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Enterprise Resource Planning Adoption and Organizational Performance: An Investigated Study in Libyan Public Organizations Using Structural Equation Modeling

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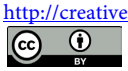

Abstract

Organizational performance (OP) and the enterprise resource planning system (ERP) are two of the most significant studies that provide benefits to organizations. Different investigations into ERP and OP exist in private and public organizations in developed and developing countries. Notably, as only a few studies have addressed the implication of ERP on OP in Arab countries, such as in the Libyan context, it needs more investigation. The main objective of this study is to explore to what extent Libyan public organizations are looking to improve their performance through adopting ERP systems. The quantitative method was adopted, and out of 242 public organizations, 149 organizations were selected as the study sample through the random sampling technique. 119 completed questionnaires were run for further analysis. The SPSS software and PLS-SEM were employed to test the hypotheses. The results revealed that the ERP system and OP relationship was enormously significant. The empirical results add a new academic contribution to the body of knowledge. Hence, the obtained outcome is hoped to provide benefits to the public sector organizations in Libya.

Keywords

Organizational Performance, Enterprise Resource Planning, Public Organization, Libya

1. Introduction

Today, the most significant discussion in businesses, industries, and service environments concerns organizational performance (OP) in several developed and developing countries. Measuring the OP for each organization has become a requirement of contemporary business environments to ensure better services (Chatterjee et al., 2021). Improving performance requires knowledge of the most effective ways to determine the extent to which management's wealth and success benefit recipients and how those services are delivered (Shaik & Abdul-Kader, 2014). Achieving excellence and enhancing the OP requires developing and implementing a new system (Olan et al., 2022). ERP is one of the most recent and relevant information technology choices for the organizational manager to enhance OP (Zheng & Khalid, 2022).

In the modern era, selecting and adopting or implementing the latest information technology systems, such as ERP, has received considerable attention. Information technology plays a vital role in the capability of organizations to enhance performance, and it has become necessary to better understand the ERP system as one of the enterprise products that provide suitable solutions which support primary activities that are converted to benefits in organizations (Egdair et al., 2020a). ERP was a replacement for the material resource planning (MRP) system and has many benefits, including information availability and coordinating operations, reducing costs and cycle time, and improving responsiveness to customer needs (Katuu, 2020).

ERP systems represent substantial activities to improve efficiency, have a significant impact on the future OP, and were developed to meet such needs. ERP systems integrate and unify all the business operations of different jobs to provide a single view of the organization of data and information as part of a unified technological structure (Karimi et al., 2007). On the other hand, developing countries still face significant challenges regarding the deployment of ERP to improve performance (Mahmood et al., 2023).

The Libyan public organizations are seeking to improve their performance in terms of information availability, quality information, standardization, inventory management and time of service. Improvement is essential and critical to the successful OP of the public sector to protect the performance of these organizations and strengthen the role of the government in providing essential services and development, leading to increased effectiveness and efficiency (Egdair et al., 2020b). The organization's profitability depends on its adoption and development of information technology, including the ERP system, which will facilitate more internal procedures and services (Balić et al., 2022).

Moreover, the growing technological developments and the dissemination of the internal technical information systems development engine can help the organization to survive. This can lead to formulating the question, what is ERP's role in improving public organizational performance in developing countries, especially in Libya? Most organizations in Libya are suffering from weakness in

overall performance. Several reasons should be considered, and more importantly, the reflection of the ERP systems and organizational performance in Libyan public organizations by studying the most critical variables to fill the theoretical gap in previous studies. The public sector and government organizations help investigate and enrich the knowledge body (Aljileedi & Amoozegar, 2023).

The current research is limited to Libyan public organizations in the service sector and investigates the relationship between the ERP system and organizational performance (Merhi, 2021).

2. Problem Statement

Organizational performance (OP) is an essential constant in organizational studies. One of the most recent and vital observations of organizational studies concerns the challenges and opportunities facing public organizations in improving their performance, reducing the gap in updating their systems, and helping organizations accomplish competitive benefits (Merhi, 2021). This has been emphasized in public organizations in developing Arab countries and the Libyan context. The current study is motivated by performance development at Libyan public organizations by investigating the relationship between the ERP system and the OP in Libyan public organizations (Egdair et al., 2017). In addition, organizational performance faces the challenge of attracting and winning the best customers who have considerable influence on organizations and the public services provided (Rana et al., 2022).

Accordingly, exploring previous studies for answers to the nature of the relationship between new technology and performance has exposed several studies that show the successful selection of effective technology to be a major contributor to performance (Ali & Miller, 2017; Mahmood et al., 2023). The ERP system was undoubtedly not an antecedent of job performance as much as it provided the bedrock for organizational advantages, such as better performance (Ali & Miller, 2017). The ERP system was selected for the current study because it has become a significant module for organizations to gain performance success and is considered an organizational advantage in achieving high performance (Anaya et al., 2023).

The ERP system requires changing procedures and the relocation of a stable environment to successful adoption or implementation (Anaya et al., 2023; Dumitru et al., 2013). ERP has become widely considered in several large government organizations in developed countries; large organizations have adopted ERP to improve financial and non-financial performance, while developing countries are still behind in ERP system adoption (Nugraha et al., 2023). Theoretically, there is still a lack of ERP studies and their benefits in the developing country context (Ali et al., 2023). Recent studies argued that researchers do not pay attention to conducting studies about ERP systems and OP in developing countries (Alkraiji et al., 2023; Egdair et al., 2020a).

3. Literature Review

3.1. Public Organizational Performance

Many organizations are looking to improve their performance by using available resources and trying to search for the best essential alternatives. From the literature review, it is found that public organizations (government) aim to have citizens participate, achieve customer satisfaction, promote transparency, enhance integrity, fight against corruption, and be accountable (Egdair et al., 2020a). The introduction of modern systems is an essential factor in enhancing and protecting the public organization's performance in providing essential services and development (Mahmood et al., 2023).

An OP of the public sector has become an integral part of the evaluation process management to see if they are achieving the strategic objectives or not and to try to find a solution for public organizations to measure performance quality, service provision, value for money, and so on (Anaya et al., 2023). The public sector seeks to achieve quality customer satisfaction, and excellent performance in providing the needs of the communities. It has to be within the available budget as public organizations have more intangible goals and objectives than the private sector (Rana et al., 2022).

In addition, the performance of the public sector, like that of the private sector, varies according to the goals of the business. The private sector, meanwhile, intends to make a profit. The public sector seeks to achieve quality customer satisfaction and excellent performance in meeting the needs of the communities. It has to be within the available budget, as public organizations have more intangible goals and objectives than the private sector (Egdair et al., 2020a).

