

# Critical Success Factors to Implement Enterprise Resource Planning in Morocco Large Companies' Case Study

Younous EL mrini<sup>a\*</sup>, Mustapha Belaissaoui<sup>b</sup>, Issam Taqafi<sup>c</sup>

<sup>a,b,c</sup>SIAD Laboratory, Hassan 1st University, Settat 20300, Morocco

<sup>a</sup>Email: [younous.elmrini@gmail.com](mailto:younous.elmrini@gmail.com)

<sup>b</sup>Email: [mustapha.belaissaoui@uhp.ac.ma](mailto:mustapha.belaissaoui@uhp.ac.ma)

<sup>c</sup>Email: [issam.taqafi@uh1.ac.ma](mailto:issam.taqafi@uh1.ac.ma)

## Abstract

To increase their performances, many companies have chosen to adopt ERP solutions in their information system including Moroccan companies. This paper attempts to identify important Critical Success Factors (CSF) impacting Enterprise Resource Planning (ERP) implementation in Moroccan context. The results presented are based on a case study (action research) in several large Moroccan companies: the business core related to those companies is different: industry, telecommunications, public administration, real estate, etc. This study concerns several kinds of projects: new implementation of an ERP, major extensions of an existing ERP or upgrade to a global new release. The factors dressed are spread over different phases of the implementation life cycle and discuss several aspects: scope, sponsoring, standard versus customizations, resistance to change / resisting forces, cultural aspects, operations and values system.

**Keywords:** ERP; CSFs; Morocco; Implementing; Performances.

## 1. Introduction

Today's performance should be considered globally (productivity, flexibility, cost, schedule/deadline, quality, safety, social performance and environmental performance) over the entire product life cycle (design, production, exploitation and recycling) [2]. The performance of a company is directly related to the performance of its processes, specifically to the relevance of the actions or decisions that control them [3].

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\* Corresponding author.

Indeed, for example throughout the Order to Cash process (from order to cash) and Procure to Pay process (from procurement to payment), if employees interact on a single centralized support, then processing and information flow will be faster and more reliable and therefore ensure better performance.

To increase their performance, many companies adopted ERP (Enterprise Resource Planning) in their Information Systems. Having said that, the ERP implementation is difficult nationally and internationally, because of many considerations: cultural, political positions, employee's maturity, legal aspect...etc. This publication attempts to draw the main factors to succeed this kind of project.

## **2. Research question**

Many companies choose to implement ERP solution to reduce operating costs, increase productivity and improve customer services [4, 5]. However, the ERP implementation projects can paralyze the company if they are not properly implemented. Horror stories are drawn in the case of failed implementations [6, 7]. Indeed, numerous reports around the world describe unsuccessful ERP implementations (For example, Nike has lost significant shoes orders). 70% of ERP implementations projects have not reached their expected benefits. Based on other studies, the percentage of failed ERP projects implementation varies between 40% and 60% and has sometimes led to a global collapse of the company. Practitioners tend to discuss the sources of failures of these implementations from different views: closed proprietary system, the bad utilization of the ERP, etc. Of course, these different failures depend on the size of the company, the nature of the activity, the project context, the country's culture, etc. [1]. So what are the most important factors affecting the success of ERP implementation in Moroccan context?

## **3. Literature review**

It would make sense in this literature review to zoom closer to the definition and the history of ERP evolution. ERP is an English word (Enterprise Resource Planning) translated into French by the acronym PGI (Progiciel de gestion intégré). This term is recommended in France by the DGLFLF (General Delegation for the French Language and the Languages of France) and in Canada by the QAFL (the Quebec Agency of French Language). According to Wikipedia, ERP is software which corresponds to the basic support of a known organization, capable of providing "integrated management" defined as the interconnection and the integration of all functions of the company in a centralized computer system (usually configured in the client-server mode).

According to Koch [15], the acronym ERP (Enterprise Resource Planning) has nothing to do with the planning (Planning) and resources (Resource), but he served only the word "Enterprise". Indeed, the ERP attempts to integrate all functions and business of an enterprise in a single and centralized information system to serve several needs of multiple business disciplines: finance, accounting, management control, human resources, maintenance, production, etc. Despite the great diversity of these needs, ERP combines them into a single database so that they can share information easily and communicate with each other. Another definition dictates that a new class of software emerged the IT market in the 90's. Usually called Enterprise Resource Planning (ERP), these complete software solutions seek to integrate all processes and

functions of a company to present an overview from a single architecture [16].

