THE IMPACT OF ERP SYSTEM ON USER PERFORMANCE

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ABSTRACT

ERP systems play an important supportive role in most sectors of the economy. This study was developed to answer the question related to the impact of ERP systems on user performance in Tunisian companies. This article proposes a model combining the Task Technology Fit (TTF), the Technology Acceptance Model (TAM) and Delone & McLean model to evaluate the user performance of ERP system. The model was tested using survey data collected from 269 users of the ERP system. The results of structural equation analyzes supported the proposed model and highlighted the important role of perceived ease of use and perceived usefulness in mediating effects between TTF, system quality and information quality and performance users.
The results show that TTF, system quality and information quality directly influences the user performance of ERP and indirectly through perceived usefulness and perceived ease of use of ERP.

Keywords : *ERP, System quality, Information quality, User performance.*

1. INTRODUCTION:

Today, information systems are pervasive in almost every aspect of human life and especially in organisations that invest significantly in the complex contemporary information systems [30]. In recent decades, the total expenditure in the world of information systems has exceeded thousand billion dollars per year [66]. Therefore, the success and systems quality established are of paramount importance for both research and practice [52- 34].

Organisations rely increasingly on investment in information systems to improve their performance [71- 43]. Information systems have been described and recognized by modern organisations as offering a tremendous potential to achieve better performance [5], in a context of new requirements arising from permanent environmental changes [2].

To cope with a changing environment and to overcome the problems of existing systems, organisations do use Enterprise Resource Planning (ERP) [58- 61]. ERP systems have been adopted by many organisations; these systems are basically the most significant development in terms of costs and use of company's information systems [78].

Organisations spend huge amounts and countless hours of implementation of ERP systems to achieve better performance [27] by facilitating organizational activities and to support various organisational objectives in order to achieve the greatest effectiveness and efficiency. Unlike other systems, ERP systems help solve in organisations the problem of fragmentation of information [45]. However, the debate still exists regarding the different contributions of ERP to performance. In particular, the lack of response to user needs led many information systems, including ERP, to failure that makes it impossible to achieve the expected benefits [72].

Accordingly and in particular in the last decade, ERP systems have begun to attract the attention of researchers. However, little attention has been paid to their impact on individual performance [85- 74- 46- 40].

Thus, this study therefore was born from the principle that only users can evaluate the benefits derived from ERP and judge whether or not they realize the estimated benefits. In addition, the lack of attention to users could explain why so many ERP implementations do not work as expected [47- 58]. Therefore, the study of the ERP systems impact on the users' performance is important in order to assess the usefulness of

ERP systems in organisations and how they contribute to the effectiveness and efficiency.

In the light of these facts and because organisations are investing significant resources in the adoption or the transition to ERP systems, this study tries to explain, in the Tunisian context, causes and factors that lead to better user performance following the use of ERP systems [47], the factors responsible for the failure and the reasons behind the problems associated with the implementation of ERP [85- 78- 53- 40]. However, the factors used to explain the impacts at the individual level and its aspects are still ambiguous. Thus, the study of the performance perceived by the user in ERP system environments, help to clarify the complex relationship between ERP systems and users, especially with the assumption that users are the first to use information systems in companies.

So, the main objective of this research is to evaluate the impact of ERP systems on the performance perceived by the user in the Tunisian organizations. In other words, in conducting this study, we must answer the following question: What is the impact of ERP systems on the performance perceived by the user in the Tunisian organisations?

2. LITERATURE REVIEW:

To date, little attention has been paid to the users performance in this area due to the complexity of these applications and the lack of completeness in the previous models in information systems [75]. The focus of these models was based either on the acceptance of the user or on the aspects of success and failure.

Botta-Genoulaz et al. [15] conducted a survey to investigate the research activities related to the ERP in recent years. They found that the research on ERP systems has experienced an impressive development in recent years, seen through the increase in the number of articles, special journal editions and sessions dedicated to international conferences.

The researches on ERP systems cover several important topics such as the implementation of ERP, ERP optimisation and management of ERP. However, little research has focused on ERP systems and user performance, which confirms the need for research in this area.

In addition, most studies have been conducted at the organisational level, although some of them are interested in the individual level such as user training and user satisfaction [5- 84- 85].

The different researches models use different information systems, but have not developed a model specifically for ERP systems. However, they provided basis and (general) principles that could be useful for further researches [68- 17- 40- 6]. Therefore, the application of the previous models in the context ERP seems to be acceptable in IS research, but with the need to adapt with the specific contingency factors of ERP systems. For example, Chien and TSAUR [20] developed the model of DeLone and McLean to explore the model's success in ERP systems and to identify the factors contributing to the high quality of ERP systems, the benefits of the use and the individual performance. The results indicated that system quality and information quality are very important factors that affect the benefits of using. However, the system quality factors play a more important role than the information quality in the realisation of benefits from the use of ERP" and user satisfaction.

In this sense, Ifinedo and Nahar [43] found that the system quality and information quality are considered as two important factors in the success of ERP systems. McAfee [54] studied the impact of ERP on the companies' operational performance. The study confirmed the high returns of the implementation of ERP for individuals and for organisations, showing that ERP systems must be studied from different perspectives in order to identify the real value of these systems.

Then, demonstrate the real value of ERP systems is not easy because they are tedious projects that require significant resources. For example, the alignment of ERP standard processes with organisational processes of the company has long been considered a crucial step in the process of implementation, and attracted the attention of many researchers [21- 76]. Therefore, some researchers have conducted studies to compare ERP systems in different contexts with different users in order to develop a new theory to facilitate the investigation of ERP in different industries.

For example, Kositanurit et al. [47] conducted a comparative study between the ERP users and non-users in the United States and Thailand to explore the most important factors that affect the performance of the ERP system user, using the

model of Task Technology Fit (TTF) and user satisfaction to predict individual performance and organisational performance. The study shows that system quality and use are very important factors affecting individual performance when ERP systems are used. Although this study has made important contributions, such as the confirmation of the system quality role, many important factors significantly affecting the users' performance as the information quality, user characteristics and utility were not included.

Gelderman [32] examined the relationship between user satisfaction, ERP use and performance. The results indicate that, in an ERP system environment, satisfaction is significantly related to performance.

Garcia-Sanchez and Perez-Bernal [31] showed that user involvement, training and managerial support are critical factors for ERP systems that relate directly to users, suggesting that these factors, as well as others serve as a framework for evaluating ERP systems. In addition to these factors, Ramayah and Lo [63] examined the impact of shared beliefs on the benefits of ERP among different users, including managers and engineers. The study found that when information systems are perceived as easy to use, they are perceived as being more useful from the point of view of the end user.

Chan et al. [19] recently conducted a study to better understand the adoption of ERP systems in an individual context. The study proposed a conceptual model to analyse the impact of factors such as social factors, compatibility and short-term consequences and their impact on the ERP use. The results showed that social factors were the most important factors affecting the use of ERP systems.

More recently, Sun et al. [72] examined the role of ERP several factors, namely the compatibility of work, perceived usefulness, ease of use, performance and intended use on the performance of ERP users and how these factors are shaping the use of ERP. The study showed that these factors were considered important for the users' performance, showing a significant effect on organisational outcomes. The results also showed the usefulness of the integration of several models in information systems, including the TTF model and technology acceptance (TAM), to investigate on the ERP systems, as models of individual information systems have been criticized for being too simplistic.

