



# Methodology to Implement the Operation's Management Processes in an Information System: Tecmic's Case

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## Abstract

Considering the actual competitive environment faced by the small and medium enterprises and, consequently, the fast response that is required for them to be able to survive in the market, the use of technologies and information systems shows as an extremely important factor. So, any kind of support that these systems can provide to the operations management is, in the same way, very important.

As an example of these systems, we have the enterprise resource planning, or ERP. This kind of system allows the integration of the various functional areas of the company operations (such as production, distribution, purchasing, etc...), allowing a faster and efficient response to the client's needs, as well as an optimization of the overall processes within the company.

Even so, it is equally important that the transition between a conventional working process to a working process assisted by an ERP system goes as smoothly as possible and that it turns out as well a success.

So, considering these factors, this paper addresses the implementation of an ERP system at Tecmic, SA – Tecnologias de Microelectrónica. This company has embarked in an implementation process of such a system, and has faced some difficulties doing so.

**Key-words: enterprise resource planning, implementation, transition**

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## 1. Introduction

It has been well recognized that companies need to be competitive and face competition with all the weapons they can get. So, ERP systems come to help in this task, supporting management activities and increasing productivity.

An Enterprise Resource Planning system is a generic term for a set of activities supported

by multi-modular software applications that help organizations to manage their resources [10]. This multi-modularity is translated in a number of modules that can be assembled together or used separately: human resources, accounting and finances, production, procurement, supply chain and distribution [6].

However, not always companies have their processes design to fulfill the software requirements. So, two situations can happen

[7]: either the company orders the adaptation of the software to its processes, minimizing the internal changes in the company but making the updates of the software more difficult to implement; or it can reshape all processes and adapt them to the software, introducing a lot of entropy in the company, but making the future updates easier. Along with this, the company should decide which of the modules should implement first. All these decisions must be considered as a tradeoff of cost-benefit. So, an ERP implementation should not be looked at just as a software installation, given that the process introduces serious changes in the company, and all variables should be taken in account so that the company can obtain the best benefits of the system. [8]

In order to succeed in the implementation process, companies need to acknowledge its importance and, as Dowlashahi [7] states they should, account for the following strategic success factors:

- Cost of implementation (including cost of owning a system like this and maintenance costs);
- Implementation time and ROI issues, where he identified 5 years as the time limit when the system begins to generate profit;
- Training of the ERP users;
- Effective and efficient use of the software and its different modules.

Following the SSF, we have the Critical Success Factors (CSF). These are the main points where satisfying results will contribute to the competitive performance of an individual, department or organization. [10]. Ngai et. Al. [10] identified 18 CSF where we can find, among others, business process reengineering, ERP strategy and implementation methodology, software development, testing and troubleshooting, top management support, monitoring and evaluation of performance.

At this point, and given all the variables a company needs to think about when deciding whether or not to implement a complex system like this one considering all associated advantages and disadvantages. As so, Meyerson [9] says that the potential benefits of an ERP solution include the improvement of the integration between functional departments of an organization, a greater emphasis on the core

business process and an overall improvement on competitiveness. So, utilizing an ERP system at its full potential allows companies to improve productivity by reducing communication time [7].

Furthermore, Ramon et al. [11] presents the accessibility of the information to all of the company, the faster generation of reports, reliability and non redundancy of data, modular implementation without loss of data integrity and other advantages.

About the disadvantages, Ramon et al. [11] identifies the direct and indirect costs, the high consumption of hardware and the duration of the implementation process as the biggest problems.

In order to optimize the process of implementation, companies need to design a plan to do so. In the literature, Myerson [9] mentions some milestones to this process:

- Forming the implementation team;
- Mapping the actual situation;
- Gap analysis;
- Designing, scripting and configuration;
- Simulation, test and training;
- Begin to use the system.

The implementation process of an ERP system, with its necessity of process reengineering, is intimately related to the certification process of a company, regarding the NP ISO 9001. This ISO regards the management systems quality and tends to prestige the efforts made by the company to respect its compromise towards the quality of its products/services and processes [5],

Under this context the current paper address the implementation process of an ERP system at a real company and tries to identify what was wrong and where improvements should be performed.

This paper is organized as follows. In section 2 it is presented the case study. Following that, in section 3, it's presented the methodology used in solving the case and, in section 4, the suggestions and the methodology proposal. The final section concludes the paper.

## 2. Case Study

In this paper we study Tecmic S.A., a Portuguese medium company operating in the

electronics sector, part of the AITEC Group, developing and innovating continuously, being today's leader in the solutions it offers. [1]

Its mission is "bring to you the information about the activity made by your company's external resources"[1]. In order to do so, Tecmic offers a set of solutions such as XTraN (fleet management), iZi TraN (online fleet management), Siga (access management), Simor (remote management) and Ecogest (recycling point management). [2]

This company has decided, two years ago, to invest in a new information system: the PHC Advanced.

