



**THE MODERATING ROLE OF ERP IMPLEMENTATION STRATEGIES ON ENTERPRISE RESOURCE PLANNING
SYSTEM ADOPTION RELATED FACTORS AMONG HEALTHCARE FACILITIES IN KENYAN CONTEXT**

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ABSTRACT

The purpose of the study was to determine the role of ERP implementation strategies on Enterprise Resource Planning systems related factors among healthcare facilities in Kenya. The study applied positivism research philosophy and descriptive cross-sectional design with target population constituted of the executives of the healthcare organizations from level 4, 5 and 6 hospitals registered in the Kenya Medical Practitioners and Dentists Board based on 2021 data base. A structured questionnaire that contained closed ended questions was used to collect data from the respondents. Data collected was analyzed using logistic regression analysis at a 95% confidence interval in order to examine significance of the relationships between the variables and to test the hypotheses. Analyzed data was presented using tables and figures for ease of interpretation. The study confirmed an existence of a moderating influence of ERP Implementation Strategies on the relationship between the technological, organizational, environmental and user characteristics on adoption of ERP system. The study recommended a robust understanding of different implementation strategies to be adopted at each level of adoption process for the success in the facilities objectives. The study also recommended that to handle ERP system value creation challenges, healthcare executives should start with maintenance and systems compatibility challenges by adopting hybrid strategies since they are flexible in adapting to the specific needs of the situation and industries can exclusively adjust implementations for their needs.

Key words: ERP adoption related factors, Implementation strategies, ERP system adoption, Health care facilities

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INTRODUCTION

Prior studies have established that the use of Enterprise Resource Planning (ERP) systems is proven to be valuable in several ways and it is considered a necessity in today's business (Mayeh et al., 2016). Slattery, Vidgen and Finnegan (2020) defined ERP system as configurable information system that integrates information-based processes using several modules to integrate business units including both managerial and operational processes. It integrates all-important parts of a business and acts as a central hub to get an overview of the business.

The software helps organizations manage business activities like Sales, Marketing, Procurement, Engineering, Human Resources, Supply chain, Project management, procurement, among others (Wagaw, 2017). A major advantage of having an ERP is that business decision-makers are fed with real-time information that is crucial for their activities (Slattery et al., 2020). However, despite the high benefits, cost and efforts required in adoption of ERP system, previous researchers assert that the success rate is reported unsatisfactory in many organizations in the world.

Adoption of ERP system and its application has been considered minimal in both developed and developing countries. For instance In Indonesia, the failure rate of ERP implementation in both private and public sector organizations estimated at sixty percent (Perdana, 2020). In India, only seven percent of organizations have adopted ERP system as the solution for their business processes (Hasheela-mufeti, 2017). In Africa countries like South Africa, Nigeria, Ghana, among others, have recorded increased adoption of the system. Ghana for instance, boasts of a vibrant information communication and technology (ICT) outsourcing industry with several organizations that provide outsourcing and offshoring business processes to local and international markets (Yaw, Sarpong & Oppong, 2014). The country has enjoyed an extended period of political stability, the country

has experienced significant growth in the banking and telecommunication sectors, which has led to the development of a vibrant ICT base and also the fact that it was one of the only two African countries considered among future IT outsourcing locations and placed ahead of countries such as Korea, Malaysia, Mauritius, Nepal, Senegal, Sri Lanka, Taiwan, and Thailand (Yaw et al., 2014). In Kenya, government institutions including parastatals and departments have continued to adopt several Information systems including ERP (Nduku & Nzuki, 2014). The adoption has had far reaching benefits that include improved financial and procurement efficiencies and improved revenue base and reduced costs. For instance, KCAA implemented ERP System in the year 2010 by initially integrating information from Finance and Procurement Departments and allowing access by other departments across the organization.

According to Hasheela-mufeti (2017) the low level of ERP system adoption and usage in both developed and developing countries include weak systems integration, uncertainties of government support, weak infrastructure systems, poor commitment of organizations including weak culture and trust on the benefits of the ERP system. Other factors are attributed to absence of behavioral intention to actual use than technological literacy on technical specifications and lack of technical, organizational support, financial constraints as well as frequent changes in module specifications.