In summary, ERP and performance studies users are obviously underestimated by placing them in an area that requires further empirical investigation and research in various environments in order to clarify the relationship between ERP and users to provide practitioners and researchers with valuable new information about this important application and its users.

3. RESEARCH MODEL AND HYPOTHESES:

The proposed model was developed after a review of the results of studies on information systems, covering the most important factors in both information systems and user performance. Thus, this research is carried out in companies with one or more information systems, users are invited to assess the actual impact of information systems on user performance. This choice is supported by previous research [33- 25].

Models TAM, TTF and D & M complement each other, which means that their integration is useful for understanding the impact of ERP system [59]. Previous research has studied these models separately without links between them. However, theoretical and empirical reasons argue for the existence of links between these models [73]. Therefore, the research model proposed by extending TAM and TTF model with D & M provides a better explanation of the impact of ERP systems on user performance (Figure 1).
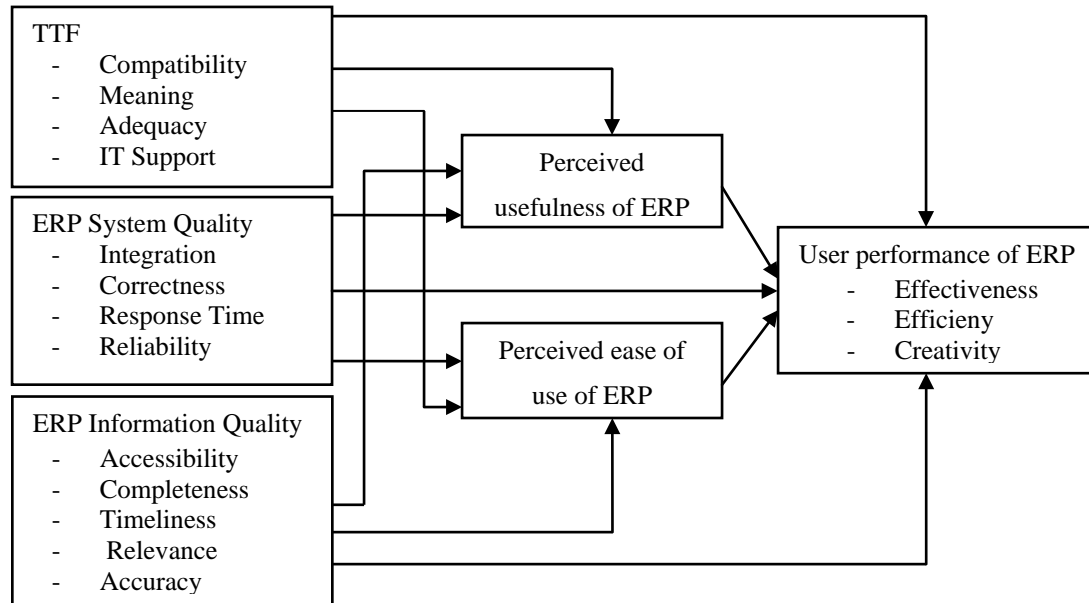
Figure 1: Operational research model

3.1. Task Technology Fit (TTF):

The Task Technology FIT (TTF) is one of the well-known models in IS used to study the relationship between a system, the task requirements and user needs. This model is based on the idea that when the characteristics of user tasks and characteristics of the information system integrate well together, both system use and user performance will be high [33]. Relationships between factors associated with TTF such as compatibility information (Compatibility), understanding the information (Meaning) and the ease of information retrieval (locatability) reflect the consistency between the needs of users, or what is called the task requirements and the technology used to perform these tasks. Thus, the consistency of the characteristics of the system with the user requirements lead to better performance [33].

Empirically, the results show that TTF factors directly affect the performance [46]. In other words, the capacity of the system can affect the perceived usefulness in improving user interaction with the system [18]. In this sense the system's ease of use, perceived usefulness and perceived ease of use are linked together [67]. For example, a high quality system provides faster response to users, leading to improvements in the perceived usefulness and performance [50].

Finally, it is worth mentioning that the level of the relationship between all the factors mentioned above differs from SI environment to another, depending on the characteristics of the system and the user. However, in developing the study design, the factors were chosen deliberately from information systems and ERP system litterature. Overall, the factors were chosen with reference to a wide range of studies and their use in information systems and user performance. From this we posit that:

H1: The TTF affects user performance of ERP system directly and indirectly through perceived usefulness and ease of use in organizations.

H1a: The TTF directly affects user performance of ERP system in organizations.

H1b: The TTF indirectly affects user performance of ERP system in organizations through perceived usefulness.

H1c: The TTF indirectly affects user performance of ERP system in organizations through the perceived ease of use.

3.2. ERP system Information Quality:

The literature on information quality reflects the existence of a number of views on what constitutes the attributes of information. A large number of empirical studies have been conducted to develop a framework for measuring the quality

of information [79- 42], from the many characteristics identified by Bailey and Pearson [11] such as accuracy, precision, currency, timeliness, completeness, conciseness, format and relevance. Confirming the previous frame, Watson and Shneider [80] identified five characteristics of information quality are accuracy, timeliness, conciseness, convenience and relevance. In this sense, Huang and Wang [42] have conducted a series of studies on information quality and have used the accuracy, relevance and accessibility.

Miller [55] used usefulness, accuracy, timeliness and relevancy to measure the information quality, while Alka [3] used the clarity, relevance, accuracy and timeliness of research users. Similarly, Bovee [16] used the relevance, interpretability, accuracy and accessibility.

In conclusion, by analyzing these measures, it seems possible to formulate a basic measure for this study. The characteristics of quality information most commonly and widely accepted are identified and presented in Livari [52], Bovee [16], DeLone and McLean [25- 26] and Wang and Strong [79]. This study therefore reinforces these features commonly used to construct a measure of the quality of information that includes the relevance, accuracy, timeliness, completeness and accessibility. From this logic, and parallel with past studies, we hypothesize:

H2: ERP information quality affects the performance of users directly and indirectly through perceived usefulness and perceived ease of use in organizations.

H2a: ERP information quality directly affects the performance of users in organizations.

H2b: ERP information quality indirectly affects user performance in organizations through perceived usefulness.

H2c: ERP information quality indirectly affects user performance in organizations through the perceived ease of use.

3.3. ERP System Quality:

The measurement of the quality of information systems is a multidimensional process focusing on different aspects, because a system has many aspects such as system aspects, quality aspects and other aspects related to technical issues. In general, the measure of system quality concentrates on the specifications of a target system. However, some studies have examined the benefits and use of the system and its efficiency. Some studies have used the reliability, response time and ease of use as mentioned in various researches to support ERP users to perform several tasks at the same time and for different purposes [4].

Typical measures of the system quality in the traditional studies include system stability, availability, response time and ease of use [82]. In this context, it should be noted that researchers used different measures to investigate the system quality depending on the nature of the research and its objectives. Some studies have focused on the technical aspects of the system, while others focus on system performance and its ability to provide quality information. However, most studies have many similar measures. According to DeLone and McLean [26] quality system is measured by the perceived ease of use, reliability, functionality, flexibility, data quality, integration and portability, reflecting the users needs dependence on system quality. However, from a practical point of view, a high level of system quality can provide users convenience, more privacy and quicker responses. For example, Lederer et al. [50] and Liao and Cheung [51] have shown that the capacity of the system have had a positive impact of perceived ease of use and perceived usefulness of the system.