However, and despite the helpfulness of a management system, such as this one, the company has failed to implement it effectively and in a short term.

So, in order to understand better why the company was having these difficulties, we needed to identify the problems leading to this delay in the implementation process, so as to suggest a methodology to overcome this fact.

Different problems have been identified:

- Loss of the implementation partner: the implementation process was driven and supported by one company that belongs to the same group as Tecmic. However, during the process, such company lost interest in the software and Tecmic saw itself alone.
- Limited support from PHC software: when implementing the ERP system, Tecmic decided to customize some of the functionalities of the software to its necessities. So, every time they see it is time to move forward in the process, they need to communicate the decision to PHC Software. However, when some error is detected by the users, it isn't communicated to PHC's support. It is added to a list of errors found and, when Tecmic finds the list extensive enough, the errors are transmitted to PHC via telephone, fax or e-mail.

In this point, two things can happen: someone from PHC goes to Tecmic and try to solve the problems (if they find the problems serious enough) or the solution is sent by e-mail or fax to Tecmic.

- Workflow information very dispersed through the company, and not standardized: by this, we mean that the workflow processes are not archived in a specific place or folder. They are dispersed trough out a number of folders and,

to aggravate this, they are not all written in the same way (due to the non existence of a template). So, any worker who feels that some procedure needs to be updated corrects it and saves it wherever he thinks is better.

- Lack of a quality manual/system: there is currently a quality manual in this company. However the administrators found it very vague and outdated. So, to change this situation, it is currently being developed a new one, more concise and focused on three major procedures.
- Resistance to change: although the decision of the implementation of the new software has been made by the top managers, the importance of it should have been transmitted to the employees. But, as this didn't happen, they do not understand yet the importance of the system and how it will help them executing their day-to-day job.
- Top managers do not give constant and consistent support: although top managers understand the importance of the successful implementation of a management support system, in this case, this comprehension isn't being passed to the employees. In addition, there isn't a timetable defining the implementation process
- Poor training: accumulating with all the above problems, there's the fact that the users of the system do not have enough training to use the software correctly. It is not like they don't know at all to operate the system, but the training they got only embraced the basic functionalities of the system. Even so, it is important to give them "emotional training". This means that that, so far, it hasn't been explained to the users how the software will help them doing their job faster, and also, no one has explained the benefits of the use of a system like an ERP, such as: productivity increases due to the reduction of the bureaucratic work and, ultimately, improving the overall performance of the company.

### 3. Methodology

In order to solve the problems identified above the suggestion of a methodology to correct such process problems seemed urgent.

However, some work was required in order to better understand how and where the help

was needed. It was then necessary to define a work methodology:

1. Identification and characterization of a set of operational procedures;
2. Characterization of the ERP in use;
3. Identification and characterizations of the problem;
4. Development of a user's manual of the software;
5. Redefinition of the procedures (workflow processes);
6. Development of user's manuals for each procedure;
7. Development of the methodology proposal for the company to use in the implementation process.

Beginning with the first step in our methodology, as soon as the work in the company began, we felt the need to understand more how it works. This meant that the gathering of all the information about the work processes of the operations department was the most immediate to be done.

After this, the next logical step was to learn how the ERP system in use works, and what it was doing for the company. Time was spent working in the software (using the training database), exploring menus and functionalities.

Even if the two points explained above seem to have been performed separately this was not done so but, simultaneously. This had to happen due to the connection between the workflow processes and the ERP system. Also, the redefinition of the processes had to take into account the actual tasks already implemented and the possibility of future implementations so that work habits and processes could be shaped to the functionalities of the system

At the same time, and in conversations with the operations manager about the procedures and the software, we started to identify some problems as well as the motives for them to exist.