The strategic mindset of many governments has shifted to initiating reforms aimed at enhancing the quality of health care services and improved efficiency. This is occasioned by the rising demand for the health care services and the related costs of running the health care facilities. Worldwide, healthcare organizations are increasingly faced with inefficiencies. These are associated with difficulties in patient record management, ineffective communication mechanisms, high bureaucracy as a result of paperwork and slow flow of information

among coordinated departments (Haberli, Oliveirab & Yanazec, 2017). In response, healthcare organizations have continued to adopt technology-based systems aimed at coping with efficiency in operations, customers' demands, competitiveness and effectiveness in managing communication and decision-making channels (Kianto, Sáenz & Aramburu, 2017).

ERP implementation strategy determines how the organization will be moved from the existing system to the new ERP system. According to Ali & Miller (2017), the transition strategies consists of the Big Bang also known as the single step, Parallel, Phased out and finally, Hybrid. Single step strategy involves low levels of technical customization assuming that the organization would adjust to the characteristics of the system. Adoption of the Big Bang strategy allows for the total integration of information systems within a short time. For its adoption, Amini and Sadat Safavi (2013) opine that appropriate change management policies need to be applied to facilitate the technical and organizational implementation of the system within the company.

Parallel adoption is considered as an intermediate between phased rollout and big bang. This Strategy is particularly useful in mission critical situations that may not survive with a major system failure. Parallel implementation strategy is however considered most expensive implementation strategy as changeover costs are high and a large amount of resources are required at the time of transition from old to new system and it involves duplication of functional integration since both systems are running in parallel (Kenge & Khan, 2020). This is thus expected to have implication on the adoption of ERP system by organizations including health facilities.

Phased out strategies on the other hand focus on how to switch over from the old legacy system to new ERP system in an efficient manner (Nagpal, Khatri & Kumar, 2015). According to Pohludka et al. (2018) the main benefits of Phased out approach to

ERP implementation is the ability to spread out costs over time, as additional applications or features are purchased after the initial investment. From a change management perspective, the approach allows for employees to handle changes in small increments over time providing them time to buy-in, realize the benefits and become competent in the use of the new software. Similarly, Pohludka et al. (2018) notes that the approach offers more time for training, testing, and fixing of problems in the process while taking into consideration that it also requires additional training for each phase of the implementation.

Finally, hybrid involves a strong integration approach which causes business and functional processes. The integration minimizes the time and the cost of business processes and increases the quality and the flexibility of them (Ali & Miller (2017). The integration allows all business departments' users to participate in designing the business processes on the ERP system and they define all their requirements either for the time being or for the future which in the process creates an impact on the performance of Procure-to-Pay business processes. The phases of the implementation strategy are therefore expected to moderate the relationship between technological, organizational, environmental and user characteristics, and adoption of ERP system by organizations including health facilities.

In the health care delivery, strengthening health systems is a global priority as indicated in Sustainable Development Goal (SDG) of 2015 where the development of health strategies that respond to the diverse and evolving needs of countries were emphasized. Tome, Johnston, Meadows and Nyemba-Mudenda (2014) argue that a judicious use of ERP system by health care facilities offers tremendous benefits including the accessibility, quality and continuity of patient care, efficiency in care giving, substantial reduction in the operational costs, medical errors reduction and increasing health care professional support.

Despite tremendous benefits however, some of the systems used in health care organizations are considered poorly designed and the outcome is constrained capacity to effectively transform healthcare operations to achieve desired outcomes. These systematic inefficiencies continue to pose a great challenge to access to basic healthcare services in terms of quality and cost of care, among others. This therefore calls the need to adopt ERP systems for sound decision-making and effective utilization of resources thus prompting a study to establish the influence of organizational characteristics on adoption of Enterprise Resource Planning system in healthcare facilities in Kenya and the moderating role played by ERP implementation strategies.

