DiMaggio, P.J. 1991 *The new institutionalism in Organizational analysis* The University of Chicago press, USA.

Robey, D. & Boudreau, M-C. 1999. 'Accounting for the contradictory organisational consequences of information technology: theoretical directions and methodological implications', *Information Systems Research*, vol. 10, no. 2, pp. 167-185.

Robey, D., Ross, J. & Boudreau, M-C, 2002, 'Learning to implement enterprise systems: an exploratory study of the dialectics of change', *Journal of Management Information Systems*, vol. 19, no. 1, pp. 17-46.

Rogers, E.M. 1995, *Diffusion of innovations*, Free Press, New York.

Ross, J.W. & Vitale, M.R, 2000, 'The ERP revolution: Surviving vs Thriving', *Information Systems Frontiers*, no. 2, pp. 233-241.

Sanchez, R, 2001, 'Managing knowledge and competence: The five learning cycles of the competent organization'. In Sanchez, R (red), *Knowledge management and organizational competence,* Oxford University Press, Oxford.

Schein, E.H, 1996, 'Culture: The missing concept in Organizational studies', *Administrative Science Quarterly*, vol. 41, no. 2.

Scott, W.R, 1995, *Institutions and organizations*. Thousand Oaks, Sage.

Scott, J, 2005, 'Post-Implementation Usability of ERP Training Manuals: The user's Perspective. *Information Systems Management*, vol. 22,no. 2, pp. 67-77.

Sheu, C., Chae, B. & Yang, C-L, 2004, 'National Differences and ERP Implementations: Issues and Challenges' Omega vol. 32, pp. 361-371.

Simonin, B, 1999, 'Ambiguity and the process of knowledge transfer in strategic alliances', *Strategic Management Journal*, vol 20, pp. 595-623.

Somers, T.M. & Nelson, K, 2001, 'The impact of critical success factors across the stages of enterprise resource planning implementations' *Proceedings, 34th Hawaii International Conference on Systems Sciences.*

Spender, J.C, 1996, 'Making Knowledge the Basis of a Dynamic Theory of the Firm', *Strategic Management Journal,* vol 17, Winter Special Issue, pp. 45–62.

Sun, A., Yazdani, A., & Overend, J, 2005, 'Achievement Assessment for Enterprise Resource Planning (ERP) System Implementations based o Critical Success Factors (CSFs)', *International Journal Production Economics*, vol. 98, pp. 189-203.

Swanson, E.B. & Ramiller, N.C, 2004 'Innovating Mindfully with Information Technology' *MIS Quarterly*, vol. 28, no. 4

Szulanski, G, 1996, 'Exploring internal stickiness: Impediments to the transfer of best practice within the firm', *Strategic Management Journal,* vol 17, Winter Special Issue, pp. 27-43.

Szulanski, G. 2000, 'The process of Knowledge Transfer: A Diachronic Analysis of Stickiness', *Organizational Behaviour and Human Decision Process*, vol. 82, no. 1

Swift, R.S 2002 'Executive response; CRM is changing our eras, the information we require, and our processes.' MIS Quarterly Executive Vol. 1 No. 2

Taylor, P, & Bain, P, 2003, 'Subterranean Worksick blues: Humour as Subversion in two Call Centers', *Organization Studies,* vol. 24, no. 9.

HH Teo, K. K Wei, and I. Benbasat, 2003, 'Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective,' *MIS Quarterly*, United States, vol. 27 No 1, pp. 1-31.

Van de Ven A.H. & Poole M.S, 1990, 'Methods for studying innovation development in the Minnesota Innovation Research Program', *Organization Science,* vol. 1, no. 3, pp. 313-335.

Willmott, H. 1993, 'Strength is ignorance; Slavery is freedom: Managing culture in modern organizations', *Journal of Management Studies*, vol. 30, no. 4, pp. 515-553.

Yin, R.K. 1994, *Case study research: Design and methods (Second Edition)*. Sage, Thousand Oaks.

Zhang, Z., Lee, M., Huang, P., Zhang, L. & Huang, X, 2005, 'A Framework of ERP Systems Implementation Success in China: An Empirical Study', *International Journal Production Economics*, vol. 98, pp. 56-80.

Copyright