

# The IT culture as an obstacle to the adoption of an ERP: Case of a high-tech SME

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## Summary

Among the characteristics considered as success factors in the adoption of an ERP, the experience of the company in information technology project holds the attention of many authors. In the same time, these researches put forward resistance to change as a main risk factor depending the professional habits and culture of the employees. Few researches has been done about firms whom the activity is IT based and the research question of this article is: may the assumed success factor “experience of the firm in IT” turns out to be a risk factor in ERP implementation project? The case study from which this article is elaborated is about a high-tech SME specialised in broadcast technology for media corporations (TV and radio channels). When the firm tried to adopt itself an ERP, its expertise in IT project management turned out to be an unfavourable factor rather than a favourable one because of the professional culture associated to this expertise. The literature analysis is based on theories related to factors dealing with resistance and conflicts in ERP implementation. Following a presentation of the company studied, the empirical section describes the lessons that may be deducted from the eight semi-directive interviews conducted. With this in mind, the arguments are supported by a certain declarations made by the individuals interviewed. The principal idea put forward in conclusion is the interest of being out of considering well-used “success and risk factors” approaches from a dual perspective and to adopt a more contextual consideration of assumed capabilities of firm to implement an ERP.

**Key words:** ERP, key factors, conflicts, culture, ICT expertise

## Introduction

For more than 10 years, a lot of companies have been taking the advantage of the ERP development to update their information system and to benefit from an integrated functional infrastructure. In Information Systems research these integrated applications have been the subject of many research projects based on large companies most of the time. In the present time, ERP editors' are targeting also SMEs with adapted solutions to modernize their applications or even to allow them to be interfaced with the ones of their customers or suppliers. Among the characteristics considered as success factors in the adoption of an ERP, the experience of the company in information technology project holds the attention of many authors (Lapointe & Rivard, 2005; Akkermans & Van Helden 2002; Markus *et al.*, 2000; Grover *et al.*, 1995; Wilcocks & Griffiths, 1994; Barki *et al.*, 1993). In the same time, these researches put forward resistance to change as a main risk factor depending the professional habits and culture of the employees. Few researches has been done about firms whom the activity is IT based and the research question of this article is: may the assumed success factor "experience of the firm in IT" turns out to be a risk factor in ERP implementation project?

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## Literature analysis

Appeared at the beginning of the 1990's, ERP (Enterprise Resource Planning) are the heart of the information systems of more and more companies. The investments made in this type of IT are often motivated by the rationalisation allowed by the integration of processes (Markus, 2000). These applications respond to a certain number of inconveniences discovered during the evaluation of information systems and originating principally from their heterogeneous and patchwork construction (Reix, 2004): problems related to the communication of data from different domains, to the difficulty of reaching synthesis status, to the high maintenance costs due to the heterogeneous nature of the application fleet or even to the difficulty involved in training users to the different application environments proposed. Among the advantages ignored regarding the ERPs, we discover several elements that are involved in the logic of rationalization of the company information system and in the resulting organization: the conception of a unique database, the deployment of standard processes through different company functions, the availability of reliable monitoring indicators, etc.

In management science, the literature on ERP can be divided into two types of work: one concentrated on conditions, *ex ante*, associated with ERP project success and failure factors and the other concentrating on the induced effects (Robey *et al.*, 2002). Finally, we consider that a multitude of exogenous and endogenous elements are likely to put the different project stages at risk (Markus, 2000). Based on the study of about 40 articles on the subject, the work identifies and organizes thus no less than 22 different risk factors!

The case of the ERPs is, effectively, probably one of the most complete illustrations regarding changes induced by the deployment of an information system. Their functional model consists into adopting and applying "business best practices" considered for the sector in which the firm competes. In other words, with an ERP, priority is given to the installation of "standard modules" instead of specific developments. In that way, the adaptation of the application to the particularities of the firm is confined to the configuration of those modules (Davenport, 1998). A form of inflexibility is therefore put forward and some authors even go so far as to consider this operation mode as a new form of Taylorism (Gilbert & Leclair, 2004)!

