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Information Systems as Redistributors of Power

Interpreting an ERP implementation from a stakeholder perspective

Albert Boonstra

SOM theme A: The human and technical side of production: the management of interdependencies

Abstract

ERP systems are software packages that enable the integration of transactions oriented data and business processes throughout an organization. ERP implementation can be viewed as an organizational change process: many problems related to ERP implementation are related to a misfit of the system with the characteristics of the organization. This article uses the evidence of a case study to uncover some important dimensions of the organizational change issues related to ERP implementation. The study shows how ERP implementation can impact the interests of stakeholders of the ERP-system and how these groups may react by influencing the course of events, for example by altering the design and implementation in ways that are more consistent with their interests. Understanding the possible impact of ERP on particular interests of stakeholders may help project managers and others to manage ERP implementations more effectively.

Key words

ERP (enterprise resource planning system), stakeholder analysis, implementation, organizational change, change management, power, politics.

Introduction

ERP systems are commercial software packages that enable the integration of transactions oriented data and business processes throughout an organization (Klaus et al. 2000). From a base in manufacturing and financial systems, ERP systems may eventually allow for integration of inter-organizational supply chains (Markus et al. 2000; Fowler et al., 2003). Because these systems affect so many aspects of a company's internal and external operations, their successful deployment and use are critical to organizational performance and survival. In the case of ERP successful implementation is urgent, since the costs and risks of these technology investments rival their potential pay-offs. Failures of ERP system implementation projects may lead to bankruptcy (Bulkely, 1996; Davenport, 1998; Markus et al, 2000; Markus and Tanis, 2000; McAfee, 2003; Fowler et al., 2003). A study of 100 projects by Sirkin and Dikel (2001) found that their sponsors considered them successful in only one-third of the cases and that tangible financial impact was achieved in only 37% of cases.

A study of Markus et al. (2000) shows that many problems related to ERP implementation are related to a misfit of the system with the characteristics of the organization. This is consistent with the finding of Davenport (1998), who argues that ERP *'tends to impose its own logic on a company's strategy, culture, and organization'* which may or may not fit with the existing organizational arrangements. This means that ERP implementation can be viewed as an organizational change process, rather than as the replacement of a piece of technology.

This article aims to uncover some important dimensions of the organizational change issues around ERP implementation by focusing on how ERP implementation can impact the interests of stakeholders around the ERP-system and how these groups may react by trying to influence the course of events and to alter the design in ways that are more consistent with their interests. Understanding the possible impact of ERP on particular interests of stakeholders may help project managers and others to manage ERP implementations more effectively (Boddy, 2002). The paper draws mainly on a two-year study of an organization that tried to implement an ERP-system in three of its business units.

So the specific contribution of this paper is to show how the outcome of ERP-system implementation can be affected by the meaning, which various stakeholders attach to the system, and by the actions they take throughout the project. There are just few descriptive accounts of how groups and individuals in organizations interpret IS-proposals and how they respond subsequently (Levine et al. 1995). Especially empirical case studies that focus on the role of politics and stakeholders in relation to IS-implementation are scarce (Knights et al., 1992; Levine et al., 1995; Markus, 1983; Noble et al., 1993; Pan et al., 2003). As a result, our insight into the role of stakeholders in the design and implementation of IS-applications in general and of ERP-applications in particular is constrained,

which means that we have a lack of understanding of why groups and individuals act in the way they do. This paper aims to contribute by providing insight in the role that different stakeholders may play during ERP-implementations. Based on this insight guidelines will be offered to manage politics related project risks during ERP implementations. The usual qualifications regarding single case studies clearly applies to this research (Yin, 1989). In defense of the method, however, we do not claim to be providing empirical facts to generalize to a wider population of organizations, but theoretical insights that may be applied in varying contexts. No doubt in such applications, results will differ but we would anticipate certain aspects to remain pertinent regardless circumstance. This is because, we suggest, power and stakeholder relations prevail in almost all humanly organized endeavors.

Backgrounds

The empirical research for this paper was informed by interpretive (Walsham, 1993), processual (Dawson, 1994) and integrationist (Orlikowski, 1992) models of change. These models emphasize how various groups of people in organizations may have different interpretations of an information system that may shape their actions and influence the implementation and evolution of the IS (Walsham, 1993; Boonstra, 2003b). The change view is rooted in social constructivism, which studies the meaning that people attach towards a particular technology (Pinch and Bijker, 1997). Social constructivism found its way to IS research by the so called interpretive approaches (Orlikowski, 1992; Walsham, 1993) and emphasizes the subjective meanings that actors ascribe to an information system, which are based on particular interests, preferences, history and so on. From this view, system implementation can be explained by studying the interplay of attitudes and actions of various stakeholders, which may change over time (Dawson, 1994).

Pettigrew (1973, 1985, 1988) argues that organizational change can be understood by considering the interactions between the substance, context and process of change in the organization. He also suggests that the change agent must be willing to intervene in the political systems of the organization, and to legitimate the change in the face of competing proposals and ideas. Bennis (1984) suggests that management of change is 'management of meaning', or with attempts to establish the credibility and legitimacy of particular definitions of problems and solutions with others, and to gain consent and compliance (Buchanan and Badham, 2000). Dawson (1994) developed this processual perspective on change more fully and argues that, to understand change, we need to take into consideration: 1) the past, present and future context in which the organization functions, 2) the substance of the change itself and its significance, 3) the transition process, tasks, activities, decisions, 4) political activity, and 5) the interactions of these factors.

Orlikowsky (1992) proposes that the results of IT investments depend on the interaction of both technology and people over an extended period. Information systems are both a product of human action and an influence of human action (see figure 1).

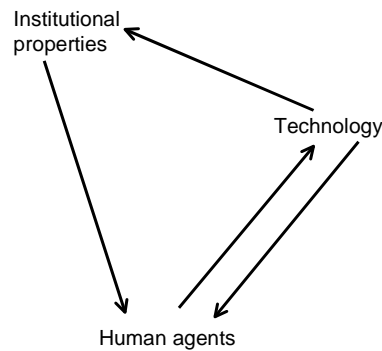


Figure 1 *Structurational model of technology (Orlikowsky, 1992)*

People initiate, design and use an IT system. Designers construct the system according to priorities and expectations. Then, various stakeholders, such as users and managers, react in different ways, e.g. by welcoming, rejecting or adapting it. In doing so they socially construct the technology in the sense that these reactions may become features of the system (Boddy, 2000). This continuing interaction means that the results eventually obtained are different from those, which were originally expected. The model of Orlikowsky suggests that people can modify technologies during design, implementation and use, since people and technology interact. Orlikowsky also suggests that IT is not a fixed, given piece of technology. To understand how a system functions in a business we must understand the nature of the relationship between various stakeholders and their interactions with the system. This understanding includes culture and power relationships. This is consistent with the findings of Markus et al. (2000) who suggests that ERP-systems are inherently flexible which means that stakeholders have many opportunities to influence the form of technology during the initial decision-making, the development, the implementation and also the use of the system. An ERP-system is not a finished product but it alters over its lifetime.