Indeed, many researchers have generally focused on the performance characteristics of a system to measure the system quality. These features were mostly drawn from the list of Hamilton and Chervany [38] concerning measures of the quality system. The list is probably the best known in the literature in terms of the measure of the system quality [38- 11- 84-85].

The list includes response time or so-called the turnaround time, reliability, flexibility and ease of use. The researchers found that the list covers all relevant elements of the quality system. Seddon [66] measure the system quality by reliability, user interface, consistency, ease of use and quality, which is consistent with the list of Hamilton and Chervany [38]. Thus, in this research the system quality measures are reliability, response time, correctness and integration. Based on the theoretic and empirical support, we hypothesize that:

H3: The quality of ERP system affects user performance directly and indirectly through

perceived usefulness and perceived ease of use in organizations.

H3a: The quality of ERP system directly affects the user performance in organizations.

H3b: The quality of ERP system indirectly affects user performance in organizations through perceived usefulness.

H3c: The quality of ERP system indirectly affects user performance in organizations through the perceived ease of use.

3.4. Ease of use and perceived usefulness:

The perceived ease of use refers to the extent to which users believe that using a particular system would be easy to manage, manipulate and regroup [49- 24- 79]. The perceived ease of use shows the degree to which a system is considered as not being too difficult to understand, learn and use. The perceived ease of use was found to influence the behavior of users, either directly or indirectly, by the use of the system.

On the other hand, Perceived usefulness refers to whether the system provides accurate, timely, relevant, reliable and valid information for users or not [55]. Therefore, using the system will enhance job performance, productivity, efficiency and quality of work.

As noted by Bhattacherjee [14], the willingness of a person to interact with a particular system is already considered useful. Thus, it is expected that users will adopt a system if they believe that it will help them to achieve the desired results of performance [6].

In the literature, the perceived ease of use and perceived usefulness are interdependent and used together in most aspects of research that affect each other in individual aspects [24]. Perceived usefulness is regarded as a term for the individual impacts such as improving individual productivity and performance [62- 66]. In addition, Wixom and Watson [81] found that the quality of information, system quality and perceived usefulness are related to each other, expressing that the higher is the level of quality of information and quality system, the higher the system is useful.

Measures for the perceived usefulness and perceived ease of use were adapted from previous studies using the model of technology acceptance [24- 44- 57-67]. Therefore, we posit that:

H4: The information quality affect perceived usefulness and perceived ease of use of ERP system.

H4a: The information quality affect the perceived usefulness of ERP system.

H4b: The information quality affect the perceived ease of use of ERP system.

H5: The system quality affect the perceived usefulness and perceived ease of use of ERP system.

H5a: The system quality affect the perceived usefulness of ERP system.

H5b: The system quality affect the perceived ease of use of ERP system.

3.5. User performance:

There are different points of view on user performance. It can simply be considered as the set of results achieved. On the individual level, it is the set of a person's realizations [69- 8 12].

Measuring performance is normally achieved by aspects such as speed, time, accuracy, efficiency and effectiveness [29]. Nevertheless, when it comes to work-based software, it is important that systems are able to provide people with information so they can work and make decisions [70]. This success is measured in terms of speed and accuracy of obtaining the necessary information to users from a system to accomplish their tasks [29]

Some researchers have indicated that the performance can be evaluated using two performance measures namely productivity and quality of work. According to Hodgkinson [39], performance is usually measured by quantitative and qualitative indicators, which generally fall into three main indicators of effectiveness, efficiency and quality in order to describe the relationship between the input and output of resources, thus, referring to the effectiveness and efficiency. Though, there is another indicator of performance measurement which is the ability of people to create new ideas related to their work or how they carry out the work.

Based on the work of Cohen [23], performance can be measured through three criteria which are the quantity of outputs, quality of outputs and behavioral outcomes. Cohen also included efficiency measures of productivity, quality time response. In short, objective measures of performance are not available and in any case, would not have been compatible with

all individuals having different jobs and tasks [33]. Therefore, for the purposes of this research, the performance of users will be measured by the effectiveness, efficiency and creativity by asking users their views about their perceived performance, because Most of the measures used in previous studies refer to these three measures.

4. RESEARCH METHODOLOGY :

Empirical validation of the research model of the impact of ERP system on the performance of the users was conducted using a questionnaire administered to 300 users of ERP system in Tunisian companies. Of the 300 completed questionnaires, 31 were rejected because of outliers. The final sample size was thus established in 269 participants of whom 176 are women and 63 men. The age of respondents varied between 26 and 60 years with a concentration in class 30 to 39 years. The age of respondents varied between 2 and 25 years with a dominance in the class 4 to 6 years. The questionnaire distributed was formed from the scales we adapted.

Measurement scales were developed following the procedure of Churchill (1979). In the exploratory phase, we proceeded to the generation of a set of items based on adaptation of existing scales (Appendice 1).

The collected data were analyzed in two stages. Firstly, the exploratory and confirmatory factor analysis was conducted to assess the dimensionality, reliability and construct validity. Secondly, the methods in Amos structural equation 18 were used to test the relationships between variables in the model of ERP and performance users. These two steps and their results will be presented in what follows.

5. ANALYSIS OF RESULTS:

5.1. Factorial analysis:

The exploratory analysis was conducted in SPSS 17. The dimensionality of the scales was assessed by a Principal Component Analysis (PCA) with varimax rotation. Four items were eliminated Complet2, Resptime2, Effectiv5 and Efficien1. These are items whose contributions are shared between several axes or those with low contributions factor [64]. Measurement instruments have good psychometric qualities. All items selected are generally good factorial contributions. Reliability and internal consistency of the items constituting a single dimension were evaluated based on Cronbach's alpha. All variables in the model have good Cronbach's alpha coefficients. Appendice 2 provides a tabulated summary of the main results of the exploratory analysis.

In a second phase, a confirmatory factorial analysis was performed in 18 Amos to test construct convergent and discriminant validities. At the conclusion of this step, the analysis of construct validity yield acceptable results. Table 1 summarizes the adjustment indices that can be considered good, given the complexity of the model and the size of the relatively small sample [64]. The first index (Chi-2/ddl) satisfies the threshold advocated 2 to 5. The RMSEA is less than the threshold limit of 0.08. CFI and TLI are above the critical threshold of 0.9. The GFI and AGFI are satisfactory insofar as their values are close to the recommended threshold of 0.9. These values may be due to the sensitivity of these indicators to the number of parameters to estimate and the sample size [64]. The adjustment of the measurement model is therefore considered satisfactory (GFI = 0.897, AGFI = 0.851, CFI = 0.938, TLI = 0.928, RMSEA = 0.042 and RMR = 0.044).

Indice	Chi-deux/ddl	GFI	AGFI	RMR	RMSEA	TLI	CFI
Value	1,570	0,916	0,893	0,074	0,046	0,913	0,920

Table 1: Adjustment of the causal model

5.2. Presentation of the causal model and verification of assumptions regarding causal links:

The causal model of our research provides a good adjustment. Indeed, absolute, incremental and parsimony indices shown in Table 1 satisfy the empirical conditions generally recommended in previous research.