LITERATURE REVIEW

Theoretically, a number of models underpin the adoption of ERP system. These include but not limited to Technology-Organisation-Environment (TOE) framework (Tornatzky, Fleischer & Chakrabarti, 1990), Innovation Diffusion Theory (Rogers, 1962) and Dynamic Capability Theory (Teece *et al.*, 1997). TOE framework and its constructs are considered to be linked to the theoretical assumptions as well as their specific application to ERP solution in the context of health sector. The framework explains the context of health sector adopting ERP system as it propagates factors that strategic leaders and managers should consider in the adoption of ERP system process. For instance, technological, organizational, environmental and user contexts are well evaluated by strategic managers, and eventually, adoption of ERP system in health care organizations, will be successful and subsequently reap the various benefits of ERP system including improved operational efficiencies and customer satisfaction in terms of service delivered will be achieved.

Diffusion of Innovation Theory holds that new ideas and technologies diffuse through various components of an organization through well-defined processes over a period. Miranda, Farias, de

Araújo, Schwartz & de Almeida (2016) opine that the theory outlines how a new idea penetrates in an organization through specific ways over a period. The theory further argues that there is need to strategically align all the components of innovation with IT and organizational processes to achieve service delivery. Dynamic Capabilities Theory on the other hand focuses on how the unique resources of an organization can be integrated, leveraged and reconfigured to ever changing business situations for the purpose of achieving operational goals and organizational competitiveness (Li & Tuunanen, 2020). According to the theory, for firms to put their valuable resources to use, they must continuously scan the dynamic environment and put necessary changes through acquisition of technologies that would give them competitive edge through improved operational processes, reduced costs and enhanced service to customers as compared to other similar firms offering complimentary of substitute services. From the theoretical underpinnings and existing literature, successful adoption of ERP system is however dependent on a number of factors, within and without the organization (Bhattacharya, Wamba & Kamdjoug, 2019). These include technological characteristics, organizational characteristics, environmental characteristics and user characteristics as well as implantation strategy.

ERP Implementation Strategies have been operationalized as the moderating factor in in the relationship between each of the independent variables on dependent variable. This includes literature on Big Bang (Single Step) as an ERP Implementation Strategy, Parallel as an ERP Implementation Strategy, Phased Out as an ERP Implementation Strategy and Hybrid as an ERP Implementation Strategy.

Guido, Lelio and Pierluigi (2007) in the assessment of feasibility of ERP implementation strategies applied methodological approach. It was assumed that the benefits to be gained from the adoption of the single step strategy are considerable as it allows

for the full integration of organization's information systems within a short time. This strategy, however, involves low levels of technical customization as it is assumed that the organization should adjust to the characteristics of the system and not vice-versa, therefore the impact on business processes is significant since deep and generalized re-planning is required. Accordingly, appropriate change management policies need to be applied to facilitate the technical and organizational implementation of the system within the company.

In exploring critical success factors for ERP implementation, Amini and Sadat Safavi (2013) conducted a comprehensive study and advised five categories of ERP implementation characteristics that should determine the ERP implementation strategy, which took scope into account. These were one, a. physical scope which determines the number of physical sites and geographical regions where ERP implementation needs to take place. Two, BPR scope which elaborates whether the BPR effort has to be done locally or globally. It also determines whether BPR is performed with or without taking the final ERP selection into consideration. Three, technical scope which address the extent to which ERP software needs to be customized. Four, module implementation strategy which takes into account the ERP modules that are to be implemented and how they would get integrated with the existing system and finally, resource allocation which encompasses both Project Schedule and Budget Allocation.

Ali and Miller (2017) in the examination of ERP System Implementation in Large Enterprises applied a Systematic Literature Review. In the study, ERP lifecycle framework was developed and presented in terms of a comprehensive structured review of the literature on ERP system implementation in large enterprise (LEs). It was revealed that this approach is very risky because of fewer learning opportunities incorporated in the approach. Besides, there is no turning back since at the beginning, when the organization switch to the new

ERP system the performance goes to the bottom value, which takes a while. After that, it will increase again. This study did not focus on ERP adoption in a healthcare facility that the current study focuses on.

