

# Factors Affecting Intention to Adopt Open Source ERP Systems by SMEs in Yemen

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**Abstract**— *Small and medium-sized enterprises (SMEs) are significant contributors to countries' economic activities. SMEs need to use enterprise resource planning (ERP) systems to increase revenue and productivity. Due to the high licensing costs of these systems, open source ERP (OSERP) could be an alternative solution to this problem. This study investigates the factors affecting the intention to adopt the OSERP system by SMEs in Yemen using the Technology-Organization-Environment (TOE) Framework and The Diffusion of Innovation (DOI) Theory. Using a questionnaire, data were collected from a sample of 600 subjects. The model was validated empirically using Structural Equation Modeling (SEM). The results show that relative advantage, compatibility, trialability, observability, ICT infrastructure, IT skills, top management support, cost-saving, competitive pressure, vendor support, and regulatory support positively influence the intention to adopt OSERP. In contrast, complexity has a negative impact on the intention to adopt. However, security and organizational culture have no significant influence on SMEs' intention to adopt OSERP in Yemen.*

**Keywords**— *open source, enterprise resource planning, Yemen, adoption, small and medium-sized enterprises*

## I. INTRODUCTION

Enterprise resource planning (ERP) is a great integrated system that serves the whole enterprise by providing several modules for all functional units that can smoothly exchange information using a central database. Modern SMEs started early to make significant investments in ERP systems to reap the benefits and improve efficiency and effectiveness. However, the high cost of the ERP system, which involves system integration and maintenance and staff training, makes organizations refrain from implementing ERP systems.

In addition, there is an essential concern that the implementation of the ERP system may not deliver all the expected benefits, or it will face the post-implementation challenges represented by ongoing costs and lack of flexibility[1]. For this reason, SMEs turn into open source ERP (OSERP) systems, which are free of charge or low cost, flexible, and customizable.

Over time, the market for OSERP systems is overgrowing, with many modern organizations adopting this type of solution to avoid the high costs of ERP systems and to have more flexibility and customization to continue improving their business[1]. Therefore, it is appropriate to review the extant literature to investigate the most critical factors that affect the adoption of OSERP systems in SMEs in Yemen.

This paper is organized as follows: First, a background and literature review of the previous studies is introduced. Second, the proposed research model and hypotheses are explained, followed by the data collection methodology and analyses of the study results. The paper concludes with a discussion of the key findings, implications for researchers and practitioners.

## II. BACKGROUND AND LITERATURE REVIEW

### A. Open-source ERP and closed-source ERP

In the last few years, ERP systems received a lot of attention. ERPs are typically defined as standard packaging software that integrates the whole value chain of an organization, as revealed in [3], [4]. The evolution of ERPs has increased the complexity of both ERP usage and ERP development. The complexity stems from ERP systems designed to integrate inter-and intra-organizational organizations and business processes into a single suite package. [5]. The literature on ERP reveals that a significant issue presented is a misfit between ERP functionality and business requirements. The term "misfit" refers to the gap between the functionality provided by the ERP package and the functionality required by the adopting organization [6]. Another delivery option, which has been around for a while, is OSERP. OSERP is a type of ERP system that may be used for free by organizations, and its code can be downloaded from the internet and modified by anyone for their own business needs. OSERP enabled organizations to customize and develop their modules according to their business processes and flows. Some of the benefits of OSERP are as follows: (1) less costly, (2) customization, (3) easy to scale up, (4) functional understanding.

### B. Open-source ERP adoption

The adoption of ERP can include various matters, like cost, understand of technology understanding and limitation of human resources as in [7]. Many motivational factors will help organizations to adopt an ERP system. These factors are cost-benefit analysis, management innovation, knowledge, skill, ability, employee skills, general acceptance of change, ICT knowledge management, and ICT infrastructure [8]. On the other side, one of the major issues organizations confront when adopting ERP is the flexibility level provided by the new system to allow a dynamic identification of new business models and processes [9]. Finally, the companies must connect their data-processing systems with new functional

business acquisitions with minimal effort [10] when deciding to adopt OSERP.