Figure 2 shows the causal model that integrates system quality, information quality, perceived usefulness, perceived ease of use and user performance of ERP. This model explains the impact of ERP systems on the performance of users and provides information about intensity and significance of the relationships between variables.
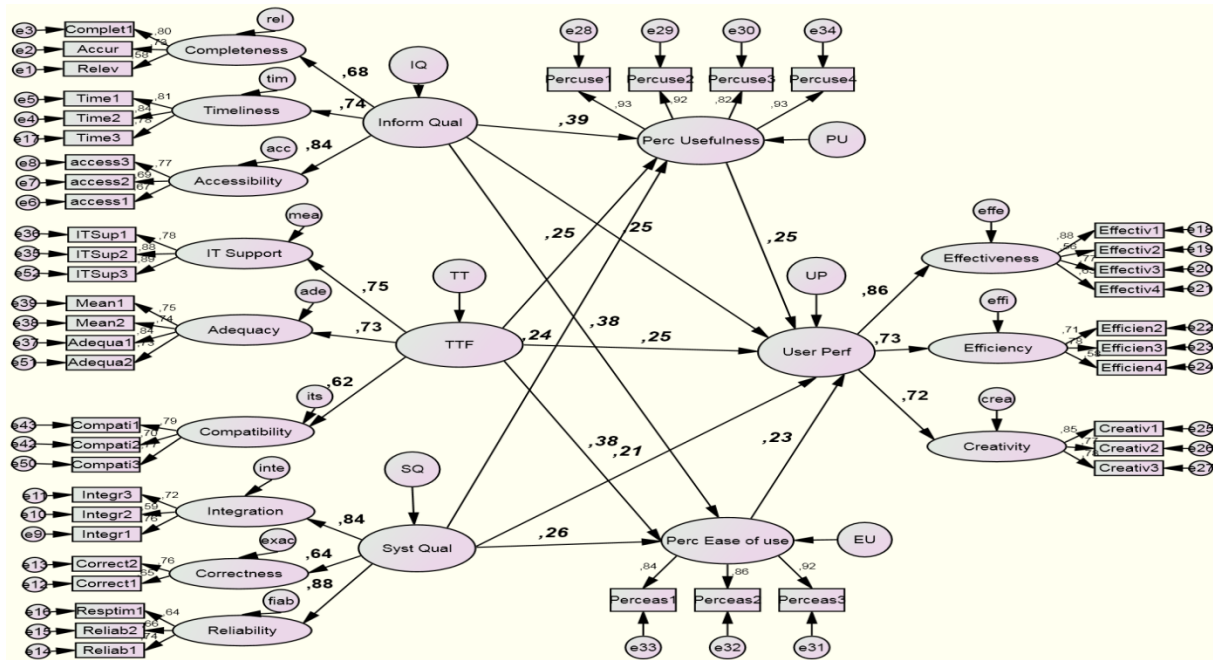
Figure 2 : The causal model

At this level, the causality of this model allows the validation of all the assumptions of our research work. Indeed, Table (2) shows that all causal links are significant at the 5% level.

Causality		Student Test	P	Estimate	Hypothesis
H1a TTF ⟶ User performance of ERP		2,922	0,003*	0,253	Accepted
H2a Information Quality ⟶ User performance of ERP		3,465	0,007*	0,250	Accepted
H3a System Quality ⟶ User performance of ERP		2,781	0,008*	0,206	Accepted
H4a Information Quality ⟶ Perceived usefulness of ERP		4,591	0,000*	0,388	Accepted
H4b Information Quality ⟶ Perceived ease of use of ERP		4,526	0,000*	0,376	Accepted
H5a System Quality ⟶ Perceived usefulness of ERP		3,496	0,000*	0,243	Accepted
H5b System Quality ⟶ Perceived ease of use		3,704	0,000*	0,258	Accepted
* : P < 0,05 (Significant).					

Table 2: Significance of the causal links of the causal model

5.3. The importance of the mediating effect at

the causal model:

After testing the significance of direct causality between the relational variables of our causal model, it is relevant to present in this paragraph the indirect links and show the importance of mediating variables in our model.

Table (3) to determine the importance of indirect effects compared to direct effects and total effects. In addition, a more detailed complement of this table was done at the level of testing mediating variables in order to check the significance of indirect effects and total effects.

Structural links		Direct effects	Indirect effects	Total effects
TTF ⟶	User performance of ERP	0,253	0,149	0,403
TTF ⟶	Perceived usefulness of ERP	0,245	0,000	0,245
TTF ⟶	Perceived ease of use of ERP	0,382	0,000	0,382
System Quality ⟶	User performance of ERP	0,326	0,120	0,326
System Quality ⟶	Perceived usefulness of ERP	0,206	0,000	0,243
System Quality ⟶	Perceived ease of use of ERP	0,258	0,000	0,258
Information Quality ⟶	User performance of ERP	0,250	0,188	0,433
Information Quality ⟶	Perceived usefulness of ERP	0,388	0,000	0,388
Information Quality ⟶	Perceived ease of use of ERP	0,376	0,000	0,376
Perceived usefulness ⟶	User performance of ERP	0,248	0,000	0,248
Perceived ease of use ⟶	User performance of ERP	0,231	0,000	0,231
* : P < 0,05 (Significant).				

Table 3: Direct, indirect, and total effects at the level of causal model

It remains to verify the significance of these indirect effects, thing that AMOS software does not carry out, hence the use of the Sobel test. Sobel test is used to verify the presence of a mediation effect; it can determine whether the indirect effect of the independent variable divided by the dependent variable through the mediator is significantly different from zero [64].

		TTF/User Performance of ERP		
		Z-Score	**P**	**Hypothesis**
H1b	Mediating Variable : perceived usefulness of ERP	2,4169	0,0157*	Accepted
H1c	Mediating Variable : Perceived ease of use of ERP	2,4376	0,0148*	Accepted
		Information Quality/ User Performance of ERP		
		Z-Score	**P**	**Hypothesis**
H2b	Mediating Variable : perceived usefulness of ERP	2,7125	0,0067*	Accepted
H2c	Mediating Variable : Perceived ease of use of ERP	2,3725	0,0176*	Accepted
		System Quality/ User performance of ERP		
		Z-Score	**P**	**Hypothesis**
H3b	Mediating Variable : perceived usefulness of ERP	2,4233	0,0154*	Accepted
H3c	Mediating Variable : Perceived ease of use of ERP	2,2265	0,0260*	Accepted
* P < 0,05 (Significant)				

Table 4: Sobel test for indirect links of the causal model

The indirect effect of the TTF, system quality and information quality divided by the user performance of ERP system through perceived usefulness and perceived ease of use of ERP is positive and significant. This result shows the mediating role of perceived usefulness and perceived ease of use of ERP system.

6. DISCUSSION OF RESULTS:

6.1. TTF and user performance:

The results indicated that the TTF affect significantly and positively user performance of ERP system. Goodhue and Thompson [33] suggested that the TTF had a significant and positive effect on the performance of the user. Consistent with previous research on this relationship [19], this study also confirmed this relationship in two different ways, including the direct effect of the TTF on user performance and the indirect effect through the perceived ease of use and perceived usefulness. The results of this study confirm what was proposed in the original model and in previous studies in terms of impacts TTF. Therefore, the TTF is an important factor in the current research model, as in the original model.

Goodhue and Thompson [33] found that when a system has the features needed to accomplish a task, better performance is achieved. In addition, if a system is designed, which will lead to more users, which should produce a greater impact on user performance. In addition, the study confirmed that TTF is also a robust model in which the task characteristics and technology determine the correspondence between the functional requirements of ERP system, and task demands [83].

Other factors such as perceived ease of use and perceived usefulness also contribute to the relationship between TTF and performance of the user. In addition, the study revealed that TTF affects user performance more significantly thanks to the perceived ease of use than perceived usefulness.