Leaving company particularities in the background and implementing pre-established process models is not without potential problems of resistance by employees. These problems can be specific to some individuals or may

even grow into inter-personnel or inter-group conflicts (Barki & Hartwick, 2001). The efficiency of an ERP deployment project includes therefore a strong social character that must not be neglected for the risk of failure (Besson, 1999). Our analysis of the literature allows us to identify two levels of resistance from participants: the first concerns the operational side and the second concerns social and political aspects.

**Table 1.** Conflicts related to the installation of an ERP

	Type of conflict	Examples of associated work
Operation dimension	Conflicts about the definition and the execution of tasks that the users must fulfil.	Robey <i>et al.</i> 2002; Markus & Tanis, 2000; Larif & Lessorbe, 2004
	Conflicts about the new professional skills	Robey <i>et al.</i> 2002; Markus & Tanis, 2000; Newman & Westrup, 2005
Sociopolitical dimension	Conflicts of values	Robey <i>et al.</i> 2002; Aubert <i>et al.</i> , 2002; Menard & Bernier, 2004
	Conflict due to a loss of power	Hart & Saunders 1997; Watson <i>et al.</i> 1999; Jaspersen <i>et al.</i> , 2002.; Bancroft-Truner & Morley, 2002

1) *The conflicts regarding the definition of task execution.* Some frictions may arise in determination of the "best practices" that will be adopted when configuring the ERP (examples: the manner of establishing invoices or orders, data collection and coding of articles, the validation process of internal documents). Robey *et al.* (2002) reveals that the problem posed by the ERP was less the capacity of the company to manage change but more so the difficulty of users to understand the way they were supposed to complete their tasks. For Besson (1999), these conflicts may first raise internally in the form of the confrontation of different processes for the same task involving several participants of the company. They can also appear externally by the alignment of the company policy with the "best practices" considered with the ERP implementation. In that case, conflicts are often illustrated by users claiming for a better consideration of the specificities of their needs (Besson, 1999; Markus & Tanis 2000; Larif & Lessorbe, 2004) and roundabout usages of ERP functions (Davenport, 1998; Markus & Tanis, 2000; Gilbert & Leclair, 2004).

2) *The competencies conflicts* are about the expertise required for the completion of the task rather than the manner in which this will be completed. The job of accounting manager is one of the classic illustrations of professional changes induced by an integrated information system. While the job included, up to the appearance of the ERP, an intense work of collection, aggregation, the synthesis of accounting and financial data these tasks are now mostly automated by the ERP. The reduction of low added value tasks has thus led accounting manager to be more focused on analysis and consulting tasks.

3) *Value conflicts* concern the perceived objectives assigned in terms of value creation (Aubert *et al.*, 2002). For instance, in the hospital sector new processes imposed by the ERP were perceived like a market takeover attempt inconsistent with a public-service mission (Besson, 1999; Ménard C. & Bernier C. (2004). In private-sector companies this type of conflict because of the finality of a profession or an institution may appear in different forms. Among these, we could talk about the well-known "Moscow eye" to which these types of IT are often compared by users.

4) *Power conflicts* concern the distribution of autonomy and the influence capability of participants. On one hand, ERPs can give key users more power by providing them real-time data processing ability (Davenport, 1998). On the other hand, they can increase the transversality of tasks and then reduce the independence of employees (Markus, 1983). As highlighted by Gilbert & Leclair (2004), in a classic management system, the individuals are not generally forced to give the information required by their collaborators produced of their own individual work. The organisation induced by the ERP brings a higher number of mutual instructions. The integration of the Information System thus represents a management vehicle of interdependencies (Rockart & Short, 1989) by which the user prescribes the conditions and the means of their colleagues.