### C. Adoption Theories and Frameworks

#### The Diffusion of Innovation (DOI) Theory

Innovation diffusion theory deals with individual observations of technology or innovation and its importance in adopting new technology. Diffusion of Innovation put forward by Rogers [1] is identified as “the process by which an innovation is communicated through certain channels over time among the members of a social society.” This theory explains the process of adopting innovation and diffusion, the differing way diffusion, and the adoption of technology by adopters, and the characteristics of invention affect like complexity, compatibility, comparative advantages, observation, and experimentation that various researchers have adopted expected rate of adoption of regulations [1]. The theory focuses upon technological characteristics ignoring other dimensions, like organizational factors, social factors, etc. Moreover, the theory is not interested in the critical psychological parameters of users, like beliefs, attitudes, and intentions. Figure 1 shows the stages of this theory. This model is suitable with dealing with the adoption of new technology like OSERP.

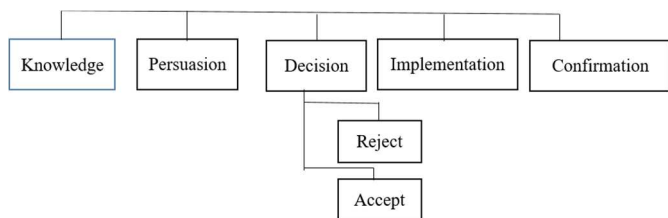


Fig. 1. Five Stages in Decision Innovation Process

#### Technology, Organization and Environment Framework

Tornatzky and Fleischer [13] proposed the TOE framework (technology, organization, and environment). It identifies three aspects of the enterprise context that impact the acceptance, adoption, and use of technological innovation: technological, organizational, and environmental. TOE, as initially proposed, provides a helpful framework for studying the adoption and acceptance of many types of technological innovations. Figure 2 depicts the framework. The technological context includes all technical equipment related to the organization, technical expertise, security of technologies. It also may encompass both infrastructure and processes inside and outside the organizations [2].

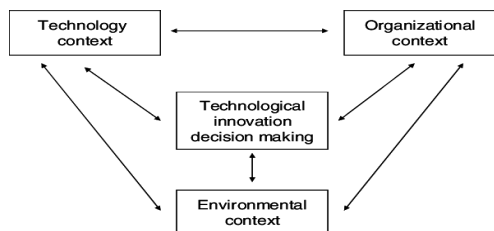


Fig. 2. TOE Framework

The organizational context refers to the organization's features and characteristics, including the organization's size, degree of centralization, degree of formalization,

administrative structure, human resources, financial resources, and communications among users. The environmental context includes the structure and size of the industry, competitors, regulatory and vendor support [2].

### D. Literature review

Caetano Haberli Jr [3] investigated the determinants of ERP adoption within the agriculture food context in Brazil using DOI theory and the TOE framework. He found that relative advantages, compatibility, the support of top management, cost-saving, the readiness for technology, the organization size, and the competitive pressure positively impacted the adoption of ERP systems. In contrast, complexity and regulator support had a negative influence on the adoption of ERP systems. The study in [16] analyzed the environment of organization technology with a diffusion of innovation theory. It has been concluded that five factors have a significant effect on the intention of ERP system adoption. These factors are the organization's culture, controlling the environment, relative advantage, trialability, and support from the vendor. In contrast, it supported no significant effect for ICT skills, complexity, observability, data security, and customization.

TOE framework used in Reuben, et al. [4] with DOI theory to study the most factors that influence the adoption of OSERP by organizations in Kenya, he concluded that technology, organization, environment, attitude, normative structure, and perceived influence the adoption-use of the OSERP. The crucial criteria that affect decision-making to adopt OSERP by SMEs in Thailand are defined in [5]. They conducted a literature review to determine these criteria. It was found that the speed of implementation, price, vendor support, reliability, ease of use, customization, compatibility, fitting with organization need, functionality, flexibility, training, scalability, upgrades, and modularity had the most significant influence on the decision makers to adopt OSERP systems. Reference [6] explored the underlying factors and their impact on OSERP adoption. They found that cost saving, reliability, functionality, web media, vendor support, and innovativeness positively influenced the adoption of OSERP by SMEs. At the same time, complexity has a negative influence on the adoption of OSERP by SMEs. The model of the unified theory of acceptance and use of technology was utilized in [7] to determine the factors that influence the managers and directors of SMEs to adopt OSERP. They found that performance expectancy and effort expectancy significantly predicted behavioral intention to use FLOSS ERP, where social influence, cost-saving, and use behavior were statistically insignificant on the adoption of OSERP in SMEs. The factors that significantly impact the adoption of ERP by SMEs are determined by [8]. They found that ICT infrastructures, IT expertise, compatibility, relative advantage, security, and organization size had a positive significant on the adoption of ERP by SMEs. Whereas scope of business operations, trading partners' readiness, demographic composition, subjective norms, external supports, and competitive pressures were had negative significant on the adoption of ERP by SMEs. The study Pathan, et al. [9] employed the TOE framework to study the factors that influence the adoption of cloud ERP by SMEs in Pakistan. It was found that relative advantage, compatibility, managerial support, organization size, competitive pressures, and regulatory support positively affected SMEs' adoption of cloud ERP in Pakistan. The complexity has a negative effect