To enable users to obtain benefits from ERP, the system itself must be seen as useful and fit properly to user tasks [33]. More specifically, the study shows that users who perceive the system as useful and fits well with its work requirements, pereceive more positive and significant effect on their performance.

However, compatibility and adequacy of the ERP systems were more important for the performance of the users while computer support was less effective in influencing the performance of the user [33- 59- 46]. This confirms the importance of compatibility and adequacy of ERP users tasks. They reach more benefits when the systems have high compatibility and a better match with their job requirements.

6.2. ERP System quality and user performance:

The results of the study indicate that the quality of the ERP system affects the user performance, both directly and indirectly, which shows a strong direct correlation between measures of system quality and user performance. The study confirmed the main proposal of DeLone and McLean [25] in the same way as in the original model. In addition, in order to identify the most important measures of the system quality which contribute to user performance, a regression was made between the dimensions of the quality and user performance of the ERP system.

The results show that the integration and reliability are the most important measures which contribute significantly to user performance and explain much of the variance in user performance.

Another important point is confirmed in this regard, is that the ERP system are designed for all levels of users and the results showed that ERP system are suitable for any type of user. This improves the user's ability to rely on these systems to carry out their tasks in different functional areas. This increases the usefulness of ERP and confirms the integration as an inevitable result and a strategic factor that improves the

user performance of ERP system in organisations. This is consistent with previous studies, as in Gupta and Kohli [37], Guimaraes et al. [36], Grant et al. [35] and Petter and McLean [60].

Regarding the indirect impact of system quality on user performance of ERP thanks to perceived usefulness and ease of use as mediators, the results showed that these mediators affect the user performance of ERP. The results show that when ERP system are perceived as high quality systems by users, they are more likely to be perceived as more useful, leading subsequently to positive effects on the user performance. Similarly, the findings show that when ERP are perceived as high quality systems for users, they are more likely to be perceived as easy to use [65].

6.3. Information quality and user performance:

Consistent with previous studies in different types of information systems, the results of the study indicate that the impact of information quality on user performance of ERP is positive and significant. This study showed the importance of the information quality as a key factor positively influencing user performance of ERP. These confirm the findings of previous studies [26- 13- 7].

All measures of the information quality were analysed to determine the importance of each measure and determine who has the most significant contribution in predicting the user performance of ERP. Among these measures, the timeliness and completness were considered the most important attributes of information quality to assist users in performing their tasks when using ERP system.

ERP system users give great attention to the completeness of the information as it contributes significantly to their performance. They reported that the completeness of the information available through the ERP system helps them achieve their performance goals and improve the quality of work performed. The accuracy and relevance are very important to the users performance, and help in conjunction with the comprehensiveness to improve user performance. It leads to a more precise work with fewer errors, and users rely on systems to obtain the accurate information needed to perform their tasks and achieve their business goals. Finally, the

availability of information also allows users to improve their efficiency and reduce the time spent in carrying out their tasks.

The results indicate that perceived usefulness mediates the relationship between information quality and user performance of ERP. When ERP system provide high quality information, they are perceived as the most useful systems by users. This leads to impacts on the system performance more.

Similarly, the results show that the perceived ease of use is a key mediator between information quality and user performance relationship. The results show that the more users perceived ERP system ease of use the more they will have positive effects on user performance. The impact of information quality by perceived usefulness was slightly stronger than through the perceived ease of use. This implies that the information retrieved from the ERP system could be useful for the performance of users regardless of the perceived ease of use.

6.4. Theoretical and managerial implications:

This study provides further evidence of the appropriateness of extending the models of TTF, TAM and Delone & McLean as a useful means to provide an overview on the most important aspects of the ERP system impact on user performance. Therefore, the main theoretical contribution of this study to the theory of ERP system is the consolidation of three different models and the interrelationships between them to explain the impact of ERP on user performance. In addition, the study goes further and provides an in-depth overview of the main measures of the factors studied. Previous studies have not provided an explanation of the dimensions of these factors and their importance in terms of impact and utility systems. First, the compatibility and adequacy as a measure of the FTT. Secondly, integration and reliability as a measure of the quality system. Finally, the timeliness and completeness as measurement of information quality.

This research shows the importance of TTF explaining the impact of ERP system on user performance. Previous research on TTF, concentrated mainly on computing, focused on factors such as user satisfaction and the attention of users to use an ERP system. The results of this study suggest the extension to other factors such as the information quality and the system quality

is important to determine the impact on the performance and use of ERP systems.

Overall, the above results can be useful for the implementation and management of ERP system. Thus, the suitability and compatibility of ERP users' needs and job requirements play an important role in improving performance. The information systems managers, suppliers and consultants must pay sufficient attention not only to improve the quality of ERP as a product, but also to improve the quality of systems outcomes, quality of information and ability to align with user needs [82].

7. CONCLUSION:

The impact of ERP systems on user performance and the relationship between information systems and user performance are the theoretical foundations of this study. The use of the TTF, the TAM and Delone and McLean model [25- 26] to predict and explain the impact of ERP system on the users performance, helped identify key factors influencing the implementation of ERP. The empirical validation of the ERP system impact model on user performance in a sample of 269 Tunisian users showed that the effects of implementation of the ERP system depends on the degree of user acceptance. The results of the study confirmed the results of previous studies [72- 18-24] showing that user performance is more better that they perceive the system more useful and easier to use of ERP.

Previous studies that have examined the impact of ERP system on users indicated that system quality and information quality are very important factors that affect the benefits of use [26- 54]. This study demonstrated the importance of all the factors mentioned above and explored the relative contribution of each factor to the user performance of ERP.

The results showed that users think that the ERP system ability is to provide high quality information, which reduces errors and resolve performance problems when they occur. In addition, the TTF and the system quality play an important role in improving the performance quality and increase the volume of users work. The results showed a satisfactory level of adjustment between ERP and users needs and task requirements, taking into account the characteristics of IS.

Furthermore, perceived usefulness and perceived ease of use have proven to be very important factors that affect the use of the system and mitigate the impact on user performance. This is an opportunity for researchers and practitioners in IS to maximize ERP impacts by improving training and organizational support in of ERP design and implement ERP in the light of the diversity of suppliers, designers, functionality of ERP and industries [83]

In spite of insights provided by the results of this research and managerial implications arising, some limitations should be noted. Some measurement scales of variables could be improved, including scales measuring perceived usefulness and perceived ease of use. Another limitation is inherent in the non-consideration of the characteristics of users to measure users' performance based on sex, age, and experience.

In addition, most areas of research require further developments. Studying the impact of user characteristics on individual performance seems interesting.

REFERENCES:

[1] Abagail, M. "Efficiency v. Structure-Conduct-Performance : implications for Strategy Research and Practice", *Journal of Management,* 9(1), 1994, pp. 63-78.

[2] Al-Hakim, L. "*Information Quality Management: Theory and Applications*", Hershey, 2006.

[3] Alka, V. "*Information Quality Perceptions*", Unpublished PhD, Washington State University, Washington, 2001.

Resource Management Review, Winter, 1995, pp. 267-288.

[13] Bernroider, E. "IT governance for enterprise resource planning supported by the DeLone-McLean model of information Systems success", Information & Management, 45, 2008, pp. 257-269.

[14] Bhattacherjee, A. "Individual trust in online firms: scale development and initial test", Journal of Management and Information Systems, 9(1), 2002, pp. 211-241.