The empirical search gap offered valuable insight into establishing ERP implementation, improving internal operational efficiency services in Libyan public sector organizations, and ensuring the organization's sustainability services to citizens, as the core services are provided only by government organizations (Egdair et al., 2020a).

Finally, the study is an excellent way for managers to make the right decisions at the right time, even under the most challenging conditions in Libya. Furthermore, the economy is still motivated by state-owned organizations active in several sectors, and most employees are in the public sector (Egdair et al., 2017).

3.2. Enterprise Resource Planning (ERP)

Since the first waves of information and technology that emerged in most organizations worldwide in late 1990 and early 2000, it has been looking to provide the best solution for enhancing organizational performance. The ERP system is a new class of packaged application software developed the first generation by vendors of ERP systems in the era of information technology. The ERP system is complete integration software that can unify all the departments in an organization to assist in completing work with high quality and in the lowest time. Organizations worldwide have implemented the ERP system previously due to the advantages. Despite

the high-cost implementations and failures in so many cases, organizations still succeed in the system in developed countries (Mohammed & Hachicha, 2024).

However, the adoption and implementation of such modern systems in organizations operating in most developing countries, are still slow in most cases and not yet up to the level of the systems used in developed countries, due to the financial cost of implementing the advanced systems (Mukred et al., 2023).

From another perspective, the ERP has become a rapidly growing system that is needed in organizational work practices. As to considering the importance of exploiting the new technology, there are still some organizations facing possibility to adopt and implement ERP due to different factors failingly (Hammad et al., 2024).

The ERP system has made it imperative for every organization to get employees' support and encourage them to accept the system. This is because the system's success and failure depend on the method introduced in the organization. The adoption of an ERP system has been related to realizing abilities such as changing the dynamics of competition in terms of financial and non-financial dimensions (Bhattacharya et al., 2023).

The previous researches (Mahmood et al., 2020; Ranjan et al., 2016) have identified a number of issues and challenges, which may be termed as most critical based on their frequency and occurrence. The most first ten issues and challenges are identified include top management approach, training and development, misfits between the ERP system's built-in processes and the organizations, change management, system integration, effective communication, business process reengineering, unreliable vendors, project management, project team formation, team empowerment, lack of skilled human resources.

However, other issues and challenges identified in Arab countries, especially in Libya, such as security risks, IT infrastructure, employees' resistance to using the system, and misalignment between the ERP system's offerings and the organization's business processes are involved in ERP implementation (Alzahrani, 2022; Hammad et al., 2024; Oumran et al., 2021).

Moreover, the adoption of the ERP system in Libyan organizations is not adequate although Libya has been able to enjoy wealth, and a spread of public sector. The financing of these projects is not a problem in most public organizations, whether productivity or services. Libya as one of the wealthiest countries in North Africa, did not attain enough use of technology in most public organizations be it manufacturing or services. As it was only at its infancy, there was little information about the ERP in Libya, or information technology in general. The current study tries to identify the effect of the adoption of ERP and organizational performance (Egdair et al., 2020b; Malik & Khan, 2021).

With Libyan organizations starting to get interested in adopting information technology (IT), such as ERP systems in different areas, the organizations in Libya are trying to improve their performance; the vigorous sectors of the state, including services and productive organizations, are trying to provide the country with a significant proportion of income. These organizations spend a lot of money and

time to improve the areas of technology and the development of systems that allow organizations in the future to improve their performance still in need (Emhmed et al., 2021).

On the other hand, it is becoming increasingly difficult to overlook the ERP system in Libyan organizations. The empirical gap in the information technology systems in Libyan organizations of public sector, which is related to the lack of accurate information, and service by the long procedures routine that created challenges and obstacles which can be classified into technological and organizational factors (Egdair et al., 2020b).

ERP System Measurement

Measuring ERP adoption as the independent variable of this study will be adopted in accordance with the model provided by the ERP. As one of the computer systems and the success of information systems based on key dimensions of the model provided by (DeLone & McLean, 2003). This model was successful in information systems studies, information technology, electronic systems measurement, etc. In addition, these dimensions have been adopted as a standard in several studies and have received the most attention from researchers (Delone & Mclean, 2004; Jenatabadi et al., 2013; Tsai et al., 2012). As follows, system quality, user satisfaction, individual impact, the organization impact.

1) System Quality: determines the degree of the information processing system itself. Measuring quality system focused mostly on the performance characteristics of the system under study ERP system (Udo et al., 2010). In terms of resource use and benefit, the system also considers the best investment of resources, timing and response time, reliability and accuracy, the ability to adapt, and the possibility of maintenance (Sohn & Tadisina, 2008).

2) User Satisfaction: is to determine the degree of recipient response to the use of the output of an information system (Jenatabadi et al., 2013; Thong, 1999), user satisfaction is associated with comparing the new system and the old system; an effective response is a measure of satisfaction that determines user satisfaction (Zaied, 2012).

3) Individual Impact: determines the degree of information derived by the beneficiary of the system through data processing, and how it is reflected on the impact of the behaviour of the recipient, more true, correct and quick access to achieve positive results, and this is what the organization aims to achieve generally (Jenatabadi et al., 2013).

4) Organizational Impact: reflects the extent of the data and information provided by the system that impacts both already existing systems or modern system (Mahmood & Mann, 1993; Melville et al., 2004). Then, the system provides quick and corrective information and responds to the recipients of the information accurately and in record time, as reflected in the possibility of the confidence of the beneficiary organization (Qrunfleh & Tarafdar, 2014). In **Table 1**. Summary measurement of variables and questionnaire instruments.

Table 1. Summary measurement of variables and questionnaire instruments sources.

Main Variable	Dimension	Scale type	Scale used	No of items	Main Key sources & items development from literature
OP	CS	Interval	6 point scale	4	Kaplan & Norton, 1992; Al-Dhaafri & Al-Swidi, 2014
	IP	Interval	6 point scale	4	Kaplan & Norton, 1992; Al-Dhaafri & Al-Swidi, 2014
	GL	Interval	6 point scale	4	Kaplan & Norton, 1992; Al-Dhaafri & Al-Swidi, 2014
ERP	II	Interval	6 point scale	4	DeLone & McLean, 1992
	OI	Interval	6 point scale	4	DeLone & McLean, 1992
	SQ	Interval	6 point scale	4	DeLone & McLean, 1992
	US	Interval	6 point scale	4	DeLone & McLean, 1992

3.3. The Relationship between ERP System and Organizational Performance

Most organizations in developed and developing countries recognize the ERP system, which is popular for information management in the professional environment worldwide (Mahmood et al., 2023). For the different management areas and activities, the system highlights the advantages it offers significantly. There are other results such as a clear advantage that organizations can show higher rates of return following the implementation of the ERP. The ERP advantage cannot appear directly, but it may take a few years, at least two years, after the continued implementation of the system (Barna et al., 2021).