Cresswell and Sheikh (2013) in the study of Implementations of health information technologies using a systematic search and critique of the empirical literature published between 1997 and 2010 found that Organizational issues surrounding technology implementations in healthcare settings are crucially important, but have as yet not received adequate research attention. This may in part be due to the subjective nature of factors, but also due to a lack of coordinated efforts toward more theoretically-informed work. All the business functions performed in the inheritance system across the entire enterprise are concurrently transferred to the new legacy system during a period of one day or a weekend. When the installation of health information systems of all modules occurs across the entire business at once, the big bang strategy promises to reduce integration costs under the condition of comprehensive and careful execution (Cresswell & Sheikh, 2013).

Nagpal *et al.* (2015) conducted a comparative study of ERP implementation strategies in a review of empirical studies found that based on varied ERP Implementation observations and given the variety of methodologies and frameworks available, the real-world ERP implementation demands the development and adoption of a strategy as a guiding principle for underlying methods. In the examination of an appropriate ERP implementation strategy, Khanna (2012) revealed that although ERP implementation has evolved certain years back but still the industries hesitate to deploy it in their structure since it is unquestionably an intricate task. According to Khanna (2012), the hesitation will itself results in the mission of successful implementation to go in vain and becomes challenging for many industries to deploy ERP in

their projects as many reports of complete and partial failures enlightened the implementation of ERP software packages as a hard-hitting task. These strategies addressed focus on how to switch over from the old legacy system to new ERP system in an efficient manner making the study to specifically, explains the relationship of ERP transition strategies between the three basic risks namely people, process and technology and thus aid the ERP implementers to better recognize what type or combination of strategies will suit their system the best.

Pohludka *et al.* (2018) did a study on implementation and unification of the ERP system in a global company as a strategic decision for sustainable entrepreneurship. From the findings, it was revealed that one of the main benefits of Phased out approach to ERP implementation is the ability to spread out costs over time, as additional applications or features are purchased after the initial investment. From a change management perspective, the study revealed that the approach allows for employees to handle changes in small increments over time providing them time to buy-in, realize the benefits and become competent in the use of the new software. According Pohludka *et al.* (2018), this approach offers more time for training, testing, and fixing of problems in the process while taking into consideration that it also requires additional training for each phase of the implementation, so it is important to allocate time and resources for this.

National health information systems (HISs) are spreading globally at a rapid pace. Therefore, it is important to understand the socio-technical factors that influence their adoption by healthcare professionals (HCPs). This study explores the change in attitudes of HCPs toward adopting a national HIS in Jordan. Data were collected from public hospitals and healthcare centers using surveys in two phases over two years and empirically tested using partial least squares (PLS). The first phase results showed that HCPs had positive attitudes toward the

national HIS and perceived it to be useful but difficult to use. In the second phase, results showed that users' attitudes positively changed regarding both ease of use and usefulness. This research contributes to both theory and practice by investigating how HCPs' attitudes can be changed regarding adopting a national HIS over time. This provides insights for healthcare providers to better understand and improve HISs adoption among HCPs.

According to Garavand *et al.* (2016) in the study of determining the most important factors affecting the adoption of health information technologies by doing a systematic review on the factors affecting the acceptance of health information technology using major databases, such as Google Scholar, Emerald, Science Direct, Web of Science, Pubmed, and Scopus found that Ease of use, usefulness, social impact, facilitating conditions, attitudes and behavior of users are effective in the adoption of health information technologies and By considering these various factors, the rate of the adoption of health information technology can be increased. The most widely used approach of ERP adoption is the phased transition strategy. Each organization may have its own factors of HIS and database.

Kruse *et al.* (2014) in identification of a full-spectrum of both internal organizational and external environmental factors associated with the adoption of health information technology (HIT), specifically the HER using a systematic literature search in PubMed (restricted to English), EBSCO Host, and Google Scholar for both empirical studies and theory-based writing from 1993-2013 shows that The conceptual model for EHR adoption associates internal and external factors, specific to the health care industry, associated with adoption of the HER whereby each factor or element is implemented practically at a time and in chronological order. It becomes apparent that these factors have some level of association, but the association is not consistently calculated individually or in combination or at different

phases. To better understand effective adoption strategies, empirical studies should be performed from this conceptual model to quantify the positive or negative effect of each factor.