[15] Botta-Genoulaz, V., Millet, P., and Grobot, B. "A survey on the récent research literature on ERP Systems", Computers in Industry, 56(6), 2005, pp. 510-522.

[16] Bovee, M. "Information Quality: A Conceptual framework and Empirical Validation", 2004,

order to help users understand the benefits of using ERP system and improving adaptability of these systems with user needs.

Careful consideration of user needs and requirements of working in a particular industry will help designers and practitioners

[4] Alloway, R. "Defining Success for Data Processing: A Practical Approach to Stratégie Planning for the DP Department", 2007, Retrieved from http// business.clemson.edu.

[5] Al-Mashari, M., Al-Mudiningh, A., and Zairi, M. "Enterprise Resource Planning: taxonomy of critical factors", *European Journal of Operational Research 146,2003, pp. 352-364.*

[6] Amoako-Gyampah, K., and Salam, A. "An extension of the technology acceptance model in an ERP implementation environment", Information and Management 41(6), 2004, pp. 731- 745.

[7] Amoli, E., and Farhoomand, "A. Structural model of end user Computing satisfaction and user performance", Information & Management, 30, 1996, pp. 65-73.

[8] Armstrong, H., and Baron, A. "Performance Management", 2002, London: Institute of Personnel and Development.

[9] Arunthari, S. "Information Technology adoption by companies in Thailand: A study of Enterprise Resources planning System Usage", Unpublished PhD University of Woliongong, NSW Australia, 2005.

[11] Bailey, J., and Pearson, S. "Development of a Tool for Measuring and Analyzing Computer User Satisfaction", Management Science, 29(5), 1983, pp. 530-545.

[12] Bat, R., and Helton, E. "Computerized Performance", Human Unpublished PhD Dissertation, University of Kansas, Kansas.

[17] Bradford, M., and Florin, J. "Examining the rôle of innovation diffusion factors on the implementation success of enterprise resource planning Systems", International Journal of Accounting Information Systems, 4(3), 2003, pp. 205-225.

[18] Calisir, F., and Calisir, F. "The relation of interface usability characteristics, perceived usefulness and perceived ease of use to end - user satisfaction with enterprise resource planning Systems", Computer in Human Behavior, 20, 2004, pp. 505-515.

[19] Chan, H., Siau, K., and Wei, K. "The Effect of Data Model, System and Task Characteristics on User Query Performance -An Empirica!

Study", *The DATA BASE forAdvances in Information Systems 29* (1), 1998, pp. 31-49.

[20] Chien, S., and Tsaur, S. "Investigating the success of ERP .Systems: Case studies in three Taiwanese high-tech industries"*,* Computers in Industry, 58(8), 2007, pp. 783-793.

[21] Chiplunkar, C, Deshmukh, S., and Chattopadhyay, R. "Application of principles of event related open Systems to business process reengineering"*,* Computers & Industrial Engineering, 45, 2003, pp. 347-374.

[22] Churchill G.A. "A Paradigm for Developing Better Measures of Marketing Constructs", Journal of Marketing Research, 16, February, 1979, pp. 64-73.

[23] Cohen, S. "What makes teams work: Group Effectiveness? ", Journal of Management and Information Systems, 23(3), 1997, pp. 230-290.

[24] Davis, F. "Perceived usefulness, perceived ease of use, and user acceptance of information technology"*,* Management Information System Quarterly 13(Sep), 1989, pp. 318-340.

[25] Delone, W., and McLean, E. "Information Systems success: the quest for the dépendent variable"*,* Information Systems research 3(1), 1992, pp. 60-95.

[26] DeLone, W., and McLean, E. "The DeLone McLean mode! of information system success: a ten-year update"*,* Journal of Management Information Systems, 19(4), 2003, pp. 3-9.

[27] Eric, W., Ngai, Chuck, C, and Law,'H. "An investigation of the relationships between organizational factors, business process improvement, and ERP success"*,* An International Journal, 14(3), 2007, pp. 287-406.

[28] Floropoulos, J., Spathis, C, Halvatzis, D., and Tsipouridou, M. "Measuring the success of the Greek Taxation Information System"*,* International Journal of Information Management, 30(1), 2010, pp. 47-56.

[29] Ford, G., and Gelderblom, H. "The Effects of Culture on the performance achieved through the use of human computer interaction"*,* 2003, Paper presented at the Proceeding of SAICSIT, SAICSIT.

[30] Gable, G, Sedera, D., and Chan, T. "Re-conceptualizing Information System Success: The IS-Impact Measurement Model"*,* Journal of the Association for Information Systems, 9(7), 2008, pp. 377-408.

[31] Garcia-Sanchez, N., and Perez-Bernal, L. "Détermination of Critical Success Factors in Implementing an ERP System: A Field Study in Mexican Enterprises"*,* Information Technology for Development, 73(3), 2007, pp. 293-309.

[32] Gelderman, M. "The relation between user satisfaction, usage of information Systems and performance"*,* Information & Management, 34, 1998, pp. 11-18.

[33] Goodhue, D., and Thompson, R. "Task-technology fit and individual performance"*, MIS Quarterly, 19(2),* 1995, pp. 213-233.

[34] Gorla, N., Somers, T. M, and Wong, B. "Organizational impact of system quality, information quality, and service quality"*,* The Journal of Stratégie Information Systems, 19, 2010, pp. 207-228.

[35] Grant, D., Hall, R., Wailes, N., and Wright, C. "The false promise of technological determinism: the case of enterprise resource planning Systems"*,* New Technology, Work and Employment, 21(1), 2006, pp. 2-15.

[36] Guimaraes, T, Staples, S., and McKeen, J. "Assessing the Impact From Information Systems Quality"*,* The Quality Management Journal, 74(1), 2007, pp. 15-30.

[37] Gupta, M., and Kohli, A. "Enterprise resource planning Systems and its implications for opérations function"*,* Technovation, 26, 2006, pp. 687-696.

[38] Hamilton, S., and Chervany, N. "Evaluating Information System effectiveness", Part 1, Comparing Evaluation Approaches, MIS Quarterly, 5(3), 1981, pp. 55-69.

[39] Hodgkinson, A. "Productivity measurement and enterprise bargaining - the local government perspective"*,* International Journal of Public Sector Management, 72(6), 1999, pp. 470-481.

[40] Hong, K., and Kim, Y. "The critical success factors for ERP implementation: an organizational fit perspective"*,* Information & Management, 40, 2002, pp. 25-40.

[41] Hossain, M. D, Moon, M., Yun, J.W., Chan Choe, Y. "Impact of psychological traits on user performance in information systems delivering customer service: IS management perspective", Decision Support Systems, 2012, pp. 1-12.

[42] Huang, K., Lee, Y., and Wang, R. "Quality Information and Knowledge"*,* 1999, Upper Saddle River NJ: Prentice Hall.

[43] Ifinedo, P., Rapp, B., Ifinedo, A., and Sundberg, K. "Relationships among ERP post implementation success constructs: An analysis at the organizational level"*,*

Computers in Human Behavior, 26(5), 2010, pp. 1136-1148.

[44] Igbaria, M., and Tan, M. "The conséquences of information technology acceptance on subséquent individual performance"*,* Information & Management, 32, 1997, pp. 113-121.

[45] Joseph, R., Small, H., and Chen, J. "Implementing enterprise resource planning (ERP) Systems in small and midsize manufacturing firms"*,* International Journal of Opérations & Production Management, 23(8), 2003, pp. 850 - 871.