on cloud ERP adoption by SMEs in Pakistan. In the study of Salum and Rozan [10], a conceptual model was developed to investigate the factors influencing the adoption of cloud ERP by SMEs. The model was based on the TOE, DOI, and Fit Viability Model (FVM). The results revealed that relative advantage, compatibility, security, trust, top management support, employees' knowledge about cloud ERP vendor support, competitive pressure, and regulatory support impacted SMEs' adoption of cloud ERP. Reference Tome, et al. [11] involved the factors influencing intention to adopt OSERP software by SMEs in South Africa and found that OSERP systems adoption barriers are: knowledge barriers, the lack of vendor support, and ironically low costs. In summary of the literature review, it is evident that relative advantage, complexity, compatibility, trialability, observability, top management support, organizational culture and cost saving, competitive pressure, vendor support and regulatory support, technological infrastructure, IT skills and security are the most widely studied factors.

### III. RESEARCH MODEL

Figure 3 shows a study model that empirically explores the impact of TOE, innovative characteristics on OSERP adoption intention by SMEs in Yemen. This model consists of the following factors:

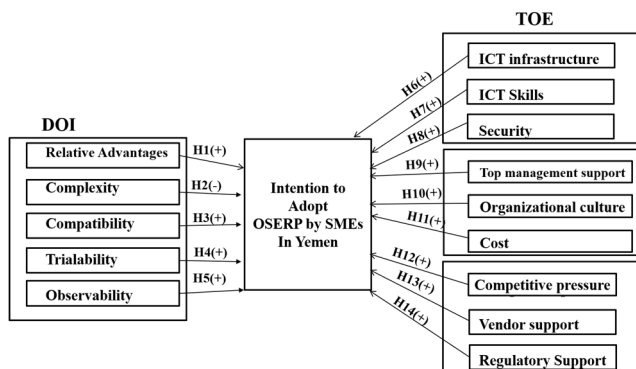


Fig. 3. Research Model

#### A. Characteristics context : Relative advantage

Study Reuben, et al. [4] supported that the characteristics of OSERPS affect the adoption intention of OSERPS by SMEs, while Olson, et al. [12] support that characteristics context affect the adoption of ERP. The study in Mahapatra and Krishnan [6] found that characteristics context on ERP affects the adoption of ERP by SMEs. Reference Abdellah, et al. [7] supports that characteristics context affect the adoption of OSERP. In contrast, Caetano Haberli Jr [3] confirmed that relative advantage positively affects SMEs' adoption intention of ERP. In addition, [10] found that relative advantage had a positive impact on ERP adoption. According to our findings mentioned above, the hypotheses of this study are stated as follows:

**H1:** Relative advantage has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

#### B. Characteristics context : Complexity

In studies [17] and [20], it is found that complexity has a direct negative effect on OSERPS adoption. Also, [22] proved the negative effect of the complexity on cloud-based ERP adoption by SMEs in Pakistan. It is also found in [26] that complexity has a direct impact on OSERPS adoption.

According to our findings above, the following hypothesis is stated:

**H2:** Complexity has a negative effect on the intention to adopt OSERP systems by SMEs in Yemen.

#### C. Characteristics context : Compatability

The study Laala [13] asserted that compatibility directly affects system adoption by SMEs in Algeria. Thus, the following hypothesis is put forth:

**H3:** Compatibility has a positive effect on the intention to adopt OSERPS by SMEs in Yemen.

#### D. Characteristics context : Trialability

In [6], it is found that trialability positively influences the adoption intention of OSERPS by SMEs. Furthermore, [3] ensures that trialability positively influences ERP adoption by farm organizations in Brazil. Study Ahn and Ahn [14] confirmed that trialability positively influences the adoption intention of ERP systems in Lebanon. In addition, [11] emphasized that trialability has a positive effect on the adoption of OSERPS in South African SMEs. Accordingly, the following hypotheses are formulated as follows:

**H4:** Trialability has a positive effect on the intention to adopt OSERPS by SMEs in Yemen.

#### E. Characteristics context : Observability

It is found that observability positively affects the adoption of ERP systems, as in Carlos J. Costa [15]. In contrast, Salum and Rozan [10] supported observability to positively influence the adoption of the cloud ERP system on SMEs. Accordingly, we formulated the following hypothesis:

**H5:** Observability has a positive effect on the intention to adopt OSERPS by SMEs in Yemen.

#### F. Technological context: ICT infrastructure, IT Skills

The study [9] utilized the TOE framework to study the effect of technological factors on ERP adoption by SMEs in Pakistan. They found that ICT infrastructure and IT skills positively related to the adoption of ERP by SMEs. Hart O. Awa [8] asserted that ICT infrastructure and IT skills directly affect the adoption of ERP by SMEs. Caetano Haberli Jr [3] states that technological factors like ICT infrastructures and IT skills directly affect the adoption of ERP by food organizations. Study [4] supported the technological element, including ICT infrastructure, IT skills, to influence the adoption-use of OSERP by organizations. Thus, we hypothesize:

**H6:** ICT infrastructures in organizations positively affect intention to adopt OSERPS by SMEs in Yemen.

**H7:** IT skills have a positive effect on the intention to adopt OSERPS by SMEs in Yemen.

#### G. Technological context: Security

In Section II, several previous studies found that the new system's perceived security affects the adoption of OSERPS in SME organizations. For example, the references [16] confirmed that perceived safety directly affects OSERPS adoption in organizations. Accordingly, the following hypothesis is proposed:

**H8:** Perceived security has a positive effect on the adoption intention of OSERP by SMEs in Yemen.

#### H. Organizational context: Top management support

The two studies, Tome, et al. [11], Laala [13], supported that organizational culture and top management positively influence OSERP adoption in SME organizations. Moreover, [17] found that top management support positively related to the adoption of OSERP by SMEs in Kenya. In addition, Cereola, et al. [17] assumed that top management support positively affects the adoption of ERP by enterprises. Hence, we assume:

**H9:** Top management support positively affects the intention to adopt OSERP by SMEs in Yemen.

#### I. Organizational context: Organizational culture

Previous studies assume that the organizational culture of the firm affects OSERP adoption by SMEs. For example, Mohammad [18] confirmed that organizational culture positively influences the adoption of ERP systems. Salum and Rozan [10] state that organizational culture positively affects SMEs' adoption of ERP systems. Reference Reuben, et al. [19] confirmed that organizational culture positively influenced the adoption of OSERP by SMEs. Mahapatra and Krishnan [6] underlined that organizational culture positively influences the adoption of OSERP by SMEs. Furthermore, [14] supports that organizational culture positively affected the intention to adopt a new ERP system in Lebanon.

Thus, the following hypotheses are formulated as follows:

**H10:** Organizational culture has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

#### J. Organizational context: Cost saving

Several previous studies found that perceived cost-saving effect OSERP adoption by SMEs. For instance, Tasnawijitwong and Samanchuen [5] found that cost-saving positively influences the adoption of OSERP by SMEs. On the other hand, the model developed by Salum and Rozan [10] confirmed that cost-saving positively affects the adoption of ERP in SMEs. Cruz, et al. [20] found that cost positively affects the adoption of OSERP by SMEs. Similarly, Abdallah, et al. [7] asserted that cost positively affects the adoption of OSERP by SMEs. Kountouridou, et al. [21] stated that cost-saving positively influences the adoption of OSERP by Greece organizations. Thus, we hypothesize:

**H11:** Cost saving has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

#### K. Environmental context: Competitive pressure

According to the literature review, competitive pressure positively affects the adoption of OSERP in SMEs. For example, [4] stated that competitive pressure positively affects the adoption of OSERP by Kenya firms. Mahapatra and Krishnan [6] proved that competitive pressure affects the adoption of OSERP by SMEs. [18] indicated that competitive pressure has a positive influence on the adoption of ERP.

