WORKING PAPER M-2005-07

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# Identifying the effects of Enterprise System implementation and use: Examples from Denmark

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## Abstract

This paper reports the results of an explorative study of six large Danish companies regarding the effects of ERP implementation and use. The study is part of a larger ERP study programme at the Aarhus School of Business. The data collection approach applied was based on interviews and management case writing. The main results show that the effects of ERP implementation and use are seldom fully predictable by management. The ERP system can be seen as an organisational actor in its own right as it to a large extent influences values, culture, behaviour, processes and procedures of other actors in the organisation. Given the complexity, size and organisational embeddedness of ERP systems, it can be said that the implementation project never ends and the ERP system becomes a significant variable in the future direction of the organisation.

## Introduction

Today virtually every major business has implemented at least one ERP system, or more simply enterprise system (ES)[*]. It is estimated that organisations worldwide have spent around US$ 18.3 billion every year on ESs in recent years (Shanks et al. 2003). A study in Denmark revealed that more than 75% of the 500 largest enterprises had implemented one or more ESs. Based on a survey, showing that the average age of the systems is 2.8 years, we concluded that an ES is to be considered a persistent part of any business. Therefore ERP technology and the innovative use of ESs has to be considered in any business context (Møller et al. 2003).

It can be argued that in the past years few IT innovations have had as much impact on business organisations as enterprise systems. An enterprise systems is a standardised software package designed to integrate the data used throughout the entire organisation (Davenport 1998). According to Nah (2002), the American Production and Inventory Control Society (APICS)[1] defines an ES or ERP as: "A method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company". The APICS definition extends the concept of ES from an IT system towards a technology for managing and organising the processes of an enterprise. It should be noted that there is not any agreement on terms and definitions regarding enterprise systems. This is a rapidly evolving concept and, as Davenport (1998), we prefer to use the term Enterprise Systems to emphasise the generics of the concept rather than to use a term such as ERP, which would lead to a more limited scope and indicate a focus on planning and coordination (Klaus et al. 2000).

Many large enterprises have implemented ESs and have now taken the next step on their ES journey. This journey is often described in terms of waves (Shank et al. 2003). The first ES wave

[*] In this paper these terms are used interchangeably
[1] See www. apics.org

includes the acquisition, configuration and implementation of the ES along with changes inflicted on the organisation after going live with the ES for the first time. The second wave includes making continuous improvements and maximising the benefits from the ES.

We have a clear picture of the research on the first wave (Esteves & Pastor 2001; Dong et al. 2002). First-wave ES implementations have been explored through case studies which have focused on e.g. ES strategic options, how to avoid failures, how to identify issues of alignment, as well as business process reengineering issues (Al-Mashari 2003). Only recently we have seen research aimed at ESs beyond the cost-intensive implementation phase – the second wave.

Second-wave ES projects are spurred by some of the questions managers ask after having gone through first-wave ES projects. These include e.g.: How can we gain greater benefits from our ES investments? How can we manage and enhance our ES to continuously align the system with the strategy and structures of the organisation? How will the ES impact the business and create new ways of working? (Kræmmergaard & Koch 2002). This means that implementation issues are no longer of primary concern, but the focus has shifted to effect, utilisation, development and business value enhancement.

The work we have seen on the actual application and impacts of enterprise systems has a clear message: these systems have the ability to transform a business, but only if the organisation is able to integrate the activities – not only internally, but also across the external value chain (Markus et al. 2003; Ross et al. 2003; Davenport et al. 2004). But before we can understand what this transformation is all about and how an ERP system should be managed during and in the transformation, we need to understand what effects the implementation of an ERP has on the organisation and whether these effects can be predicted by the organisations in advance.

This paper reports the results of a study of the ES implementation and use in large Danish companies in the period 2002-2003. The aim of this paper is to describe the nature of these effects and discuss the potential practical and academic implications. The main aim of the study itself was to provide input into an extensive research project at the Aarhus School of Business (see Møller et al. 2004) and to form assumptions about the effects of enterprise systems in large organisations which the intention of studying them in more detail. Because the aim of the research is to be explorative and provide input into a larger project, an explorative research strategy is adopted (Yin 1994).

