

# Study of the impact of ERP System on Employee Professional Performance in Cameroonian Companies

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**Abstract.** Companies invest a lot of time and money in implementing Enterprise Resource Planning (ERP) systems to improve their overall performance. The objective of such technological investment is to improve the well-being of users in particular and the company in general. This study was conducted to answer the question about the impact of ERP systems on user performance in Cameroonian companies, particularly those in Douala and Yaoundé. This work proposes a research model combining the technology, organization, and environment (TOE) framework and the Delone & McLean IS success model to evaluate the determinants of ERP users' satisfaction and the impact of this satisfaction on their professional performance. The results obtained show significant, positive and direct links between user satisfaction and service quality; but not significant with the quality of information and the quality of the system, which in turn has a very significant link with the quality of information. Also, perceived usefulness positively, directly and significantly influences user satisfaction. Similarly, independent variables such as improved coordination and change management significantly, positively but indirectly improve user satisfaction. Finally, as a result, there are very significant and positive links between user satisfaction and professional performance.

**Keywords:** Enterprise Resource Planning (ERP) System, User Satisfaction, Professional Performance.

## 1 Introduction

The company's environment has undergone many changes and competition has increased steadily in recent years. Therefore, wanting to do better than its competitors has become the motivation of any organization. To stand out and improve their productivity, companies will try to reduce their costs, improve their responsiveness by working more simply and efficiently with partners and better meet customer needs through information technology (IT). These technologies have enabled the emergence of new practices in everyday life. Business strategies, trade policies and different work organizations are now designed and implemented with a view to digital thinking. Technology and productivity have therefore become two essential allies for the

success of any business project [1, 2]. Companies are now obliged to adapt their operations and production processes to new technologies if they want to survive in a constantly changing market [2, 3]. IT has therefore become the ideal solution, providing greater agility and flexibility in the organization of work [4, 5]. Thus ERP will allow the management of all company functions from a single database with the main objective of optimizing the company's operations and therefore its productivity [6-8]. ERPs can be defined as a set of functions and functionalities that enable an organization to accurately record and process data throughout the supply chain [9-12]. Although the ERP market has matured, the demand for ERP solutions continues to grow worldwide. Increasingly, small and medium-sized companies are investing in and benefiting from ERP [10-13]. According to the latest Gartner report, the global ERP software market continues to grow at an average annual rate of 6% [14]. As a result of this widespread adoption of ERP systems, there is a strong demand from large companies, as well as SMEs [8, 15]. This is the case for Cameroonian companies, which are increasingly using the services of major global management software vendors, such as SAGE ERP X3 for SMEs and Sopra Banking Software, a publisher of banking software for banks and microfinance institutions.

Despite the resulting advantages, the implementation of ERP presents certain disadvantages and challenges for the adopting organization [8, 15, 16]. The implementation of such systems does not necessarily guarantee a return on investment [10-12]. There is a relationship between user response to the ERP system and the success of the ERP [11, 17, 18]. Understanding employee reactions to the ERP system should help to assess why some ERP implementations are more successful than others implementations [12, 19, 20]. The perceived benefits of user utility and ERP system usability affect the behavioral intent to use the ERP system [12, 18, 21]. Velcu [22] postulated that the benefits perceived by users would affect the success of ERP implementation. Therefore, identifying these benefits from the user's perspective is important, critical and imperative. So, to what extent does an ERP system impact a user's performance? Two specific questions result from this problem: **What are the determinants of an ERP user's satisfaction in the Cameroonian context?** *What is the impact of an ERP user's satisfaction on their professional performance?*

To answer this problem, we have based ourselves on previous studies conducted in the information systems literature, concerning the success model of DeLone and McLean [23] and the TOE framework Developed by Tornatzky and Fleischer [24]. The first aims to anticipate the effects of IT on an organization's performance by also taking into account the individual performance of the organization's members. The second allows us to identify the technological, organizational and environmental contexts as the three aspects that influence the process by which a company adopts and implements a technological innovation. For, in a country like Cameroon where the rate of IT usage is still low, many companies, regardless of size or sector of activity, are increasingly adopting ERP systems for their operations in order to optimize and synchronize the management of their activities [11, 12]. However, the results expected from these systems are not always those obtained [11, 12]. This is because user

needs are not always taken into account in some cases, yet the successful implementation of an ERP system cannot be achieved without user satisfaction.

