

2006

ERP misfits: What is it and how do they come about?

Lene Pries-Heje

The IT University of Copenhagen, lpries@itu.dk

Follow this and additional works at: <http://aisel.aisnet.org/acis2006>

Recommended Citation

Pries-Heje, Lene, "ERP misfits: What is it and how do they come about?" (2006). *ACIS 2006 Proceedings*. 48.
<http://aisel.aisnet.org/acis2006/48>

This material is brought to you by the Australasian (ACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ACIS 2006 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

ERP misfits: What is it and how do they come about?

Lene Pries-Heje
The IT University of Copenhagen, Denmark
Email: lpries@itu.dk

Abstract

When an Enterprise Resource Planning (ERP) system is unable to adapt in a satisfactory way to the environment or the circumstances around a specific organization we have a "misfit". In the ERP literature misfits is very often reported although there seems to be a lack of common understanding of what constitutes misfits and how to investigate misfits throughout the lifecycle of an ERP system. In this paper, I compare a case study from a major engineering company with the most comprehensive categorization framework of ERP misfits. Never the less my coding of qualitative interview data reveals that misfit in the case goes beyond what the framework prognosticates. In the concrete, I then develop an extended model of sources of misfit for ERP adoption in large organizations and a new categorization of the nature of misfits. The empirical material also shows that depending on the socio-technical design, the ERP-systems attributes may or may not cause a notion of misfit. This implies that in the investigation of sources and nature of misfits it is necessary to focus more on how the system is constraining the socio-technical design, and how a better socio-technical design can be achieved.

Keywords

Enterprise Resource Planning (ERP), misfit, interpretive field study

INTRODUCTION

Historically adopting Enterprise Systems has been associated with "misfits" although there is no common understanding of the term. Some research has focused on misfit at the strategic level (Davenport 1998) and others at the operational level (Soh et al. 2000, Kien & Soh 2003). A survey among 126 business managers made by Keil and Tiwana (2005) shows; that managers considered functionality the most important attribute of standard software in order to predict perceived value of the system. However, the understanding of what constitutes functional misfits and how to investigate the functional misfit throughout the lifecycle of an ERP system remains unclear. This paper presents the preliminary results of a research project investigation what kind of misfits an organization experiences during different phases in the lifecycle of an ERP system adoption. Focus is on the end-users perception of misfits in the Onward and Upward phase (Markus & Tannis 2000) using Kien and Soh's (2003) framework as a starting point for analysing the nature and source of the misfits. The conclusion is that the framework's two dimensions needs more (different) categories to be able to cover all the misfits found in the case organization. Business partners need to be added, as a context factor, and the nature of the misfits need to be recategorised.

CONCEPTUAL BACKGROUND /THEORETICAL FOUNDATIONS

The strategic perspective on misfits

When implementing ERP systems one of the key issues for the organizations executive leaders are whether the investment will pay off (Markus & Tannis 2000), and central to achieve the expected benefit is the development of a proper fit between the organizational strategy and the ERP system (Somers and Nelson 2003). Shang and Seddon (2002) propose a framework for enterprise benefit including five dimensions: Operational benefits, Managerial benefits, Strategic benefits, IT infrastructure benefits and organizational benefits. The framework was used in a survey including 233 organisations who implemented an ERP system. All organizations claim to have achieved benefits within at least two categories. Operational and infrastructure benefits were the most quoted benefit (73% and 83%), and all five categories were represented. There seems to be a difference in the kind of benefit an organization is realising depending on which system they implement, thus indicating that the choice of system matter. To realise the strategic fit and the expected benefit Somers and Nelson's (2003) ERP fit model suggests a number of integration mechanisms to bring the fit around; Business driven implementation, project organization, package adaption and organizational adaption. Davenport (1998) on the other hand focuses on the characteristics of the software (at the outset) and its ability to fit the strategy. He argues that the system imposes its own logic on the company's strategy and may push the company in an unwanted direction.