First, the methodology of the project is briefly presented and discussed. Second, the general effects identified by the respondents are described and discussed. Third, the implications for practice and research are presented.

## The methodology of the project

The aim of the empirical study was to create a general understanding of the effects of implementing and using an enterprise system in a large organisation. Thus it was a prerequisite of the companies in the study to have implemented their enterprise systems some time ago and for them to have had some time to reflect on any changes that had occurred.

The research is based on qualitative exploratory case studies and its basic assumptions are founded on the interpretive paradigm (Burrell and Morgan 1969). The method used in the study draws on the principles of hermeneutics and grounded theory by Glaser and Strauss (1967) and the results are not intended to be representative in any way.

The methodology is based on the phases of the hermeneutical circle and an inductive approach to the research field (Strauss and Corbin 1990; Eneroths 1974). The inductive approach is based on the following general phases:

1. Definition of the research issue.

2. Approaching the issue so as to illuminate as many aspects of it as possible. This was done through the research process as described later.

3. The focus of the data collection was not predefined but changed as the study progressed and more interesting issues were discovered. This was to ensure that new issues and aspects were not ignored. Thus the researchers approached the field with a relatively open agenda without predefined questionnaires or structured questions. The data was collected through interviews with various managers in the selected companies.

4. The empirical evidence was analysed and the researchers selected various aspects and issues which were analysed further. Then the researchers resumed the fieldwork and asked the managers to write a case study of the company based on a "writing guide" developed by the researchers on the basis of the interviews. This guide included a standard structure for the case in the form of a "checklist" or table of content. The main headings were:

    a. Company description
    b. Experiences regarding the ERP system selection process
    c. Experiences regarding system implementation
    d. The current status of the ERP system
    e. The ERP system and organisational change
    f. Financial effects of the ERP system
    g. Future development

5. The interviews and cases were then used to illustrate various issues inherent in the ERP implementation and post-implementation process.

The organisations were selected through personal contacts as well as by scanning the business press for stories of enterprise system implementations. As the research approach would involve the managers and demand somewhat more of their time than just a few interviews (se below) the selection process took some time, with several companies opting out in the course of the project. In the end six large Danish organisations participated in the project, as shown in table 1.

| **Organisation** | **Type** |
|---|---|
| LEGO | Children's toys |
| The Municipality of Copenhagen | Municipality |
| Martin Group | Audio and visual effects equipment |
| Hydro Automotive Structures | Aluminium components for the auto industry |
| Bang & Olufsen | Audio equipment |
| Fritz Hansen | Furniture |

Table 1: The companies in the study

As mentioned above the data was gathered through the approach shown in figure 1.

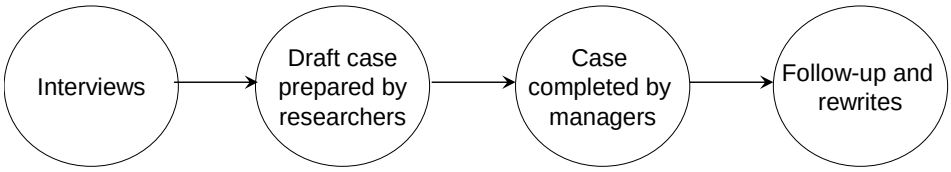


Figure 1: The case writing process

First, interviews were conducted with representatives of the management team, usually the chief information officer, the chief financial officer and the chief production manager. They were asked questions about the implementation process; what effects the ES had had in the time since deployment; value, if any, derived from the ES as well as future effects. Second, the respondents were asked to write a case describing the experiences of the organisation regarding the implementation and use of the ES. This case was based on a set of standard writing guidelines distributed by the researchers. The cases went through several rewrites in a collaboration between the researchers and the managers during the writing process and were discussed with the managers. The cases were included in a book on Danish companies' experiences with enterprise systems published in late 2004 (Rikhardsson et al. 2004).

