The Impact of the Implementation of ERP Satisfaction of End Users in Major Moroccan Companies

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Abstract: In recent years, the implementation of ERP is as a lever for development and inter-organizational collaboration. Despite the benefits of ERP, the success of their implementation is not always assured. The introduction of an ERP in a company requires organizational changes that may provoke resistance to cause adverse effects on the success of these projects. This article proposes a model and tests to evaluate the success of a system "Enterprise Resource Planning "(ERP) based on a measure of user satisfaction. Referring to the model DeLone & McLean and the work of Seddon & Kiew The criteria that can influence user satisfaction, to ensure the successful implementation of the ERP system are identified. The results of the exploratory study, carried out on 60 users in 40 Moroccan companies, shows that user satisfaction of ERP is explained by the quality of the ERP system, perceived usefulness and quality of information provided by this type of system. The study also found that the quality engineering change is a predictor of satisfaction measured by user involvement in the implementation of ERP, the quality of communication within such a project and the quality of training given to users.

1 INTRODUCTION

The current context of global economic activity is characterized by a large and permanent competition as well as a large customer requirement for immediate and complex solutions. In this context, process control and continuous improvement become prerequisites for success. As a result, numerous companies around the world are trying to take advantage of an overhaul, using software packages, their information systems, and hundreds of them have opted for systems integrated management ERP (Enterprise Resource Planning) as a basis for the integration of their industrial management (Marbert, Soni & Venkataramanan, 2000).

Companies operate in an environment increasingly complex and changing. They now confront several problems: saturated markets, increased competitiveness, customers more demanding and less loyal, etc. In such an environment, business competitiveness depends increasingly on their flexibility and their ability to innovate, both in their organizational structure, their production as in their mode of exchange with customers and suppliers. However, in their search for competitiveness, the main obstacle faced by companies is the difficulty of obtaining data and accurate information and appropriate interfaces between the various business functions.

This study is interesting on two levels:

- The objective of this article is therefore to identify the drivers of satisfaction of users of ERP systems. On a finer way, we try to determine the satisfaction and enhance the need for good conduct ERP projects to increase the degree of the satisfaction. To do this, it was reduced to build a model for the explanation of this satisfaction.

- In what follows, we will try to review the state of the art in measurement of user satisfaction of IT before submitting the research model and the results of an exploratory study conducted with a sample of 'Moroccan companies.

2 ERP AND ITS CONTRIBUTIONS FOR USERS

The evolution of computing, which is progressing towards greater information sharing and flexibility is

a key factor explaining the growing success of ERP to companies. Despite the unquestionable progress they make today, ERP do not fully meet satisfactorily the needs of companies.

2.1 The Emergence of Integrity Management Software

Historically, functional systems businesses were developed on different materials following different methodologies: the achievements are generally heterogeneous both in terms of data representation at the level of processing modes. It follows multiple disadvantages:
- Communication problems between areas expected to share common data;
- Process control challenges due to the multiple treatments required to obtain synthetic statements;
- Students maintenance costs in the absence of modularity resulting low scalability;
- Complexity of the training was the use of very varied software;
- Difficulties for many controllers, in the collection and re-keying data from different systems and serving to consolidate budgets, develop reporting tables, etc.

2.2 What is an ERP?

Acronym of American origin, ERP (Enterprise Resource Planning) is commonly used to designate the integrity management software. The term "ERP" is not totally adequate because it puts only evidence planning appearance. However the French translation "ERP" does not include the planning dimension and its use is problematic.

As defined by Robert Reix (1999), an ERP is a computer application that incorporated the following general characteristics:

- An ERP is a software package: according CXP4, a software package is "a coherent and independent set is service programs, supports, or handling of information and documentation, designed to perform standard IT processes, including the distribution is of a commercial nature and that a user can independently use after installation and limited training.

