User Resistance Evolution in IT Projects: A Longitudinal Analysis of a French High-Tech SME

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Abstract: The objective of this article is to present the effects induced by a “passive management style” on conflict situations based on existing theories of user resistance and IT implementation. This article is an advanced work that has been already presented at the 10th AIM conference. The case study of Netia corp a high-tech SME puts forward the evolution of the project and the reactions of the users. This longitudinal research has concerned two “key moments” [Gi95] which switched from an inter-group conflict situation to straightforward individual resistances. This article shows that our results are opposed, in some aspects, to the ones found by Barki et al. [BH01].

1 Introduction

A lot of studies have been done on users’ resistance in case of IT implementation. Several articles analyse this topic by identifying explanatory factors in different industrial and organisational contexts. However, most of these articles are focusing on attitudes and behaviours after IT implementation in the organisation. [LR05]. If the results of these articles support practical knowledge on Information Systems project in terms of user acceptance [VMDD03], conceptual models offer little visibility of resistance factors prior to the decision to implement Information systems.

The empirical part of this article is based on a longitudinal analysis that lasted one year in a French High-Tech SME leader in video and audio broadcasting. This case-study offered the opportunity to observe the evolution of user resistance during the preliminary phase of an ERP implementation project.
The Literature review part identifies (1) different types of users or group of users’ resistance toward Information Technology and (2) management styles which can be used by CEO or project managers to avoid conflicts situations. Using the theoretical model of Barki et al. [BH01]; the objective of the article is to illustrate consequences involved by an “avoiding management style”, which is often considered as a defective way to manage conflicts in IT project.

Our case-study presents how and why a conflict situation between several categories of employees switched from an inter-group blocking situation to a user acceptance situation. This evolution is depicted by the re-transcription of two « key periods » of the IT project.

As results, the observations are inconsistent with the conclusions of Barki et al. [BH01]. An other observation illustrates that user resistance can go beyond perceived threats associated to process redesign and job transformation involved in IT implementation. The case-study revealed that user resistances toward IT implementation was due to the fact that professional concepts and activities are differently defined by employees. In conclusion, the article put forward research issues on semantic analysis of professional jargons ambiguity as a possible resistance factor of IT adoption.

2 Literature analysis

In order to develop research on Information Technology implementation in organisations, several researchers have provided theories for user adoption factors. One of the most aggregating works is probably the one of Venkatesh et al. [VMDD03] who identified 8 theoretical models and proposed a unified one. However, even if this kind of research identified success factors of IT acceptance, users’ resistances arising before the implementation are still analysed a posteriori [LR05]. But, the organisational changes involved by IT request a deeper attention to individual perception and reaction from the beginning of the project [MAPT00]. Scientific literature on this subject shows that theories on user resistance and conflicts (see table 1) are correlated to the one of user acceptance.
<table>
<thead>
<tr>
<th>Type of conflict</th>
<th>Examples of associated work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation dimension</td>
<td></td>
</tr>
<tr>
<td>Conflicts about the definition and</td>
<td>Robey et al. 2002; Markus &amp; Tanis, 2000; Larif &amp; Lesorbe, 2004</td>
</tr>
<tr>
<td>the execution of tasks that the</td>
<td></td>
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<tr>
<td>users must fulfill.</td>
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<tr>
<td>Conflicts about the new professional</td>
<td>Robey et al. 2002; Markus &amp; Tanis, 2000; Newman &amp; Westrup, 2005</td>
</tr>
<tr>
<td>skills</td>
<td></td>
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<td>Socio-political dimension</td>
<td></td>
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<tr>
<td>Conflicts of values</td>
<td>Robey et al. 2002; Aubert et al., 2002; Menard &amp; Bernier, 2004</td>
</tr>
<tr>
<td>Conflict due to a loss of power</td>
<td>Hart &amp; Saunders 1997; Watson et al. 1999; Jaspersen et al., 2002; Bancroft-Truner &amp; Morley, 2002</td>
</tr>
</tbody>
</table>

Table 1: Conflict types

According to Besson [Be99], a first form of resistance can be internally initiated when users compare the way they achieve their tasks. Indeed, several employees often do differently complementary tasks where IT implies more transversal and homogeneous processes across services. Such redesign highlights organizational inconsistencies and requires services that are able to homogenize processes while users can resist to changes locally required on their daily work. Conflicts can also occur externally because of the process constraints imposed by the system to implement. For instance, ERP “standard modules” implementation represents one of the most well known conflict driver because of a new “best practice” imposed to employees without too much consideration of organisation specificities [Da98; GL04].

