

## THE DARK SIDE OF THE MOON: SOME LESSONS FROM DIFFICULT IMPLEMENTATIONS OF ERP SYSTEMS

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**Abstract:** Although the implementation of an ERP system is known as being a hard, hazardous and difficult task, most of the communication on the subject focuses on - and generalises from - success stories. We have chosen here to discuss several difficult implementations of ERP systems made in France within the next five years. The context of these case studies is explained, the difficulties which have been encountered are listed and tentative explanations are provided. We finally emphasise some basic and pragmatic principles which should remain in mind while installing such systems.

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**Key words :** Information systems, implementation, organisational factors, social impact of automation

### 1. INTRODUCTION

While the web site of each ERP (Enterprise Resource Planning) editor describes tens of success stories, some authors consider that between one quarter and one half of the implementations of ERP systems fail (Stewart, 2002). Anyway, the implementation of such huge information systems is a complex and risky exercise (see e.g. Davenport, 2000): each company has customers, and communicating on its own difficulties while implementing a "modern" management system is not seen as a good advertisement. As a consequence, "positive" points of view explaining the reasons of success are more easy to find in the literature than a "negative" one trying to explain why the difficulties have occurred (see for instance Hammer and Champy, 2001 or Cameron and Quinn, 1999). Nevertheless, the notion of "failure" or "success" is rather relative in an area where nearly all the projects are late and exceed the initial budgets.

We have chosen here to describe ERP implementation projects which have all suffered from major problems, and have sometimes been the origin of important

difficulties for the companies. The apparent causes of these problems are compared to the classical "key factors of success" which can be found in the literature.

The context and the progress of the studied projects are described in section 2, and the main origins of the encountered difficulties are listed in section 3. Some key points are emphasised in section 4, whereas some research perspectives are shortly described in the conclusion.

### 2. THE PROJECTS

#### *2.1 Context*

Most of the described projects concern companies which managers have had cross-exchanges within an informal meeting group between ERP users, co-ordinated by the author during year 2000. Others concern projects in which the author has been more directly involved.

This "user group" was born with the idea to allow exchanges of experiences in a very free way. An interesting point was that the companies were belonging to different areas, having for consequence to set their priority on different ERP modules. This level of maturity varying according to the considered modules allowed each user to provide his own expertise, and to take advantage of a different expertise from other companies.

In the following, the names of the companies have been changed but their main characteristics are real.

## 2.2 Why implementing an ERP ?

The reasons of the listed companies for implementing an ERP were rather common:

- *obsolescence of old systems*. Most of the existing systems were not Y2K and Euro compliant.

- *integration of functions (horizontal integration)*. Even the smallest companies planned to replace a number of heterogeneous software by the ERP. For the largest ones, several tens of software, requiring continuous maintenance and upgrade, were to be replaced. In some cases, downsizing the Information Processing Department was enough to financially justify the purchase of the ERP.

- *real-time multi-site information management (vertical integration)*. Nowadays, most of the companies have multiple plants. Optimising the control and synchronisation of the information and material flow between companies requires to link them by a unique information system, provided by the ERP (a Supply Chain Management system can be required to optimise the material flow synchronisation between sites (Stadtler et al. 2000)). This coordination should allow a (almost) real-time cost control among factories. Even if this point was not an immediate objective, it is clear that it was one of the reasons why the ERP was always a choice made at the group level.

All the implementation projects have involved people from the software editor, and more than a half of them other external consultants.

## 2.3 A global view on the projects

**BIG:** This company belongs to an important industrial group manufacturing complex products, the considered plant having more than 1000 employees. In the users-meetings, BIG had the oldest experience in ERP systems: their system was installed as early as 1990, after a three years period of choice. Three years had been required to implement the system but since this implementation was already rather old, this company has mainly brought its experience on the "post implementation" aspects. After seven years of use, the following considerations could be drawn:

- the system was working, and even if all the initial objectives were still not met, its "basic" use was considered as satisfactory,

In spite of this, several points were to be noticed:

- the system was completely managed by the Information Processing Department: it was concerning maintenance and version upgrade, but also many aspects of the daily use of the system (release of orders, performance of a master production planning, scheduling...). The main reason was that the turn-over in a large company is important, and most of the users which have had a training on the ERP during the implementation phase had changed their position through time. The new generations of users had learnt on the job, and the level of skill had dramatically decreased. As a consequence, many daily transactions had been progressively and implicitly transferred to people that had kept this competence, i.e. the Information Processing Department. The head of this department could be considered as Deputy-Production Manager.