- An ERP is customizable: standardized product, the ERP is designed originally to meet the needs of various businesses. II usually are different versions by sector (automotive, banking, etc.) and prolonged use. In addition, the adaptation of the product to the needs of a particular business is by setting (choice of management rules, choice of treatment options,

choice of data format, etc.). The setting may be accompanied by an appeal has additions of specific programs articulated around standard programs.

- An ERP is modular: it is not a monolithic structure but a set of programs or separable modules each corresponding to a management process: installation and operation can realize autonomously. The division into modules allows you to dial a specific solution for assembly and extend the implementation has different areas of management.

- An ERP is integrated: the various modules are not designed independently they can exchange information according to patterns provided. The PGI guarantees at all times a perfect integrity and data consistency for all users, allowing DC to end interfacing problems, synchronization and double entries.

- An ERP is a management application: it captures the company's transactions (accounting, stock management, order tracking and production program ...) and propagates the information collected to the appropriate levels. However, it contains no optimization program or automatic decision.

2.3 Why Moroccan Businesses They Opt for ERP?

The term ERP comes from the name of the method MRP (Manufacturing Resource Planning), industrial method used since the 1970s for the needs of management and planning of industrial production and computer-aided production management.

As to migration patterns, some companies opt for highly problematic solution to migrate their IT systems through process redesign while others opt for outright deportation of the existing.

Now this type of establishment "Big Bang" is desirable, particularly in the following cases:

Existence of bottlenecks and sticking points of information between services; the implementation of ERP will provide an opportunity to everyone to overhaul their procedures.

Excessive heterogeneity of the applications used and abundance of interfaces between business and auxiliary applications with the central accounting system.

Great difficulty for employees to adapt to new applications when they change service within the company.

In general, it should return to the main benefits and difficulties of ERP to determine whether the context of implementation of ERP is favourable or not.

2.3.1 Organizational Factors

In view of concentration transactions (mergers and acquisitions) facing most industries and growth marked at several international groups, many companies are forced to include in their calendars projects migration to ERP, and, just as the parent company or other subsidiaries.

Moreover, partnership agreements and often require their contractors to implement the same management systems that their reference customers, and to ensure the exchange of data, transparency and reliability of information financial communicated to the third party.

2.3.2 Technical Factors

The evolution of information systems to more sharing, more integration and flexibility are key factors behind the growing success of ERP to companies. Today, as we will examine later, they do not yet fully satisfactory answer to the expectations of the latter.

Nevertheless, they represent the most promising path towards a more comprehensive computer.

2.3.3 Prudential and Internal Control Factors

Indeed, in accounting and financial reporting and management, ERP also provides an audit trail and traceability data, the ability to set up multiple quantitative and qualitative controls to increase assurance of the device internal control during the course of the various transactions through the "workflows" of validation and execution of manual data processing, semi-automatic or automatic.

2.4 The Measurement Models of Successful ERP System

Many models have been developed to evaluate the systems and the success of technology (Davis, 1989b; DeLone and McLean, 2003 1992 Gable et all., 2003; Ifinedo and Nahar, 2006; Sedera and Gable, 2010; Shang Seddon, 2002). These models have been validated empirically by numerous studies in the information system. The results show that many case studies are studied by applying the DeLone & McLean model success using a modeling approach structural equation (Dörr et all., 2013).
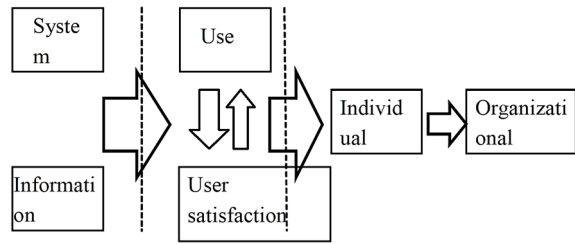

Figure 1: D&M IS Success Model (Delone& McLean.1992).