A functional perspective on misfits

However, the strategic view is only one perspective on ERP misfits, functional misfits at the operational level is another. If the day-to-day operation is disrupted too much it is difficult to realise any kind of benefits and in extreme cases like Fox Meyer, it may cause the company to close down the business. Therefore, different researchers have investigated functional misfits. The adopting organizations perceived importance of functional fit has been reported by Keil & Tiwana (2005), Chang et al. (2000), and Bernoier & Koch (2000). Common for these surveys is that they treat misfit as a black box, thus leaving it up to implementing organizations to figure out what categories of functional misfits to look for and how to do it. Soh et al. (2000) and Kien & Soh (2003) on the other hand try to clarify the source and nature of misfit primarily from a cultural perspective, their framework is the most comprehensive within the ERP literature.

A work practice perspective on misfits

One of the difficulties investigating functional misfits in a specific organisation is to decide what qualifies as a misfit. Asking different actors in the organization often illustrate that what some actors considered a misfit others perceive as an example of resistance to change. It seems that the more distant an actor is from the actual operation the more likely difficulties in using the software would be considered a matter of resistance to change (Suchman 1995). Another difficulty investigating functional misfit is different users conflicting requirements, resolutions have to be negotiated and tradeoffs may result in some users experiencing difficulties using the software.

RESEARCH METHOD

This paper's goal is to provide a thorough understanding of the functional misfits still unresolved in the Onward and Upward phase (the period after the system has gone live and is stabilized). The study was carried out in the Danish head quarter of an international engineering company, in this article called Alfa. In January 2001 Alfa started the process of selecting and implementing a standard ERP system, and in October 2003 they went live. A series of interviews with the ERP project program manager, users serving as team leaders during the implementation, managers and end users representing all the functional areas of the project's scope, a consultant participating in the project on the vendor side and the vendor's solution architect has been carried out. Twenty interviews in total, all semi-structured and lasting 1½ to 2 hours. The interviews were taped and transcribed afterwards. The interviews are part of a more comprehensive study of the socio-technical design of Alfa's new system, and the tools and methods used during the implementation and the continuous design in use (the first years after go-live).

The interviewees were selected based on their knowledge about Alfa's business processes in the four functional areas included in Alfa's implementation: purchase, resource management, project management, finance and controlling. The first group of interviews used in this paper includes users working on a day-to-day basis within the four areas and a second group consisting of internal functional consultants in the IT department representing the four areas. Going through the transcribed interviews misfits (difficulties using the system) were coded, and as a starting point Kien and Soh's (2003) framework were used to categorise the findings. However, it became clear, that the findings were not fully explained by the framework and at the same time, the material showed a lack of consensus among the interviewees. Therefore, a second round of analysis was conducted trying to regroup the misfits in order to provide a deeper understanding of Alfa's situation and suggestions for adjusting the framework. A hermeneutic interpretive approach (Klein and Myers 1999) has been used going back and forth between the field material and different interpretations.

One of the difficulties using the interview material is, that the interviewees' interpretations of the history as well as the immediate situation often is influenced by difficulties or conflicts taking place at the time of the interview. Written project documentation has therefore been used to verify the interviews if possible. Alfa has provided elaborate documentation including detailed requirements specification, documented workshop evaluations of the candidate systems, business cases, gap analysis, issue-log and change requests. After go live the users were invited to express experienced difficulties using the system (without considering the cause) and more than 500 examples were reported.

CASE DESCRIPTION

Alfa's ERP implementation

The case organization Alfa is an engineering company with more than 80 years of experience - a leading supplier of systems, consultancy and engineering services to the pharmaceutical and biotechnological industry. The organization has 1200 employees in Europe, China and USA. A large number of the employees have a degree from a university, typically from a technical university. Alfa's competencies span all technical disciplines applied to engineering, construction, validation and reconstruction of facilities for plants and laboratories within the

pharmaceutical and biotechnological field. Most of the work at Alfa takes place in large projects lasting several years and costing billions of US\$.

The ERP project started in January 2001 and took place at the headquarter in Denmark. A Project Manager with extensive ERP Project Management experience was hired to manage the project. From the very beginning it was clear, that this was a common project for management and employees in Alfa. It was never questioned that users should participate throughout the project and in all aspects of the project. A project organisation was set up and user representatives for each functional area of the project were appointed. The primary goal was to replace a large number of domain specific systems with one integrated standard system, and at the same time strengthen the IT support for the project management.