ERP adoption is becoming widespread in the various public, governmental, and private organizations in the e-business world. It has become a powerful tool for supporting organizations' operations, reducing operating costs, and increasing the sharing of information about resource activities (Putra et al., 2021).

However, the ERP system is complex due to its need to integrate all units and adequate support necessary to successfully continue that work. However, it improves the cost, flexibility and quality performance, user satisfaction and customer satisfaction (Mohanty et al., 2022).

In addition, the control process, benefits, and features that can help gather results helped explain the improved financial performance following the adoption of ERP. Information technology has affected the organisation's ability to absorb the OP. Also, the ERP implementation aids in decision-making and proper administration and improves customer service and retention.

The successful system of ERP seems to improve the overall OP such as the efficiency and effectiveness. Recent studies have examined and addressed the concept of underlying systems, suggesting that organizations depend mostly on ERP applications. It can be utilized to maximize the benefits. ERP supports all business and internal activities of the organization. Through the integration of the functions of various business units of the organization, in one or more areas the

organization provides complete information, and this leads to effective decision-making (Abobakr et al., 2024; Weerasekara & Gooneratne, 2023). **Table 2** illustrates the study variables.

The above explanation of the proposed relationship suggests that a relationship has been formed between ERP and OP. Many results exist, including positive signals from previous studies (AlMuhayfith & Shaiti, 2020; Igna, 2021). Furthermore, there is a strong relationship between ERP and OP based on the confirmed model proposed by DeLone and McLean 1992 regarding the success of the information technology system (Chatzoglou et al., 2017). On the other hand, the ERP system dimension is found to have a positive impact on OP, with a significant positive relationship between the proposed variables ERP and OP (Mohamed & Farahat, 2019; Obeidat et al., 2016). ERP that has a direct impact on organisational performance is difficult to separate (Putra et al., 2021). **Figure 1** shows the study framework.

Table 2. Summary of study variables

Variable Name	Variable Code	Variable Type	Variable Dimensions	Dimensions Code
ERP system	ERP	Independent	Individual Impact	II
			Organizational Impact	OI
			System Quality	SQ
			User Satisfaction	US
Organizational Performance	OP	Dependent	Costumer Service	CS
			Internal Process	IP
			Growth and Learning	GL

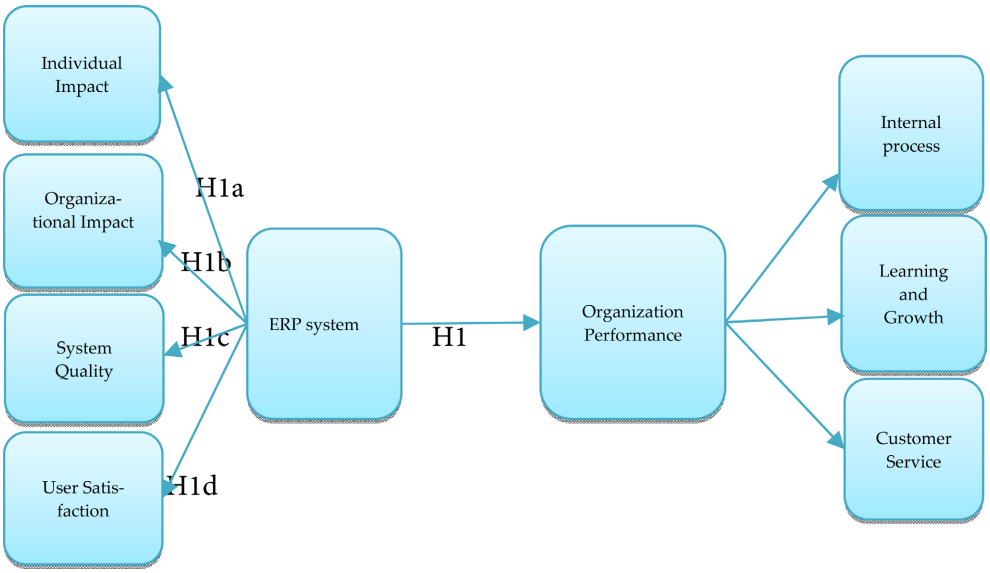

Figure 1. The study framework and hypotheses.

Thus, the hypothesizes of the study can be explained in the following:

H1: There is a significant positive relationship between the ERP system and organizational performance (OP) among Libyan public organization services.

H1a: There is a significant relationship between individual impact and ERP.

H1b: There is a significant relationship between organizational impact and ERP.

H1c: There is a significant relationship between system quality and ERP.

H1d: There is a significant relationship between user satisfaction and ERP.

4. Methodology

This study followed a quantitative methodology because it is more suitable for investigating the relationships between effect factors (Creswell & Creswell, 2017). The study adopted the analysis data using SPSS software and PLS-SEM as an indicator in interpreting factors. Furthermore, the main purpose of this study is to analyze the causal relationships in the study model. SEM is a statistical technique to test those relationships and assumptions associated with them. SEM is a combination of factor analysis and multiple regression analysis (Chou & Chiang, 2013). The PLS-SEM does not require any prior assumptions on sample distribution and can deal with small-sized samples (Abdullah et al., 2016).

The questionnaire used was tested for primary data collection on the relevant variables. As recognized, the ERP system is a strategic plan that can be used for an organization; thus, the questionnaire was sent to the relevant responsible parties for the direct ERP system success adoption and implementation in the selected organizations, such as the general and executive managers.

The current study reviewed the literature on enterprise systems (ES) studies in adoption and implementation models at the organizational level. The theoretical underpinnings of the current study model are adopted and adapted to explain the ERP system and organizational performance—the potential for application to ES adoption studies. The Technology Acceptance Model (TAM) and institutional theory conclude that the same context in a specific theoretical model can have different factors in implementing complex new technology studies.

Sample and Population

The main target of any empirical investigation is the accuracy of a sample size to make confident results in generalizing the results about a population. In practice, the current study is used to determine the sample size based on the expense of data gathering and the need to have appropriate statistical power; in this case, to get an accurate sample size the study used some equations and formula calculations sourced from www.calculator.net/sample-size-calculator

Based on the population of this study, there are public organizations in Libya, and the target is to obtain the actual number of public organizations in Libya. The statistics from the official website of the Libyan General Information Authority, www.gia.gov.ly indicate that Libya has 242 public organizations. According to a

random sample, every organization has an equal opportunity to participate and be part of the sample.