Given the organizational upheavals induced by the deployment of an ERP, lot of of research projects agree that a project of this type can not be correctly completed with few implication of the general management. The hierarchy must be a "sponsor" (Davenport, 1998; Markus & Tanis, 2000) of the project and make its "publicity" by assorting credible objectives (Goodman & Sproull, 1990).

However, according to the threats perceived by the installation of an Information System, the users may use their influence power to promote or even to inhibit the project (Beaudry & Pinsonneault, 2005). Indeed, power should not be perceived only as a vehicle of formal decision granted by an authority or by withheld resources. At the heart of an organization every

actor has a reasonably large margin of freedom to gradually increase their power (Crozier & Friedberg, 1977). Those sociopolitical games illustrate the management problem induced by information systems.

Therefore, it is not surprising to observe that the experience of a company in the area of information technology project management is thus considered as a key competency (Wilcocks & Griffiths, 1994; Akkermans & Van Helden, 2002) in the deployment of a sophisticated information system like ERP is. However, for Crozier & Friedberg (1977), key skills existing in an enterprise may also represent action levers in such power games. In this case, individuals can use their recognized experiences as a vector of influence and as a force of persuasion to orient choices in the way of their personal interests. Consequently, the issue regarding the ambivalent character of the enterprise expertise in the domain of IT must be raised. To what extent can this expertise be used as positive levers for the deployment of an ERP?

The empirical section puts forward the fact that such a property can turn out to be an other inhibitor of ERP project.

## **Case-study**

NÉTIA, a French SME (located near Montpellier), is one of the leaders in broadcasting (40 countries covered). Its customers are TV channels and public radios like, BBC, ABC, Rai uno, Canal+, France Télévision, etc. Created in 1993, the company employs 70 persons spread over two sites in France and subsidiaries abroad (Amsterdam, Liège, Rome and New York). The firm is an IT service agency dealing with the deployment of audio and video data digital solutions. Besides development, its activity consists into implementation management (consulting, process analyse, engineering, training, maintenance and evolution).

The information system of Nétia had been developed progressively by ad-hoc initiatives and requirements. These isolated and independent developments have been involving a lack of data coherence as well as an excessive growth in the number of applications required to treat these developments. Consequently, a large part of the employee tasks are used up re-typing data in order to feed all of the parallel systems installed to response to local needs. For example, the control service, had developed a set of Excel programs to partially deal with a divided use of the SAGE software used for the accountancy. Each process (the arrival of an order form, a delivery form, etc) corresponds to a data entry for one or more shared Excel files (on the server there is a file for the order forms, another

for the clients, another for prospects, etc.) The operational structure of the information system consists therefore of office files from which the data is manually extracted in order to produce management indicators required for the control of the company. Thus, the loss in productivity becomes apparent not only in the multiple repeated data entries due to the absence of information integration, but also by redundant procedures attempting to ensure a type of reliability by the systematic and repetitive cross referencing of data related to operation. The lack of integration of the information system is also highlighted by data access problems. Thus, the project coordinator can not know the status of the provisions of relating to the client order in progress apart from directly telephoning the logistics service who in turn must consult the SAGE application. Given that the transaction history is dispersed throughout several isolated management applications, purchase tracking (in the case of client feedback or use of a guarantee) is difficult to reconstitute. Client invoicing is not automatically triggered by a delivery. Logistic managers must enter the information in an Excel file shared with the accounts department in order to in a state the process, etc.

It is thus the ensemble of the administrative personnel who was asking of the deployment of an integrated information system to ensure a more coherent and efficient management of the tasks. We can at this point highlight the originality of this case, where the project is not requested by the management but directly by the users who are usually described in documentation about the ERPs as potential resistance vectors.

Two failed attempts at the integration of an information system have been made at Nétia. In 1998, a project to install an ERP was launched. The coordinator in charge of the project carried out an initial study that lasted more than six months and ended by the abort of the project. The second tentative had been structured around a CRM application which was planned to be purchased in 2002. Tainted by an initial feeling of failure, this second attempt was also abandoned.