Despite being able to use them properly, new IT implementation can also required from users new professional skills. The way accounting activity practices evolved in firms illustrate very well the request for IT implementation of new competences [Be99] to automate a large part of the tasks by IT even if accounting was limited to collecting and aggregating countable and financial data. As a consequence the accounting activity has been evolving to more valuable tasks like analyse, consulting and decision support. Moreover, accounting manager are less concentrating on the development of documents and reports generated by IT applications and are more interpreting ex post the way they have been constructed.

From another perspective which focused on individual resistance (vs group resistance), Josh [Jo91] developed a theoretical model stating that user resistance appears when he/her perceives changes involved by the “unfair”project in regard to his/her personal work or in regard to the group he/her belongs to.
Markus [Ma83] proposed a socio-political approach to user resistance. According to the author, users resist to a system if they perceive that the project could reduce their official or unofficial power in the organisation. So, these behaviours are associated to the subjectivity of individual and group perception [JKN94] and are supported by empirical studies which have shown that resistance is higher at group level than at individual or organisational levels [LR05]. In other word, group of persons represents the adequate “unit of analysis” for user resistance. Indeed, at group level, user resistance is often political whereas at the individual level it is more psychological [Ma83; LR05]. In both cases, user resistance can be driven by different factors and occurs in different forms through individual and organisational contexts: active resistance (protestation) or passive resistance (disinterest toward the project, lack of motivation and implication, etc.).

So user resistance can be tacit (introverted) or expressed and affecting interpersonal relations between partisans and detractors of the IT project. In fine, such dissension inside an organisation about a project is likely to jeopardize its efficiency and durability [RRB02]. In terms of project management model, Markus et al. [MAPT00] laid out a “shakedown phase” during which the enterprise must be concentrated on the management of such organizational dissensions.

Thus, conflict management can be considered as a key factor of IT implementation project efficiency. Barki et al. [BH0] observed and evaluated five conflict management styles:

- **Problem solving**: managers try to identify possible causes of the conflict and to solve the problem with the optimal solution;
- **Compromising**: there are no optimal solution to the problem, managers try to find a satisfactory solution;
- **Asserting**: authoritarian decision are made and imposed by managers to users;
- **Accommodating**: managers renounce to their preferences and satisfy users’ claims;
- **Avoiding**: managers not intervene in the conflict and hope for the situation to resolve by itself.

Generally, literature states that active conflict management styles are associated to better results than the avoiding style [MAPT00; BH01] which is most of the time considered as a risky way relying on users’ wishes to find an issue to their conflict while hierarchy can give the impression to disregard the situation.

However, it sounds interesting to question the confirmation of those considerations in function of the organisational context studied. Indeed, Mintzberg [Mi79] organisation theory is supporting the famous ad-hocratic model by which hierarchy is supposed to let employees be self-organised. This autonomy allow them to coordinate their work in function of many characteristics: firm size, activity sector, management style, professional culture, task complexity, etc. The limit beyond which specific situation requires a formal management style instead of an ad-hocratic organisation can not be clearly established. So, we can wonder how an ad-hocratic style can be an efficient...
solving system of a conflict linked to an IT implementation project. This question is relevant to the case-study depicted in the next part that deals with a High-Tech SME presenting all functional characteristics of an ad-hoc organisational mode instead of a formal one.

3 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 has 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 respond to local needs. For example, the management control service has developed a set of Excel programs to partially deal with a divided utilisation of the SAGE accountancy software. Each process (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 management 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 reliability by the systematic and repetitive cross referencing of data related to usual operations. 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 related to the client order in progress; he has to contact directly 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 a Warranty) is difficult to reconstitute. Client invoicing is not automatically initiated by a delivery. Logistic managers must enter the information in a shared Excel file with the accounts department in order to begin the process, etc.

The administrative personnel asked for the implementation 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 as potential resistance vectors.
4 Methodology

The longitudinal methodology used to analyse Nétia case study began first semester 2005. The aim of this first step was to identify explicit and tacit causes explaining why the firm has failed into implementing an IT system to manage efficiently its activity. The most representative attempt was the one of an ERP implementation project which has turned out to be given up at the end of the preliminary phase. To carry out this analysis, 8 semi-directive interviews have been conducted over 4 months.

Even if the overall activity of the firm was highly technological, we have considered the IT culture as a whole. It was more relevant to analyse how the co-existence of sub-cultures have favoured a conflict situation which involved the project abortion because different categories of employees existed. So, interviews were realised with professional representative categories of the firm.