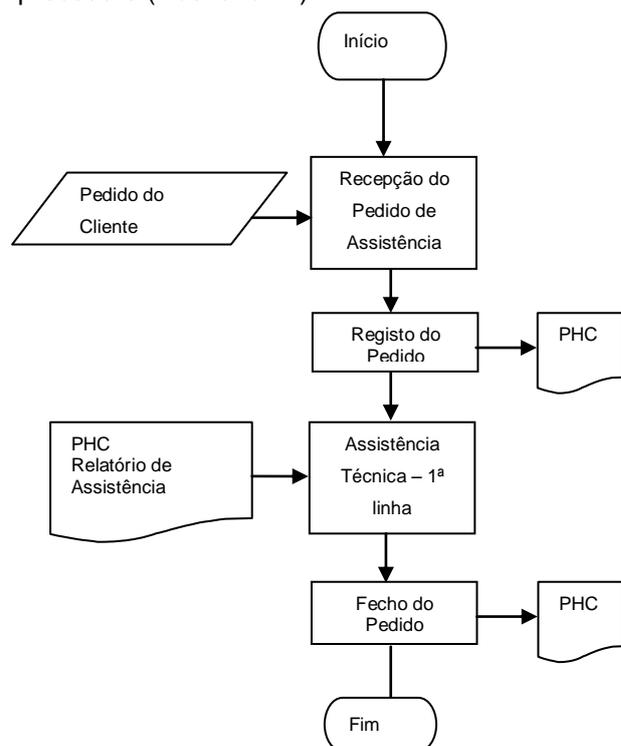
The next logical step, and given the poor training the users had and the non existence of a user's manual for the software, in partnership with one of Tecmic's workers, a manual of the basic tasks for the operations department was developed. This manual had the purpose of standardizing the basic procedures, as well as to be utilized for consultation when doubts

appeared. At the end of the manual, as it was a digital version, it was included a form that the users would fill if they found some problems in the software and if they found some errors in the manual. This form was connected to e-mail of the person responsible of the maintenance and update of the document.

Once the work got to this point, we thought it would be useful if some operation's procedures could be redesign. Along with this, it would be interesting to see how they were already connected to the software and how the workers should use it in order to perform some tasks.

So, among the procedures available to choose from, the decision was to rewrite the purchases procedures, the materials reception procedure, the installation procedure and the technical assistance procedure. All of these procedures aid the client's orders satisfaction procedure. However, the last one was not addressed due to its connection with all company's departments leading to an extra complexity that could not be addressed within the time available.

Next, we present a workflow diagram developed in Tecmic for its technical assistance procedure (Illustration 1):



**Illustration 1.** Workflow Diagram for the Technical Assistance Procedure

In order to do this rewriting work, it was necessary to talk with the operations manager assistant, and to go through each one of the procedures individually. This means going step by step, analyzing every task identified on the process and its connection with the software. Also, the next phase, required working with the software in order to make the user's manuals with print screens of the main menus and instructions to perform the needed tasks.

#### **4. Suggestions**

In order to overcome the problems faced by Tecmic in the use of the ERP system implemented the following suggestions arise from the work developed:

- Regarding the purchases procedure, it should be encouraged to use the "market research" option to chose the best supplier for a given article;
- In the materials reception procedure, the user has to perform a given task in several menus (closing a folder), and this should be automatic. This means that the different menus should be linked and, once the user closed the folder regarding an order, the system should ask if he wanted to close it in all the other menus;
- To the technical assistance procedure, there is already a change in course: the orders of assistance are going to be received directly in the software. This means that the employee responsible for this task won't have to introduce the data himself, reducing the risk of errors and data redundancy.

##### **4.1. Methodology Proposal**

After developing all this work, and thinking about Tecmic as a company with its own needs, we developed a methodology considering all the problems identified and the suggestions found in the literature.

The first step should be nominating a person responsible (or a team of responsible) for the implementation process. The none existence of such a figure implies that the works don't feel the urge to use more correctly the software. Also, this person (or group), would be responsible to coordinate the process and

make the link between the company and the ERP vendor.

Next, Tecmic needs to revise all of its procedures and compile them in a folder. This would make possible a best analysis and a broader view of the work that needs to be done in rewriting those procedures. The problem is that there are too many versions of each document, spread over a number of digital folder and modified by several employees. So, the responsible (or team of responsible) named has to gather all this information and regulate the updating process of the documents, Next, they need to rewrite them accordingly to the new work processes currently in use (altered when the new system started functioning).

Also, there is a need to elaborate the quality manual. Not only to fulfill the ISO objectives, but also to define some best practices within the company.

In our proposal, then follows the training and the development of the user's manuals. This is an extremely important point, because it will teach the user's how to work correctly with the system and, also, it will enable the development of new functionalities within the PHC software. The manuals will allow users to clarify some doubts they have on a daily basis.

It is important to note that all this process only makes sense if the users are able to communicate the errors found while performing their day-to-day tasks, as well as their opinion on how the system could be improved.

#### **5. Conclusion**

It is clear the importance that a system like ERP has, nowadays, in companies. However, it is also extremely important that the system is working along with the company, enabling the work, instead of working against the company.

It is also important that the company understands the importance of a successful implementation and the correct use of the system.

So, in the current paper, it has been exposed the case of Tecmic, a medium company facing an implementation process with some resistance.

In order to try to help them, we developed a methodology that considers all their problems

and limitations, as well as the recommendations found in the literature review.

It's important to say that, even though many companies face similar problems such as the ones explained, the methodology proposal suits only Tecmic, seeing that this kind of pointers were developed, as said, considering the environment and culture of the company.

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