Getting managers to write a case, in collaboration with the researchers, about their experiences with enterprise systems is a rather novel research approach that has both benefits and drawbacks. The benefits include the chance that the managers get to reflect on their experiences as they write, thus drawing out new insights and evaluations of the ES implementation and use. As writing is a relatively systematic activity, the managers can structure information and dig up facts that are not immediately available during interviews or when they answer written questionnaires. Furthermore, the managers can draw on the experience of other employees in the organisation to verify information and supplement the descriptions in the case. The drawbacks are of course the issues of time and effort. Managers are busy people and writing a case can take a lot of time and effort. It was thus often difficult to meet deadlines and motivate managers to finish the cases as well as to discuss them. A great deal of perseverance was therefore required by the researchers to get the cases completed. Another drawback is difference in writing styles. Not all people are comfortable with writing and some find it difficult to structure and write longer texts. Thus some of the cases required more rewriting than others. Still another drawback is what could be called "selective memory" – i.e. only the positive aspects of the implementation process and the following post-implementation phase are included in the case. This may be a natural reaction as managers wish to portray their performance and the organisation as a whole in as positive a light as possible. The role of the researcher was thus to play the devil's advocate in the rewriting phases and ask critical questions. This however is a difficult task and this drawback may be the most significant weakness of the method. Still, taken together, the organisation cases give an impression of the effects of implementing and using a large integrated system in an organisation. These effects are described below.

**Experiences and effects: Results of the exploratory study**

In the case studies and the interviews a distinction was made between experiences and effects. Experiences were what the managers themselves had experienced during the implementation and use of the system and what they wanted to emphasise as important aspects of this process. The

effects of the ERP system implementation and use were what the managers thought the system had brought with it of changes and consequences on various levels. It is important to note that the below is based on the subjective evaluations of the managers who were interviewed and subsequently wrote the cases used in the project.

*Experiences with ERP implementation and use*

The companies participating in the study all had their specific reasons for implementing the enterprise system. These can be classified into "immediate" and "strategic" reasons. In the former category were reasons such as the cost of maintaining a large number of old legacy systems, Year 2000 problems and important customers requiring electronic interfaces which the current system could not handle. One of the more strategic reasons mentioned was getting a system that the organisation could "grow in". That is to say that the system can easily accommodate future needs and strategic changes, such as acquisitions, sell-offs and new products, without extensive reprogramming. Another strategic reason mentioned was that when competitors implemented an enterprise system, the organisation felt a need to do so as well. The advantages of enterprise systems are well–known, regarding e.g. supply chain integration, and the fear that the competitors will get an advantage is always present.

One of the issues commonly mentioned is the difficulties in separating "need to have" and "nice to have" in the implementation process. The ES has so many functionalities that separating the critical ones from the supplementary ones can be difficult. Or as one project manager said: "It's like being a kid in a candy store – you always want more". This is where the organisation often draws on the experiences of consultants, which however can be dangerous if the consultants have limited knowledge of the industry and the business issues involved. The "nice to have" functionalities also increase the risk of "scope creep" in the implementation project where the project grows but no more resources are allocated to it. Some of the companies mentioned this as one of the reasons why ES projects often experience cost overruns.

One decision that has implications for the organisation and the system environment is whether it implements a "wall-to-wall" (WoW) enterprise system – i.e. one system for all processes – or whether it implements a "best-of-breed" or BoB solution – i.e. the best modules and components from different enterprise systems. The companies in the study represented both approaches. One had implemented one global solution for the whole organisation. There was only one ES server and all of the companies in the group were logged on to that server. This had for example meant that all data definitions had to be standardised which was also the case for e.g. accounting data, time data and product definitions. This company discovered e.g. that in various countries it had 12 different definitions of "operating profit" that now had to be merged into one definition. Another company had implemented one type of enterprise system in the corporate headquarters and another type in the sales divisions around the world. This had caused a number of unforeseen difficulties in data consolidation and IT support. Today the company has actually replaced both systems with a new WoW ES solution claiming that the resources needed to support such a "best-of-breed" solution ultimately did not match the benefits.