Alfa's core business is project administration and project management on behalf of their customers, they have no production and no stock; all materials for the projects are bought specifically to the project and delivered directly to the building site. Alfa was aware that ERP systems in general are not targeted at their line of business. Therefore, a thorough evaluation and selection process was conducted to ensure that the standard system met their needs. Alfa spend almost a year specifying requirements, evaluating candidate systems and finally selecting a system and they used 9-10 month configuration and customizing the system before going live.

The 8th of October 2003 Alfa's Oracle solution went live. Because of the time pressure many reports were still outstanding and a lot of promising and nice functionality were left to be implemented in a later phase. During the next months the system were stabilised, missing reports developed and the user organisation got experience with the system. The fit of the system were in some areas more problematic than in others. Members of the IT-department suggested including all users in an evaluation of problematic issues regarding the system. Meetings were set up with all user groups within Alfa. The IT-people met the users with an open mind and all issues reported were noted without considering the relevance or the reason; resulting in a list of more than 500 issues. Afterwards the reasons for the issues were discussed and the appropriate action decided. Some issues were handled with end-user training and some with reconfiguration or customizations of the system, some issues were researched thoroughly, but could not be solved due to the design of standard system. At the end of 2004 this phase, named the ONE-TWO project, was completed. Two years after going live with the system and a year after the ONE-TWO project the users are still experiencing misfits. To understand the nature of these persistent misfits interviews were conducted and the findings are discussed below.

Analysing the misfits found at Alfa using Kien & Soh's framework

A number of misfits were identified before the implementation project started and therefore a number of customizations were included in the contract with the vendor. During the configuration of the system, more misfits were found resulting in; additional customizations, workarounds or taking functionality out of the ERP project scope. This paper is focusing on the misfits still unresolved 1-2 years after going live as they are experienced by users.

Misfits around resource management functionality

The processes around Alfa's resource management are causing exasperation and hostility toward the system among project managers and project assistants. When asking what it is that is not fitting the end-user representatives point to the cumbersome user interface as the main problem. In Alfa a project can have hundreds of participants and a project can last several years. On a weekly or monthly basis, the resource allocation has to be very precise but on the long-time basis, only rough estimations are possible and necessary. A project manager explains: (Ex. 1) *"Updating allocations in the ERP system for all participants in a project may take several days...it seems a waste of time doing it the way the ERP system requires when it is possible to provide the same overview in a few hours using Excel. Furthermore, if spending the time entering data, useful output cannot be generated. First a list is not a useful way of presenting output (no overview is provided) and secondly output screens and standard reports does not include the necessary data"*.

Alfa expected the system to be able to "automate" the coordination between project managers and the department managers regarding resource allocations. The project manager explains: (Ex. 2) *"we expected the system to support the resource allocation; The project manager's request for resources should be entered in the system, where it becomes visible for the department manager allowing him to approve the allocation, but it is not working."* Although a workflow is set up to support the automation of the request/approval process it is not working.

At first glance, the user interface seems to be the reason not to use the resource management functionality, but the interview indicates, that there may be other difficulties involved. The systems logic indicates a process like this: (1) the project manager start up the project by creating a project structure and the related budget. (2) Resources (people) are allocated to the project and approved by a resource manager. (3) Resources work on the project and report the time spend on a timecard. If the focus is on capturing financial transactions when they occur, this could

be a valid logic to design the system around. In Alfa's case however, it is more complicated. To begin with, the project plan (resource allocations) is based on rough estimates, and as the project progresses plans that are more detailed are made for the next year, quarter, month and week. Although the system allows you to modify allocation, in the project managers opinion it is not designed to support Alfa's very dynamic situation around resources.

The system is also colliding with a practise providing flexibility. Traditionally the individual resources (project participants) have planed some of their time themselves. If a resource is suddenly needed more or less than planned in a specific project, he often has a small pole of tasks for various projects, which he can do when time allows. This ensures utilizing his time and provides needed flexibility. However, the individual resources ability to plan his own time is not included in the workflow. Reporting the time spent is only possible if the resource is scheduled in advance to work on the task, this is causing "dummy" allocations disrupting the data quality.

Finally, it was Alfa's ambition to allow the project manager to look for resource qualifications and availability in the system before requesting a specific resource. A record with almost a hundred qualification parameters has been set up. However, the project managers do not use the data. They talk to the department manager and rely on there own knowledge about people. Their argument for not using the data in the system is that what really matters cannot be represented in a qualification table.