We will start with a literature review, followed by the hypothetical-deductive methodology we adopted and the discussion on the results obtained, and finally the conclusion and future research directions.

## 2 Theoretical Background

Our study is based on The TOE Framework and the Delone and McLean IS success model. The combination of these models allowed us to identify and describe the different variables that make up our research model presented below. **The choice of this research model is justified by the complexity of the African context, where companies are lagging far behind in IT[12, 25]. In addition, other studies carried out in this same context were satisfied with variables such as system quality, quality of service, to explain directly the satisfaction of ERP users and indirectly the performance (organizational, process, personal)[11]. In order to better respond to the vagaries of our context, we have added variables related to the environmental context(coordination improvement, Change Management Support), which are often necessary for the satisfaction of ERP users in organizations[16, 26, 27].**

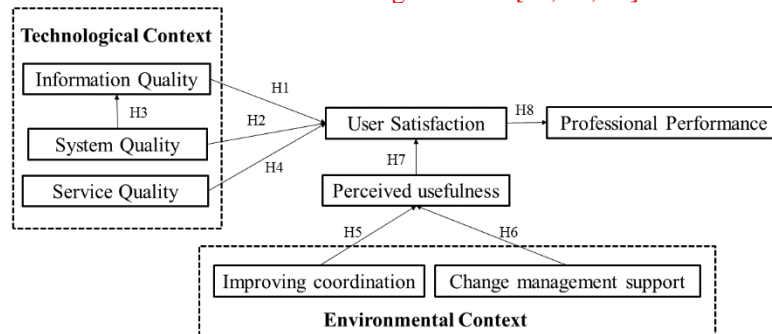


Fig. 1 Conceptual research model

### 2.1 Technological Context

Identified by Tornatzky and Fleischer [24], the technological context refers to all internal and external technologies relevant to the company, current practices and the company's internal equipment, as well as all available technologies external to the company[3, 24]. This technological context influences the way in which a company perceives the needs for new technologies, seeks them out and adopts them [28]. The technological capabilities of this context represent the three dimensions of quality: the quality of information, the quality of the system and the quality of the service. Each of the three dimensions must be measured or verified separately because they will affect user satisfaction either separately or together[29].

**Information Quality (IQ)** refers to the characteristics of the information provided by the ERP system in terms of speed, relevance, availability, comprehensibility [30]. **System Quality (SQ)** refers to the performance characteristics of the ERP system in terms of ease of use, accuracy, reliability and efficiency [30]. As far as **Service Quality (QSE)** is concerned, it corresponds to the support that the organization receives from the ERP supplier, often made operational by the reliability and quality of the expertise [30]. Althonayan and Papazafeiropoulou [31] and Chou and Hong [32] showed that there is a relationship between these dimensions and user satisfaction. De Ruyter, Bloemer [33] and Brady and Robertson [34] used respectively the SERVQUAL scale empirically and the LISREL analysis respectively to show that there is a significant relationship between service quality and user satisfaction. In addition, authors such as Gorla, Somers [35] have shown that the quality of the system influences the quality of information.. Therefore, we formulate the following hypothesis:

*H1: IQ has a significant positive effect on US.*

*H2: SQ has a significant positive effect on US.*

*H3: SQ has a significant positive effect on IQ.*

*H4: QSE has a significant positive effect on US.*

## 2.2 Environmental context

It is theorized that the environmental context has an influence on the perceived utility of a user, in the case of the implementation of a computer system [36-38]. This is the case of Improving Coordination (IC), which represents the ability of the ERP system to enable coordination, synchronization between different organizational units and to adapt to change [36]. Many studies such as those by Chou and Chang [36], Ha and Ahn [37], have shown that there is a link between improved coordination and Perceived Usefulness (PU).