Developing a business case prior to the implementation was mentioned by a number of the respondents as important. A business case should include an overview of the strategic, tactical and operational effects of the implementation project as well as the business rationale for these effects, i.e. how the ES will benefit the company through e.g. lower costs, increased sales, risk reduction,

stronger competitive position. The cases also often contain plans regarding project resources needed, quantified target benefits, critical success factors etc. It was interesting however to note that only two of the companies in the study had actually followed up on the business case after the implementation was completed and the system was live. One reasons mentioned was that following up on a business case that was up to two years old was difficult because of changed evaluation criteria, changed business conditions as well as changes in targets and strategy.

The implementation process had for some of the companies been so demanding that all other development activities and projects had been postponed until the system was implemented. One had actually enforced a total "new project stop" during the enterprise system implementation period. The effects of such an organisational "stand-by mode" were difficult to identify but some of the respondents mentioned potential loss of business opportunities and organisational inertia as some of the effects.

All of the companies mentioned that the time after go-live was characterised by user insecurity, changes, "brush fires", frustration due to errors in system set-up as well as unfamiliarity with the new system. In the companies where the implementation had been pushed through in a short span of time, this was more pronounced than in the other companies where the process had taken longer time. Some mentioned that the actual challenge was not always to get the software and hardware to work properly but to change employee behaviour and attitudes. Or as one manager said: "Systems can be made to work in no time – but not people".

The dissolving of the project team after the project was completed was also mentioned as an important issue after the go-live date. What should happen to employees that in some cases had worked on the project for a number of years and now had to return to their daily tasks? Several of the companies mentioned this as causing unrest in the organisation as some employees had trouble returning to their usual functions. Some chose to leave the organisation, some even to become ERP consultants. This understandably was an issue of concern in the organisation as it put a drain on its core ES competencies. Some of the companies thus tried various initiatives to keep these competencies in-house such as assigning a super-user status to the project participants and making them part of an ES support organisation.

*Organisational effects of ERP implementation and use*

An interesting question is whether top managers realise what they are committing the organisation to when they give the go-ahead for an ES implementation project. And if they can foresee all the organisational changes that such a system can cause. Judging from the research, it is doubtful whether this is the case. In the companies involved, the enterprise system became much more than just a new IT system. It initiated changes in business processes, organisational structures, communication patterns and human relations, resulting in various consequences which had not been foreseen by the management. Some of these consequences are immediately visible but some will take a long time to materialise.

One effect mentioned was that the enterprise system had generally changed the way the IT department worked and the competencies needed in this department. One organisation had e.g. gone from 200 specially programmed changes in their old system to about 20 in the new system which greatly simplified the support, maintenance and upgrading processes. Furthermore, the move

towards standard systems environments implied that the IT department supported one standard system instead of several specially designed systems and that all development and add-on activities took place in a standardised environment. One effect was that the competence profile of the IT department changed. From being a department of programmers, “de-buggers” and “techno-nerds”, the department now needed requirement analysis and system selection skills coupled with business skills and the ability to link IT and business issues. With growth in organisational visibility and in the importance of tasks performed, the organisational power of the IT department can increase. The companies mentioned examples of the IT department receiving more funding, the IT manager being moved up to direction level and increase in staffing. Some also mentioned that the IT function becomes more centralised as the need for independent IT departments at various locations disappears.

Another organisational change mentioned is the upgrade in IT literacy that accompanies the ES implementation effort. An ES implementation may call for pre-changes in office applications, networks and operating systems, which means that employees have to focus on various IT issues apart from the ES itself. One organisation experienced for example that it had to upgrade all office applications and operating systems on its PCs before the enterprise system could be implemented. This meant courses and training for many employees, resulting in a higher IT awareness and skill level. Although this postponed the actual ES project at the outset, it had beneficial effects later on as employees were prepared for the ES system and had a better understanding of the issues involved.

Better coordination regarding accounting processes is also attributed to the ES. This includes better coordination among various departments and functions as well as better coordination between the organisation and external stakeholders such as suppliers and customers. Electronic order processes and automatic handovers from one department to another reduce the possibility of errors and the need for manual input. Still another accounting effect regards the reporting processes in the organisation and how information is reported to decision makers. In the past the accounting department acted as a sort of filter between decision makers and decision-relevant information. The accounting department had this status qua its access to data, the processing of this data and then by reporting it to decision makers. Today with the advent of enterprise systems, the accounting department no longer has this “monopoly on access”. ESs enable managers to access accounting data through advanced business analysis software. So the accounting department has to change and service decision makers as well as the organisation at large. Data analysis, scenario building and information assurance and presentation were mentioned as some of these areas.