[46] Klaus, T., Gyires, T., and Wen, J. "The use of Web-based information Systems for non work activities: An empirical study"*,* Human Systems Management, 22(3), 2003, pp. 105-114.

[47] Kositanurit, B., Ngwenyama, O., and Osei-Bryson, K. "An exploration of factors that impact individual performance in an ERP environment: an analysis using multiple analytical techniques"*,* European Journal of information Systems, 15, 2006, pp. 556-568.

[48] Kositanurit, B., Osei-Bryson, K.M., Ngwenyama, O. "Re-examining information systems user performance: Using data mining to identify properties of IS that lead to highest levels of user performance"*,* Expert Systems with Applications, 38, 2011, pp. 7041-7050.

[49] Kwasi, A. "Perceived usefulness, user involvement and behavioral intention: an empirical study of ERP implementation"*,* Computers in Human Behavior, 23(3), 2007, pp. 1232-1248.

[50] Lederer, L., Maupin, D., Sena, M., and Zhuang, Y. "The technology acceptance model and the World Wide Web"*,* Décision Support Systems, 29, 2000, pp. 269-282.

[51] Liao, Z., and Cheung, M. "Internet-based e-shopping and consumer attitudes: an empirical study"*,* Information & Management, 38, 2001, pp. 299-306.

[52] Livari, J. "An Empirical test of the DeLone - McLean Model of Information System Success"*,* Database for Advances in Information Systems, 36(2), 2005, pp. 8-27.

[53] Mabert, V. A, Soni, A., and Venkataramanan, M. A. "Enterprise resource planning: Managing the implementation process"*,* European Journal of Operational Research, 146(2), 302-314.

[54] McAfee, A. "The impact of Enterprise technoiogy adoption on operationai performance: an empirical investigation"*,*

Production and Opérations Management, 77(1), 2002, pp. 33- 53.

[55] Miller, H. "The multiple Dimensions of Information Quality", 2007, article Retrieved from : http://www.muhlenberg.edu.

[56] Oreilly, C. "Variations in Décision Makers' Use of Information Sources: The Impact of Quality and Accessibility of Information"*,*The Academy of Management Journal, 25(4), 1982, pp. 756- 771.

[57] Palvia, P., Pinjani, P., and Sibiey, E. "A profile of information Systems research"*,* Information & Management, 44(1), 2007, pp. 1-11.

[58] Park, J.-H., Suh, H.-J., and Yang, H.-D. "Perceived absorptive capacity of individual users in performance of Enterprise Resource Planning (ERP) usage: The case for Korean firms"*,* Information & Management, 44(3), 2007, pp. 300-312.

[59] Dishaw, T., Strong, D., and Bandy, B. "*Extending the task technology fit model with self efficacy constructs*"*,* Paper presented at the *Eighth Americas Conférence on Information Systems, 2002.*

[60] Petter, S., and McLean, E. R. "A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level"*,* Information & Management, 46(3), 2009, pp. 159-166.

[61] Poon, P.-L, and Yu, Y. T. "Investigating ERP Systems procurement practice: Hong Kong and Australian expériences"*,* Information and Software Technology, in Press, Corrected Proof, 2010.

[62] Rajiv, S., Anand, J., and Charles, C. "Information System Success Individual and Organizational Déterminants"*,* Management Science 52(12), 2006, pp. 1849-1864.

[63] Ramayah, T., and Lo, M. "Impact of shared beliefs on "perceived usefulness" and "ease of use" in the implementation of an enterprise resource planning system"*,* Management Research News, 30(6), 2007, pp. 420-431.

[64] Roussel P, Durrieu F., Campoy E., El Akremi A. "Méthodes D'équations Structurelles: Recherches et Applications En Gestion"*,* Paris, Economica, 2002.

[65] Saeed, K. A, and Abdinnour-Helm, S. "Examining the effects of information system characteristics and perceived usefulness on post adoption usage of information Systems"*,* Information & Management, 45(6), 2008, pp. 376-386.

[66] Seddon, P. "A Respecification and Extension of the DeLone and McLean Modei of IS

Success"*, Information Systems Research, 8(3), 1997, pp. 240-253.

[67] Shih, H. "An empirical study on predicting user acceptance of e-shopping on the Web"*, Information & Management, 41, 2004, pp. 351-368. [68] Somers, T., and Nelson, K. "The impact of critical success factors across the stages of enterprise resource planning implementations"*, Paper presented at the Proceedings of the 34th Hawaii International Conference on System Sciences, January, 2001.

[69] Sonnentag, S. Psychological Management of Individual Performance"*, Germany: John Wiley and sons, 2002.

[70] Spool, J., Scanlon, S., Schroeder, W., Snyder, C, and Deangelo, T. "*Web Site Usability: A Designers Guide*"*, San Francisco CA: Morgan Kaufman Publishing, 1999.

[71] Stone, R., Good, D., and Eveleth, B. "The impact of information technology on individual and firm marketing performance"*, Behaviour & Information Technology, 26(6), 2006, pp. 465 -482. [72] Sun, Y., Bhattacherjee, A., and Ma, Q. "Extending technology usage to work settings: The rôle of perceived work compatibility in ERP implementation. Information & Management ,46, 2009, pp. 351-356.

[73] Thompson, R., Compeau, D., and Higgins, C. "Intentions to Use Information Technologies: An Integrative Model"*, Journal of Organizational and End User Computing, 76(3), 2006, pp. 3-25.

[74] Umble, E., Haft, R., and Umble, M. "Enterprise resource planning: Implementation procédures and critical success factors"*, European Journal of Operational Research, 146, 2003, pp. 241-257.

[75] Urbach, N., Smolnik, S, and Riempp, G. "Development and validation of a model for assessing the success of employée portals"*, Paper presented at the 17th European Conférence on Information Systems, from http://www.ecis2009.it.

[76] Van der Aalst, W. M. P., and Weijters, A. J. M. M. "Process mining: a research agenda"*, Computers In Industry, 53(3), 2004, pp. 231-244.

[77] Venkatesh, V., and Davis, F. "A theoretical extension of the technology acceptance model: Four longitudinal field studies"*, Management Science, 46(2), 2000, pp. 186-205.

[78] Wang, E., Shih, S., Jiang, J., and Klein, G. "The consistency among facilitating factors and ERP implementation success: A holistic view of fit"*, The Journal of Systems and Software 81(9), 2008, pp. 1609-1621.

[79] Wang, R., and Strong, D. "Beyond accuracy: What data quality. means to data consumers"*, Journal on Management of Information Systems, 12(4), 1996, pp. 5-34.

[80] Watson, E., and Schneider, H. "Using ERP in éducation"*, Communications of AIS, 1(9), 1999, pp. 12-24.

[81] Wixom, B., & Watson, H. "An empirical investigation of the factors affecting data warehousing success"*, MIS Quarterly, 25(1), 2001, pp. 17-41.

[82] Wu, J., and Wang, W. "Measuring KMS success: A respecification of the DeLone and McLean's model"*, Information & Management, 43(6), 2006, pp. 728-739.

[83] Yen, D. C, Wu, C.-S., Cheng, F.-F., and Huang, Y.-W. "Déterminants of users intention to adopt wireless technology: An empirical study by integrating TTF with TAM"*, Computers in Human Behavior, In Press, 2010, Corrected Proof.