<table>
<thead>
<tr>
<th>Initials</th>
<th>Service</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB</td>
<td>Accounting</td>
<td>Management coordinator</td>
</tr>
<tr>
<td>AG</td>
<td>Computer Dept.</td>
<td>Computer Dept. Coordinator</td>
</tr>
<tr>
<td>PV</td>
<td>Computer Dept.</td>
<td>Software developer</td>
</tr>
<tr>
<td>SR</td>
<td>Accounting</td>
<td>Supplier invoicing</td>
</tr>
<tr>
<td>SB</td>
<td>Accounting</td>
<td>Client invoicing, salaries</td>
</tr>
<tr>
<td>OC</td>
<td>Operations</td>
<td>Project Director</td>
</tr>
<tr>
<td>PD</td>
<td>Logistics</td>
<td>Logistics coordinator</td>
</tr>
<tr>
<td>XZ</td>
<td>Sales</td>
<td>Sales coordinator</td>
</tr>
</tbody>
</table>

Table 2: Interviews realised during step 1

The interview grid used has been conceived with reference to the risk factor lists of Markus et al. [MAPT00], Akkermans & Van Helden [AV02], Besson et al. [Be99]. To avoid any barriers, the interviews were realised in a one-to-one interaction with an anonymous format responses gathering. During the first part, the employees interviewed were asked to select on the grid, the factors he/she considered as explaining the rejection of the project. In a second part, we asked him/her to explain what happened and to develop his perceived differences and tensions between employees revealed by the ERP project. Each interview lasted around one hour and a half.

A second step of analyse has been conducted ten months later when Nétia was looking for another IT solution. After several invitations to bid, a software editor (Genesys corp.) was asked to present its software specialised on SME sector. The presentation has been
done in front of the employees that we interviewed (see table 3), and we took the advantage of being invited to this meeting to analyse the live reactions of persons facing this new IT solution. The research methodology used was essentially observation without interfering in the meeting.

<table>
<thead>
<tr>
<th>GeneSys Corp.</th>
<th>1 management engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 technology engineer</td>
</tr>
<tr>
<td>Accountancy service</td>
<td>2 persons</td>
</tr>
<tr>
<td>Direction Administration et Finance</td>
<td>2 persons</td>
</tr>
<tr>
<td>Computer service</td>
<td>2 persons</td>
</tr>
<tr>
<td>Customer service</td>
<td>2 persons</td>
</tr>
</tbody>
</table>

Table 3: Presentation meeting during step 2

The meeting lasted around 3 hours and took the form of a presentation of the software functionalities. Seeing directly on the screen the usability of the product, participants did not hesitate to ask a lot of questions all along the presentation. This type of “brainstorming” allowed us to note verbal and non verbal users’ behaviours.

## 5 Results and discussion

### Step 1

The first analysis step of this longitudinal study revealed, among other points, conflicts of value and power between administrative employees (initiator of the ERP project) and computer dept. employees (opposed to the implementation of this type of software).

A project coordinator statement: “my analysis on the lack of evolution and integration of our 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!”
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 billed 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 a strong negotiation power towards the hierarchy. Thus, they have gained, overtime, strong independence in the completion of their tasks. « I decide 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 organize 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 booking. 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 implementation of an ERP implies the deployment of formal processes that are inconsistent with this type of ad hoc processes. Considered as a “spy eye”, such a system represents a threat for the developers and programmers to the independence that they have gained.

This conflict situation between computer service employees and administrative employees is consistent with Robey et al. [RFF89] conclusions, Barki et al. [BH01] in the sense of cultural differences influencing contrasted interpretation of a same technology.

For their part, the top manager behaviours illustrate the tendency to avoid any risky decision [CM63]. CEO never interfered in the conflict situation and did not impose this unpopular solution to computer employees. 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 settle this situation and to take a decision that will likely disturb the social climate. « Regarding the successful implementation, the management favours the R&D, only the R&D… the rest, such as improving the organization, is not considered as vital».

However this “avoiding management style” did not involved the project abortion. The ad-hocratic organisational mode of Nétia revealed tacit tensions and compromising solution as well.

<table>
<thead>
<tr>
<th>Statement Type</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>A management controller statement:</td>
<td>“When they (the programmers) examined the interfaces and the application functions they were systematically pessimistic: I would have done better than that, in my opinion it's not great!”</td>
</tr>
<tr>
<td>A programmer-developer statement:</td>
<td>“I prefer non proprietary softwares”</td>
</tr>
</tbody>
</table>

Table 4: Most salient statements quoted during step 1
Step 2

Because of (1) the disagreement of developers-programmers about the ERP adoption proposition and (2) the passive attitude of the hierarchy to solve the resulting conflict situation, administrative employees looked for a system less impacting from an organisational point of view. The project did not stop and has been reoriented to a less controversy software.