An effect often mentioned by the companies in the study is “integration” of business processes. That is to say, sales, purchasing, production, accounting etc. are integrated through common definitions and system architecture. Furthermore, the processes within the value chain in which the companies are operating are also in some way integrated. This implies that the companies in the value chain – from resource extraction to production, to distribution, to customers – are in some way cooperating and e.g. their sales and purchasing processes are integrated in some way across time and space.

But what precisely is integration? In some of the companies the word integration was merely another word for “plugged in” or transfer of data. That is to say, one system transfers data to another system through a standardised interface. This does not necessarily imply integration which seems to signal something more than just being “plugged in”. The Webster Dictionary does not define integration in connection to business processes per se. It defines integration and to integrate

as “to make complete by adding parts” or “absorb into an existing whole” and gives examples in e.g. a racial, mathematical and psychological perspective. This implies that organisational integration happens when business processes are a whole – meaning that when sales end, the production process begins and when the production process ends, then delivery begins etc. Integration in the value chain means in some way that the value chain becomes a whole – i.e. an entity in itself – where the actors are integrated through data exchange, behaviour, flow of goods and coordinating activities.

The “integration effect”, according to the managers who mentioned it, has the result that suddenly employees have to “think outside their departments” meaning that the tasks these employees performed or the information they used were now dependent on the tasks performed by or information generated by other employees upstream or downstream in the business process. For example sales employees could not close an order before the accounting department had performed and authorised a credit check on the customer in question and logged this in the ES. Another example is a production planner that could not finish a planning schedule before maintenance personnel had approved a certain machine in the system as operational. As such this means that employees should get a better understanding of the business processes of the company, how they are connected and the interdependencies of the processes, and thus a better understanding of the company as a whole.

One reason for the integration effect is that ES systems come with integrated models of business processes which often do not match how company business processes are carried out in practice. All of the companies had to change business processes in the course of the project to match those in the ES solution. Some saw this as positive and a chance to modernise company business processes and make them more effective and secure. Some saw the process changes as negative and mentioned implementation resistance and employee obstruction as some of the effects. The main change involved was standardisation meaning that business processes were to be carried out in the same manner throughout the organisation. This was often a difficult process as employees had developed their own ways of doing things and now suddenly had to conform to processes that were “pressed on them from above”. It is interesting to note, however, that despite these various difficulties, all of the companies had chosen to adapt the company to the processes in the system instead of changing the system to conform to company practice. The terms used by the respondents to describe the changes in business processes differ but standardisation seems to be the most widely used term. This means that employees cannot solve problems or conduct business as they see fit but must conform to the steps and procedures laid out in the enterprise system. In one of the companies for example there was a strong emphasis on customer problem solving such as extending credits. This could be done by individual sales representatives in the old system. In the new system there were certain procedures as regards extending credits, including standardised extension periods, charges for credit extension and authorisation by the accounting department. When the sales representatives could no longer extend credits to “their” customers, this caused some dissatisfaction with the new system. Management however did not budge and soon the new procedures were followed. The new system therefore carried with it changes in customer service, changed the behaviour of the sales representatives and made them interact more with other functions in the company.

On the issue of financial effects these can be classified into effects on income and effects on costs. However, it is often difficult to isolate from other variables how an ES impacts the financial performance of the organisation. It is especially difficult to valuate how an ES influences corporate income. An example could be when the enterprise system leads to better customer support such as

shorter order cycles or the bundling of additional features with the product. Increases in income only materialise if the customer comes again or other customers are drawn to the company due to good customer service. So it is not the enterprise system per se that increases income but the increase in the quality of the customer service which in turn is *enabled* by the ES. Another difficulty in isolating the financial effects of the system appears when the system increases capacity but maintains cost levels. Examples are when an activity can be done more efficiently and some of the involved personnel can be assigned to other tasks. The total employee cost of the organisation remains the same but more activities are carried out for that cost. That is to say, a saving has occurred but it does not appear so in the financial accounts. These increases in the administrative capacity are mentioned by several of the respondents as an important effect – i.e. that the organisation can handle larger volume in transactions, orders, customers etc. with the same number of employees.