Pinch and Bijker (1997) propose that as people design a system they do not interact with their context in a linear way, moving systematically from idea to working model. A better description would be “multi-directional”, in which many possible forms of the artifact exist in the early stages of

development - but only some survive. Why they survive and others fail depends on the actions of the stakeholders in the project. *“The social groups concerned with the artifact, and the meanings that those groups give to the artifact, play a crucial role: a problem is defined as such only when there is a social group for which it constitutes a ‘problem’”* (Pinch and Bijker, 1997, p. 30). The most influential of these groups will ensure that the system deals with “their” problem.

McLoughlin (1999) defined these stakeholders as: *“those who share a particular set of understandings and meanings concerning the development of a given technology.... Each group will be identifiable through the different views they have (about) the artefact, or even whether it is a desirable technology at all. They will thus each perceive different problems and potential solutions to them”* (p.92). Crucially, McLoughlin argues that these cannot sensibly be defined by prior assumptions about the likely interests of pre-defined groups, but *“by the empirical device of asking the actors themselves”* (p.93).

In the case described in this article, the promoters vision of the ERP system was one in which all business units should use the system in the predetermined way - and in so doing would help resolve the top management problem of a lack of integration and management information. Business units had several different visions - and attached different meanings to the ERP-system. Some welcomed it, either because they shared the management concerns over the lack of integration and information, or because they believed the system would bring other benefits to their business unit. Others did not recognize the problem as presented by the promoters, or saw counter-balancing disadvantages in the system. The paper will examine how the interaction between these stakeholders affected the outcome of the project.

A successful innovation depends on those promoting it achieving consensus amongst the relevant stakeholders, which stabilizes the form (sometimes called “closure”) of an acceptable system. This occurs as stakeholders accept that a design deals with the perceived problem: *“one need not solve the problems in the common sense of that word. The key point is whether the relevant social groups see the problem as being solved”* (Pinch and Bijker, 1997, p. 44). Or, as McLoughlin (1999) suggests, the final form of a technology is not that which is technically superior, but that which the groups who take part in the social process of design agree is superior. Until the players achieve closure the new system is not stable, and is unlikely to meet promoters’ expectations. This paper will examine how the initial form of system implementation favored by some groups (joint and similar implementation at all business units) changed during implementation into a more limited form of implementation at the various business units.

Stakeholders can be defined in many different ways (Mitchell et al., 1997). Different kinds of entities can be stakeholders, such as persons, groups inside as well as outside an organization. Within this research we follow Freeman's classical definition 'A stakeholder is any group or individual who can affect or is affected by the achievement of the organization's objectives' (Freeman, 1984). In case of a certain change project such as the implementation of an ERP system, this implies that any person or group, who can affect or is affected by this change, is a stakeholder.

Stakeholder salience theory (Mitchell et al. 1997) identifies that stakeholders possess one or more of three relationship attributes: power, legitimacy and urgency. A group has *power* to the extent it has access to coercive, utilitarian or normative means for imposing its will in the relationship. *Legitimacy* is a social good and more over-arching than individual self-perception and is shared amongst groups, communities or cultures. *Urgency* is based on time sensitivity and criticality. Combining these attributes generates eight types of stakeholder: dormant, discretionary, demanding, dominant, dependent, dangerous, definitive and non-stakeholder (see figure 2)

1. *Dormant stakeholders* possess the power to impose their will on a firm but, by not having a legitimate relationship or an urgent claim, their power remains unused.
2. *Discretionary stakeholders* possess legitimacy, but have no power for influencing the firm and no urgent claims. There is no pressure to engage in a relationship with a stakeholder.
3. *Demanding stakeholders* exist where the sole stakeholder relationship attribute is urgency: those with urgent claims, but having neither legitimacy nor power.
4. *Dominant stakeholders* are both powerful and legitimate. Their influence in the relationship is assured, since by possessing power and legitimacy they form the dominant coalition.
5. *Dependent stakeholders* are characterized by a lack of power, but have urgent and legitimate claims. These stakeholders depend on others to carry out their will. Power in this relationship is not reciprocal and is advocated through the values of others.
6. *Dangerous stakeholders* possess urgency and power but not legitimacy and may be coercive or dangerous. The use of coercive power often accompanies illegitimate status.
7. *Definitive stakeholders* possess power legitimacy and urgency. Any stakeholder can become 'definitive' by acquiring the missing attributes.
8. *Non-stakeholders* possess none of the attributes and, thus, do not have any type of relationship with the group, organization or project.

Stakeholder salience theory can be conducted to describe, analyse or interpret behaviour of stakeholders in relation to organizational change. Stakeholders are an integral part of IS implementation and are part of the 'sociology of technology'. Information systems (e.g. ERP systems) are not technical systems but social systems and their design, implementation and use involve dynamic social and political processes in articulating interests, building alliances and struggling over outcomes (Webster, 1995; Levine et al., 1995).