Another factor that may influence perceived utility in the context of the environment is Change Management Support (CMS). It is the introduction and implementation of transformation strategies at the organizational level to stimulate the organization to achieve its goals [39]. It has been defined by Brightman and Moran [40] as a mechanism for the continuous renewal of an organization's leadership, structure and capacity to respond to the ever-changing needs of internal and external clients. In the case of the implementation of a new system, the first objective of change management is to get users to see the need for change and therefore to perceive its usefulness. Thus, we can make the following assumptions:

*H5: IC has a significant positive effect on PU.*

*H6: CMS has a significant positive effect on PU.*

## 2.3 Perceived Usefulness (PU)

PU is the degree to which an individual believes that the use of the particular system would improve their work performance [41]. Generally used in the TAM model, perceived usefulness is the perception of the value obtained from the potential use of

a technology. In the context of information technology use, utility has been identified as the most predictive variable [41]. A relationship between perceived usefulness and user satisfaction is suggested by the literature and verified by Cenfetelli, Benbasat [42], Dezdar and Ainin [43]. They showed that perceived usefulness positively influences user satisfaction, hence the following hypothesis:

**H7:** *PU has a significant positive effect on US.*

#### 2.4 User satisfaction (US)

User satisfaction can be defined as “*An important measure of user satisfaction in terms of opinions over the entire experience cycle*” [44, 45]. It is one of the factors that have a significant influence on the successful implementation of ERP systems [45]. It has recently been highlighted in numerous studies to evaluate the success of ERP projects by many IS literature investigators through specific tools developed to assess the level of satisfaction of ERP users [11, 45, 46]. Demonstrated by Morris, Marshall [47] and Gattiker [48], the correlation between user satisfaction and job satisfaction, professional performance. Indeed, Locke [49] defined job satisfaction as “*a positive emotional response to work resulting from an evaluation of work as an achievement or respect for the individual’s professional values*”. Concerning professional performance, it represents the impact of ERP on user performance [11, 50]. **Furthermore, in this study this professional performance refers to the impact of the ERP on the user’s performance/productivity in the execution of his work within the organization.** Thus, we can make the following assumptions:

**H8:** *US has a significant positive effect on PP.*

### Methodology

We focused our study on two key cities in Cameroon, Douala and Yaoundé, which represent the economic capital and the political capital respectively and which are for us a guarantee of better accessibility of information. We were interested in companies or organizations of all sizes and in all sectors that have implemented an ERP system for more than two (02) years for the professional purposes of their employees. (Table 1). Within these companies, our attention was focused on any employee (in the organization’s value chain) who uses an ERP system implemented for business purposes on a daily basis. We developed one based on the research hypotheses developed from our research model, with questions drawn from the literature and adjusted for better adaptation to the context of our study. For our questionnaire available in two versions (paper and Google form), we opted for the 7-level Likert scale as recommended by Bankole, Bankole [51] and Shanmugam, Savarimuthu [52]. Based on the methodology developed by these authors, we conducted the pre-test on a small group to verify the acceptability of the questionnaire content. In the Partial Least Squares Structural Equation Modeling (PLS-SEM) method we used; the minimum sample size was 60 individuals based on the application of (source) recommendations. However, we were able to obtain 107 observations during our data collection to test our research hypoth-

eses. Once the data was collected, we used SmartPLS 3 to analyze it. We will therefore analyze external loads, discriminant validity, Composite reliability( $>0.7$ ), Average Extracted Variance (AVE $>0.5$ ), Cronbach's Alphas( $>0.7$ ), and Rho\_A( $>0.7$ ), according to the criteria of Hair Jr, Hult [53], Hair, Howard [54] and Nunnally and Bernstein [55] in order to evaluate our research model.