Kofahi and Alryalat (2016) studied the ERP Implementation Approaches and Performance of Procure-to-Pay Business Processes with a special emphasis on companies that implement Oracle ERP systems in Jordan. In spite of the importance of implementing Enterprise Resource Planning (ERP) system in any organization, Kofahi and Alryalat (2016) observed that there are still many fears of not getting the return on investment from implementing it. In addition, there are many ERP systems implemented in different organizations that claim they did not get enough benefit from these systems. Elsewhere, Moawad *et al.* (2011) evaluated the performance of Procure-to-Pay business processes by adopting quantitative research approach using the survey strategy. The findings of the study showed that the hybrid ERP Implementation approach had a significant impact on the performance of Procure-to-Pay business processes. This was attributed to strong integration Hybrid Approach causes among business processes and among functional departments' processes (cross-functional). According to Moawad *et al.* (2011), the integration minimizes the time and the cost of business processes and increases the quality and the flexibility of them. The reason for this strong integration is that all business departments' users participate in designing the business processes on the ERP system and they define all their requirements either for the time being or for the future. This in the process creates an impact on the performance of Procure-to-Pay business processes. This study did not focus on ERP implementation in healthcare facilities that the current study aimed at addressing.

Tarafdar and Roy (2003) in the analysis of the adoption of enterprise resource planning systems in Indian organizations – using a process framework revealed that Enterprise Resource Planning (ERP)

systems are designed to integrate various functions and processes. The outcome of the study indicated that the ERP implementation process is composed of successive phases and specific number of modules of the software are implemented in each of the phases. Each phase has distinct stages, which address specific activities within the phase and describe different aspects of the implementation process. This study in the ERP implementation focused on developed countries, there is very little literature on the experiences of organizations in Kenya especially in the health facilities that this study will focus on.

In the examination of Hybrid Project Management Approach: Bridging Theory and Practice in ERP Implementation Projects, Bidgood and Gaim (2017) applied a six in-depth semi-structured interviews with industry experts to gain insight on their opinions and experience in this specific context. In the study, secondary data was collected, utilizing company documents and websites to support the findings. The data analysis approach utilized the development of themes *a priori* from the literature review, however the codes were generated directly through analyzing the collected primary data. It was found out that Hybrid approaches are generally applicable in large ERP implementations in which organizations are distributed across multiple business units. They averred that a typical hybrid implementation requires the organizations to choose the big bang approach for smaller business units whereas a phased approach somewhere else. Advantages and Disadvantages of a hybrid strategy vary from organization to organization and requirement to requirement.

According to Sharma and Sehrawat (2020) in their study of investigating the main determinants influencing the adoption decision of cloud computing (CC) in the healthcare sector using qualitative interviews and the Delphi method and an integrated hybrid approach of interpretive structural modeling, analytic hierarchy process, and Technique for Order Preference by Similarity to

Ideal Solution (ISM-AHP-TOPSIS) have been employed to identify interrelationships among criteria, rank critical criteria as well as sub criteria, and find the most suitable cloud service provider (CSP) respectively. They found out the methodological contribution in terms of an integrated hybrid method, to select a suitable CSP for the healthcare sector and the theoretical contribution in terms of criteria & sub-criteria i.e., whether the benefits of CCA outweighs its barriers, thereby exploring the potential (and future) of CC for the advancement of healthcare provision

Zareravasan and Alizadeh (2021) in their study of investigating the challenges of HIS business value creation using a combination of the Fuzzy Analytic Hierarchy Process (FAHP) and fuzzy Decision-making Trial and Evaluation Laboratory (DEMATEL) found that technological dimension, “maintenance costs” and “systems compatibility” challenges are the most critical since they are in the cause area and directly influence the HIS outcomes. Under the organizational dimension, “Change in strategic objectives” is the most important challenge. Moreover, “inter-departmental coordination”, “training costs”, “proficiency”, and “users’ knowledge” are affected by each other as well as influenced by the net causes. The outcome of this study shows that to handle HIS business value creation challenges, healthcare executives should start with maintenance costs, and systems compatibility challenges since hybrid strategies are flexible in adapting to the specific needs of the situation and industries can exclusively adjust implementations for their needs.