Most very large organizations around the world have already adopted ERP, while small and medium-sized enterprises (SMEs) find it too profitable and competitive necessity to make the step. ERP solution aims to integrate all business systems into a single organization to make the company more efficient [17].

Definitions of ERP are many and various. We retain in this article the one proposed by Reix, Fallery, Kalika and Rowe [18] which present the ERP as an information system "configurable, modular and integrated, leading to integrate and optimize enterprise management process by providing a single repository based on standards management rules". This definition highlights two main dimensions inherent in ERP solutions that distinguished them from other information systems: "Integrity" and "Settings". These dimensions imply different characteristics:

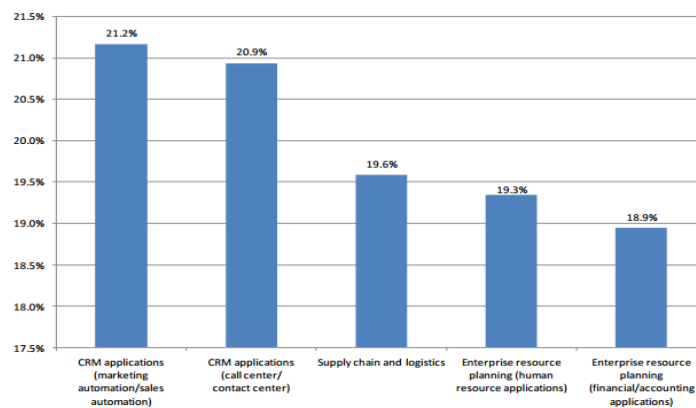
- Having one designer
- Improving the quality of information by eliminating redundancies and ensuring the uniqueness of the information made available to the end user
- The existence of different modules restrained in one centralized database
- Continuous improvement and integration of changes in real-time
- Facilitating both the audit and the control by providing traceability of the various transactions
- Integration of different management functions (Human Resources Management, Management accounting, Logistics, etc.) making up the company information system

Concerning the evolution of the ERP acronym, Klaus [16] considers that it was derived from the terms Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRP II). MRP (Material Requirements Planning) was developed to calculate more efficiently the necessary materials. It evolved into MRP II (Manufacturing Resource Planning), which includes new features such as scheduling sales, capacity management and planning. Although MRPII was initially seen as the next logical step in efficient manufacturing planning, companies have quickly realized that the profitability and customer satisfaction are goals applied to the entire company not only to the manufacturing, including finance, sales, logistics and human resources. Therefore, another term has been developed rapidly: Computer Integrated Manufacturing (CIM) that integrates the technical functions of product development and production processes in global integration frame. The concept of an enterprise solution fully integrated is now called ERP (Enterprise Resource Planning). Besides General Ledger, Material Requirements Planning (MRP) was the first enterprise application designed in the 50's [19]. The MRP covered this time the creation and the maintenance of basic materials for all products in one or several factories. Thereafter, materials planning processes and forecasting algorithms have been integrated into MRP. During the 70s, the MRP was enriched by other applications to provide a complete solution for the planning cycle and production control. It also integrated a planning module of the global production (MPS: Master Production Schedule): It's MRP II. The MRP II approach was extended in the 80s to the technical areas covering the development process of products and production. These functions are named with various CA-acronyms: Computer Aided Engineering (CAE), Computer Aided Design (CAD), Computer Aided Planning (CAP), Computer Aided Manufacturing (CAM) and Computer Aided Quality Assurance (CAQA). Finally, the entire

conceptual framework for the integration of all administrative and technical functions of a company was named Computer Integrated Manufacturing (CIM) [20]. The first version of the ERP was invented in the late 80s [21] and early 90s by Gartner Group of Stanford University [14]. They developed their enterprise software system and successfully transferred MRP to the ERP system. The most important difference between the MRP and the ERP systems is that while MRP focuses primarily on internal resources such as manufacturing, ERP system integrates programming and planning of resources based on external factors such as dynamic requirements of suppliers and customers. In the mid-90s, many efforts have been made to improve the ERP system by replacing the traditional database to reduce the response time. Then, the ERP was expanded with additional functions (order management, financial management, logistics, distribution, production, quality control, etc.). With its recent improvement, ERP technology has also developed some advanced features such as e-commerce and supply chain management systems [14]. Other modules have been integrated in the last decade as advanced planning and scheduling (APS), customer relationship management (CRM) and supply chain management (SCM). Today, several studies on the ERP market present a new concept: the cloud ERP. It's completely in line of platforms like SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service). We include in this literature review the results published by the international firm IDC [22] announcing that the interest in the adoption of cloud ERP is in continuous evolution given the different benefits offered by that new trend:

- It is a very modern experience that increases the employee's satisfaction and productivity.
- Integrated analyzes facilitate making effective decisions in real time.
- Social Collaboration tools embedded to increase collaboration and productivity.
- Mobile access to application services.
- Easy to find and share information to support making collaborative decision and increase productivity.
- Balance between the financial needs of the company and investment and operating budgets.