To avoid an incorrect sample size, this formula used a formula with finite population correction in Equations (1) and (2).

$$n_0 = \frac{P^{\wedge} \times \left(1 - P^{\wedge}\right) \times Z^2}{MOE^2} \tag{1}$$

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \tag{2}$$

with:

n_0: sample size pre-correction (rounded up)

$\hat{p} = 0.5$

$z = 1.96$

$MOE = 0.05$

$N = 242$

n = sample size

$$n_0 = \frac{0.5 \times 0.5 \times 1.96^2}{0.05^2} = 384 \tag{3}$$

$$n_0 = 384$$

$$n = \frac{384}{1 + \frac{384}{242}} = 148.44 \tag{4}$$

$$\text{n} = 148.44 \simeq 149$$

With a margin of error of ±0.05% and an expected sample proportion of 0.5, the sample size would need to be 149.

Based on the results above, 149 organizations are needed to complete the survey to fulfill the purpose of this study since a larger sample size would be more representative of the study population. The unit of analysis for this study is naturally the organization level.

Therefore, one of the top management or executive management team managers was selected from each organization to test the hypothesized relationships on the public organizational level (Christiansen et al., 2022). Only one questionnaire was submitted to be answered by the representative of the chosen organization, who is an expert in or dealing with an ERP system. That depends on the nature and role of the organisation, which differs from one organisation to another.

5. Results and Discussion

The main data used for this research are collected from public organizations in Libya. A total of 149 questionnaires were personally distributed. Almost 127 questionnaires were returned out of 149 that were collected within two and a half months. However, out of the 127 responses obtained, only 119 questionnaires were used for further analysis. This is because eight questionnaires with uncom-

pleted answers were cancelled, as presented in Table 3.

Table 3. Response rate of the questionnaires.

Response	Total
The distributed questionnaire	149
Returned questionnaires	127
Usable questionnaires	119
Response rate	79.8%

In addition, Table 4 revealed no significant differences between the early and late respondents for all variables. This is done by comparing the mean and standard deviation between the two groups—early and late responses.

The mean of this study's exogenous (independent) and endogenous (dependent) variables is arranged between 5.2424 and 5.4198. Particularly, the standard deviation ranged between 0.35953 and 0.55391, implying that the latent variables are slightly different from each other; the reason for this difference is due to the response of item's score of each main variable of the study in Libyan public organizations, may have a different perspective from another organisation because of the nature of each organisation.

Table 4. Descriptive statistics of the group statistics early and late respondents.

Constricts	Response	N	Mean	Std. Deviation	Std. Error Mean
CS	Early	53	5.3208	0.50568	0.06946
	Late	66	5.3182	0.55391	0.06818
IP	Early	53	5.2500	0.53709	0.07377
	Late	66	5.3295	0.47060	0.05793
GL	Early	53	5.2453	0.46381	0.06371
	Late	66	5.2992	0.49072	0.06040
II	Early	53	5.2830	0.46003	0.06319
	Late	66	5.2424	0.47021	0.05788
OI	Early	53	5.3255	0.40899	0.05618
	Late	66	5.3144	0.42361	0.05214
SQ	Early	53	5.4198	0.35953	0.04939
	Late	66	5.3447	0.48983	0.06029
US	Early	53	5.3632	0.38156	0.05241
	Late	66	5.3409	0.45072	0.05548

Note: IP = Internal Process, GL = Growth Learning, CS = Customer Service, II = Individual Impact, OI = Organization Impact, SQ = System Quality, US = User Satisfaction.

In addition, (Armstrong & Overton, 1977; Hair et al., 2010) It emphasizes the use of the P-value to determine if there are any variances between the two samples. To support this recommendation, an independent-sample T-test was conducted to examine the alterations between the two groups (early and late respondents).

Therefore, we can use the t-value, degree of freedom (df), and two-tail significance for the equal variance estimated to determine whether early and late response differences exist (George & Mallery, 2016). The consequences of the independent-sample T-test suggest that Levene's test has a probability greater than 0.05. Levene's Test (t-value > 0.001), and Sig. (2-tailed) > 0.05 can be summarised. In relation to the result of the independent samples test, there is no significant difference, and the equal variance estimated that no significant differences are apparent.

To conclude, **Table 5** exposed that no response bias could significantly affect the study's ability to generalise the results. **Table 6** illustrates the Independent Samples Test of Constructs.

Table 5. Levene's test for equality of variances.

Construct		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
CS	Equal variances assumed	0.015	0.901	0.026	117	0.979	0.00257
	Equal variances not assumed			0.026	115.041	0.979	0.00257
IP	Equal variances assumed	0.569	0.452	−0.860	117	0.391	−0.07955
	Equal variances not assumed			−0.848	104.198	0.398	−0.07955
GL	Equal variances assumed	0.304	0.582	−0.611	117	0.543	−0.05396
	Equal variances not assumed			−0.615	113.886	0.540	−0.05396
II	Equal variances assumed	0.013	0.910	0.473	117	0.637	0.04059
	Equal variances not assumed			0.474	112.503	0.637	0.04059
OI	Equal variances assumed	0.776	0.380	0.144	117	0.886	0.01108
	Equal variances not assumed			0.145	113.060	0.885	0.01108
SQ	Equal variances assumed	0.463	0.065	0.932	117	0.353	0.07511
	Equal variances not assumed			0.964	116.133	0.337	0.07511

5.1. Assessment of Significance of the Structure Model

This section discusses the assessments used to measure the validity of the structural model of the current study. Assessing the structural model involves evaluating the collinearity matters, implication and significance of the relationships, the R^2 level, the effect sizes f^2, and the predictive significance Q^2 and the q^2 effect sizes (Hair Jr et al., 2014).

As can be understood equally from Table 6 below, the estimates for the full structural model the direct effect is by evaluating the P-value.

Table 6. Direct relationship of the model.

Research Hypotheses	Direct relationship	β	Std.E	T-Value	P-Values	Decision
H1	ERP -> OP	0.636	0.099	6.452	0.000	Significant
H1a	ERP -> II	0.908	0.017	52.750	0.000	Significant
H1b	ERP -> OI	0.926	0.013	68.729	0.000	Significant
H1c	ERP -> SQ	0.887	0.030	29.420	0.000	Significant
H1d	ERP -> US	0.885	0.021	41.740	0.000	Significant

P* < 0.10 (2 tailed), P** < 0.05, P*** < 0.01(2 tailed). Note: *ERP = Enterprises Resources Planning, II = Individual Impact, OI = Organization Impact, SQ = System Quality, US = User Satisfaction, OP = Organization Performance.*

As can be noticed in Table 6, the evaluation of the full model originally, it was predicted in the first hypothesis that ERP is positively related to organizational performance with (β = 0.636, T = 6.452, P = 0.000). By implication, the ERP system has a significant direct relationship with organizational performance, and it is necessary for achieving high performance, as has been explained by the values assessment. Furthermore, the main hypothesis has four sub-hypotheses: H1a, H1b, H1c, and H1d. The results are as follows.