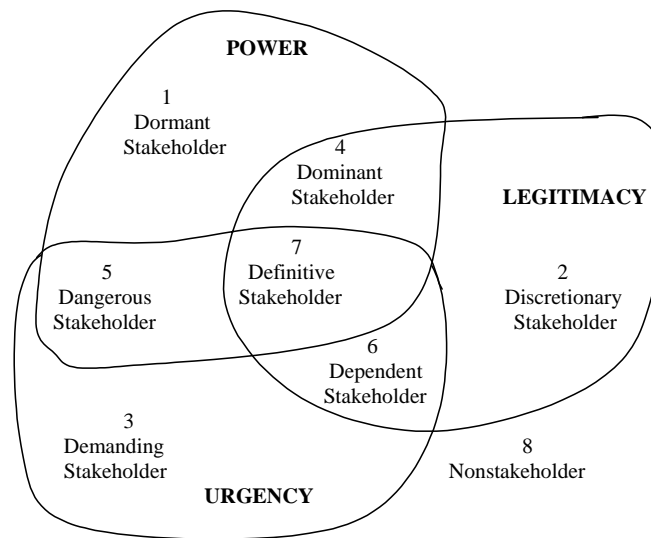


Figure 2 Stakeholder typology (adapted from Mitchell et al, 1997)

Methodology

The use of a single case study as the basis for the analysis reflects the nature of the issues under discussion. We are posing ‘how’ and ‘why’ questions (Yin, 1989), exploring how the organization introduced ERP, how stakeholders interpreted the system, how they reacted in particular ways. The issues within these questions are unclear, as there have been few academic accounts on the interaction of ERP system implementations on stakeholders. We also needed to collect information in its natural setting to understand the nature and complexity of the processes taking place in its historic and situational context. This approach, carried out over an extended time, enabled us to trace the dynamic nature of stakeholder behavior and the unfolding of the process.

The specific questions in relation to the case and derived from the literature review are:

- What stakeholders have been involved over time (Mitchell, 1997)?
- How did these stakeholders interpret the technology and how did this influence design (McLoughlin, 1999)?
- How does ERP implementation affect interests of the stakeholders over time and how does this influence the implementation process (Orlikowsky, 1992)?
- How did the final system arise and how was closure achieved? (Pinch and Bijker, 1997).

The case study has been conducted at company T. An organization chart and the position of the internal key informants are shown in figure 3.

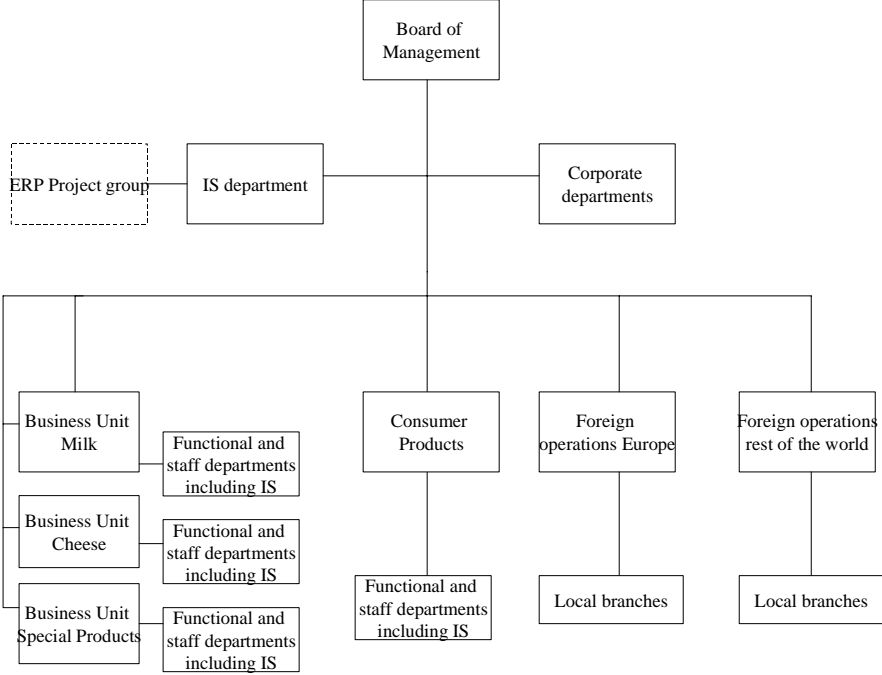


Figure 3 Simplified organization chart of company T

Company T is a European multinational that develops produces and sells a wide range of branded dairy products and fruit-based drinks for the consumer market, professional users and food producers. The company has a strong presence in dairy markets, especially in Western Europe, Central Europe, West Africa and Southeast Asia. They operate at more than 100 locations with a total of 17,000 staff. Their activities are carried out by various operating companies and business units, which operate quite independently on most matters and are treated as distinct profit and loss centers. They have a net turnover of nearly \$ 5 billion. The company has grown through mergers that are never fully integrated in the past. The company has multiple manufacturing locations within the business units, which are each functionally organized. In the past, the business unit Milk had the highest turnover and also the highest profit (in absolute terms), but due to lower selling prices of milk, there is a clear development in which special (branded) and innovative products realize much higher profits. For that reason the company follows a policy of developing and launching differentiated products that address specific consumer needs, while just maintaining the processing and supply of milk.

This case study, which will be described in the following section is longitudinal in character and consists of real time analysis in combination with a retrospective analysis to cover a 2-year change project. Studying such a project in process provides useful knowledge about how the ERP

implementation unfolds over time. This is especially useful in identifying how perceptions and actions of stakeholders may change and to understand why they act in the way they do.

Initial access was negotiated through a finance officer (staff department at corporate level) in 2000. Over the following two years the author visited the company on twelve occasions, during which time interviews were held. Based on exploratory interviews a list was prepared containing relevant stakeholders (and typical representatives of each group) who could be approached for participating in the research. The first phase of data collection was an open inquire into the recent past. This first series of interviews was followed by a second due to a further consideration of earlier interviews and to inquire about recent developments. A non-directive interview technique enabled people to express and develop their own perceptions and interpretations. All the interviews were conducted under conditions of explicit confidentiality. The following table shows the number and seniority of the staff interviewed..

Table 1 Distribution of interviews over categories of stakeholders

| | |
|-------------------------------------|-----------|
| Board of management | 2 |
| Business Unit management | 6 |
| IS department | 4 |
| ERP Project group | 4 |
| Staff department (finance, HRM) | 2 |
| External consultancy | 3 |
| Users | 2 |
| <i>Total number of interviewees</i> | <i>23</i> |

Furthermore access has been gained to personal and project archives, formal reports and handbooks, minutes of meetings, memo's, letters etc. Data were gathered from December 2000 until January 2003. The first phase of interviewing took place between January 2001 and March 2001. The series of follow up interviews mainly took place in October and November of 2001 and spread over 2002. Duration of these interviews varied from 1 to 2 hours; during these interviews notes were made and later transcribed for analysis. Transcriptions of interviews were circulated to interviewees to check for factual accuracy. Also preliminary accounts of the case were circulated to key persons; they were invited to comment on our interpretation of data. Excerpts from some of these transcriptions are offered below, together with observations based on other sources of data.