### 3 Results and Discussion

The sample on which our descriptive analysis is carried out consists of one hundred and seven (107) observations. Table 1 presents the following results: Concerning gender in terms of percentage, our sample is made up of 55.67% men and 44.33% women. The different age groups ranging from 21-30 years; 31-40 years; and 40 years and over constitute 51.55%; 45.36% and 3.09% of our study sample respectively. The experience in terms of ERP use of the different individuals in our study sample varies according to the different categories in this table. We note that more than three-quarters of our sample have experience levels of two years or more. Evidence of a fit between our study and the target sample.

Table 1. Sample Demographics Description

Sample	Sample Composition	
Age (years)	21-30	51,55%
	31-40	45,36%
	>40	3,09%
Gender	Male	55,67%
	Female	44,33%
	<1	7,22%
Experience using ERP (Years)	1-2	11,34%
	2-3	41,24%
	3-4	25,77%
	> 4	14,43%

Table 2 presents the internal coherence of the research model. The indicators with the respective values presented in this table, gives us an assessing measurement model[54]. Correlations between item pairs are sufficiently high with Cronbach's Alpha and Rho\_A above the required threshold of 0.7. Similarly, the correlation relationship between indicators measuring the same phenomenon is good, with the majority of loads greater than 0.7 and EV values greater than 0.5[54].

Table 2. • Reliability and validity of the construct

Constructs	Items	Loadings	Cronbach's Alpha	Rho_A	Composite reliability	AVE
IQ	IQ1	0.759	0.873	0.893	0.905	0.618
	IQ2	0.828				

Constructs	Items	Loadings	Cronbach's Alpha	Rho_A	Composite reliability	AVE
	IQ3	0.812				
	IQ4	0.566				
	IQ5	0.843				
	IQ6	0.869				
	SQ1	0.714				
	SQ2	0.823				
SQ	SQ3	0.801	0.829	0.840	0.882	0.602
	SQ4	0.894				
	SQ6	0.616				
	QSE1	0.773				
	QSE3	0,795				
QSE	QSE4	0,888	0.892	0.906	0.921	0.701
	QSE5	0,921				
	QSE6	0,800				
	IC1	0,890				
IC	IC2	0,941	0,895	0,902	0,935	0,827
	IC3	0,896				
	CMS1	0,914				
CMS	CMS2	0,955	0,934	0,950	0,958	0,883
	CMS3	0,948				
	PU1	0,862				
PU	PU2	0,932	0,909	0,911	0,936	0,786
	PU3	0,847				
	PU4	0,903				
	US1	0,827				
US	US2	0,899	0,846	0,849	0,907	0,765
	US3	0,896				
	PP1	0,963				
PP	PP2	0,960	0,952	0,952	0,969	0,912
	PP3	0,941				

**Table 3** shows the correlation between the variables in the model according to the Fornell-Larcker criterion, that suggests the shared variance between latent constructs is lower than the square root of AVE[54, 56, 57]. This test of the quality of our research model reveals that each of our **constructs** are distinct from each other. **This reflects the good discriminant validity of our constructs. This table makes sense because its values show that two measures that are not supposed to be related are, in fact, unrelated[54].**

**Table 3.** Discriminant Validity

	IC	CMS	IQ	PP	US	QSE	SQ	PU
IC	<b>0,909</b>							
CMS	0,634	<b>0,939</b>						
IQ	0,616	0,506	<b>0,786</b>					
PP	0,629	0,526	0,654	<b>0,955</b>				
US	0,725	0,736	0,606	0,651	<b>0,875</b>			

	IC	CMS	IQ	PP	US	QSE	SQ	PU
QSE	0.763	0.725	0.673	0.712	0.798	<b>0.837</b>		
SQ	0,686	0,595	0,718	0,534	0,703	0,765	<b>0,776</b>	
PU	0,685	0,681	0,557	0,825	0,705	0,704	0,574	<b>0,886</b>

**Table 4** summarizes the results of the analyses. The values presented in this table give us an assessment of structural model (verification of path coefficient: p-values are  $p < 0.05$ ,  $p < 0.01$  and  $p < 0.001$ ), which are indispensable elements for the verification of our research hypotheses[54]. We notice that the level of significance of the relationships between the different constructions has been evaluated from the bootstrap calculation at a level of significance equal to 0:05. It is noted that assumptions H3, H4, H5, H6, and H8 are all supported with the level 0.001.