**SIMPLEX:** The implementation was concerning a plant employing 200 persons, belonging to an important international group manufacturing simple products in mass production. The ERP implementation was planned in parallel on several plants of the group, but the sequence of deployment of the modules was different in the various sites according to its specificity. The experience gained on a module (*capitalisation*) by a site was to be transferred to the other as a second step (*support*). A key-user committee, which members had been deeply trained on the ERP, had been resolved for the implementation phase at the group level. These users were supposed to come back to their initial job when the system would be operating. It has progressively be understood that this group had to be a permanent one, managing periodic training, version upgrade, implementation of new modules, etc.

**COMPLEX:** COMPLEX is an autonomous entity of more than 1000 employees belonging to an important industrial group and manufacturing highly customisable complex products. The ERP had been chosen at the group level, and successfully deployed in several plants. A local project team had been built, and an ambitious Business Process Reengineering program (Hammer and Champy 2001) launched in order to involve the users in the definition of the new management processes. The members of the project team had been highly trained of the system, and one of their task during this BPR phase was to be sure that the defined processes were consistent with the standard processes of the ERP. Scenarios have then been built in order to realise a prototype software on the ERP and were to be tested when the experts from the group, who had already implemented the ERP in several plants, intervened. They did not considered local work anymore, and the standard processes of the group were implemented. After several months, the technical implementation can be considered as a

success - the processes are operative - but the acceptance of the system remain poor, the users having the feeling that their wishes had not been taken into account.

DYNA: An autonomous entity of around 250 persons, manufacturing rather simple but highly configurable products. This company was cited as an example in all the region for its dynamism and results. It had just moved into completely new buildings and was the pilot site of the ERP implementation for the group. Several experienced persons had been especially hired for the project which was supposed to long for six months. After one year, it was clear that one year more was required to implement the system. Several persons of the project group were fired.

DIR: Autonomous company belonging to a large industrial group, with more than 800 employees in the considered site. DIR manufactures sub-systems for assembly in complex products. A project group including key users was built. The project was supposed to take 2 years, but was one year late. A chaotic period arose when the system was finally made operational: the ratio of orders delivered on time crashed from 85% with the previous system to 20%... When the results finally became acceptable, all the people were discouraged, and it was considered that a stand-by period was necessary before trying to meet the initial improvement objectives. The project team was finally scattered. After one more year, the system was less and less used, and as a consequence, the divergence between its internal data and reality was increasing, encouraging the users to develop their own local systems. The decision was made at the higher level to set new efforts on the ERP, and a new project group was built. It tries presently to convince people to abandon the tools that they have developed and to re-focus on the ERP.

MEDIX: A company of around 200 persons, belonging to a large group, manufacturing a great variety of small medical products. Only few modules of the ERP were to be installed (Manufacturing, Inventory Management, Finance) and the project duration was estimated to one year. The system was made operative with a lateness of several months. In the meantime, the hardware had been up-sized two times in order to obtain acceptable processing times. The first four months of use are qualified as "hellish" by the head of the company: no billing, false inventories, incomplete article database, difficult cost evaluation, etc. This period was followed by twelve months of "laborious continuous improvement", followed by nine months of "unsatisfactory but stable situation".

FOOD: An important group in the "food and beverage" industry, composed by entities belonging to the group for a long time, and also by other companies recently acquired by the group. The ERP solution was chosen at the group level in order to make easier the financial control of all the entities by

the holding. The implementation in the oldest entities of the group, mainly concerning financial and marketing modules, was afterwards considered as "difficult but satisfactory". Nevertheless, the implementation was difficult to launch in the new entities of the company, fully satisfied by their old systems internally developed.

CHEMIS: US group in the chemical industry with several production sites in France and Italy. An ERP had been chosen as an integration tool for the group, and installed in the US. The implementation was then planned in France and Italy, and experts who have participated to the implementation in the US were sent in order to manage the implementation, in co-operation with the local engineers. After some months working with the European project groups, the US experts were in expectation: "In the US sites, when a decision is made at the highest level, it is applied and only the means are discussed. In France and Italy, you have to discuss at each level in order to justify the decision makings. Things are much more difficult".

After having switched to the ERP system in Italy, it has been necessary to hire several tens of persons during three months in order to make manual billing. Nevertheless, this ERP customer is now included in the "success stories" of the Web site of the ERP editor.