Misfits around Alfa's use of Project Management functionality

The project management module has also caused difficulties. In Alfa, they have at least three different kinds of projects: Large construction projects, where they provide the project management service and purchases materials, smaller maintenance projects, and very small graphical design projects. The large projects are the main business. At the beginning of the ERP project 95-90% of the business were related to one customer, four years later it is down to 75-70%. Alfa, is owned by its largest customer but the vision is to generate more external business. In the large projects the planning, budgeting and financial reporting are centred on two areas: project management resources (consultant services) and purchase of materials on behalf of the client. Independent of type of customer ALFA has to be able to purchase materials on behalf of the client, but the cost should not be reflected in Alfa,'s financial books (GL). This requirement could not be fulfilled by the standard functionality. Thus, Alfa's ERP-system includes a major customization and double registration of all invoices; once in Alfa's system and once in the customer's system.

Both end-users and internal (IT) functional consultants agree that the customization is interfering with standard functionality in other areas of the ERP system. Especially within the standard project management functionality, the customization is causing users to experiencing difficulties with scalability of project initiation and financial reporting. As described under resource management the logic built into the ERP system primarily support registration of financial transactions while support for project (time) planning and financial reporting is limited.

A project manager at Alfa can have several hundred people working on a project. The project managers consider The ERP systems user interface and operational functionality unfit to cope with the amount of data and the dynamic nature of data concerning planning and budgeting. For planning purposes, integration to MS project has been made to provide a more flexible user interface and the possibility of graphical representation of data. The cumbersome work creating the project structure, the project budget and purchase orders related to the project has been placed in a project office. .

Examples of misfits around Alfa's purchase of items

Purchasing materials for the projects are also challenged by the ERP systems logic. Alfa is not manufacturing any goods, and they are not a trade business. All they do is selling services (project management) and purchase services and materials (project specific items) for the project on behalf of the customer. When purchasing material they cannot use predefined item numbers because the materials are unique. However, Alfa still need project managers (or there assistants) to be able to order the services and materials them self, and to "forecast" the order. Alfa's workaround uses generic item numbers in the "approval" workflow although this solution does not allow changing the item number later in case the claimant chose the wrong item.

Another difficulty concerns the "homecoming" of items. In Alfa's case, an item can be a physical item or it can be a service item, the different types of items require different workflows. Alfa would like to sign the receipt of the item in both situations; however, the ERP system only allows one setup.

Another complicated situation is the approval of invoices when buying services for the project. When ordering a service, e.g. painting of a room, you may agree upon an estimated price, but the final price in most cases will differ from the estimate. The systems logic anticipates that the price on the order in most situations will reflect the price on the invoice and in that case, the invoice approval is simple. However, Alfas situation is the opposite,

the price on the order has to be changed almost every time and the logic in the system makes it rather complicated and time consuming.

The purchase department uses two different ERP systems, Alfa's system and their main customer's SAP R/3 system. In general they find the user interface poor in both systems and a common complaint is, that the user is meet with a lot of index cards (screens) with too many data fields makes it time consuming to use the system. Choosing the right item and an approved supplier can be difficult and in many cases results in an error message. In general, the system's handling of error situations makes users that are more sporadic-users uncertain. This has coursed a lot of resistance to use the system and therefore secretaries, controllers and project assistants has been educated as super users, and are now doing most of the work in the system on behalf of the project manager or other users. In some cases, items are ordered without using the system.

Requesting items for a project is supposed to be an electronic coordination mechanism between the project management and the purchase department, allowing the purchase department to request a quotation from the supplier and place a purchase order. However, the lacks of data discipline and difficulties ensuring sufficient and accurate knowledge when making the requisition cause a lot of manual communication between the project and the purchase department.

Using Kien and Soh's framework as a lens

After collecting the empirical data, the initial analyses were conducted using Kien & Soh's (2003) framework as a lens.