Case history

Start of the project

At the end of 2000 the board of management agreed that many of the transaction processing systems of the Milk processing business units (Milk, Cheese and Special Products) had become obsolete.

Symptoms were:

- the planning functions did not provide adequate information;
- a part of the transaction systems were not connected and made use of inconsistent sets of data;
- possibilities of generating consistent management information for division managers and business unit managers was restricted;
- the systems were hard to maintain;
- the systems were not available for suppliers which made e-procurement impossible;
- the systems of the different business units and divisions could not provide similar financial statements for the board of management.

This all meant that the board of management believed that the systems needed renewal. This was a strong perception, also affirmed by IS management. For this reason, the ERP-project was started and a project group, chaired by the IS manager had the task to acquire, adapt and implement an enterprise wide information system. This system had to replace all the existing transaction processing systems at the Business Units Cheese, Milk, and Special Products. Later on, the system should also be extended to the Consumer Products and Foreign Operations. The system should provide real time management information and enable e-procurement with main suppliers. The major benefits which managers looked for from the ERP system were improved horizontal information flows within business units, improved capability to exchange information with other business units, better connections with staff departments and the executive level as well as the possibility to make electronic connections with external parties, such as customers and suppliers. The official and complete list of objectives was:

- to reduce inventory;
- to improve information provision for management decision making and to integrate sites;
- to enable on-line connections with systems of suppliers and customers with the internal information processing;
- to integrate information systems of various divisions.

The real project started with the formation of a project group. Since the IS department had a dominant role in the pre project phase, it was quite clear that the IS manager should lead the ERP implementation process. The board of management also decided that the business units Cheese, Milk and Special Products should be represented with a high positioned person. The project manager of WNN completed the project group as an external representative. Right at the start this group had to decide on a number of important implementation dilemmas which included:

- which of the modules to select (Holland et al., 1999). Modules included for example finance, controlling, asset management, human resources, materials management, plant maintenance, production planning, sales and distribution.
- to start at one business unit as a pilot or to implement similarly the selected modules in all business units (Markus et al., 2000);

The project group decided first to select mainly logistic modules, which would help the organization to control the material flows through the company. Immediately after that, financial modules and reporting modules to the board of management should to be installed. The main motive for this choice was related to the problems, which the company faced. The most urgent ones were related to logistics and to financial reporting facilities. Another decision was to start at the Business Unit Milk. The business unit manager of this division was most eager to replace his old system and all members of the project group agreed that it was wise to make the system work in one business unit and then to roll it out to the other entities.

About this decision the representative of BU-Milk said: *'we think that we can take benefit of the system immediately and that we have a headstart by implementing the system at our unit first. If we are successful, and I am sure we are, others have not much more choice than to follow our way of implementation'*. One of the other BU representative said (in a confidential conversation): *'let them try and find out and deal with the initial problems. Our current systems are not that bad and have worked for many years so they will also operate for a few more years. If the whole thing turns out to be mess, its their mess, not ours'*. The project leader (also head of the IS department) already mentioned in this stage that starting in one business unit included some risks. *'The problem is that the others may lay back, waiting and seeing how things work out at BU-Milk. But a massive implementation in all the units at the same time also has high risks'*.

The third decision was to modify processes as little as possible since the project members felt that they primarily had a systems problem, not a process problem. But at the same time they decided to spend only a limited sum of money to adapt the system. This means that an intermediate form of process replication and software modification was chosen (see figure 4).

These decisions had important consequences for the functioning of the project group. The focus became on the process details at BU-Milk. Logistic managers and prospective users from this division joined the project group to discuss specific issues of the processes within this division. Details of processes within this business unit had to be explained to the consultants of WNN and the original project group agreed that only one monthly meeting was needed to keep the other participants up to

date. As the representative of BU-Special Products said: *'I have no interest in all those details. Let them make it work, then we'll see whether it will work at our unit'*.

Pilot at Business Unit Milk

So the project turned its focus from a company wide orientation to a focus on the adaptation and implementation of the system in one BU. At that stage the board of management was happy that the project was making progress, as a top manager said: *'the thing was moving'*. The IS manager reported on a regular basis to the board about the steps which were made. He felt that success of the project would be important for his personal reputation as well as for the position of his department. The IS department would gain importance by implementing and maintaining a company wide system. The new ERP-system should replace local systems and local IS-support. The expectation expressed by the IS department was that the first module would work within five months after the approval to start.

From that point in time the focus of the project group narrowed down to specific processes at BU-Milk and to solve problems how to adapt the system or the processes to achieve the right fit. Consultants from WNN were working on an intense basis with middle managers at BU-Milk to discuss details of the operational processes. Specific modifications to the system had to be made, while at some other points managers agreed that processes had to be adapted. In a later stage, specialists from IS had to test whether the ERP-system could work on the current IT infrastructure at BU-Milk. Since there was decided first to implement only the logistic modules, these modules had to be linked with legacy systems some servers were already somewhat old and slow and were replaced by new ones. Another huge task was to clean up data from the legacy systems and to convert data to the new system. After five months the first modules were tested and implemented. A coalition of three influential people was important during this part of the project: the IS manager, the BU-manager of Milk and the project manager of WNN. These three people had a strong interest in a quick and positive result. They worked together on an intense basis to make these modules work in this business unit. One of them mentioned: *'we were a great team, it was very intense but we all wanted a result'*.

During the implementation of the first logistic modules at BU-Milk, some specific problems arose. Examples of such problems were: poor system performance, stress of key users and support personnel, data input errors, and negative reactions from users (Bagchi et al., 2003). These were partially caused by a lack of knowledge, experience and training of some users and staff. These problems also led to a serious performance dip after initial implementation in terms of process cycle times, inventory levels and operating labor costs. It was sometimes difficult to find causes of the problems and IT staff levels had to be increased. The organization was not prepared to these huge problems in this phase. This affected the willingness to continue and to roll out the system to other divisions. But after a few weeks of explanation and adaptation (including refining of the software settings), the new modules worked

quite well. However, the BU manager of Milk mentioned that the project goals (reduced inventory, better management information, on-line connections and integration) were not yet met. He said: *'the main success now is that the system is working technically at our BU, but only by extending the system to other modules we will be able to realize real business results'*. Since the project group decided to cut the scope during this first stage to only BU-Milk and the logistics and financial modules, the immediate business results were lower than where was hoped.