H1a showed that individual impact (II) is positively related to ERP (β = 0.908, T-value = 52.750, P-value = 0.000) supported the hypothesis. H1b emphasised a positive significant relationship between organisational impact (OI) and the ERP system, and it is supported in the level of (β = 0.926, T-value = 68.729, P-value = 0.000). Results of H1c between system quality (SQ) and ERP confirmed a significant positive relationship by (β = 0.887, T-value = 29.420, P-value = 0.000). Finally, the H1d between user satisfaction (US) and ERP has been explained by (β = 0.885, T-value = 41.740, P-value = 0.001).

5.2. Assess the Predictive Relevance of the Model

In the final step of the structural model, the researcher needs to assess the predictive relevance (Q^2). This procedure is accepted following the Stone-Geisser test for predictive relevance (Geisser, 1975; Sarstedt et al., 2014; Stone, 1974). It should be (Q2 > 0), and it can be calculated by the blindfolding procedure in PLS-SEM. The procedure aims to compare the original values with the predicted values of endogenous constructs that have a reflective measurement model specification and to the endogenous single-item construct (Sarstedt et al., 2019). The Stone-Geisser test of predictive relevance is normally used to calculate the goodness-of-fit in PLS-SEM (Duarte & Raposo, 2010).

However, the current study used blindfolding to define the predictive relevance of the study model. The use of the blindfolding method to achieve Q^2 = 1-SSE/SSO is from the constructed cross-validated redundancy report. If Q^2 is positive, the model has predictive validity; if it is negative, the model does not have any predictive validity (Hair Jr et al., 2014). The reflective dimension model recognises that a latent or unobservable perception causes a difference in some established indicators. Therefore, since all endogenous latent variables in the current study are reflective, a blindfolding technique was generally applied to these variables. The main results have been illustrated in **Table 7**.

Table 7. Construct cross-validated redundancy.

	SSO	SSE	Q^2 (=1-SSE/SSO)
OP	354.000	172.496	0.513
CS	472.000	130.776	0.723
GL	472.000	154.968	0.672
II	472.000	155.958	0.670
OI	472.000	162.523	0.656
SQ	472.000	213.472	0.548
US	472.000	193.951	0.589

In **Table 7**, the sum of the squared observations (SSO) and the sum of the squared prediction errors (SSE) was obtained. The table also provides the model's Q^2 value. Q^2 = 1-SSE/SSO, Q^2 for all endogenous latent variables were above zero, suggesting the predictive relevance of the model (Chin, 1998; Henseler et al., 2009). The final assessment lies in the q^2 effect size. This procedure should be computed manually because smart PLS does not provide this technique. Noticeably, the q^2 values of 0.02, 0.015, and 0.35 represent small, medium, and large predictive relevance, respectively (Benitez et al., 2020).

The current study conducted these procedures for a certain endogenous construct with the Q^2 of the main endogenous, which is (OP), predicted by ERP, as an exogenous construct. The result illustrated in **Table 8** can conclude the model's effect size of (q^2).

Table 8. Effect Size for The Model

Exogenous Construct	q^2 Included	q^2 Excluded	q^2	Total Effect
ERP	0.513	0.381	0.271	Medium

Generally, after presenting all the effects that have been presented in previous sections, including the main relationship among the effects, **Table 9** illustrates the results of all hypotheses established and outlines the study findings.

Table 9. Summary of the study findings.

Hypotheses	Statement of Hypotheses	Decision
H1	There is a relationship between ERP and OP.	Supported
H1a	There is a relationship between Individual impact and ERP.	Supported
H1b	There is a relationship between organizational impact and ERP.	Supported
H1c	There is a relationship between system quality and ERP.	Supported
H1d	There is a relationship between user satisfaction and ERP.	Supported

6. Discussion

The explanation of the importance of the ERP system to other public organizations in Libya appeared to have a significant relationship with the ERP system. To provide quality service. As a small country, Libya depends on public organizations, which are considered the main sector to service their citizens. The first objective is to understand the relationship between ERP and OP, which aligns with the first hypothesis. A positive and significant relationship between the ERP system and OP using PLS output was shown at (β = 0.636, T-value = 6.452, P-value = 0.000).

It is confirmed that the ERP system is positively related to OP. This empirical result matches the results of earlier studies, which argue that ERP positively influences OP in such cases (Abobakr et al., 2024; Putra et al., 2021). Furthermore, the results advanced significantly from the initial subjects. There are several chances for ERP system studies to develop and expand organisational performance, mainly by focusing on procedure methods instead of different approaches (AL-Abrrow et al., 2018; Shen et al., 2016).

Thus, the indirect hypothesis has also investigated the dimensions of the ERP system to confirm the model which is provided by (DeLone & McLean, 1992) These hypotheses tests are mentioned in **Table 6**.

The results of the direct path, which reflect the relationship between the dimensions of the ERP system, confirmed positive significance relations. It is employed by the existence of four different and individually important dimensions (individual impact, organisation impact, system quality, and user satisfaction) of a successful ERP system, which is consent with (Goundar et al., 2021).

Although ERP systems have been increasingly adopted and used in Arab countries, in Libyan organizations, a few public organizations are interested in developing partly systems to provide services and facilitate internal procedures. At the same time, some of these organizations have attempted to outsource and have asked to build ERP applications. However, due to the instability of conditions of the country in the last few years, the organizations have failed to adopt and implement ERP systems broadly (Egdair et al., 2020a).

The implementation of ERP can provide the best performance conditions to Libyan public organizations. At the same time, internal processes, partly or totally,

still need more and more automation to be established, and the effect of the implementation of such a complex ERP structure is to be considered (Bakeer, 2017; Egdair et al., 2020b).

Furthermore, some other variables, such as technical and organisational conditions, infrastructure, professionalism, human resources capacity, financial capacity, and managerial support, can be obstacles (Emhmed et al., 2021; Mahmood et al., 2020).

7. Limitations

Although the study investigated the direct relationship between the ERP system and OP in the Libyan public organisation context, the results may not be generalizable to longer time periods because of changes in related factors mentioned previously, such as time, financial cost, the unstable situation of Libya in the current study period, etc.

Conversely, this study proposed a practical and theoretical contribution. Nevertheless, it cannot escape some limitations:

First, the study carries out a casual examination research by investigating the hypothesised relationship. This strategy emphasises in a short time, although the organisation's characteristics always change. So, the study's assumptions may be different with new investigations.

This study strongly encourages future studies to investigate other factors in the organizational culture and technology involved in ERP implementations, including change management, leadership, and user training, which are critical for realizing the benefits of ERP in public organizations.

Additionally, the measurements used were adapted from previous studies as a quantitative method. The possibility of future investigation can adopt a mixed method research design, quantitative and qualitative research.