Hence, we assume:

**H12:** Competitive pressure has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

#### L. Environmental context: Vendor support

This review of the literature sustained that vendor support affects the adoption of OSERP by SMEs. Reuben, et al. [4] supported that vendor support positively affects the adoption of OSERP by Kenya firms. Mahapatra and Krishnan [6] found

that vendor support affects the adoption of OSERP by SMEs. Study [18] confirmed that vendor support has a positive influence on the adoption of ERP. Furthermore, Study [3] found that vendor support had a positive impact on ERP adoption. Another study [22] found that vendor support positively influenced the adoption intention in Saudi Arabia. Thus, as the previous authors, we expect:

**H13:** Vendor support has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

#### M. Environmental context: Regulatory support

May previous authors stated that regulatory support has positive effects on the intention to adopt OSERP in SMEs. For example, a study [23] asserted that government agencies' regulatory support influences SMEs' adoption of new technological innovation. Furthermore, [24] proved that regulatory support positively affects the adoption of OSERP in UK firms. [9] found that regulatory support had a positive effect on the intention to adopt ERP by SME enterprises. In addition, [10] supports that regulatory support affected the adoption of ERP by SMEs. Thus, we can assume:

**H14:** Regulatory support has a positive effect on the intention to adopt OSERP by SMEs in Yemen.

## IV. RESEARCH METHODOLOGY

This section will explain the used measurements and data collection in the research methodology.

### A. Measurements

To test the hypothesis of this study, the data is collected using a survey questionnaire. The measured items of variables are also collecting from the literature review. It uses the five-point Likert scale, and all measurements were scored.

### B. Data collection

The data in this study were collected from employees of SME organizations in Sanaa city, Yemen. 600 questionnaires were distributed to 350 SMEs from 4855 SMEs in Sanaa. 482 questionnaires returned out of 600 distributed, representing a response rate of 80.3% of the original sample. However, 66 responses were discarded because they had significant missing values or were empty of those questionnaires returned. So, the remaining 416 questionnaires were used for further data analysis. Therefore, the final response rate was 69.3%. This response rate is acceptable.

## V. ANALYSIS AND RESULTS

The collected data were analyzed using SMART PLS version 3 and SPSS version 24. First, Measurement models were analyzed, and second stage structural equation modelling (PL-SEM) was used to verify the research hypotheses.

### A. Measurement Model

To analyze the measurement model, reliability and validity should be measured.

In this study, the validity of the construction was examined when it is analyzed both convergent validity and discriminative validity. According to the validity of the construction, it is explored investigating its relationship with other constructions, both correlated (convergent validity) and unrelated (discriminating validity). The average extracted

variation (AVE) must be 0.5 or more to suggest adequate convergent validity, and bird estimates for two factors must also be greater than the correlation square between the two factors to provide discriminating validity tests. If the bird is higher than the correlation coefficient plaza between buildings, it can be said that the discriminative validity is satisfied. Furthermore, reliability assessed through internal reliability (Cronbach Alpha  $\geq 0.70$ ) and build reliability (CR  $\geq 0.70$ ). Table I shows that it is possible to observe values above 0.700 for reliability composite, which indicates an adequate model.

TABLE I. CONSTRUCT RELIABILITY AND VALIDITY

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
AI	0.854	0.861	0.890	0.538
CO	0.788	0.789	0.855	0.541
CP	0.840	0.841	0.882	0.555
CU	0.861	0.862	0.894	0.546
CX	0.854	0.875	0.883	0.520
OB	0.744	0.753	0.839	0.566
PR	0.802	0.809	0.871	0.630
RA	0.881	0.883	0.906	0.546
RS	0.842	0.843	0.884	0.560
SE	0.885	0.892	0.910	0.560
SK	0.860	0.861	0.893	0.545
TE	0.809	0.821	0.867	0.568
TM	0.922	0.923	0.934	0.563
TR	0.846	0.849	0.886	0.565
VS	0.881	0.888	0.905	0.515

Convergence validity evaluation indicators can measure the degree of latent variables (construction). It can be verified by observing factor loading and AVE patterns. Factor loading over 0.700 and variances above 0.5 were accepted as high and significant. The evaluation of the construct's discriminant validity was done using two criteria:

- **Fornell-Larcker** supports the reason why the square bird root of AVE should be greater than the construction correlation.
- **Cross loadings** require that a load of each indicator is greater than transversal loads.

As presented in Table IV Table 5-19, the square roots of AVE, as a diagonal element, are greater than the correlation between each structure's pairs (elements outside of diagonal).