2.5 Evaluation Approaches

Many researchers have tried to understand the relationship between IT investments and performance, focusing on five main approaches for evaluating IT projects (Bellaaj, 2010). These approaches are:

- Evaluation Approach economic theory (Brynjolfsson): the main objective of this approach is to understand the gap between IT investment and productivity of the organization according to certain economic criteria.

- Evaluation Approach Social Psychology (Davis, 1989a, 1989b; Venkatesh et all., 2003): beyond the economic approach, it incorporates the human factor as a key factor in the process of IT investment and impact assessment.

- Evaluation Approach Based on the analysis of competition: this approach is developed by (Porter and Millar, 1985) explains how technology affects all business. The authors outline the information technology needs to be understood more than just computers, it must be broadly conceived to encompass information that companies create and use as well as a wide range of technologies more increasingly convergent and linked this process the information in their perception of IT they adopt the concept of the value chain to explain the competitive advantages of IT investments.

- Evaluation Method based on strategic alignment: This approach is developed by (Henderson and Venkatraman, 1993), it is widely used by researchers in the information to understand two key concepts system; the first is the adequacy of the information technology goals and strategic objectives of the organization; the second is the functional integration (integration between business and functional areas). This approach suggests that the IT strategy must be consistent with the business strategy to improve organizational performance.

- Evaluation Process Approach: a new conception of assessment is success was brought by this approach based on the theory developed by

emerging process (Markus and Tanis, 2000). This approach highlights the failure of the economic model to assess the success, and proposes a new vision of evaluation not only on the input evaluation on the base, but also based on the use and impacts of IT, by virtue of a valuable creative process.

In this section, we present two examples of evaluation approaches that synthesize the different perspectives of assessment mentioned above. First, we will propose an AHP approach to assessing performance measures ERP (Tsai et all., 2006). Second, we will introduce the Balanced Scorecard approach widely adopted by many researchers to assess the benefits of the ERP system (Chand et all., 2005).

2.6 The Theoretical Foundations

First, we present our conceptual model which is based on both theoretical and empirical background. This framework will be considered a success evaluation model of ERP system that combine causal processes and considerations for evaluating the success of the ERP project in three performance levels: The individual performance, the performance of the task force and performance Organizational (Ifinedo Nahar et al, 2011).

2.6.1 Mathematical Theory of Communication

The mathematical theory of communication (Mason, 1978; Weaver and Shannon, 1949) explains the interaction of three factors: the information system, information such as a product and the impact of information on individual performance and organizationall. This approach is used by (DeLone and McLean, 1992) in their model of success for developing sexual constructions considered the main variable to evaluate the success of the information system.

2.6.2 Innovation Diffusion Theory

Based on the theory of diffusion of innovation, mainly paradigm variables determining the adoption of innovation (Rogers, 1983), three main factors emerged: Innovation /Technological factors, environmental factors and factors Organization. In this taxonomy, each of these factors can be explained in the context of the ERP system. These factors are extremely important in the adoption of ERP phase and they must be integrated in the process of successful ERP system (no success without adopting one hand technologies).

2.6.3 Structuring Theory (AST Approach)

Structuration theory associated with institutional theory Giddens social assessment has been widely applied to understand and explain organizational technology adoption (DeSanctis and Poole, 1994). We focus solely on the AST proposed by DeSanctis and Poole, 1994 to explain how technology brings productivity, efficiency and satisfaction to both individuals and organizations. This approach is based on the school of technology was applied and explained by DeSanctis and Poole, 1994 in their approach to the theory Adaptive Structuring. The ASP is considered a framework to study the variation in the change of the organization and illustrating the impact of advanced technology on organizations. It has been tested on a GDSS (Group Support System to the decision) to answer questions about how technology affects people and organizations that use it, and how it improves the performance of the working group.

3 DEVELOPMENT OF A MODEL SEARCH

Therefore, if a company wants to incorporate an ERP system, even though its operations are not integrated, it should not, alone, buy a software package and associated computer equipment but it is called, also, to acquire know-how and establish a suitable organization of work.