This new trend has been adopted by various core businesses including logistics and ERP as a big part. Figure 1 below shows the percentage of cloud ERP adoption in the different disciplines:



**Figure 1:** The most used applications in the cloud (Source: IDC, 2013)

In the first part of this literature review, we tried to draw up the history and the evolution of ERP around the world. In this second part, we'll discuss some researches addressing the difficulties encountered during ERP

projects implementation. Bingi, Sharma and Godla[25] assert that the difficulties of implementing ERPs are many: the top management commitment, the willingness of the company to conduct reengineering and accept full integration, the expert consultant's deficiency on some core business with changing demand, time and cost implementation's, the variety of suppliers, the willingness of employees, etc.

Ehie and Madsen say that several authors have dealt with difficulties of implementing ERP; however, few empirical studies have been conducted to validate this work. In their article, the main factors impeding the success of this kind of strategic project are respectively the adoption of project management principles, the feasibility of the project in the company, the support of top management, process reengineering, the consultant's service quality and time and costs project. [26].

Huang and Palvia [27] conducted a comparison on these issues between the developed and under development countries. They claimed that the difference comes from two broad categories of factors: "National / environmental" and "organizational / internal", each one includes five variables which are respectively: economic growth, infrastructure, industrial maturity, government regulation and the regional environment; then the maturity of information systems, computer education, company size, the commitment of senior management and experience in reengineering of business processes. They ultimately concluded that the existing difference between these factors places the developed countries in advance of those being in development.

After the ERP review, let's talk now about CSF: Bullen and Rockart (1981) define critical success factors (CSFs) in IS as the few key areas of activity in which favorable results are absolutely necessary for a particular manager to reach his goals. Successful managers must focus their scarcest resource, their time, "on those things that make a difference between success and failure (Bradley, Joseph, 2008, 178). The CSFs of ERP are those conditions that must be met in order for the implementation process to occur successfully (S.Finney, and M.Corbett, 2007, 334). ERP implementation success often results from a number of factors, such as user participation and involvement in systems development, assessment of business needs, processes during the analysis phase of the project and the level of data integration designed into the system. ERP changes the processes from designing a custom system to accommodate the existing business processes of a firm to selecting a packaged application system that best meets the firm's needs. CSFs for ERP systems can be expected to differ from other IS projects because of these changed conditions (Bradley, Joseph, 2008, 178) [30].

In Morocco, we did not find work discussing the actual subject. Brahim, El Mehdi and Chihab[28] present factors promoting the ERP implementation success and El Abbassi and Chafik[29] address the decision to invest in the implementation of ERP information systems of large Moroccan companies.

#### **4. Methodology**

Given the purpose of this work which address the most important CSFs of ERP's implementation in large companies in Morocco, and due to the scarcity of large Moroccan structures incorporating an ERP as information system, a qualitative approach is needed to lead our exploratory case study to list the CSF and also a research hypothesis, which can form the basis our empirical study [23].

In order to access to concrete situations in company, our choice examined the case method, insofar as the case method appears particularly suited to our research which has been little studied so far. The challenge of the case method is to give the opportunity to explore, understand or explain a composite reality of a dense content. Moreover, "the case studies are particularly recommended when addressing new and complex fields, where theoretical developments are weak and the resumption of the context is crucial for the development of understanding process" [24]. This corresponds to our exploration problem of a complex reality: understanding how and why in this situation is our main concern. Our research objective then is to produce the right representation of the observed reality.

There is no standard definition for the case study. We will define it as presented by Benbasat [8], Bonom [9], Kaplan [10], Pierre [11] and Yin [12]. A case study examines a phenomenon in its natural setting, using multiple techniques such as data collection to gather information from one or several entities (individuals, groups or organizations).

The method "Action Research" or "participatory research" used in this paper, which is a type of case studies, describes the studies in which the author, usually a researcher, is a participant in the implementation of the system [13].

Participatory research is based on the notion that the company must be experimentally understood through its major process of change such as the implementations of ERP. Three important factors must be considered: context, relational quality, and quality of the research itself [14].