On the other hand, results showed that adopting an ERP system positively related to individual impact, organisation impact, system quality, and user satisfaction. This can introduce other theories to test different perspectives and enrich the body of knowledge.

8. Conclusion

The contribution of this study starts with the importance of the variables as discussed; the ERP system is one of the systems that can provide more benefits to organizations, both private and public. The current study attempted to provide evidence that says the importance of the ERP system to public organizations, especially in developing countries, in this case, in Libyan public organizations. The result exposed the strong relations between ERP and OP as main variables and their items, reflecting the study object's goal and finding a solution for the investigated issue.

Thus, the successful introduction of an ERP system will increase the ability to provide quality customer services and accurate information and reduce the time

consumption in the internal process. At the same time, there is still a need more and more for future investigate other factors that can affect the ERP system adoption and implementation on the organizational performance in Libyan public organizations not addressed in the main infrastructures and the organization culture and technology factors, and resistance to change for new system introduction.

As mentioned, this study's implications are that ERP provides many strategic advantages, such as operational benefits, business process and management benefits, and strategic new systems planning benefits, to enhance performance sustainability through operational process integration.

The study investigation result can help managers to better understand the importance of ERP system implementations by addressing carefully such factors mentioned top management approach, training and development, misfits between the ERP system's built-in processes and the organizations, change management, system integration, business process reengineering, lack of skilled human resources, also IT infrastructure, resistance of change to new systems.

This study was attempted in public government organizations; the next investigation is supposed to compare the public and private sectors to ensure the main differences between these sectors or SME organizations.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Abdullah, N. H., Hamid, N. A., Shamsuddin, A., & Wahab, E. (2016). Exploring the Relationships among Transformational Leadership, Organizational Culture, and Product Innovation Using PLS-SEM. In *Proceedings of the 1st AAGBS International Conference on Business Management 2014 (AiCoBM 2014)* (pp. 151-160). Springer Singapore. https://doi.org/10.1007/978-981-287-426-9_13

Abobakr, M. A., Abdel-Kader, M., & F. Elbayoumi, A. F. (2024). An Experimental Investigation of the Impact of Sustainable ERP Systems Implementation on Sustainability Performance. *Journal of Financial Reporting and Accounting.* https://doi.org/10.1108/jfra-04-2023-0207

AL-Abrrow, H., Alnoor, A., & Oudah Abdullah, H. (2018). Socio-Technical Approach, Decision-Making Environment, and Sustainable Performance: Role of ERP Systems. *Interdisciplinary Journal of Information, Knowledge, and Management, 13,* 397-415. https://doi.org/10.28945/4149

Al-Dhaafri, H. S., & Al-Swidi, A. K. (2014). The Entrepreneurial Orientation and the Organizational Performance: Do Enterprise Resource Planning Systems Have a Mediating Role? A Study on Dubai Police. *Asian Social Science, 10,* 257.

Ali, A. H., Kineber, A. F., Elyamany, A., Hussein Ibrahim, A., & Daoud, A. O. (2023). Exploring Stationary and Major Modular Construction Challenges in Developing Countries: A Case Study of Egypt. *Journal of Engineering, Design and Technology.* https://doi.org/10.1108/jedt-03-2023-0099

Ali, M., & Miller, L. (2017). ERP System Implementation in Large Enterprises—A Systematic Literature Review. *Journal of Enterprise Information Management, 30,* 666-692.

https://doi.org/10.1108/jeim-07-2014-0071

Aljileedi, S. M., & Amoozegar, A. (2023). The Mediating Effect of Organizational Commitment Between Transformational Leadership Styles and Employee Performance in Public Banking Sector in Libya. *The Seybold Report, 18,* 865-866.

Alkraiji, A. I., Jayawickrama, U., & Olan, F. (2023). Taxonomy of Critical Success Factors Based on Players and Activities across ERP Projects: The Perspective of ERP Vendors. *International Journal of Business Information Systems, 43,* 186-215. https://doi.org/10.1504/ijbis.2023.131351

AlMuhayfith, S., & Shaiti, H. (2020). The Impact of Enterprise Resource Planning on Business Performance: With the Discussion on Its Relationship with Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 6,* 87. https://doi.org/10.3390/joitmc6030087

Alzahrani, A. O. (2022). Culture Influence on Enterprise Planning Resource (ERP) Implementation in Saudi Arabia's Public Sector. *International Journal of Computer Science and Network Security, 22,* 397-403.

Anaya, L., Flak, L., & Abushakra, A. (2023). Realizing Sustainable Value from ERP Systems Implementation. *Sustainability, 15,* Article 5783. https://doi.org/10.3390/su15075783

Armstrong, J. S., & Overton, T. S. (1977). Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research, 14,* 396-402. https://doi.org/10.1177/002224377701400320

Bakeer, A. (2017). *A New Model for E-Business Deployment in Libyan Public Universities.* Ph.D. Thesis, University of Gloucestershire.

Balić, A., Turulja, L., Kuloglija, E., & Pejić-Bach, M. (2022). ERP Quality and the Organizational Performance: Technical Characteristics vs. Information and Service. *Information, 13,* Article 474. https://doi.org/10.3390/info13100474

Barna, L., Ionescu, B., & Ionescu-Feleagă, L. (2021). The Relationship between the Implementation of ERP Systems and the Financial and Non-Financial Reporting of Organizations. *Sustainability, 13,* Article 11566. https://doi.org/10.3390/su132111566

Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2020). How to Perform and Report an Impactful Analysis Using Partial Least Squares: Guidelines for Confirmatory and Explanatory IS Research. *Information & Management, 57,* Article ID: 103168. https://doi.org/10.1016/j.im.2019.05.003

Bhattacharya, M., Ramakrishnan, T., & Fosso Wamba, S. (2023). Leveraging ERP Systems for Improving ERP Effectiveness in Emergency Service Organizations: An Empirical Study. *Business Process Management Journal, 29,* 710-736. https://doi.org/10.1108/bpmj-06-2022-0303

Chatterjee, S., Rana, N. P., & Dwivedi, Y. K. (2021). How Does Business Analytics Contribute to Organisational Performance and Business Value? A Resource-Based View. *Information Technology & People, 37,* 874-894. https://doi.org/10.1108/itp-08-2020-0603

Chatzoglou, P., Chatzoudes, D., & Apostolopoulou, G. (2017). Examining the Antecedents and Outcomes of ERP Implementation Success: An Explanatory Study. In *Information Technology for Management: New Ideas and Real Solutions: 14th Conference, AITM 2016, and 11th Conference, ISM 2016, held as Part of FedCSIS* (pp. 157-178). Springer International Publishing.