Preparing the categorisation of the misfits, it became clear that the circumstances around the development of the framework were differing from the circumstances of my use of the framework. First Kien and Soh based their framework primary on written project documentation, and only included material up to the point of implementation (which I assume in this case means go-live). I do have project documentation for all phases of the Alfa project, but in this part of my research, I want to focus on experienced misfits troubling the users after the system has gone live and is stabilized. However, I decided to use the framework as a starting point, but be open to the fact, that different phases in an ERP project may bring different categories of misfits to light, although I assume Kien & Soh's categories will be equally valid for all phases. Another difference seems to be deciding what qualifies as a misfit. Kien & Soh used issue logs and change requests as the source, and therefore they did not have conflicting opinions. My data on the other hand originates from interviews with end-users and functional (IT) consultants providing different interpretations of the same situation. What some interpret as a misfit others may define as resistance to change. In order to provide a deeper insight in the nature and source of misfits, I will not disqualify any interpretation or try to reach consensus, but instead use the differences to explore the way misfits are defined. In most cases the disagreement is about whether the functionality is provided by the system or not, and for the purpose of using the framework all reported misfits are included although some of them may disqualify at a closer analysis.

Source of misfit:	Exogenous Sources			Endogenous Sources
	Country-specificity	Sector-specificity	Industry-specificity	Organizational-specificity
Input Cosmetic • Incomplete data elements • Inappropriate data format • Cumbersome interface			? ? ?	X X X
Input Substantive • Inappropriate data model			?	X
Process Cosmetic • Inadequate control functionality			?	X
Process Substantive • Inadequate operational functionality			?	X
Output Cosmetic • Inappropriate presentation			?	X
Output Substantive • Unavailable data elements			?	X

Figure 1 Misfits found at Alfa using Kien and Soh's framework

The first dimension in the framework: Source of misfit.

As shown in table 1 no country or sector specific misfits were found. This may be explained by the fact, that the ERP system has been used within the private sector in Denmark for many years. Categorising the misfit using the industry specific or organizational specific categories was not easy.

Kien and Soh define Industry-specific misfits as misfits that “*arise from the incompatibilities between the generalized practices embedded in the ERP-system and the unique practices specific to some industry*”. The system used at Alfa has been developed over many years and targeted at different industries and maybe therefore, it were very difficult to recognise the logic in the system as belonging to a specific industry. At the same time classifying Alfa as belonging to a specific industry is not strait forward: (1) when Alfa is buying material on behalf of its largest customer, the process and product characteristics from the medical industry is important. (2) When Alfa is selling project management services, the processes and product characteristics from project and service industry is important. And (3) having a history as a department at its largest customer, but now being an independent business, Alfa is not fully working according to market terms, which is most common for organisations using ERP systems. Thus, Alfa seems to have characteristics from different industries at the same time. There were several cases where the logic (practice) in the system and the logic at Alfa did not fit well, but because of the uncertainty determining if the misfits found are industry specific or not a question mark is placed in the column in table 1.

Kien and Soh’s definition of organizational-specific misfits includes differences arising from; “*differences in products offered, pursued strategies, the organizational structure, the management preferences, the user composition, and even the internal power balances that have evolved over time in each organization*”. This category is very broad and all of the misfits found at Alfa could to some extent belong to this category.

The second dimension in the framework: The nature of misfits.

The second dimension in the framework tries to clarify the nature of misfits and has three categories: Input related, process related and output related. Investigating the misfits found during the interviews, it is easy to recognise shortcomings of the modified ERP-system as belonging to these categories, some misfits did only relate to one or two categories, but the majority of misfits involved all three categories.

Findings not explained by the framework.

On the source dimension of the framework Alfas customization to fit the special relation to the largest customer point to the fact, that there seems to be another exogenous Source of misfits not included in the framework: relations to external partners (customers, suppliers, and collaborators). It could be that the relation to external partners in some cases is generic to a specific industry, sector or country, like e.g. parts of the automobile industry and therefore indirectly included. However in Alfas situation I would say this it is not the case and therefore it should be added as an independent category.

In Alfas case the configuration and customization process in it self is seen as a source of misfits. The end-user’s understanding of misfits, as they were explained during the interviews is interweaving social and technical factors. The end-user does not see the original ERP-system (IT-artefact) but the socio-technical product developed during the configuration and implementation process. Kien and Soh’s framework are focusing solely on shortcomings in the original ERP-system expressed as issues or change requests, but the empirical data from Alfa indicate that is only part of the story.