Therefore, methods of effective use of ERP systems require something other than a good computer. Moreover, several companies say they face serious difficulties in the implementation of an ERP system without the technical aspects are actually involved: this is due, in fact, to disregard and neglect human and organizational factors.

Thus, and in support of some researchers the factors considered can be classified keys to the success of an engineering change under the under the following dimensions: the involvement of management Generally, user involvement, communication management, training and the implementation strategy that includes both reengineering business processes (BPR) that the same approach of implementation of these systems.

At the basis of this reasoning, it is assumed that an ERP system is effective at the individual level where its users are satisfied. This level of satisfaction is determined by the quality system implemented in the company, a good quality of the information it provides, high value perceived by

users and good engineering changes necessary for its implementation.

Thus, the various built the model proposed for measuring user satisfaction of an ERP system, detailed below, may be diagrammed as in Figure 2.
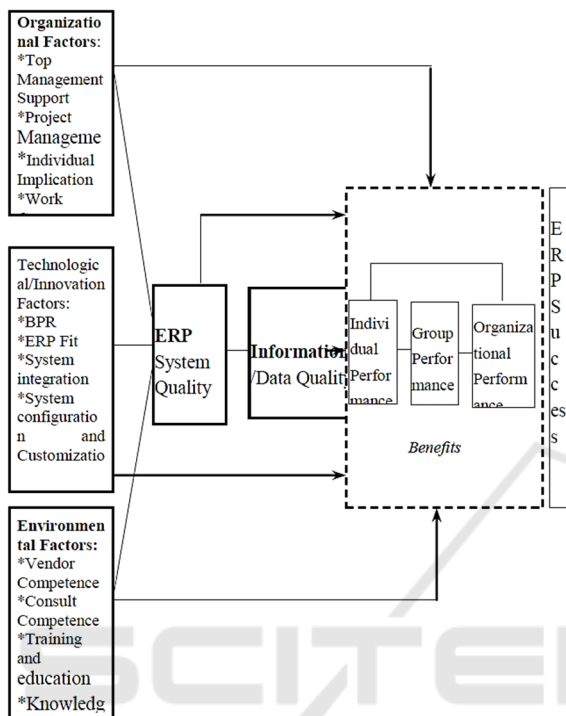

Figure 2: The conceptual model of measuring user satisfaction of an ERP system.

4 DEVELOPMENT HYPOTHESES

This dimension has been used extensively in the literature as the dependent variable success SI. DeLone & McLean (1992) fall within a number of 33 empirical studies published between 1981 and 1987 who enjoy success in terms of user satisfaction (Bailey and Pearson, 1983).

In general, this satisfaction was defined by the attitudes and perceptions. In specifically, this satisfaction was defined as the result of the evaluation that individuals are on continuum "content - dissatisfied"; or the sum of feelings and attitudes towards each of a variety of factors affecting the situation.

4.1 Quality System ERP

This dimension is widely used in the literature (Doll

& Torkzadeh, 1988; Davis, 1989; DeLone & McLean, 1992; McGill et all., 1999; etc.). It is a powerful determinant of the effectiveness of IT as well as user satisfaction. The quality of the system relates to the quality of application itself (the different system functionality, ease of use and learning). In addition, it summarizes some issues such as the lack of "bugs" in the system, the user-friendly interface, etc.

Therefore, the hypothesis H1 states: "The better the quality of the system (ERP) is good, more satisfaction is high."

4.2 Quality of Information Provided by the System ERP

The concept of quality of information has been widely used as a key success factor in research in SI. In fact, this construct has been measured primarily by Bailey & Pearson (1983) and Doll & Torkzadeh (1988) as a measure among other satisfaction. This dimension usually includes attributes related to the quality of the information provided by the ERP system, such as the format of the information, clarity of information, accuracy of information, availability of necessary information in real time, the information content, etc.