Chin, W. W. (1998). Commentary: Issues and Opinions on Structural Equation Modelling. *MIS Quarterly, 22,* VII-XVI.

Chou, S., & Chiang, C. (2013). Understanding the Formation of Software-as-a-Service (SaaS) Satisfaction from the Perspective of Service Quality. *Decision Support Systems, 56,* 148-155. https://doi.org/10.1016/j.dss.2013.05.013

Christiansen, V., Haddara, M., & Langseth, M. (2022). Factors Affecting Cloud ERP Adoption Decisions in Organizations. *Procedia Computer Science, 196,* 255-262. https://doi.org/10.1016/j.procs.2021.12.012

Creswell, J. W., & Creswell, J. D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* Sage Publications.

DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research, 3,* 60-95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19,* 9-30.https://doi.org/10.1080/07421222.2003.11045748

DeLone, W. H., & McLean, E. R. (2004). Measuring E-Commerce Success: Applying the Delone & Mclean Information Systems Success Model. *International Journal of Electronic Commerce, 9,* 31-47. https://doi.org/10.1080/10864415.2004.11044317

Duarte, P. A. O., & Raposo, M. L. B. (2010). A PLS Model to Study Brand Preference: An Application to the Mobile Phone Market. In V. Esposito Vinzi, W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares* (pp. 449-485). Springer. https://doi.org/10.1007/978-3-540-32827-8_21

Dumitru, V. F., Albu, N., Albu, C. N., & Dumitru, M. (2013). ERP Implementation and Organisational Performance. A Romanian Case Study of Best Practices. *The Amfiteatru Economic Journal, 15,* 518-531.

Egdair, I. M. M., Rajemi, M. F., & Nadarajan, S. (2020a). Adoption of Enterprise Resource Planning and Organizational Performance Conceptual Study on Public Sector. *International Journal of Supply Chain Management, 9,* 129-135.

Egdair, I. M. M., Rajemi, M., & Nadarajan, S. (2020b). Enterprise Resource Planning, Organizational Factors and Organizational Performance. *International Journal of Supply Chain Management, 9,* 136-141.

Egdair, I., Rajemi, M. F., & Nadarajan, S. (2017). Review Factors of Organizational Structures and Organization Size on the ERP Adoption System in Public Organization-Libya Context. *System, 28,* 65-70.

Emhmed, S., Al-Sanjary, O. I., Jaharadak, A. A., Aldulaimi, S. H., & HazimAlkawaz, M. (2021). Technical and Organizational Facilitating Conditions—The Antecedent Factors and Impact on the Intention to Use ERP System in Libyan Universities. In *2021 IEEE 17th International Colloquium on Signal Processing & Its Applications (CSPA)* (pp. 41-46). IEEE. https://doi.org/10.1109/cspa52141.2021.9377305

Geisser, S. (1975). The Predictive Sample Reuse Method with Applications. *Journal of the American Statistical Association, 70,* 320-328. https://doi.org/10.1080/01621459.1975.10479865

George, D., & Mallery, P. (2016). *IBM SPSS Statistics 23 Step by Step: A Simple Guide and Reference.* Routledge.

Goundar, S., Buksh, A., Masilamani, K., Rajan, N., & Prakash, K. (2021). Measuring The Success of ERP with the Delone and Mclean Model. In S. Goundar (Ed.), Enterprise Systems and Technological Convergence: Research and Practice (p. 237). Information Age Publishers.

Hair Jr., J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. (2014). Partial Least Squares

Structural Equation Modeling (PLS-SEM): An Emerging Tool in Business Research. *European Business Review, 26,* 106-121. https://doi.org/10.1108/ebr-10-2013-0128

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate Data Analysis: A Global Perspective (Vol. 7).* Pearson.

Hammad, M. Z. M. B., Yahaya, J. B., & Mohamed, I. B. (2024). A Model for Enterprise Resource Planning Implementation in the Saudi Public Sector Organizations. *Heliyon, 10,* e24531. https://doi.org/10.1016/j.heliyon.2024.e24531

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The Use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing, 20,* 277-319. https://doi.org/10.1108/s1474-7979(2009)0000020014

Igna, R. D. (2021). The Influence of the Implementation of ERP Systems on the Performance of an Organization. *Proceedings of the International Conference on Business Excellence, 15,* 268-279.

Jenatabadi, H. S., Huang, H., Ismail, N. A., Binti Mohd Satar, N., & Jasimah bt Wan Mohamed Radzi, C. W. (2013). Impact of Supply Chain Management on the Relationship between Enterprise Resource Planning System and Organizational Performance. *International Journal of Business and Management, 8,* 107-121. https://doi.org/10.5539/ijbm.v8n19p107

Kaplan, R. S., & Norton, D. P. (1992). The Balanced Scorecard: Measures that Drive Performance. *Harvard Business Review, 70,* 71-79.

Karimi, J., Somers, T. M., & Bhattacherjee, A. (2007). The Role of Information Systems Resources in ERP Capability Building and Business Process Outcomes. *Journal of Management Information Systems, 24,* 221-260. https://doi.org/10.2753/mis0742-1222240209

Katuu, S. (2020). Enterprise Resource Planning: Past, Present, and Future. *New Review of Information Networking, 25,* 37-46. https://doi.org/10.1080/13614576.2020.1742770

Mahmood, F., Khan, A. Z., & Bokhari, R. H. (2020). ERP Issues and Challenges: A Research Synthesis. *Kybernetes, 49,* 629-659. https://doi.org/10.1108/k-12-2018-0699

Mahmood, F., Khan, A. Z., Shah, S. A., & Adil, M. (2023). Post ERP Implementation Issues and Challenges: Exploratory Case Studies in the Context of Saudi Arabia. *Kybernetes*. https://doi.org/10.1108/k-06-2022-0914

Mahmood, M. A., & Mann, G. J. (1993). Measuring the Organizational Impact of Information Technology Investment: An Exploratory Study. *Journal of Management Information Systems, 10,* 97-122. https://doi.org/10.1080/07421222.1993.11517992

Malik, M. O., & Khan, N. (2021). Analysis of ERP Implementation to Develop a Strategy for Its Success in Developing Countries. *Production Planning & Control, 32,* 1020-1035. https://doi.org/10.1080/09537287.2020.1784481

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value. *MIS Quarterly, 28,* 283-322. https://doi.org/10.2307/25148636

Merhi, M. I. (2021). Evaluating the Critical Success Factors of Data Intelligence Implementation in the Public Sector Using Analytical Hierarchy Process. *Technological Forecasting and Social Change, 173,* Article ID: 121180. https://doi.org/10.1016/j.techfore.2021.121180

Mohamed, G. A., & Reda Hassan Farahat, E. (2019). Enterprise Resource Planning System and Its Impact on Tourism Companies' Operational Performance. *Journal of Sustainable Tourism and Entrepreneurship, 1,* 69-85. https://doi.org/10.35912/joste.v1i1.172

Mohammed, I., & Hachicha, M. (2024). The Conceptual Relationship between e-Government and ERP Systems on Organizational Performance in Government Organizations. *International Journal of Business and Management Invention, 13,* 114-119.