Restart company wide project; impasse

At that time the original project group had to start its activities again to discuss the company wide implementation policy. The most important questions were whether to 1) implement other modules of the system further (especially financial modules) at BU-Milk, 2) to implement the logistic modules first at the other business units, or 3) to do both at the same time. This problem led to extensive discussions during several meetings. BU-Milk insisted to continue implementation of other modules at their business unit. After proven success this could be rolled out elsewhere. They were eager to keep the lead. Business units Cheese and Special products argued that successful implementation at BU-Milk should not be a guarantee for success at their units. To illustrate this position, the following quotation is from the manager of BU-Special Products:

'BU-Milk is quite much an undifferentiated mass-producer of a few Milk products. We have strong brands and we develop new ones on a continuous basis. They are somewhat supply driven, while we are really marketing and customer driven. That's quite a difference, which is translated in different internal processes. So I believe that a new enterprise system should be configured and modified to our business unit in completely different ways than at BU-Milk. I am willing to dedicate resources to such an implementation but only on our conditions, not if we are urged to implement a predetermined system from Milk at our BU. That should be a big mistake.'

After some weeks of stagnation the Board of Management discussed the (lack of) progress and decided to implement the logistic modules at BU Cheese and Special Products. The CFO (Chief Financial Officer) was especially assigned to this project and explained that *'it is now crucial to continue the project and to implement the system at other business units'*. He said: *'We can only reap the full benefits –and reduce the average costs per user- by implementing Indepta wherever it is possible and by replacing all those old isolated legacy systems. We need to have an overall insight and to integrate processes between BU's. I see this system as a tool to integrate the enterprise. Many functions, such as purchasing and maintenance, can be integrated as soon as we make use of a common set of data and systems, which can exchange those data, '*

Divergence

This decision resulted in some new initiatives to see whether the logistic functions of BU-Cheese and Special Products would fit into the logistic modules, which were adapted during the first phase to BU-Milk. At both business units, a BU-representative, an external consultant and an IS staff member had to study this and to report within two weeks to the project group. But in the same period, management of BU-Milk independently decided to continue to implement some financial modules whatever the other units would think about that. This all meant that three project groups worked quite independently on three different tasks.

The BU-Milk had become used to some modules of the ERP-system and BU-management believed that important parts of the financial module could be implemented quite easily. Especially the sub-modules accounts payable, accounts receivable, general ledger and asset management could replace the current financial package. These new financial modules could be connected with the new logistic modules of Indepta. At BU-Milk they already used a financial package and consultants from WNN found that data conversion from that package to Indepta was quite easy. Since BU-Milk did this study quite independently from the Board and from other divisions, they did not have to reckon with many external constraints. Another advantage of these modules was that the potential number of users of the financial modules was much smaller than the number of users of the logistic modules. The outcome of the study at BU-Milk was that Indepta-Finance could be implemented within two months against reasonable costs. The BU-manager decided to ask the Board of Management to implement this module and to use this also as a means to communicate financial information with the Board. A manager of BU-Milk said: *'we are focused on cost control and efficient operational processes. Our margins are quite low so we have to operate on a very competitive basis. We feel that this system can help us to improve our processes and to provide management information, which improves decision-making. For that reason we don't want to wait for others who may have other priorities'*.

During the same period project groups at BU-Cheese and BU-Special Products were studying whether the logistic modules could be implemented in the same way as at BU-Milk. In both project groups, representatives of the IS-department and from WNN emphasized that it should be cost effective and practical to implement the logistic modules in the co called 'Milky-way' and to adapt the system later if there should be a clear need. In that case, adaptation should only be possible if the three business units would reach consensus about this. But the representatives from BU-Cheese as well as from BU-Special Products could not agree with that. They argued that this should be a dictation from one division, which was perceived as unacceptable. Moreover, BU-Cheese extent and BU-Special Products became increasingly important for the company. A manager from Special Products said: *'our customer focus and our market sensitivity make us a different operation with other information needs.'*

Demand to our products varies much more than those of BU-Milk and we have to adapt our processes to that'.

This all meant that the original project group did not play a guiding role. The three different project groups operated quite independently and reported in contrasting ways. The BU-Milk urged to continue the implementation of Indepta at their own business unit and to implement financial modules and HRM modules within a year. The other business units reported that the logistic modules could only be implemented at their divisions if they should be adapted to their own business processes and business practices. They concluded that the BU-Milk mode of implementation was inappropriate for their BU. Representatives from WNN and from IS at those project groups could not endorse those strong views but could also not prove the opposite. This led to a new impasse at the original project group.

At that time, BU-Milk management decided definitively to continue implementing Indepta, whatever the project group would decide. This position was enforced by an informal agreement with the CFO. The CFO believed that ERP-success at one BU would be a great promotion for Indepta, which automatically would lead to diffusion throughout the company. He said that system-success is much more effective for diffusion than formal decisions right from the top. Two years after the first start, this did not prove to be true. At the end of 2002 the company wide project group had been dismantled, and at BU-Milk the Indepta ERP system was rolled out to a high extent. The other business units were working independently on finding ways to improve their own information capabilities.

At that time the board of management agreed that the different business units should follow different implementation paths. During 2003 this led to completely different modes of ERP use. At BU-Milk, an integrated full use of Indepta in almost all of the processes was the ultimate aim. In 2002 and 2003 main modules (logistics, finance, HRM e-procurement, e-selling) were implemented fully. At BU-Cheese and BU-Special Products things were moving not that fast. Here management decided to adapt ERP much more to the specifics of the processes as well as to use the project to rethink and modify processes (system modification and system exploration, see figure 4). Both business units were not happy with the approach of WNN, which was perceived as being too operational and too much limited to software implementation. BU-Cheese and BU-Special Products decided to look for other consultancies to help them implementing ERP. They jointly attracted a more prestigious consultancy, which argued that Indepta was not the most appropriate ERP-package for their business processes. During 2003, the IS-infrastructures of the three business units diverged even more and the dream of one integrated system for the whole company became even more far away that when project was started. The board of management agreed with this development with the only restriction that the information flows to and from the board of management should be uniform and consistent.

Table 2 shows the flow of events during the study period.