### B. Structural Equation Modeling

Structural equation modeling (SEM) was applied in this study; Combine statistical data with qualitative hypotheses to test and estimate the causal relationships. Researchers have recognized the possibility of distinguishing between measurement models and structural models and considering the measurement error. SEM techniques are divided into two different categories. These are the technique of covariance and variation technique. In the method of variance, and these cases: Case1, when not all the articles in the data are normally distributed (P & LT; 0.01 in the Kolmogorov-Smirnov test), CASE2, the search model not tested in literature, Case 3 The research model considered complex, in these cases for variance technique, PLS can be used.

### C. Hypothesis Test

To emphasize the hypothesis defined in this work, the assessed the significance of the structural model coefficients. This is the signal between the explanatory variable (independent variable) and the OSERP adoption (dependent variable). The hypothesis has tested the effects of all independent variables on the dependent variable (Intention to adopt OSERP). Moreover, the Significance level of factor loading was measured using bootstrap for 5,000 samples. Bootstrapping takes a large number of samples from the original samples and replaces them. Replacement means that observation is randomly selected from the sample population and returned to the sample population before the next observation is drawn. Therefore, for each bootstrap sample, an observation may be chosen multiple times, or observation may not be selected for the sample at all. Each bootstrap sample has the same number of observations as the original sample—the results of direct hypothesis testing by 5000 bootstrapping are represented in Table II.

TABLE II. HYPOTHESIS ANALYSIS RESULTS

Hypothesis	Path	B standard	t-Value	P Values	Sig Level
H1	RA -> AI	0.068	2.012	0.044	**
H2	CX -> AI	-0.054	2.623	0.009	***
H3	CP -> AI	0.070	2.741	0.006	***
H4	TR -> AI	0.104	2.649	0.008	***
H5	OB -> AI	0.145	4.106	0.000	****
H6	TE -> AI	0.119	3.686	0.000	****
H7	SK -> AI	0.073	2.591	0.010	***
H8	SE -> AI	0.080	1.848	0.065	NS
H9	TM -> AI	0.098	2.376	0.018	**
H10	CU -> AI	0.027	0.876	0.381	NS
H11	CO -> AI	0.088	3.603	0.000	****
H12	PR -> AI	0.068	2.552	0.011	**
H13	VS -> AI	0.059	2.292	0.022	**
H14	RS -> AI	0.144	3.851	0.000	****

Note: NS: Not Significant, \*\*  $p \leq 0.05$ , \*\*\*  $p \leq 0.01$ , \*\*\*\*  $p \leq 0.001$

## VI. DISCUSSION AND CONCLUSIONS

This section will discuss the results and highlight the implications.

### A. Discussion and findings

The empirical analysis results showed that relative advantages, compatibility, trialability, observability, ICT infrastructure, IT skills, top management support, cost-saving, competitive pressure, vendor support, and regulatory support had a significant positive influence ( $p < 0.05$ ) on the intention to adopt OSERP. In contrast, complexity had a negative impact ( $p < 0.05$ ) on the intention to adopt OSERP. Furthermore, security and organization culture had no significant influence ( $p > 0.05$ ) on SMEs' intention to adopt OSERPS in Yemen. The compatibility was identified to be a crucial factor in adopt OSERPS. To adopt ERP, it is necessary to compatible with existing systems and resources. Second, since the availability of ICT infrastructure is identified as an essential factor in the adoption intention of OSERP, to adopt OSERP, the organization must provide all ICT infrastructure needs to adopt ERP system. Third, regulatory support proved to be a crucial factor. The results reveal that the support for a

government organization and any organization supporting SMEs to adopt ERP systems adoption is essential. Fourth, the observability of OSERP benefits identified as a crucial factor in intention to adopt OSERP by SME. The organizations that intend to adopt OSERP need to know about the results from adopting this ERP at similar organizations. Fifth, trialability proved to be a critical factor. The OSERP, which provides a trial version, will be most adopted in the organization in Yemen. Sixth, cost-saving is an essential factor in the intention to adopt OSERP, and open source often reduces the cost of adopting ERP systems. Seventh top management support is identified as a necessary factor in intention to adopt OSERP. To adopt OSERP, the top management must support the adoption of OSERP.