It is sometimes easier to identify where the ES has had an impact on costs. The companies participating in the survey mentioned several specific cost effects resulting from the implementation and use of the ES. Reduced inventory costs and related reduction in cost of capital were most often mentioned. The reasons for reduced inventory costs were attributed to better planning, better coordination with suppliers and customers, more integration between purchasing, production and sales and shorter order cycle times, meaning that it was possible to order smaller quantities at a time reducing inventory with up to 25% of total inventory value. Some also reported in this connection reduced costs due to e.g. errors in purchasing, waste in production and errors in sales.

All of the companies mentioned that enterprise system investments have been high. Usually the licenses and cost of acquiring the software are a small part of the overall investment when consultant costs, personnel costs and internal process changes costs make up most of the overall investment. One financial effect not usually calculated is the resources the ES project requires that could have been used for other projects. Often the ES project is the largest IT project that the company has ever conducted and other development projects are postponed until the ES project is finished. The financial effects of postponing e.g. the launch of new products, process changes or R&D efforts are difficult to measure. On the subject of measurement, some of the companies admitted that they did not follow up on the business case that was prepared before the implementation began. Some said that this was due to the “phew” factor – i.e. after a difficult implementation the responsible managers said “phew” and moved on to other issues. The companies that tried to measure the business effect compared to the business case laid out in the beginning discovered that in the months or years since the business case was presented, the world had moved on and some of the assumptions and calculations in the case were not relevant anymore making comparisons difficult.

Regarding the question whether the enterprise system creates competitive advantage, the respondents in the study did not think so. The enterprise system may be a prerequisite for competing and an enabler of competitive strategies but as all companies are implementing enterprise systems, the advantage of having one are negligible. An enterprise system is a combination of software, hardware, persons and work processes where the sum is greater than the individual parts. But the enterprise system could be seen as the “entrance ticket” to the market, i.e. without an ES, the company could not compete. Thus it enables the company to compete but the success of the company is still dependent on factors such as product quality, price, customer service, promotion etc. The enterprise system may have an effect on these issues but its effects are still second-order effects – i.e. the system enables but is not in itself sufficient for changes to take

place. But the respondents in the study all agree that the enterprise system is a necessary part of being able to compete on the global market in the future. One important issue mentioned was how the system enables linking suppliers and customers to company operations but also at the same time decreases the dependency on suppliers and customers through e.g. web-based marketplaces.

An overview of the effects of the ERP systems implemented is shown in table 2:

| **Organisation** | **Baseline** | **Main stated effects of ERP** |
|---|---|---|
| LEGO | Financial crisis, complicated business processes. Many old legacy systems | Streamlining of business processes<br>Better integration of processes<br>Changed business practices |
| The Municipality of Copenhagen | Old fragmented IT architecture.<br>Ineffective accounting processes | Increased business process efficiency<br>Increased IT literacy<br>Increased flexibility regarding adapting to political decisions |
| Martin Group | Management crisis and old legacy systems | Better integration of processes<br>Tool for the new management |
| Hydro Automotive Structures | Old non-integrated legacy system, low user acceptance | Increased transparency of processes<br>Increased data quality |
| Bang & Olufsen | Many old legacy systems. Y2K problems | Reduced stock<br>Increased flexibility |
| Fritz Hansen | Strategic change, old non-integrated system | Better business process support<br>Better support of strategic initiatives<br>Better supplier control |

Table 2: An overview of the effects of the ERP system implemented in the participating companies

**Discussion and conclusions**

It becomes apparent from the above description that the implementation of an ERP system is an organisational development "journey" rather than a system implementation project. This is mainly because:

1. The system supports processes and not functions.
2. These processes are integrated meaning that there is only one database and data structure.
3. These processes are based on standard process set-up in the system often requiring the organisation to change their own processes.
4. Focus during the implementation of the system is not so much on technical aspects, but is instead related to organisational and business process issues.