### 2.3 Preliminary comments

Of course, we do not pretend that these examples are fully representative from the difficulties in implementing an ERP. Nevertheless, they concern companies which can be considered as randomly chosen (in a given area). Speaking of *failures* can be considered as an overstatement (after all, most of the systems are now properly working), but we must notice that 100% of the projects on which we have had a precise information in the above mentioned context have suffered from important difficulties. Implementing a complex system in a company, and by doing so changing the habits of hundreds of persons in their daily work, will never be an easy task. Nevertheless, we think that some difficulties could sometimes be identified at an early stage of the project, and that solutions could be found in order to decrease their effects. In the following section, these difficulties are compared to some problems often stated in the literature.

## 3. A TENTATIVE OF EXPLANATION

### 3.1 Success factors of ERP implementation

The success factors for implementing an ERP are generally considered as (Stewart, 2002):

*Ability to accept changes.* An ERP implementation

requires to set into question the usual business processes. For several authors, this cannot be done without cultural change (Cameron and Quinn, 1999), but for others (Bancroft et al., 1998), it requires to understand what is the corporate culture, which should be preserved through changes.

*Communication.* This point is often considered as of prime importance (see e.g. Bancroft et al. 1998): during a period of intensive changes, people need to be secured, and their ability to accept changes also depends on their confidence in the project, and on how it will influence their future professional career.

*High level support.* Changes imply to set into question the way the decisions are made, and even the responsibilities of decision makers. The required changes should be supported by the top-management.

*Find a capable project manager.* The personality and competence of the project manager is usually considered as important for the success.

*Build a balanced team.* An efficient team is usually considered as involving key-users, high level decision makers, Information System members and experts in the ERP modules.

*Select a good methodology.* Like every long and complex project, an ERP implementation requires a methodology. Each software editor suggests its own method, but they of course have many points in common.

*Train all the users.* Training is usually considered as representing 30% of the budget.

### 3.2 A short analysis of the difficulties

Even if the key success factor list suggested above is not exhaustive, many of them were satisfied by all the considered projects.

The message on "balanced team building" seems to have been heard. Impressive competencies were present in all the teams, and the implication of the key users was a daily reality.

The implementation method and plan had been built in co-operation with the software editors and the consultants. The suggested methods are still considered as "good" by most of the companies, even if the time needed to perform each step was systematically too short.

The capacity of the team manager has only be set into question in one project.

Communication was considered as a basic need by each team, and many information meetings were performed before and during the implementation process. Information letters relating the state of the

implementation were often published, and dedicated web sites have been created in several companies. Each member of the project team had been trained, then each user on the module he used.

Nevertheless, some of the key factors have apparently been underestimated:

*Operational high level support.* It was clear in each company that the Top Management level was supposed to support the project. This support has often had problems to pass from a formal level (participation to meetings, editorial in the Information Letter, etc.) to an operational level (conflict management). As an example, the main workshop manager of DYNA did not agree with the necessity to formalise routings. The products were highly configurable, and the definition drawings were directly sent to the workshop, which collected the required raw materials using Kanbans. As a consequence, a middle term material requirement planning was not possible, nor a short term scheduling. All the members of the project team were convinced that he was wrong, but it has been considered by the head of the company that the workshop manager was a key person, and that it was better to avoid any conflict with him.

*Lack of training.* An important effort had been made in all the companies in that area. All the project manager now agree for saying that a 30% training budget is still not enough... Moreover, as shown by the BIG experience, continuous, or at least periodical training seem to be necessary. A solution in order to minimise the costs can be the perpetuation of a part of the project team, the support and training of the users being added to its functions (SIMPLEX experiment).

Other causes, among which some are seldom considered in the literature, may explain some other problems:

*Quality of the technical data.* The quality of the data, e.g. the technical data like list of articles, bills of materials, routings etc. is a key factor for a successful implementation of a production management system, and with greater reason, of an ERP. In spite of this, this effort has been underestimated in all the projects, with the limit case of COMPLEX where the effort in order to make the technical data reliable was only estimated several months after the project had begun. Several thousands of hours were required, for which no budget had been planned.