Ford *et al.* (2010) in the assessment of complete versus incomplete HIT implementation levels among U.S. hospitals in light of the various technology adoption strategies employed. Logistic regression is employed to identify differences among HIT adoption strategies relative to implementation. The findings from this study are important for policymakers and hospital administrators. For policymakers, the results

provide insights into the likelihood of certifying hospitals' meaningful use of EHR systems by 2011 or beyond. Given the short deadlines and small number of current users, the vast majority of hospitals face a major challenge in completing the implementation of a complex set of HIT systems because the complexity of a hybrid strategy varies tremendously depending upon the state. Small single site HIS implementations tend to have simpler hybrid strategies than those used by large conglomerate corporations with many dissimilar environmental locations.

METHODOLOGY

The study applied positivism research philosophy and descriptive cross-sectional design with target population constituted of the executives of the healthcare organizations from level 4, 5 and 6 hospitals registered in the Kenya Medical Practitioners and Dentists Board based on 2021 data base. A structured questionnaire that contained closed ended questions was used to collect data from the respondents. This study used a structured questionnaire which as method used in gathering information through a tool comprising of inquiries and prompts to get a reaction from participants. The questionnaires were then distributed to the respondents with the assistance of ten research assistants. Before issuing the questionnaire, participants were assured of confidentiality and anonymity concerning their contributions. Data collected was analyzed using logistic regression analysis at a 95% confidence interval in order to examine significance of the relationships between the variables and to test the hypotheses. Analyzed data was presented using tables and figures for ease of interpretation.

RESULTS AND DISCUSSION

The ERP implementation strategy was perceived to be key in the adoption of ERP system. The study determined how it manifests under descriptive statistics and its moderating role under inferential statistics. The results are presented in Table 1 and 2.

Table 1: ERP Implementation Strategy Attributes

G.1 ERP Implementation Strategy	N	Mean	Std. Dev	CV	Skewness	Kurtosis		
							Stat.	Stat.
	CODE	Stat.	Stat.	Stat.	Stat.	Std Error	Stat.	Std Error
Our facility uses or prefer to use a single-step where all users move to the new system at the same time	IMPLS1	213	4.014	0.849 0.21	4.014	- 1.099	.167	1.923 .332
Our facility has deployed or may prefer deploying ERP features, tools and components over an extended period, which may cover weeks or months	IMPLS2	213	3.859	0.764 0.20	3.859	-.268	.167	-.266 .332
Our facility has continuously used or may prefer using the old system in parallel with the new ERP for a specific length of time	IMPLS3	213	3.169	1.336 0.42	3.169	-.253	.167	- 1.087 .332
Our facility has switched or may prefer to switch on core ERP modules using a single step strategy,	IMPLS4	213	3.836	0.731 0.19	3.836	-.100	.167	-.406 .332
Our facility has rolled or prefers rolling out other modules in phases to specific locations or departments/units	IMPLS5	213	4.066	0.726 0.18	4.066	-.101	.167	- 1.086 .333
Average Mean Score		213	3.789	0.881 0.24	3.789			

The results in the table show that the overall mean score for the statements describing the manifestation of ERP Implementation Strategy among health care facilities is 3.789, standard deviation of 0.881 and coefficient of variation of 24%. This was a strong mean implying that ERP Implementation Strategy is key to adoption of ERP system. The statement with the highest mean score was facility has rolled or prefers rolling out other modules in phases to specific locations or departments/units (Mean = 4.066, SD = 0.726 and CV = 18%). This was followed by the statement that our facility uses or prefer to use a single-step where all users move to the new system at the same time (Mean = 4.014, SD = 0.849 and CV = 21%). However, the statement with the lowest mean score was that our facility has continuously used or may prefer using the old system in parallel with the new ERP