When trying to understand what influences the socio-technical design process in Alfas situation, I will take a starting point in the existing processes (1)¹ in the organisation and the ERP-system (2) (IT-artefact) before it has been modified by customizations or configuration. In the outset, there may be differences (misfits) between Alfas processes (practices) on the one hand and the generalized practices (processes) embedded in the ERP system on the other hand. As Kien and Soh suggests such differences may origin in context specific differences and in Alfa’s case partners, especially the largest customer played an important role in shaping the existing processes. This point to the fact that *partners* could be added as an exogenous source of misfits.

During a socio-technical design process, the ERP-system is configured and customized resulting in a modified ERP-system (3), and on a conceptual level, new processes (4). In Alfas case this design phase were influenced by several factors adding additional sources of misfits: Organizational characteristics, conflicting requirements/interests among organizational actors, the characteristics of the ERP-project, participating consultants (skills, knowledge and believes), and finally configuration possibilities and customizations. These additional sources of misfits are described below. In figure 2 all sources of misfit are marked as a small circle.

¹ Numbers refer to figure 2.

Organizational characteristics

Over time, a successful organization will develop business processes, which suit the competitive environment the organization is operating in and the internal organizational resources (Melville et al. 2004). Although an ERP project may be used to pursue new strategic opportunities, the existing organizational characteristics are influencing the design process and the notion of misfits. First, they played an important role in shaping the existing processes, and secondly they will constrain the socio-technical design. In the empirical material, there are many examples, but here I will emphasize one characteristic. Historically Alfa has been a department in its largest customer's organization, but is now an independent company also selling services to other customers. After the segregation from the mother company Alfa continued to provide services to the largest customer on a time and material basis and therefore they knew that in order to earn money they just had to utilize the people (resources). Financially departments were in focus not projects. Recently new customers and in some cases also the largest customer require Alfa to perform fixed price contracts. This requires a change in the financial reporting from departments to project. During the design this two perspectives on financial reporting is competing causing inconsistent configuration and customization requirements.

Conflicting requirements/interests among organizational actors

In Alfas situation, the financial department had the power to impose a specific set-up of the chart of accounts and a customization giving all financial transaction seven dimensions used to determine the specific entry. This is an example of a political factor causing a customization. The customization disrupts original functionality in the IT-system causing end-users to experience cumbersome interfaces, pure data quality, and even "missing" functionality. If the specific setup and the appurtenant customization had not been made, the user's experience with the system had been different. This point to the fact, that different actors in the organization may try to use there power position to influence the socio-technical design process to promote special interests, and that could be a source of misfits in other parts of the organization. In other cases, different departments in Alfa had requirements, which were not conflicting from a logical point of view but the standard functionality could not be configured to fulfil both.

ERP-project characteristics

Characteristics of the ERP-implementation project has been recognised as influencing the outcome of the project. Nah et al. (2003) has summarized some of the more important contributions investigating Critical Success Factors implementing ERP-systems. Most of the findings are related to common risks around large complex projects (e.g. clear goals, top management support, project champions, good project management, change management and project communication). In Alfas case some interesting characteristics about the implementation project as such has influenced the design process and the derived misfits. As described above Alfa spend almost a year defining requirements as a basis for evaluating different candidate systems. During the contract negotiation this requirements were used to define customizations to the standard system and a fixed prise contract were signed. Together with a very tight time schedule this made both the external consultants and the participants from Alfa focus on requirements fulfilment during the design phase. Thus to a very large degree neglecting both considering cross organizational process fit and the design of individual users work situation. Another consequence of defining customizations before a more careful socio-technical analysis were (in some cases unnecessary) customizations subsequently disrupting standard functionality.

ERP-system consultants/implementation partner

Another well-documented source of misfits is the difficulties obtaining sufficient knowledge about the ERP-system in order to utilize its capability (Nah et al. 2003, Robey et al. 2002). The project approach used by the implementation partner and the specialization of the consultants caused difficulties in Alfas project. The consultants had expertise within one or a few modules, but they were not able to provide a cross functional (or process oriented) view. Very late in the design process, devastating cross module issues were recognized and a wide-ranging customization had to be made.