Therefore, the second hypothesis H2 states: "The better the quality of information provided by the system (ERP) is good, more user satisfaction is high."

4.3 Perceived Utility

This construct is defined by Davis (1989) as the degree to which a person believes that the use of a particular system would increase the work performance. This dimension has been considered as a factor affecting the satisfaction of users that it comprises, on the one hand, items related to the perceived ease of use and, on the other hand, those related to the perceived usefulness. Moreover, Davis (1989) shows that the acceptance of a technology depends on perceptions of users of this technology. Indeed, the Technology Acceptance Model (MAT) assumes two types of beliefs, perceived ease of use and perceived usefulness, determine the intent of the individual who influences the use of technology.

This allows, therefore, bringing forward the third hypothesis H3 namely: "The greater the perceived usefulness by users, the greater their satisfaction is high."

4.4 Quality Engineering Change

As shown above, this new dimension can be

understood by the five under following detailed dimensions.

4.4.1 Involvement

To drive change caused by the implementation of an ERP system, it is essential that this project will become the project of the entire company: from top management to operational:

- **The Involvement of Senior Management**

Indeed, the leaders are not called, only to finance the project but also to take an active role in managing change. This role is mainly to guide the overall operation, encourage local initiative, indicate very clearly the kind of organization that wishes to establish, define the corresponding steps of achievements, etc.

- **The Involvement of Users**

Added to the commitment of senior management and middle management, the implementation of an ERP system can be conducted only by the involvement of the community of operational users and a user project manager full time representing the whole of this community.

However, it is important to note that the involvement of users could not be, in itself, a prerequisite for the proper conduct of change. The latter requires, in addition, good communication management.

4.4.2 Communication

Certainly, the quality of communication within work groups plays an important role in employee attitudes towards change. Where communication and atmosphere were good, new technologies were generally welcomed with enthusiasm, while in groups where members felt compelled to comply with the new rules, reactions were much less favourable. In fact, communication is essential not only to create an understanding and approval of the establishment, but also to win the agreement of users. This communication should begin early, be consistent and continuous.

In addition to good communication during an implementation project of an ERP system, it is inevitable to provide training to users.

4.4.3 Training

Training is seen as an important factor to facilitate change in the organization and introduction of new technologies .This training aims mainly to prepare staff and help them adapt to their new tasks in order to be successful organizational change. It is not intended; only use new systems but also the understanding of new processes and their integration into the system. Hence, training is an ongoing process and updating a challenge.

4.4.4 The Implementation Strategy of an ERP System

The implementation of an ERP system means a continuous learning cycle in which the organizational process supported by ERP systems is aligned gradually with the company's goals. Lequeux (1999) says: "Far from leading a purely IT project, the adoption of ERP should be an opportunity to reconsider the mechanisms and improve the flow participating in the operation of the business, even to consider a business process reengineering".

- **The Business Process Reengineering**

Moreover, the re-engineering of business processes and implementation of ERP systems are inseparable. They should be carried out simultaneously in order to obtain the best fit between the technologies and processes. This adjustment requires considering the role of ERP systems such as infrastructure, which now support the process and no longer functions and, therefore, improve their organizational effectiveness.

- **The ERP System Implementation Approach**

Akkermans and Helden (2001) have focused on ERP systems implementation approach while trying to show that the incremental approach, scalable, based on continuous improvement is a key success factor in the implementation of a project ERP. They add that users of an ERP system are less satisfied if there was a radical approach (Revolutionary) that this approach results in a rigid management style based on a high degree of control and command, Intensive use of external experts, even non staff involvement and therefore a loss of skills and know-how internally.

Thus, and from the previous development on engineering changes, it was agreed to present the hypothesis H4 on this new dimension, "the higher the quality of engineering change is good, more user satisfaction is better ".