### B. Theoretical implications

The study has two academic implications. First, the factors influencing the intention to adopt OSERP were identified from a holistic perspective. To address what led to the adoption of OSERP, an integrated research model was presented and analyzed through empirical analysis. Specifically, the TOE framework was introduced to analyze factors from a holistic perspective. Second, it is said that the TOE framework was introduced earlier. The limitation of the TOE framework is that it cannot take into account the characteristics of innovative technology such as OSERP. Therefore, since OSERP is an innovative technology different from traditional ERP, it is a research topic with features that need to be included in the model. Consequently, as stated in Stedman's practical implications, critical factors of innovation characteristics were used as variables to reflect this in the model [9].

This study has the following practical implications: First, it helps managers and policymakers in Yemen to identify the factors that influence the adoption of OSERP in the organization. Second, the findings can help the information systems department of the organizations from the perspective of OSERP adoption. Third, OSERP vendors need to focus on these matters, ensure the availability of compatibility, advantages, ease of use, trialability, and observability, to make organizations intended for adopting OSERP systems. Fourth, top management of the organization should focus on these points: ensure the availability of IT skills, ICT infrastructure, and training to increase the adoption of OSERP systems. In addition, fifth, government policymakers responsible for the SME organization in Yemen must support the organization that intends to adopt OSERP with good technical and legal service to encourage the adoption intention of OSERP in SMEs in Yemen.

## VII. REFERENCES

- [1] E. Rogers, *Diffusion of Innovations*. Simon and Schuster, 2003.
- [2] L. Tornatzky and M. Fleischer, *The process of technology innovation* (Lexington Books). Lexington, 1990.
- [3] T. O. Caetano Haberli Jr, and Mitsuru Yanaze, "Understanding the determinants of adoption of enterprise resource planning (ERP) technology within the agrifood context: the case of the Midwest of Brazil," *International Food and Agribusiness Management Review*, RESEARCH ARTICLE vol. 20, no. 5, p. 18, 2017.
- [4] J. Reuben, J. Obura, and M. Oginda, "The Extent and Significance of the Drivers of Adoption-Use of Open Source ERP by Deposit Taking Saccos in Kenya," *International Journal of Scientific Research and Engineering Development*, vol. 2, pp. 292-310, 2021.
- [5] S. Tasnawijitwong and T. Samanchuen, "Open source ERP selection for small and medium enterprises by using analytic hierarchy process," in *2018 5th International Conference on Business and Industrial Research (ICBIR)*, 2018, pp. 382-386.
- [6] M. Mahapatra and S. Krishnan, "Adoption of open Source ERP in small and medium-sized enterprises," presented at the Pacific Asia Conference on Information Systems (PACIS).171, Langkawi, 07/2018, 2017. Available: <http://aisel.aisnet.org/pacis2017/171>
- [7] Z. Abdellah, A. A. Arrahmane, and J. Fatima, "Factors affecting adoption of FLOSS ERP aystem by SMEs' directors and managers in developing countries using UTAUT2, SEM and R," presented at the 2016 4th IEEE International Colloquium on Information Science and Technology (CiSt), Tangier, Morocco, 2016.
- [8] O. U. O. Hart O. Awa "A model of adoption determinants of ERP within T-O-E framework," vol. 29, no. 4, pp. 901 - 930, 21/11/2016 2016.
- [9] Z. H. Pathan, Z. Jianqiu, U. Akram, Z. Latif, M. K. Khan, and M. Z. Tunio, "Essential factors in cloud-computing adoption by SMEs," *Human Systems Management*, vol. 36, pp. 261-275, 2017.
- [10] K. Salum and M. A. Rozan, "Conceptual model for cloud ERP adoption for SMEs," *Journal of Theoretical and Applied Information Technology*, vol. 95, no. 4, pp. 743-756, 28/02/2017 2017.
- [11] L. Tome, K. A. Johnston, A. Meadows, and M. Nyemba-Mudenda, "Barriers to open source ERP adoption in South Africa," *The African Journal of Information Systems*, Research Paper vol. 6, no. 2, 2014.
- [12] D. L. Olson, B. Johansson, and R. A. D. Carvalho, "Open source ERP business model framework," *Robotics and Computer-Integrated Manufacturing*, vol. 50, no. C %J Robot. Comput.-Integr. Manuf., pp. 30-36, 2018.
- [13] A. Laala, "Adoption and diffusion of innovation information systems in SME in Algeria," Doctoral, 2017.
- [14] B. Ahn and H. Ahn, "Factors Affecting Intention to Adopt Cloud-Based ERP from a Comprehensive Approach," *Sustainability*, vol. 12, p. 6426, 2020.
- [15] E. F. Carlos J. Costa , Fernando Bento , Manuela Aparicio, "Enterprise resource planning adoption and satisfaction determinants," *Computers in Human Behavior*, vol. 63, p. 13, 2016.
- [16] C. Martins, T. Oliveira, and A. Popovič, "Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application," *International Journal of Information Management*, vol. 34, no. 1, pp. 1-13, 2014.