## **Research methodology**

If Nétia is expert in IT project management, from a client point of view, it turned out to be unable to apply its expertise to itself. Different reasons incited us to adopt an “action-research” methodology for this purpose:

- Because of the aborted previous projects, the company was eager of recommendations about IS project management from researcher point of view.

- The SME had a short budget concerning this project and could not afford buying the services of a consulting agency.
- In information systems research, “action-research” is turning out to be a more popular and accepted methodology (Baskerville & Myers, 2004).

Our interventions began the first semester 2005 and the first step conceived with top managers was to identify the explicit and tacit conflicts explaining the ERP project rejection. We conducted 8 semi-directive interviews spread out over four months.

We had to avoid an approach consisting of the perception of the company culture as a whole. It was more consistent to identify the existing subcultures and examine in which ways these drove the company into dead-end situations. The interviews were divided among representative employees of the different professions (see table 2).

**Table 2: Interviewees conducted**

Initials	Service	Function
VB	Accounting	Management coordinator
AG	Computer Dept.	Computer Dept. Coordinator
PV	Computer Dept.	Software developer
SR	Accounting	Supplier invoicing
SB	Accounting	Client invoicing, salaries
OC	Operations	Project Director
PD	Logistics	Logistics coordinator
XZ	Sales	Sales coordinator

The interview grid used (see appendix) has been conceived with reference to the risk factor lists of Markus *et al.* (2000), Akkermans & Van Helden (2002), Besson *et al.* (2002). To avoid some reluctance the interviews were realised in a one-to-one interaction and with an anonymous format of the responses collected. During a first part of the interviews the employee was asked to select on the grid, the factors he considered as explaining the rejection of the project. In a second part, we asked him to explain what happened and to develop his perceived dissents and tensions between employees revealed by the ERP project. Each interview lasted around one and a half hours.

## Results and discussion

The interviews conducted allowed us to identify a profound opposition between the computer personnel and the administrative personnel (management control and logistics in particular) toward the ERP project.

### A conflict of values

During the interviews, the developers and the programmers put forward “the inconsistency of ERPs to the needs of Nétia” as the official reason of their reluctance. Nevertheless, other interviews done allowed us to note the following declarations that highlight a conflict of values:

- Project coordinator statement: *“my analysis on the lack of evolution and the integration of an Information System is the following: the computer staff are really expert regarding computer based applications. So, they develop the tools they like without worrying about coherence. Thus we could not impose the development of collaborative systems despite the overwhelming number of meetings!”*
- Management controller statement: *“When they (editor's note: the programmers) examined the interface and the application functions they were systematically pessimistic: I would have done better than that, in my opinion it's not great!”*
- Programmer-developer statement: *“I prefer non proprietary tools”.*

So, here the conflict of values concerns the principal of adopting a “ready to use application” like an ERP instead of preferring the development of solutions programmed by the developers themselves. In this context, it seems that the strong IT culture works against the acquisition of professional applications offered on the market. One of the management controllers even confided: *« If the programmers were not at the heart of the company activity, we would not have had these problems. »* We can now draw parallels to this conflict of values between programmers and users to the work of Ballé & Peaucelle (1972) which exposed that the culture of computer employees often collides with the logic of managers. The last ones are more concentrated on the completion of their work rather than on how the applications used to this purpose are constructed or should be constructed.

However, a second level of analysis reveals that this apparent stalemate situation hides a power conflict.

### **A power conflict**

Programmers and developers represent a key competence asset for Nétia. Effectively, the broadcast software's developed by the company are in no way standard or straightforward applications that can be bought to a classical editor. Consisting of solutions invoiced for several K€, these programs ensure the storage, the management and broadcasting of audio and video programs. Therefore, very specific skills are required regarding sound, image and storage (on servers of several Terabytes), broadcasting by satellite, etc.