**Table 4.** Results of Analysis

Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Significance level	Decisions
IQ-> US	0.015	-0.015	0.133	0.112	0.911	NO	NS
SQ-> US	0.193	0.227	0.163	1,184	0.237	NO	NS
SQ-> IQ	0.718	0.737	0.061	11,689	0.000	99.9%	**** S
QSE->US	0.451	0.441	0.117	3,856	0.000	99.9%	**** S
IC-> PU	0.424	0.427	0.087	4,893	0.000	99.9%	**** S
CMS->PU	0.412	0.411	0,077	5 342	0,000	99,9%	**** S
PU-> US	0.268	0.274	0.108	2,491	0.013	99%	** S
US-> PP	0.651	0.646	0.082	7,908	0.000	99.9%	**** S

\*\*\*P<0.001; \*\*P<0.01; \*P<0.05; \*P<0.1|  $\triangleright$  1,65: 90%;  $\triangleright$  1,96: 95%;  $\triangleright$  2,57 :99%;  $\triangleright$  3.29:99.9%. S: Supported and NS: Not Supported.

Only hypotheses H1 and H2 are not confirmed in our study, proof of a good experience gained in the use of ERPs in our sample. This shows that the quality of the information or the quality of the ERP system are no longer indicators contributing to user satisfaction in this context. This demonstrates a maturity of employees in the use of IT, who are no longer satisfied with the characteristics of the technologies, but take into account the other levers that contribute to their proper diffusion[8, 16, 58].

## 4 Conclusion and Future Research Directions

Our research hypotheses were tested using the hypothetical-deductive method based on quantitative measures, allowing us to measure the behavior of a large number of ERP users. We were thus able to measure their usefulness and satisfaction on the one hand and the impact of this satisfaction on their professional performance on the other. Our study reveals, as we have seen in the literature, that when a user is satisfied with his or her experience in terms of use and the advantages provided by the ERP



system, his or her professional satisfaction/performance is positively and very significantly impacted. This implies that managers must implement all the parameters (training adapted to the needs, support and unconditional presence of ERP suppliers and/or IS staff and system choice) likely to make employees satisfied with their use of the implemented. Given the fact that very few studies have been conducted on the impact or benefits of ERP systems at the individual level in Africa and Cameroon in particular, our study will make significant contributions to the literature on information systems. We were also able to show that, although the quality of the information and the quality of the system do not have a real impact on user satisfaction in the case of our study, the quality of the information is significantly influenced by the quality of the system. In addition, improved coordination has a significant and significant impact on perceived usefulness. In other words, improving the coordination, integration and synchronization of information between the different units of the company through ERP has facilitated or improved users' belief in the usefulness of ERP. In fact, this article shows that despite the context of the study, which is marked by its delay in the adoption, implementation, dissemination and use of IT, a large proportion of the employees of these companies have already become aware of the crucial importance of IT in terms of information quality, quality of service and system quality. These three elements are no longer necessarily the only indicators of user satisfaction and critical success of ERP systems in a company, but rather take into account factors related to the organization and the environment, in order to better correlate ERP systems with employee activities. Some possible reasons for these results may be maintenance not performed regularly, bugs in the system, or the presentation of information in a format that is difficult for the user to understand; hence the unfavorable opinions of users regarding their ERP experience. **This study was also able to reveal that the environmental context maximizes user satisfaction in the case of large Cameroonian companies in the cities of Douala and Yaoundé. Therefore, organizations wishing to implement an ERP solution should try to master this context as much as possible, in order to limit failures.**

In order to improve the quality of the results obtained, we can propose the following recommendations: Extend the geographical scope of data collection throughout Cameroon. Define a specific choice of company size for a more accurate study and more consistent results, as companies' needs vary in terms of ERP choice, implementation cost and training depending on whether the company is small, medium or large. Extend the study of the impact of the benefits or advantages of ERP systems not only to users but also to the company in general.

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