- [17] S. Cereola, B. Wier, and C. Norman, "Impact of top management team on firm performance in small and medium-sized enterprises adopting commercial open-source enterprise resource planning," *Behaviour & Information Technology*, vol. 31, no. 9 %J Behav. Inf. Technol., pp. 889–907, 2012.
- [18] A. Mohammad, "A framework to apply cloud-based enterprise resource planning in the United Arab Emirates manufacturing companies-a case approach," PhD, ACE, University of East London, 2018.
- [19] J. M. Reuben, J. Obura, and M. Oginda, "Factors Influencing Adoption-Use of Open Source ERP by Deposit-Taking Saccos in Kenya," *International Journal of Managerial Studies and Research (IJMSR)*, vol. 7, no. 5, pp. 16-26, 2019.
- [20] T. M. Cruz, J. Gutiérrez-Artacho, and J. Bernardino, "Open Source CRM Tools for Small Companies," in *World Conference on Information Systems and Technologies*, Cham, 2017, pp. 426-435: Springer International Publishing.
- [21] N. Kountouridou, P. Antoniou, and I. Stamelos, "A Comprehensive Approach for Implementing an Open Source ERP in a Greek Industry," presented at the Proceedings of the 20th Pan-Hellenic Conference on Informatics, Patras, Greece, 2016. Available: <https://doi.org/10.1145/3003733.3003744>
- [22] R. H. Adnan M. AlBar, "Determinants of cloud ERP adoption in Saudi Arabia: An smpirical study," *2015 International Conference on Cloud Computing (ICCC)*, 2015.
- [23] N. Ngisau and N. Ibrahim, "Technological Innovation Adoption in Manufacturing Sector: The Moderator Role of Government Support," *Journal of Economics, Business and Management*, vol. 8, pp. 200-205, 01/01 2020.
- [24] R. Ramanathan, U. Ramanathan, and L. W. L. Ko, "Adoption of RFID technologies in UK logistics: Moderating roles of size, barcode experience and government support," *Expert Systems with Applications*, vol. 41, no. 1, pp. 230-236, 2014.
- [17] E. F. Carlos J. Costa , Fernando Bento , Manuela Aparicio, "Enterprise resource planning adoption and satisfaction determinants," *Computers in Human Behavior*, vol. 63, p. 13, 2016.
- [18] C. Martins, T. Oliveira, and A. Popovič, "Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application," *International Journal of Information Management*, vol. 34, no. 1, pp. 1-13, 2014.
- [19] S. Cereola, B. Wier, and C. Norman, "Impact of top management team on firm performance in small and medium-sized enterprises adopting commercial open-source enterprise resource planning," *Behaviour & Information Technology*, vol. 31, no. 9 %J Behav. Inf. Technol., pp. 889–907, 2012.
- [20] A. Mohammad, "A framework to apply cloud-based enterprise resource planning in the United Arab Emirates manufacturing companies-a case approach," PhD, ACE, University of East London, 2018.
- [21] J. M. Reuben, J. Obura, and M. Oginda, "Factors Influencing Adoption-Use of Open Source ERP by Deposit-Taking Saccos in Kenya," *International Journal of Managerial Studies and Research (IJMSR)*, vol. 7, no. 5, pp. 16-26, 2019.
- [22] T. M. Cruz, J. Gutiérrez-Artacho, and J. Bernardino, "Open Source CRM Tools for Small Companies," in *World Conference on Information Systems and Technologies*, Cham, 2017, pp. 426-435: Springer International Publishing.
- [23] N. Kountouridou, P. Antoniou, and I. Stamelos, "A Comprehensive Approach for Implementing an Open Source ERP in a Greek Industry," presented at the Proceedings of the 20th Pan-Hellenic Conference on Informatics, Patras, Greece, 2016. Available: <https://doi.org/10.1145/3003733.3003744>
- [24] R. H. Adnan M. AlBar, "Determinants of cloud ERP adoption in Saudi Arabia: An smpirical study," *2015 International Conference on Cloud Computing (ICCC)*, 2015.