Mohanty, P. K., Sekhar, S. F. C., & Shahaida, P. (2022). Determinants of ERP Adoption, User Satisfaction, and User Engagement. *International Journal of Information System Modeling and Design, 13,* 1-16. https://doi.org/10.4018/ijismd.297044

Mukred, M., Alotaibi, F. M., Yusof, Z. M., Mokhtar, U. A., Hawash, B., & Ahmed, W. A. (2023). Enterprise Resource Planning Adoption Model for Well-Informed Decision in Higher Learning Institutions. *Journal of Information Science, 49,* 792-813. https://doi.org/10.1177/01655515211019703

Nugraha, D. W., Ismail, H., Wardhana, A., Wijaksana, T. I., & Yunani, A. (2023). A Systematic Literature Review: Implementation of ERP Systems in Logistics Companies Supply Chain Management in Developed and Developing Countries. In *International Conference on Mathematical and Statistical Physics, Computational Science, Education and Communication (ICMSCE 2023)* (pp. 257-264). SPIE. https://doi.org/10.1117/12.3012259

Obeidat, B. Y., Al-Suradi, M. M., Masa'deh, R., & Tarhini, A. (2016). The Impact of Knowledge Management on Innovation: An Empirical Study on Jordanian Consultancy Firms. *Management Research Review, 39,* 1214-1238. https://doi.org/10.1108/mrr-09-2015-0214

Olan, F., Ogiemwonyi Arakpogun, E., Suklan, J., Nakpodia, F., Damij, N., & Jayawickrama, U. (2022). Artificial Intelligence and Knowledge Sharing: Contributing Factors to Organizational Performance. *Journal of Business Research, 145,* 605-615. https://doi.org/10.1016/j.jbusres.2022.03.008

Oumran, H. M., Atan, R. B., Binti Nor, R. N. H., Abdullah, S. B., & Mukred, M. (2021). Knowledge Management System Adoption to Improve Decision-Making Process in Higher Learning Institutions in the Developing Countries: A Conceptual Framework. *Mathematical Problems in Engineering, 2021,* Article ID: 9842902. https://doi.org/10.1155/2021/9698773

Putra, D. G., Rahayu, R., & Putri, A. (2021). The Influence of Enterprise Resource Planning (ERP) Implementation System on Company Performance Mediated by Organizational Capabilities. *Journal of Accounting and Investment, 22,* 221-241. https://doi.org/10.18196/jai.v22i2.10196

Qrunfleh, S., & Tarafdar, M. (2014). Supply Chain Information Systems Strategy: Impacts on Supply Chain Performance and Firm Performance. *International Journal of Production Economics, 147,* 340-350. https://doi.org/10.1016/j.ijpe.2012.09.018

Rana, T., Steccolini, I., Bracci, E., & Mihret, D. G. (2022). Performance Auditing in the Public Sector: A Systematic Literature Review and Future Research Avenues. *Financial Accountability & Management, 38,* 337-359. https://doi.org/10.1111/faam.12312

Ranjan, S., Jha, V. K., & Pal, P. (2016). Literature Review on ERP Implementation Challenges. *International Journal of Business Information Systems, 21,* 388-402. https://doi.org/10.1504/ijbis.2016.074766

Sarstedt, M., Hair, J. F., Cheah, J., Becker, J., & Ringle, C. M. (2019). How to Specify, Estimate, and Validate Higher-Order Constructs in PLS-SEM. *Australasian Marketing Journal, 27,* 197-211. https://doi.org/10.1016/j.ausmj.2019.05.003

Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair, J. F. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM): A Useful Tool for Family Business Researchers. *Journal of Family Business Strategy, 5,* 105-115.

https://doi.org/10.1016/j.jfbs.2014.01.002

Shaik, M. N., & Abdul-Kader, W. (2014). Comprehensive Performance Measurement and Causal-Effect Decision Making Model for Reverse Logistics Enterprise. *Computers & Industrial Engineering, 68,* 87-103. https://doi.org/10.1016/j.cie.2013.12.008

Shen, Y., Chen, P., & Wang, C. (2016). A Study of Enterprise Resource Planning (ERP) System Performance Measurement Using the Quantitative Balanced Scorecard Approach. *Computers in Industry, 75,* 127-139. https://doi.org/10.1016/j.compind.2015.05.006

Sohn, C., & Tadisina, S. K. (2008). Development of E-Service Quality Measure for Internet-Based Financial Institutions. *Total Quality Management & Business Excellence, 19,* 903-918. https://doi.org/10.1080/14783360802224412

Stone, M. (1974). Cross-Validatory Choice and Assessment of Statistical Predictions. *Journal of the Royal Statistical Society Series B: Statistical Methodology, 36,* 111-133. https://doi.org/10.1111/j.2517-6161.1974.tb00994.x

Thong, J. Y. L. (1999). An Integrated Model of Information Systems Adoption in Small Businesses. *Journal of Management Information Systems, 15,* 187-214. https://doi.org/10.1080/07421222.1999.11518227

Tsai, W., Lee, K., Liu, J., Lin, S., & Chou, Y. (2012). The Influence of Enterprise Resource Planning (ERP) Systems' Performance on Earnings Management. *Enterprise Information Systems, 6,* 491-517. https://doi.org/10.1080/17517575.2011.622414

Udo, G. J., Bagchi, K. K., & Kirs, P. J. (2010). An Assessment of Customers' E-Service Quality Perception, Satisfaction and Intention. *International Journal of Information Management, 30,* 481-492. https://doi.org/10.1016/j.ijinfomgt.2010.03.005

Weerasekara, U., & Gooneratne, T. (2023). Enterprise Resource Planning (ERP) System Implementation in a Manufacturing Firm: Rationales, Benefits, Challenges and Management Accounting Ramifications. *Journal of Accounting and Management Information Systems, 22,* 86-110. https://doi.org/10.24818/jamis.2023.01005

Zaied, A. N. H. (2012). An Integrated Success Model for Evaluating Information Systems in Public Sectors. *Journal of Emerging Trends in Computing and Information Sciences, 3,* 814-825.

Zheng, J., & Khalid, H. (2022). The Adoption of Enterprise Resource Planning and Business Intelligence Systems in Small and Medium Enterprises: A Conceptual Framework. *Mathematical Problems in Engineering, 2022,* Article ID: 1829347. https://doi.org/10.1155/2022/1829347