## **5. Findings and results**

The case study which represents the purpose of this paper was conducted in several large Moroccan companies. We will focus only two: The first company A is in the industrial field and the second company B is a telecom leader.

The company A uses a large ERP in the top 3 in the world since 2000. This use is evolving ever since: the first implementation was followed by an extension of scope, then a first upgrade version after the integration of new modules and finally a major upgrade version that is in progress. The known ERP is used by thousands of users and covers many of the information system management applications.

The Company B also uses an ERP in the top 5 in the world for a decade. It has about 1,000 users involved in several business areas: finance, accounting, logistics, sales, etc. The projects realization around this ERP is based on the first implementation, extension of areas with new modules and upgrade version. I had the opportunity to work on these experiences which allowed me to conduct these projects as the main actor. In this study several difficult situations were experienced with the various project teams. These situations vary according to the context, nature of business, the deadline and many other parameters. We list below the most important difficulties shared by the two known companies. In other way, those difficulties represent the seven CSF to adopt in order to succeed a Moroccan ERP implementation.

### **5.1. Project scope**

The scope of the ERP implementation projects is among the main issues to be defined first. Indeed, it impacts directly the cost and time / deadline of overall implementation. This effect becomes more important if the scope changes in the implementation step.

### **5.2. Commitment of top management**

Having a sponsor is among the major challenges to be considered early in the ERP project implementation or extension of an existing ERP. In the cases studied, the sponsor didn't exist, or exists but in a political way or it is changed many times during the project life cycle. Therefore, the project is significantly delayed compared to the estimated timing; sometimes it might be dropped; or at best, delayed for a very long time. This is the second CSF described on June 2017 by Jonathan Arvidsson & Daniel Kojic [31].

### **5.3. Standards or customizations**

This is a key question that remains unresolved until an advanced project implementation phases. This creates an important risk that can lead to remake the study and design steps with all the consequences related to them: processes reengineering, validations, contract amendments with suppliers, etc.

### **5.4. Resistance to change**

Implementing an ERP provides a structural change on all the company's bricks: operational, organizational, cultural, etc. Most project managers neglect the resistance to change part: either by ignorance or by advancing the Budget optimization pretext. However, this component may lead to project failure if not at least a loss of time and money as the final customer satisfaction was not successful.

### **5.5. Cultural constraints affecting the calendar**

This is an important factor which is usually overlooked when assessing the overall project schedule for the ERP implementation. During the holy month of Ramadan, the number of hours worked decreased like the performance of the various teams: MOA, AMOA, MOE and AMOE. Holidays that coincide with religious celebrations, school holidays or summer vacation also have a strong impact on the efficiency of teams and consequently on the overall progress of the project.

### **5.6. Exploitation**

A special care must be taken into consideration at the selection phase of the ERP that best meets the business needs: major updates. The best illustration is that the editor requires a major upgrade version of the ERP every 5 years while the company sees no interest in this kind of update. The risk is the loss of the IT support and penalties payable in addition.

### **5.7. Values system**

In the case of presence of foreign consultants, cultural differences may slow the normal progress of the project. These cultural differences are becoming more impactful if internal and external teams are not enough walls to handle such conflicts. The final purpose is to avoid blockings between the different stakeholders.

## **6. Conclusion**

First of all, this article contributes to both the theory and practice by providing a comprehensive review of the ERP solution appearance to their evolution nowadays: we went from MRP MRPII and CIM, then the ERP and finally the ERP in the cloud. Secondly, we synthesized non-successful experiences in the implementation of ERP in different projects, allowing us to confirm our problem explained previously, which is to identify the most critical success factors to succeed the implementation of ERP in a Moroccan context.

Then we have justified the qualitative research method, motivated mainly by the Action Research rarity of this type of work and the relevance of the results through the experience.

Finally, we have spread our case study through research efforts in two major Moroccan companies, while detailing the significant challenges that have not conducted a total failure of implementation projects, but have actively contribute to a partial advantage of these types of projects.

Nevertheless, it is wise to mention that this study presents several limits, namely:

- The scarcity of this kind of research in the Moroccan context: we haven't find any research related to this subject in Morocco.
- The difficulty of extending the scope to cover small and medium enterprises and more than two large companies because it's so difficult to reach their managers.
- The confidentiality of this kind of strategic projects which represents a crucial vector change in companies

## **7. Recommendations**

Finally, we suggest some future research topics: study other large companies from other sectors; extend this study on small and medium enterprises; and confirm these qualitative research results through other quantitative research.

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