A new invitation to bid was done for a software implementation able to manage most classical activities of a SME without integrating the whole organisation: customer prospecting, estimates, orders, hot-line, salaries, etc. Among the applications having these functionalities, the one chosen (Genesys) presented the main advantage to be compatible with the SAGE existing database used by Nétia for accounting activity and did not required data migration.

Our participation to the product presentation meeting organised by Nétia with Genesys corp. allowed us to observe the previous conflict situation vanishing. Both computer service representative declared considering this new solution as satisfactory with reference to the needs previously expressed (during step 1) by users. As comment, some administrative employees simply joked about the former recalcitrant behaviours of developers during step 1.

However, despite the global good impression of the software for Nétia employees, an unexpected form of resistance appeared few minutes later when conversations converged towards the required organisation process reconfiguration by the application. Indeed, resistances observed were not really about the changes involved for employees in their daily work. Actually problems expressed were more due to the way Genesys versus Nétia employees defined differently same professional concepts. For instance, because of his frequent moves abroad, the Asia commercial agent of Nétia evoked some practical problems apparently unresolved by software functionalities. Especially, the estimation of potential customers, this agent was used to make a text file within which he typed complementary information and comments about the customer. Then, he uploaded the file on Nétia server in order to make it available to other employees. But the customer management function of Genesys software did not allow joining complementary files like that. So he firstly reacted by considering it as an annoying limit of the application toward his day to day activity. Later, the discussion was about how bypassing this constraint and lasted around a quarter hour with unsuccessful propositions. Finally, by chance, one employee made a remark to the fact that problem was more on the professional definitions than the software appropriateness to user needs. Actually, Nétia employees were used to include in “transaction” concept, all previous processes to the order (quotations, bargaining, etc.) while in the Genesys application those tasks were included in an other functionality than the one talked about. So, Genesys software covered the needs expressed whereas a resistance appeared because of an ambiguity in professional jargon.

Few minutes later in the meeting, another similar misunderstanding about treasury showed the equivocate appropriateness to bring on unsubstantial user resistances. Indeed, while Genesys engineers presented the treasury management function of the software, the Finance Director appeared reluctant to use the software because she
explained that the function only satisfied a minor part of the daily activity of treasury managers. A long discussion about accounting task practices of Nétia revealed that on-going payments of invoices sent to customers were anyway included in treasury while not yet cashed. If this practice may sound as inconsistent with accounting classical rules, it was consistent with Nétia activity sector. Indeed, the recovery rate of customer debts is always 100% and paid immediately when the invoice is received. So, any invoice sent to customer was considered as existing cash for all practical purposes without too much attention about the little delay of the real payment. Actually, the way treasury was defined by Nétia employees differed from the one used in Genesys software: on-going payments were manage in different function than the one of treasury.

Both examples illustrate that IT implementation not only asks users to change their way of managing processes. It requires also them to be aware of the necessity of (re)defining properly professional jargons and concepts following the application referential. Not being aware of the ambiguity involved may raise some biased resistances. Hopefully, in Nétia case, employees and Genesys engineers have took enough time to find a solution to the resistances expressed by users. Indeed, the software was considered as a good choice in term of price which helps Nétia employees to make these efforts.

6 Conclusion

The main limits of this research are associated to the longitudinal methodology used. Other research methods could obviously produce other results and interpretations. In particular, it was impossible to observe continuously the daily evolution of the project, and we have been forced to concentrate on two key moments of the conflict. The case study analysis is limited to a French SME and future investigations seek other findings in other cultural, professional and organisational contexts.

However, Nétia case allowed us to illustrate how a conflict situation of IT project implementation has been outbalanced while CEO adopted an “avoiding management style”. These results don’t support the ones of Barki et al. [BH01] according to which this type of conflict management was associated to more active participation of the CEO. So, our results are in line with theory on potential advantages allowed by an ad-hocratic organisational mode [Mi79, Ma83b, Av97]. The case study highlights the interest to conduct more contingent research on explanatory factors (organisational, cultural and professional) on user resistance toward IT implementation.

The paper also put forward that user resistance were not simply limited to organisational or socio-political changes as expected in literature analysis (see table 1). It may be linked to ambiguities about definitions and interpretations of concepts in organisation [HN91]. Future research issues are possible on semantic theories and ontology. In IT project management, perhaps the first requirement to limit user resistance risks is to properly define activities and tasks before redesigning them.
References