The computer programmers in the company represent a reasonably rare workforce on the market and this gives them some power with regards to the hierarchy. Thus, they have gained, overtime, strong independence in the completion of their tasks. « *I decide on my own objectives!* » declared one of the computer coordinators interviewed. An administration coordinator described for us the characteristic example of holiday management: “*The programmers were accustomed to freely organizing their work depending on the tasks and on the assignments to be completed. They do not really respect the procedures for taking holidays. Holidays are taken without being reserved. Instead of filling out the relevant forms and having them validated by the hierarchy, the requests (when they are made) usually take the form of an informal conversation*”. However, the installation of an ERP implies the deployment of formal processes that are inconsistent with this type of *ad hoc* processes. Regarded as a control tool, such a system represents a threat for the developers and programmers to the independence that they have gained.

For their part, the top managers have, until now, been passive and they have avoided imposing this unpopular solution to the computer personal. An administration coordinator stated: “*If we really wanted to impose a standard solution, we could. However, this would mean interfering with the developers. But they are the makers of the programs sold, so...*” Moreover, the fact that there has been no concrete or major prejudice due to the unreliability of the information system does not particularly motivate top managers to no more settling for this situation. « *Regarding the successful installation, the management favours the R&D, only the R&D. . . the rest, such as improving organization, is not considered as vital.* » The computer coordinator told us his feelings according to which this lack of attitude by the management could be explained by « *a lack of awareness of the necessity to modernize the information system* ». However, the same person declared not doing all that was necessary in order to draw the attention of management to this point...

## Conclusion

Nearly all of the work done on the resistance to change resulting from the possible deployments of an ERP was concentrated on the opposition of users to the operation mode of acquiring the ERP. Moreover, it is often considered important to involve the « key users » in the project team from the launching phase. One unique point about the case study is that the main inhibiting factor was not the users themselves (in this case they were asking for the ERP) but the computer employees who were opposed to the idea of using a program package made by another company. Certainly perceived as a potential threat to their independence, the preference for a “ready to use application” bought to an editor could also be interpreted as raising doubts regarding their expertise. Even if the present information system results in reduced productivity, these losses appear not to be judged sufficient by management to proceed with the installation of a new system to which the computer stuff are opposed and thus risk a degradation of the social climate.

In IS research, most of the articles about ERP consider a lack of IT experience as a *risk factor*. However, the case study of this article highlights the fact that, in the same time, organizational maturity in the field is not necessarily a *key success factor*. Adopting an ERP equally requires (perhaps above all) an experience in terms of information system outsourcing.

The scientific and professional literature on IS is enthusiastic about work distinguishing *risk factor* and *success factors*. If those models could be useful in terms of project management, it is however convenient to avoid all determinist approaches and to adopt of more contingent analysis that may reveal that a supposed strength of a firm (like IT expertise) could in fact become weakness and vice versa ... If *risk factors* and the *success factors* are not independent elements but interrelated often (Akkermans & Helden, 2002) then they do not have any ontological value.

This article equally highlights the risks linked to a management style avoiding conflict management (Barki & Hartwick, 2001). If change must be achieved, then the coordinators must accept the inevitability of certain conflicts, try to channel expertise, and even impose arbitrary choices, rather than letting the organisation sinking into the abyss of power and influence games.

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## Appendix: Key factor grid

Project size	Number of users outside of the organization Number of users inside the organization
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	Number of people in the implantation team Team diversity Number of hierarchy levels occupied by users Number of business units concerned
Lack of internal expertise in project management	Lack of expertise in the implantation of information management plan Lack of expertise in information technology organization Lack of experience and expertise in the contract management related organization Lack of inter-functional representation in the team Dependence on users
Organizational context	Insufficient resources Conflict intensity Lack of clarity in the definition of roles Organizational complexity and level of geographic dispersion Level of inter-service cooperation Level of the functional specialization Level of vertical centralization of decision taking Lack of engagement by the project team Lack of engagement by the higher management levels Level of organizational growth