Table 2 Chronology of the ERP project at company T

| | |
|---------------|--|
| End 2000 | Selection of system |
| February 2001 | Start of project, main choices |
| Spring 2001 | Start describing processes and configuring software for BU-Milk |
| June 2001 | Redefinition of task project group |
| June 2001 | Implementation logistic modules at BU-Milk |
| October 2001 | Implementation financial modules at BU-Milk |
| October 2001 | Restart company wide project group |
| November 2001 | Crisis |
| January 2002 | Redefinition project, cutting scope |
| Spring 2002 | Three different project groups, further implementation of Indepta at BU-Milk, special studies at BU-Cheese BU Special Products in adapted mode |
| Autumn 2002 | Comprehensive implementation of Indepta at BU-Milk. An initiative to implement other IS at Cheese and Special Products. |
| December 2002 | Official dismantling of company wide project group. |
| During 2003 | Further divergence of IS-systems at the three BU's. |

Discussion

This section begins by explaining some organizational backgrounds, which partially explain the chain of events of this case history. Then a discussion follows about the meaning, which the main stakeholders attached to the system. After that, these findings will be interpreted in terms of the stakeholder typology.

Organizational context of the events

Two different developments, which took place before and during the implementation process of Indepta, explain the course of events to some extent.

The first is that the profitability of BU-Milk was going down further during the project. High but stagnating volumes and decreasing margins led to a decreasing profitability from 8% (1990) to 1% (2002). Traditionally, this business unit was the cash cow of the company and enabled the company to start other activities and to acquire other businesses. Many people at BU-Milk still see themselves as the core of the company; this business unit gives company volume in terms of revenues, size and employment. BU-Milk also has the longest history because the company originated about 100 years ago mainly as a milk processor. Because of the increasing profitability of other growing business units, the stagnation at BU-Milk remained somewhat hidden for outsiders. At BU-Milk, BU-management believed that a fierce policy of cost control could help to improve the profitability in a structural way. Integrated and up to date information systems, such as Indepta could help to achieve

that goal. For that reason, BU-Milk was eager to implement the Indepta ERP-system in a way, which was most efficient and appropriate to BU-Milk. The management of BU-Milk believed that leaving the initiative to the other business units would slow down this process far too much. BU-Cheese and BU-Special Products provided much more comfortable sales figures: growing profit margins, increasing revenues, new product launches and promising market perspectives did not make the urgency high to implement a company wide ERP-system. Although they agreed with the problems of the current company wide information provision, they did not perceive that as a crucial point to them.

The second is that at the beginning of 2000 the board of management believed that the company was entering a new era. After a decade of acquisitions, internationalization and differentiation, they felt that more integration and coherence was necessary to realize many of the potential benefits of being one company. They viewed the different business units as too independent and autonomous. Different histories, cultures, markets, languages and products caused these differences. Although these differences were perceived as perfectly understandable and right at that time, the board of management believed that a gradual but clear move to a common culture and to one integrated company should be the main strategic objective for the new decade. A company wide jointly implemented and maintained ERP-system should be one of the means to realize this. A new CEO, who started in 1999, pleaded strongly for this new policy. However some other board members, especially the CFO, did not express such grand visions and was more focused on quick results and small but effective steps in particular business units. For that reason the CFO agreed with BU-Milk to continue implementation at that business unit and supported them in that policy. The sole implementation at BU-Milk gave room to the other (increasingly strong) business units not to follow.

Views from stakeholders

During the case study period we identified relevant stakeholders by using the snowball method (Pinch et al., 1997). This means that during the process of data collection various actors are revealed. Sometimes these actors can be categorized in groups, depending on the common meanings they attach to the system and the interests they stand for during the research period. The following description and table 3 shows the groups we identified as well as a characterization of their interests, their power position, their problems, solutions and meanings they attached to the system

Board of management

Board of management longer-term objective was to become a more integrated company with fluent horizontal and vertical information flows. They believed that the company was too fragmented which resulted in different reporting styles, incompatible systems and contrasting cultures. One common system with a centralized entity for maintenance and support should be a means to integrate, to unite and remove inefficiencies. However, the board of management proved not to be completely consistent

in their policy. At the start of the project they had a strong presence, as a real definitive stakeholder. Later on they withdraw somewhat, also because the project group started implementing modules at BU-Milk. From that time, the board of management believed that '*the thing was moving*'. The CEO delegated the board of management responsibility with respect to the implementation of Indepta to the CFO and to the ERP-project leader (the head of the IS department). The CFO, who already worked for quite a long time at the company, was keen to promote short time results. For that reason he supported BU-Milk in its choice to continue implementation and not to wait for the other business units. That decision, in Spring 2002, led to a definitive divergence of the implementation process.

BU-Milk

The representatives at this business unit took a prominent position during the whole project. They believed that an ERP-system could solve a number of their problems. Their IS-systems were outdated and a new system, funded by the company as a whole was perceived as an opportunity. BU-Milk management believed that such a system could help them to improve information flows and to reduce costs. Focus on cost control was perceived as a key to future business success since they are operating in a stable and somewhat static market. Dominance by having an active role in the project group was seen as useful strategy to gain the benefits of the system as soon as possible. The BU-management also believed that a leading position in this project would bring this business unit again at the place where it belonged: at the centre of the organization. This all made BU-Milk clearly to a definitive stakeholder using power and legitimacy and combining this with a strong sense of urgency.

BU-Cheese and BU-Special Products

These business units formally affirmed the decision to implement a company wide ERP-system. They agreed that from a company wide perspective it was important to integrate information flows and to centralize the IS function. From a business unit perspective, both units did not perceive this as an urgent problem. Both used appropriate logistic systems and also adequate financial applications, so they both did not give a high priority to this project. During the project they observed that BU-Milk 'ran away' with the ERP by being the pilot as well as by continuing implementation without a clear consent from the other BU's. That made them decide in 2002 not to continue co-operating in the project group. During the project they interpreted the project as a tool of BU-Milk to dominate and to dictate others how to organize the company as a whole. Both BU's were dominant stakeholders: they did not feel the urgency but they possessed both power and legitimacy to influence the project. These sources were derived from business success (they were both more successful than BU-Milk in terms of growth and market share) and from the control of knowledge of their business units. They used this power and legitimacy by not agreeing to roll out the pilot at BU-Milk at their business units. They increasingly felt that BU-Milk, the ERP-project management and the CFO intended to use the project to increase their power base at the cost of their business units.