This hypothesis derived secondary hypotheses for sub dimensions of engineering change. They are formulated as follows:

- H4a "More DG is involved in the project implementation of an ERP system, more user satisfaction has increased."
- H4b: "More user involvement, the greater their satisfaction is high."
- H4c: "More communication is good, most users are well satisfied."
- H4d: "More training is good; more user satisfaction is very high."
- H4e "The incremental implementation approach can increase user satisfaction more than the radical approach."

5 RESEARCH METHODOLOGY

Once part of the research is defined and the variables of the research are identified, it is important to conduct data collection. For this, a questionnaire, multi-scale, was built and tested with users belonging to both different hierarchical levels as various services, and finally administered face to face in Moroccan companies.

Given that companies have adopted ERP systems are not numerous, it was not possible to focus on a specific industry. The selection of the study population was guided by a single criterion, namely: the existence of an ERP system that is already operating at all levels (all modules are already functional) or at least a good part of the system east.

Data collection has collected a sample of 40 companies surveyed; representing an effective response rate (60.45%). However, it should be noted that the unit of this study is defined as the user of an ERP system. Therefore, the respondent is either the project leader or the leader or one of the senior or middle managers, or one of the last entry clerks. What mattered was the use of the ERP system.

6 RESULTS AND INTERPRETATION

It is important to note that the measurement scales were either adopted from previous work or created for the need of this research.

6.1 Descriptive Analyzes of Research Variables: Evaluation of Measures

After proposing measures to the various concepts identified in the model and collected the data from the selected population, it is appropriate now to ensure the quality of these measures before making adequate statistical treatment. To do this, we made two types of tests for evaluating the measures namely: tests

The dimensionality and reliability test (Cronbach's alpha) (Evrard, Pras & Roux, 1997). Through these purification tests, which are based on principal component analysis ACP was determined for each building its KMO MSA and each of its items.

So we tried to conclude whether built or not is one dimensional and to specify the contribution of each item to the formation of the factor. Finally, we calculated, for each cleared factor, Cronbach's alpha.

6.2 Explanatory Analyzes of Research

Once the measures have been evaluated and the new structures are identified, we proceeded to test hypotheses. This part, devoted to the operationalization of the model and test hypotheses, has identified the following results.

Results thus obtained confirmed the work of DeLone & McLean and those Seddon & Kiew. These results have shown that this satisfaction is explained:
- Primarily by the quality of the system, the quality of information provided by this system and the utility perceived by the users;
- Partially by the quality of engineering changes needed to implement the ERP system. It is true that the data analysis performed could provide only partial verification of this dimension engineering change because, firstly, user involvement, communication and training partially affect that satisfaction on the other hand, the other two sub-dimensions i.e., the involvement of the DG and the implementation strategy does not seem to affect the satisfaction.

Notwithstanding, the results presented are limited to the sample of enterprises and should be interpreted with caution given the nature and sample structure, but also methods of data collection used.

So it will be wise to take this model while increasing the sample size to allow better analysis to improve results. This should be possible since the number of Tunisian companies that are in the process of implementing ERP systems is increasing.

7 CONCLUSIONS

In conclusion, it should be noted that in our time, the information system has become the cornerstone of

consolidating the company's strategy .Thus, the IS manager is asked to provide future solutions enabling the company to be more competitive. It is no longer to increase productivity but to provide the general direction the technological know-how through which the company will be able to adapt its service to the needs of its customers while controlling costs.

Through this article, it is important to note the prominence that ERP systems are currently in Moroccan companies. In fact, these integrated management systems, which are increasingly "backbone" of the SI of the company, need special attention, including in their implementation and evaluation.

Closer to the work of the "Management Information Systems" relating to the determinants of success of IF including the determinants of user satisfaction, the results of this research show that the dimensions outlined in previous studies (Quality System, quality of information and usefulness) remain well determinants of user satisfaction of an ERP system.

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