Another interesting point in the above descriptions of the effects of ERP systems in the organisations studied is that the ERP system is not a "system" but becomes more of an "actor" defining possibilities, costs, benefits, behaviour, integration, relationships etc. of various other organisational actors. That is to say, the ERP system participates in the daily interaction within the organisation (Hanseth and Braa 1998; Kræmmergaard 2000) – i.e. that the ERP system is thus an

"actor" in the organisation. To understand this, we need to expand a bit on how an organisation is created and how it changes and develops.

It could be said that an organisation is always in a stage of becoming – i.e. it never ceases to change and never reaches a stage where all organisational dynamics are at a stand still (Astley & Van de Ven 1983; Hatch 1997). An organisation is basically created through the interaction between actors, i.e. managers, employees and external stakeholders such as suppliers and customers. Throughout the history of the organisation and in the ongoing interactions in every day life, the organisation develops assumptions about what is the predominant language, value and culture, and more specifically about the processes, plans, procedures, rules, instructions and programmes in the organisation (Weick 1979) – or what has also been called the action space in the organisation (Fast 1992). The existence hereof creates an order in an otherwise chaotic pattern of interactions within the organisation. The action space tells employees how to do their job, which expectations others have of them, which business partners the organisation has, which relation one department has to another, which processes there exist etc. The action space can become taken-for-granted and is rarely brought to the surface and reflected on. Nevertheless it remains significant in influencing how actors within an organisation think and act (Orlikowski and Gash 1994).

Organisational actors do not have the same perception of reality. There will always be contradictions between actors' perception of reality which they will use in their interactions within the organisation. The existence of contradictions in an organisational context is just as important as consensus and order. Contradictions can be seen as sources of energy or a catalyst for organisational change (Boudreau and Robey 1996). Since contradictions are important, new organisational actors are important for the further development of the organisation. An ERP system can be seen as such a new actor. When the system set-up gives another version of reality than the one existing within the organisation, there will be contradictions, which can lead to changes. This is apparent in all of the organisations participating in the study. In this sense the ERP system facilitates change. The implementation of an ERP system can thus change both the basic assumptions about what is the predominant language, value and culture, and also the specific procedures, rules, processes etc. within the organisation. Although ERP systems have greater influence on creating the action space than most other information technologies, organisational outcome is not necessarily determined by the ERP implementation. An example is when sales staff no longer can extend credit to certain customers thus impacting on processes and procedures but also on values such as customer service and power relations between sales staff and e.g. the accounting department. When an ERP system interacts with the actors of the organisation, the outcome of the interaction is only partially predictable and the ERP system as a deterministic technology is not valid (Boudreau and Robey 1999). One has to keep in mind that the organisation already has an action space and a history before implementation. The changes are the result of the interaction between the system and the organisation. This is also apparent in the companies studied as the changes resulting from the ERP implementation seldom were fully predicted neither in the short nor in the long run.

The ERP system will thus influence the organizations' stage of becoming. Thus, instead of understanding the implementation and use of an ERP system as an activity taking place within a given time frame (e.g. as a project), one should understand the implementation of an ERP system as an ongoing process that basically never ends. New problems which require changes or expansion within the system are recognised. New functionalities within the system are discovered and considered to be interesting. Previous procedures and processes are suddenly regarded as being inappropriate. New releases of the system containing updated best-practise procedures and

processes may create a demand for change. New modules may be regarded as interesting additions to the system, etc. Thus, letting an ERP system into the organisation is a commitment to change, a process without end.

The implications for companies are first of all that an organisation should be aware that implementing an ERP system is basically not a project activity, but an ongoing process. The going-live date should be understood as the first step of many - whether the company wants this or not.

For academia the challenge for further research would be to find out how dominating the enterprise system is for the creation of the action space in the organisation and the future development of the organisation. Another challenge would be to find out what changes the system constrains or facilitates in the long run. A more fundamental question in this context could perhaps be whether the ERP is a system that supports business processes or whether it in itself is a new way of doing business.

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ISBN 87-7882-082-0

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