IS department and external consultancy

These two stakeholder groups can be interpreted as dependent stakeholders. They possessed both varying forms of legitimacy as well as urgency to make the project run. At the same time these groups were highly dependent on the co-operation and willingness of the other stakeholders to make real progress. The IS department had a strong interest in one company wide ERP. This would lead to a strong centralized IS department and the abandonment of many local systems and local IS-groups. The external consultancy had an interest in realizing the predetermined objectives, at least an appropriate implementation of the logistic modules at the three business unit. The consultancy believed that the project would impact the prestige of the group, either positive or negative, depending on the result.

Table 3 shows the interests, problems, solutions and attached meanings of the most relevant stakeholders in relation to this project.

Table 3 Relevant stakeholders in relation to ERP and their interpretations

| Relevant stakeholder | Interests | Kind of stakeholder | Perceived problems | Solutions | Meaning |
|--|--|--|---|--|--|
| <i>Board of management</i> | Becoming one more integrated company CEO more focused on longer term cultural change CFO more focused on quick results | Definitive, later dominant and dormant | Current systems are fragmented and expensive. Current systems promote decentralization and autonomy. Poor information provision to top management. High IS maintenance costs | New ES, integrating data and information flows at lowest cost. Fast and cost effective implementation | Improving management information Controls from centre, less autonomy, more integration. More cost efficiency at business units |
| <i>Management BU-Milk</i> | Taking initiative. ERP can help to solve immediate problems. ERP can help to put BU again at the centre | Definitive | Current systems are not effective High IS maintenance costs Efficiency gains difficult to realize with old system | Taking the lead in implementing new system New system can help to solve perceived problems | ERP as a means to take the lead ERP as to improve processes and to control operations and costs |
| <i>Management BU-Cheese</i> | To maintain and strengthen the position of the BU To protect BU for initiatives with threaten interest of BU-Cheese | Dominant | Current systems are not excellent but new system is not necessarily better. New system might be helpful to solve some operational problems | Protect BU cheese for IS initiatives which are not clearly in the interest of BU-Cheese If IS will become real, adapt system to local needs | ERP might be used to solve problems outside business unit at the cost of business unit ERP might be an instrument of BU-Milk and Top to improve their position at the cost of BU-Cheese |
| <i>Management BU- Special Products</i> | To maintain and strengthen the position of the BU To protect BU for initiatives with threaten interest of BU-Special Products | Dominant | Current systems are not excellent but new system is not necessarily better. New system might be helpful to solve some operational problems | Protect BU Special Products for IS initiatives which are not clearly in the interest of BU-Special Products If IS will become real, adapt system to local needs | ERP might be used to solve problems outside business unit at the cost of business unit ERP might be an instrument of BU-Milk and Top to improve their position at the cost of BU-Special Products |
| <i>IS department</i> | Important role of internal IS department to regain the position of 'centre of IS expertise' | Dependent | Current systems are not integrated, outdated and hard to maintain | Implement one integrated system in 'vanilla' mode | A technical system, centrally managed. |
| <i>External consultancy</i> | Implementation within time/money constraints | Dependent | Current systems are inappropriate. | ES system in adapted mode should be implemented | ES implementations are business |

The various stakeholders were not always ‘on stage’ during the project. Table 4 indicates which groups were active and ‘front stage’ during the various project stages.

Table 4 Changing role during the project

| <i>Stakeholders</i> | Selection phase and project start | Implementation Logistic Module at BU-Milk | Impasse | Implementation Finance module at BU-Milk | Implementation at BU-Cheese and BU-Special Products |
|----------------------|--|--|----------------|---|--|
| Board of management | ██████████ | ░░░░░░░░ | ░░░░░░░░ | ░░░░░░░░ | ░░░░░░░░ |
| IS department | ██████████ | ██████████ | ██████████ | ██████████ | |
| Project group | ██████████ | ░░░░░░░░ | ██████████ | | |
| External consultancy | ██████████ | ██████████ | ██████████ | ██████████ | |
| BU-Milk | ██████████ | ██████████ | ██████████ | ██████████ | |
| BU-Cheese | ██████████ | ░░░░░░░░ | ██████████ | | ██████████ |
| BU-Special Products | ██████████ | ░░░░░░░░ | ██████████ | | ██████████ |

██████████ = active role
 ░░░░░░░░ = background role
 White = no role

The Board of management had a strong presence at the start of the project and was, together with IS, the initiator and strongest supporter of the idea. Later on, they withdraw to some extent by taking a more background role. For the CEO, other issues demanded top management attention and delegated ERP to the CFO. This person decided (backstage) to support the BU-Milk in its decision to continue further implementation, which also led to the break-off of the other business units. The project group with representatives of all relevant groups was active during the start of the project, but during the implementation of the logistic modules at Milk, this group just had some infrequent meetings. When the implementation at BU-Milk was finished the group came alive again but entered the impasse how to continue. Since the group could not reach a real consensus on how to continue, the real functioning of the group stopped. Table 4 also shows that BU-Milk played an active role during project, which was consistent with their role as a definitive stakeholder.

Interpretation in terms of the stakeholder typology

The Board of Management started as a definitive stakeholder, but moved during project to a dominant and later to a dormant position. In the meantime, IS department tried to take over the lead. However,

they were mainly a dependent stakeholder, lacking the power to influence the project in a way they wished. The other business units felt less urgency and played a background role during certain stages. See also figure 5.

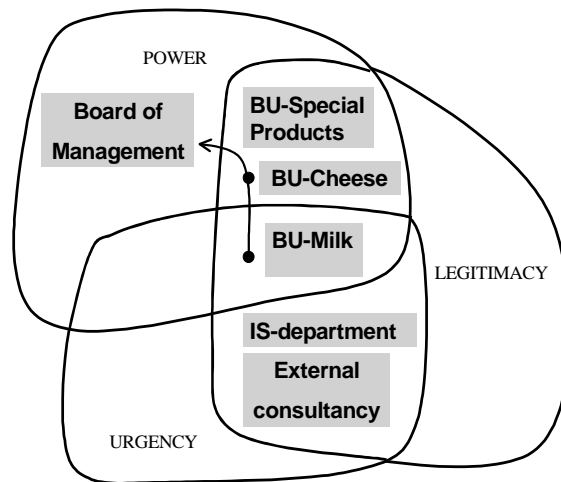


Figure 5 *Categorization of stakeholders during the ERP project*

Since the board of management changed during the project from being a definitive stakeholder at the beginning to a dominant and a dormant stakeholder in later stages, they actually did not use their power to reach a common policy. By doing so, they created a power vacuum, which caused competition among the other stakeholders. This vacuum was also caused by the slight differences between the experienced CFO and the relatively new CEO. A definitive stakeholder (BU-Milk) tried to use the project to strengthen their position and to move it into one particular direction. However, two dominant stakeholders (BU-Cheese and BU-Special Product) possessed the power as well as the legitimacy to block that direction which led to an impasse. The IS department and the external consultancy were lacking power to impose a solution.