*Resistance to external changes.* All the project managers have noticed that the users are often ready to accept and even to promote the changes when they are involved in the process (see e.g. the COMPLEX BPR project). Nevertheless, a condition is in our opinion that the necessity to change is accepted by the users. In many cases, the choice of an ERP is a top-down decision were the system is prescribed by the

group. In case of large multi-site companies which have an important turn-over inside the group, a corporate culture may exist that helps to accept a top-down necessity to change. In case of very autonomous entities, a "site" culture can grow through years, inducing a resistance to changes imposed by the "group", seen as attempts to set into question the autonomy of the site. This is particularly true for plants of the South West of France in which the mobility of the operators remains very poor, being usually attached to their region of origin. As an illustration, more than 70% of the employees of DYNA were born in a place less than 100 km distant from the plant. In that case, fighting against the ERP can be considered as resisting to a centralisation project setting into question the autonomy of the site. The situation is still worst when the company has been bought by a growing and successful group after having been faced to financial difficulties (FOOD): each action of the group on the company can in that case be interpreted as an expression of contempt, or as expressing a doubt on their competence.

*Competence of the consultants.* The competence of the consultants has been considered as a critical success factor for all the companies. Y2K and Euro have induced a high number of projects at the same time in Europe, and Consultancy firms have had to find an important number of new experts, some of them having clearly a too short experience. Finding the right person was considered as more important than choosing the right Consultancy firm.

*Self-confidence.* We have had the opportunity to discuss with some project managers and with other members of the project teams before the project really begins. In all these cases, we have been impressed by their self-confidence and serenity. Most of the projects in which they had participated before had suffered from important problems and delays, and it was clear for all of them that implementing an ERP is a difficult task. Nevertheless, they all thought that they had learnt a lot from their previous experiences. Moreover, they were now leading the project: everything would be easier... We have for instance attended a meeting between BIG and DYNA, where DYNA was supposed to learn from the long experience of BIG in the ERP implementation. Unfortunately, the message of BIG could be summarised as "It will be very difficult. What you want is too complex. Try to make operative the most simple system possible". After that, we have been surprised to see that the very young project manager of DYNA began to give advises to BIG's one...

The difficulties are generally not underestimated, but the project group often overestimates its own capacity to overcome them.

*Adaptation of the system to specific needs.* In all the companies, the ERP was replacing one or several old systems, including many additional tools developed through time. Even if an ERP can be configured to better satisfy specific needs (i.e. at the interface level

using tools like ABAP in SAP R/3, or using OLAP tools for building specific performance indicators), this configuration is an "additional" and difficult work which had been delayed by all the companies, considering that solving the difficulties that the projects were facing was the priority.

As a consequence, the users often give up a mastered and customised system for an almost unknown standard one. Moreover, the use of additional tools is often forbidden when the ERP is installed, in order to be sure that there is no leak in the information flow. During our meetings, the companies have set the adaptation of the system at the top of the list of their common preoccupations, at the same level than the management of the relationship with sub-contractors, which also seems to be a problem for each company.

#### 4. SOME GUIDELINES

It would be presumptuous to claim to have definitive solutions on the base of few experiments. Nevertheless, we think that the usual lists of key factors for success could be complemented by others:

- the budget of an ERP implementation is often very important. Nevertheless, it seems that training still requires an effort, and that the budget for increasing the data reliability is systematically underestimated, perhaps because it emphasises problems which were previously hidden. Also, we think that adapting some subsidiary aspects of the ERP to the users needs is not a waste but a condition of acceptance, considering that it usually replaces very familiar tools.

- in several the European countries like France, the first levels of operators are in majority people who do not have an important professional mobility (which is not true for the managerial staff for instance). Together with the business concentration which has more or less recently obliged many SMEs to integrate larger and distant industrial groups, it leads to possible conflicts between a *site* culture and an *industrial group* culture. When a *site* tool (the ERP), which gives a framework for all the company's daily life, is chosen by the *group*, this choice may crystallised a latent conflict.

- the risk evaluation that should be performed for each step of the implementation planning before anything begins is in our opinion a good indicator on the self-confidence of the project team. The risks often are identified but only very simple actions are usually considered as being sufficient to control them. In that case, it is perhaps necessary to add more experienced (pessimistic ?) persons to the project group.

#### 5. CONCLUSION AND PERSPECTIVES

Installing a complex tool like an ERP in a complex system like a company will always remain a difficult

task. Many "traps" have been identified for ten years. The implementation methodologies are more and more efficient, and experienced people are now available, even if they remain a scarce resource. After large sites of industrial groups, the typical implementations now concern smaller plants, which do not always have an important background in industrial management, and which have sometimes important cultural specificities. We have tried to emphasise here that methodological answers are not enough for these companies, who could also need a sociological approach.

Considering the last point of section 3, a project has been launched, aiming at developing a CASE tool for Decision Support Systems development. Each DSS could be "plugged" on ERP systems but would send back their results to the main information system in order to keep the continuity of the data flow (Geneste et al. 2001, Grabot et al. 2001).

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