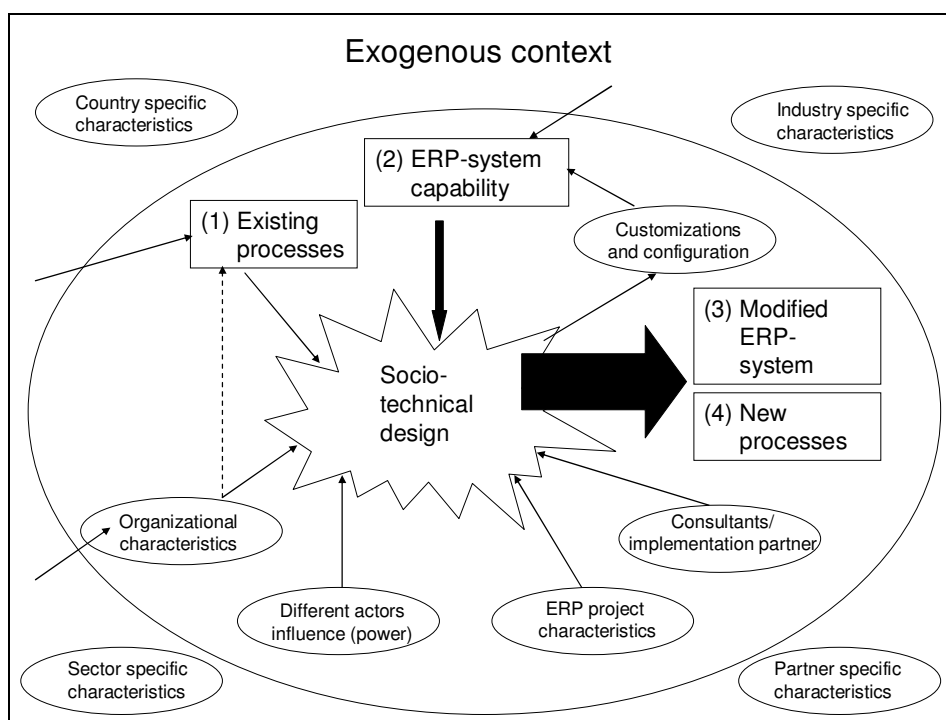


Figure 2, Sources of misfit derived from Alfas data.

Also related to the second dimension (the nature of misfits) Alfa's data pointed to new categories or at least a need for better defined subcategories. Kien and Soh's framework use input, process and output as categories. The input category is split into incomplete or inappropriate data model and cumbersome user interface. The process category is split into inadequate control functionality and inadequate operational functionality. Finally the output category is split into unavailable data elements and inappropriate presentation. These categories seem to be very general and covering all aspects of an IT artefact. From the case's data material the following groups developed:

1. Inadequate scope of the ERP-system (missing processes within existing modules)
2. Inadequate data model
3. Cumbersome user interface
4. Inadequate processes within the ERP-system
 - a. Parts of a process is missing
 - b. Stereotyped processes
 - c. Inadequate control functionality
 - d. Inadequate support for coordination and cooperative work (focus on capturing transaction data)
 - e. Inadequate process scalability (e.g. equal support for small as well as large projects)
5. Inappropriate presentation of data
 - a. Missing or pur reports
 - b. Lack of graphical representation (ability to provide overview)
 - c. Inadequate support for ad hoc analysis and simulation
6. Lack of cohesive force between the ERP-system, other IT-systems and manual procedures forming an individual's work environment.

CONCLUSION AND IMPLICATIONS

The purpose of the case study was to investigate the source and nature of misfits, as they are experienced by end-users in the Onward and upward phase of an ERP-system lifecycle. The related literature on ERP misfits presented in section 2 provides three different perspectives on ERP-system misfits: the strategic perspective, the functional perspective and the individual (work practice) perspective. In this study, the primary perspective has been the functional perspective although completely leaving out the two other perspectives has not been possible.

As a starting point analyzing the empirical findings Kien and Soh's framework has been used as a lens. From the analysis, it became clear, that the original framework did not fully explain the empirical data. The notion of misfits, and their source and nature showed to be far more complex. Derived from the empirical material business partners have been added as an exogenous source of misfits, together with five categories of endogenous sources of misfit. Organizational characteristics and different actors influence is covered by the original framework, but consultants/implementation partner, ERP-project characteristics, customizations and configuration is added as new sources of misfits. Finally on the nature dimension six new categories has been suggested instead of the original categories.