This confrontation of three powerful and legitimate stakeholders (BU-Milk, BU-Cheese and BU-Special Products) and some dormant or dependent ‘bystanders’ finally led to divergence in the move to ERP-implementation. Not one party possessed enough sources of power to realize one common solution. Closure was achieved by a full implementation at BU-Milk and separate ERP-projects at the other business units.

This solution can be viewed as ‘acceptable’ in the sense that stakeholders accept that design as being the best possible solution under the given circumstances. It is not a superior solution from a technical or strategic point of view, but given the power division at this company at that period of time it can be viewed as socially acceptable (Pinch and Bijker, 1997).

Conclusion

The case history clearly illustrates that different stakeholders can interpret ERP-systems in different ways, given their own histories, interests, self-images, prospects and views. Some groups perceive the system as a means to realize certain new company wide objectives, while others see the system as a way to regain lost power or as a threat to legitimate local interests. The case study shows how these different interpretations may easily lead to differences about priorities and ways of implementation. These differences are not all clear at the start and are not all expressed and discussed during formal meetings. They are more latent and develop and change over time. The technology is shaped and socially constructed during the process, given all these different perceptions and positions (Orlikowsky, 1992). Finally, some form of closure is achieved in the sense that, for the time being, stakeholders agree on some form of implementation, given the interplay of main stakeholders over time. This closure is not the best solution from the perspective of one the stakeholders, but much more a form of agreement, given the current positions of the main players.

ERP systems are build according certain business models, with an own logic of businesses should operate. They are based on the assumption of integration, control, generic processes and centralization. This paradigm can fit or misfit with an organizations or with organizational units which may lead to either organizational validity (fit) or organizational invalidity (misfit). Invalidities may lead to a range of problems in the field of business strategy, business processes, people, culture and so forth.

The aim of this paper was to show how the outcome of ERP implementation can be affected by the meaning, which various stakeholders attach to such systems, and by the actions they take throughout the project. To answer the main question, the study posed the following sub-questions:

- *What stakeholders have been involved over time?*

The case study indicates that different persons and groups were affected and affected the ERP-initiative. In this study we showed that the board of management, the managers of the different business units, the IS-department and an external consultancy were important stakeholders with each a variety of interests. They all attached different meanings to the system and acted accordingly, also depending on their power, their legitimacy and the degree of urgency they felt.

- *How did these stakeholders interpret the technology and how did this influence design?*

The research clearly supports the idea that different stakeholder groups attend to different aspects of the context, and interpret them in unique and subjective ways. The promoters stressed the cost-saving

pressures in the context of the company as an integrated unit, and the potential of the system to contain costs. The various stakeholders did not interpret this system and its context in a unified way. They held strongly contrasting views on whether the system helped or hindered the interests of different business units and staff departments. This is consistent with Pinch and Bijker's (1997) view that problems are not universally recognized or objective phenomena. People are only likely to accept a solution if they have already developed a common set of shared meanings and understandings about the situation.

- *How does ERP implementation affect interests of the stakeholders over time and how does this influence the implementation process?*

The research shows that implementation of ERP is a socially, politically and technically complex undertaking that influences nearly every aspect of organizational functioning and thus affects the interests of many different stakeholders during the various stages of the project. This influence can lead to altering the specification in ways that are more consistent with existing organizational arrangements and according to the position of influential stakeholders. This is consistent with the interaction view and the structurational model of technology (Boddy, 2000; Orlikowsky, 1992).

- *How did the final system arise and how was closure achieved?*

The research shows that ERP implementation has an emergent rather than a planned nature. This has various reasons.

In the first place, ERP systems are building blocks of organizational strategy. This means that ERP implementations resemble the nature of the strategy processes, which often have emergent and adaptive characteristics rather than planned (Quinn, 1980; Mintzberg, 1994; Stacey, 1994). Changes in the external environment, the emergence of new opportunities, and other unanticipated events make departure from initial ideas often inevitable.

In the second place, ERP implementations challenge vested interests, and lead to opposing views from various players. Implementation includes multi level activities, which are not the exclusive area of a single project manager. Outcomes of decisions are not always products of rational considerations but shaped by the interests and commitments of individuals and groups, forces and momentum. This study shows that ERP implementation can be perceived as an organizational change project and should be managed accordingly. Organizational change enabled by IT systems comprises technical problems as well as cultural, political and psychological issues, which are also intertwined (Markus, 1983, Buchanan and Badham, 1999). The study also shows that historical and contextual factors may influence the implementation process.

In the third place, ERP implementation is a dynamic process, which means that views, which are held by stakeholders at one point in time, may change during the project. This may depend on various reasons, including cognitive, political and opportunistic ones.

This all means that ERP projects is a complex cocktail of rational assessment mixed with various perceptions, quests for power, leadership and subtle processes to gain support for further progress of the project. In this case a power vacuum (caused by the board of management) resulted in more political behavior and in a lack of agreement on direction and use of the system. Without that agreement, the various stakeholders followed mainly their own goals and undermined to some extent the company wide explicit objectives of the project. The paper shows that the promoters of the company wide ERP system took an optimistic view of the power of an ERP system to improve the operations of the different business units. In the rush to implement, it paid no careful attention to the interests of stakeholders and their mutual relations. The rational image of systems implementation revealed a poor understanding of deeper organizational realities such as history, culture and power.

Overall, the evidence in the paper supports Walsham's (1993) suggestion about the benefits of an interpretive approach to information systems. It has enabled us to show the range of factors, which people use to form their attitudes to a system, and the different ways in which they interpret those systems. The evidence that power is an important source of these perspectives adds to our theoretical understanding of attitudes towards computer-based information systems, including ERP. Politics and power relationships are a part of many ERP projects. If these are not diagnosed, a key factor is overlooked, which is a serious threat for the project.

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