[84] Yusuf, A., Gunasekaran, and Abthorpe, M. "Enterprise information Systems project implementation: A case study of ERP in Rolls-Royce"*, International Journal of Production Economies, 87, 2004, pp. 251-266.

[85] Zhang, Z., Lee, M., Huang, P., Zhang, L, and Huang, X. "A framework of ERP Systems implementation success in China: An empirical study"*, International Journal of Production Economies 98, 2005, pp. 56-80.

Appendice1 : List of items selected for measurement scales

Task Technology Fit	Compatibility	ERP applications you use are suitable for your needs and help you to accomplish your tasks.	Compati1
		Applications that you ERPI uses are compatible with your tasks.	Compati2
		ERP applications are matched with the aspects of your work.	Compati3
	Meaning	Understanding of the information obtained from the company's ERP on your task is easy to find.	Mean1
		The exact meaning of the information is obvious and clear on the company's ERP.	Mean2
	Adequacy	The company's ERP meets your requirements of the task.	Adequa1
		The ERP of the company is sufficient to handle your processing needs of your work.	Adequa2
	IT Support	You receive computer training you need.	ITSup1
		People with whom you are using IT include your work objectives.	ITSup2
		It is easy to get computer support and advice from other users when you are using the company's ERP applications.	ITSup3
Source	Goodhue and Thompson, 1998; Kositanurit and al., 2006 ; Lin and Huang, 2008; Klaus and al., 2003; Abugabah and al., 2009 ; Kositanurit and al., 2011.		
ERP information quality	Accuracy	Your ERP system provides you with accurate information.	Accur
	Relevance	Your ERP system provides you with relevant information.	Relev
	Timeliness	Your ERP system provides you with the necessary information in a timely manner.	Time1
		The information contained in your ERP system is timely and regularly updated.	Time2
		Information from your ERP system time improves the quality of my work.	Time3
	Completeness	You can find complete information if necessary in your ERP system.	Complet1
		The information contained in your ERP system are sufficient to do your job.	Complet2
	Accessibility	The information contained in your ERP system are easily accessible.	Access1
		The information in your ERP system are easily retrievable.	Access2
		The convenience of the information in your ERP system saves time in your work.	Access3
Source	Wixom and Todd, 2005; DeLone and McLean, 2003; Abugabah and al., 2009 ; McGill and al., 2003		
ERP system quality	Reliability	Your ERP system is reliable	Reliab1
		Your ERP system provides consistent information.	Reliab2
	Correctness	You find easier to correct your errors in your work with your ERP system.	Correct1
		Your ERP system helps you to reduce errors in your work.	Correct2
	Response time	Your ERP system reacts and responds quickly when you entered data.	Resptim1
		ERP reacts and responds quickly to your questions.	Resptim2
	Integration	ERP provides integration with other systems.	Integr1
		Your ERP system effectively combines data from different areas of the business.	Integr2

		Your ERP system is designed for all levels of users.	Integr3
Source	**Wixom and Todd, 2005;** Abugabah and al., 2009 **; DeLone and McLean, 2003; McGill and al., 2003**		
Perceived usefulness		The use of ERP system is useful for the performance of your work.	Percuse1
		I can not do your job without ERP system.	Percuse2
		Your ERP system supports you in achieving the overall objectives of performance.	Percuse3
		With your ERP system, it is easier to do your job	Percuse4
Source	Davis,1989; Ahn and al.,2007; Amoako-Gyampah, 2007 ; King and He, 2006.		
Perceived ease of use		Your ERP system is user friendly.	Perceas1
		It is easy to learn to use your ERP system.	Perceas2
		You find your ERP system easy to use.	Perceas3
Source	Davis, 1989; Kositanurit and al., 2006; Staples and Seddon, 2004 ; Kositanurit and al., 2011 .		
User performance	Effectiveness	ERP has a positive impact on your productivity	Effectiv1
		ERP to reduce the time needed to accomplish your tasks	Effectiv2
		ERP multiplies case you realize your work.	Effectic3
		Thanks to your ERP system in your work you can accomplish tasks faster	Effectiv4
		Your ERP system allows you to do more work than before.	Effectiv5
	Efficiency	Your ERP system improves the quality of your performance	Efficien1
		Your ERP system helps you to solve your employment problems	Efficien2
		Your ERP system reduces errors in your work performance	Efficien3
		Your ERP system improves your efficiency in your work.	Efficien4
	Creativity	Your ERP system improves user creativity	Creativ1
		Your ERP system helps you to create new ideas in your work	Creativ2
		Overall, the ERP system can achieve your employment goals.	Creativ3
Source	McGill and al., 2003; Goodhue and Thompson, 1995 ; Abugabah and al., 2009 ; Livari ,2005; Stone and al., 2006 ; Kositanurit and al., 2011 ; Hossain and al., 2012 .		

Appendice2 : Main results of the exploratory and confirmatory analysis

Variables	Dimensions	Items	Exploratory factor analysis		Confirmatory analysis	Joreskog rho
			Cronbach's alpha	Factor contributions	Factor contributions	
TTF	Compatibility	Compati1		0,861	0,790	
		Compati2	0,784	0,821	0,698	0,799
		Compati3		0,739	0,774	
	Adequacy	Mean1		0,786	0,754	
		Mean2	0,848	0,774	0,741	0,852
		Adequa1		0,792	0,844	
		Adequa2		0,789	0,729	
	IT Support	ITSup1		0,817	0,777	
		ITSup2	0,886	0,896	0,884	0,887
		ITSup3		0,872	0,889	
ERP Information quality	Accessibility	Access1		0,707	0,669	
		Access2	0,783	0,697	0,685	0,753
		Access3		0,730	0,773	
	Timeliness	Time1		0,839	0,805	
		Time2	0,837	0,756	0,835	0,848
		Time3		0,807	0,779	
	Completeness	Relev		0,736	0,577	
		Accur	0,713	0,799	0,732	0,748
		Complet1		0,786	0,798	
		Complet2	-	0,304	Eliminated	-
ERP System quality	Integration	Integr1		0,715	0,760	
		Integr2	0,723	0,627	0,595	0,734
		Integr3		0,745	0,716	
	Reliability	Reliab1		0,661	0,741	
		Reliab2	0,755	0,637	0,663	0,723
		Resptim1		0,651	0,640	
		Resptim2	-	0,230	Eliminated	
	Correcteness	Correct1	0,696	0,728	0,654	0,697
		Correct2		0,732	0,757	
Perceived usefulness	Perceived usefulness	Percuse1		0,900	0,934	
		Percuse2	0,948	0,877	0,920	0,947
		Percuse3		0,789	0,822	
		Percuse4		0,891	0,934	
Perceived ease of use	Perceived ease of use	Perceas1		0,832	0,836	
		Perceas2	0,904	0,838	0,857	0,905
		Perceas3		0,875	0,922	
Users performance	Effectiveness	Effectiv1		0,774	0,879	
		Effectiv2	0,800	0,756	0,562	0,808
		Effectic3		0,704	0,769	
		Effectiv4		0,761	0,634	
		Effectiv5	-	0,471	Eliminated	
	Efficiency	Efficien1	-	0,185	Eliminated	
		Efficien2		0,875	0,709	
		Efficien3	0,770	0,771	0,779	0,733
		Efficien4		0,560	0,580	
	Creativity	Creativ1		0,798	0,846	
		Creativ2	0,851	0,842	0,770	0,843
		Creativ3		0,837	0,784	