During the analysis, some interesting observations were made. Kien and Soh's framework was developed using primarily written material (issue log and change requests) documenting the ERP-projects up until the implementation. This means that they did not include evaluations of the system in use or end-users experience with the system. My research focuses on the end-users interpretation of misfits of the system in use and the empirical material showed, that when the system were put to use it was modified by configuration and customization to an extent where it became very difficult to judge if a misfit were caused by the original capability of the ERP-system, by customizations disrupting the original capability or poor configuration decision. The implication of this is that the organizations implementing ERP-systems should understand that configuring and customizing an ERP-system is resulting in an (modified) IT-artifact, which needs careful design considerations.

At the same time the implementing organization have to be aware, that from a use perspective misfits cannot be understood as simply a matter of necessary changes to the IT-artifact in order to make it work. Depending on the socio-technical design, the ERP-systems attributes may or may not cause a notion of misfit. This implies that in the investigation of sources and nature of misfits it is necessary to focus more on how the system is constraining the socio-technical design, and how a better socio-technical design can be achieved. However, this is complicated by the fact, that before the system is put to use the misfits can only be understood at a conceptual level (it has not been used in a real situation) and there might therefore be a tendency to focus on the ERP-system as an IT artifact with properties isolated from the use situation. However when the system is evaluated by the users after a period of use the properties of the system is judged by how it constrain or improve the users work situation, technical and social misfits are mixed and interweaved because at the end what matters is how the system and manual parts of the processes come together.

REFERENCES

- Bernroider & Kock (2000), "Differences in Characteristics of the ERP Systems Selection Process Between Small or Medium and Large Organisations", *Proc. Of the Sixth Americas Conference on Information Systems (AMCIS 2000)*
- Chang et al. (2000), A Delphi Examination of public sector ERP Implementation Issues, *International Conference on Information Systems, 2000*
- Thomas H. Davenport (1998), "Putting the Enterprise into the Enterprise System", *Harvard Business Review July-August 1998*.
- Keil, M., and Tiwana A. (2005), "Beyond Cost: The Drivers of COTS Application Value," *IEEE Software, Vol. 22, No. 3 (May/June), 2005*
- Kien, Sia Siew and Soh, Christina (2003), "An Exploratory Analysis of the Sources and Nature of Misfits in ERP Implementations". In *Second-wave Enterprise Resource Planning Systems, edited by Shanks et al., Cambridge University Press, 2003*.
- Klein, H. and Myers, M. (1999), A set of principles for conducting and evaluating interpretive field studies in information systems, *MIS Quarterly, Vol 23 No. 1 March 1999*.
- Markus L., and Tanis, C. (2000), "The Enterprise Systems Experience - From adoption to success", In R. W. Zmud, ED, *Framing the Domains of IT Research: Glimpsing the Future Through the Past*. Cincinnati, OH: Pinnaflex Educational Resources, Inc. 2000.
- Melville et al. (2004), "Information Technology and Organizational Performance: An Integrative Model of IT Business Value", *MISQ, Volume 28, Number 2, June 2004*.
- Nah, F. F., Zuckweiler, K. M., and Lau, J. L., (2003), "ERP Implementation: Chief Information Officers' Perceptions of Critical Success Factors, *International Journal of Human-Computer Interaction, 16(1), 2003, p. 5-22*.
- Soh, C., Kien, S.S., Tay-Tay, J. (2000), Enterprise resource planning: cultural fits and misfits: is ERP a universal solution? *Communications of the ACM, Volume 43, Issue 4 (April 2000)*

Shang, Shari & Seddon, B. (2002), Assessing and Managing the Benefits of Enterprise Systems: The Business Manager's Perspective, *Information Systems Journal* (2002) 12, 271-299

Suchman, Lucy (1995), Make work visible, *Communication of the ACM*, September 1995/vol. 38, No 9

Robey et al. (2002), Learning to Implement Enterprise Systems: An Exploratory Study of the Dialectics of Change, *Journal of Management Information Systems* (19:1), 2002

COPYRIGHT

Lene Pries-Heje © 2006. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.