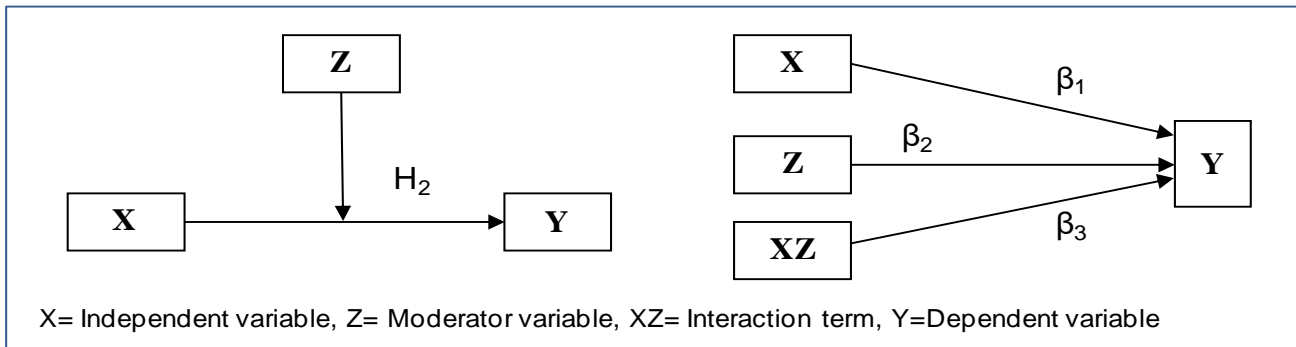
for a specific length of time with a mean of 3.169, SD = 1.336 and CV = 42%. The overall coefficient of variation of 24% implies that the statements under ERP Implementation Strategy closely measures ERP system adoption across the health care facilities surveyed.

The hypothesis that *ERP implementation strategies have no significant moderating effect on the relationship between Technological, Organizational, Environmental and User characteristics and adoption of ERP system in healthcare facilities in Kenya.*

The hypothesis was tested by using Baron and Kenny (1986) three step models of moderation. The graphical representation in Figure 1 demonstrates a simple moderation model with the composites of the independent variables (Composite (TC, OC, EC

and UC) as the independent variable (X), Implementation ERP strategies (ERPIS) as the

moderator (Z) and ERP system adoption (ERPSA) as the dependent variable (Y).



Scale: TC= Technological Characteristics, OC= Organizational Characteristics, EC= Environmental Characteristics, UC= Users Characteristics, ERPIS= ERP implementation Strategies, ERPSA=ERP System Adoption

Figure 1: Simple Moderation Model for composite, ERPIS and ERPSA

In step one, composite TC, OC, EC and UC was regressed on ERP system adoption. In step two, composite C, OC, EC and UC and ERP system implementation strategies were regressed on ERP system adoption. In step three the interaction term between composite TC, OC, EC and UC and ERP implementation Strategies was introduced to ascertain the significance of the moderating influence of implementation strategy.

The findings as depicted in Table 2 shows that model 1 (In step one, (Composite (TC, OC, EC and UC) was regressed on ERP system adoption) had the overall attained R^2 of 0.2277 of the McFaddens static of model fitness which lies between the perfect fit of between 0.2 and 0.4 threshold meaning that the model can well be used in predicting adoption of ERP system. Further, the model showed statistically significant effect with a Chi^2 score of 0.0222, which is below the 0.05 threshold at 95% confidence level. In model 2 which

involved the composite of TC, OC, EC and UC and ERP system implementation strategies were regressed on ERP system adoption. This had an R^2 value of 0.3372 of the McFaddens static of model fitness which lies between the perfect fit threshold meaning that the model can well be used in predicting adoption of ERP system.

Further the model showed statistically significant effect with a Chi^2 score of 0.03100, which is below the 0.05 threshold at 95% confidence level. In model 3 when an interaction term between composite TC, OC, EC and UC and ERP implementation strategies was introduced, R^2 (0.3872) of the McFaddens static improved. This implies that with introduction of the strategy implementation, the variations in terms of adoption of ERP system improved. Finally, the model shows a statistically significant effect with a Chi^2 score of 0.0201, which is below the 0.05 threshold at 95% confidence level.

Table 2: Moderation Model for Composite, ERPIS and ERPSA

Model	Constant B ₀	Estimate	p-value	Odds ratio
1 Model: Logistic regression (logitf) log likelihood = 4.27121 Prob> chi ² = 0.0222 McFadden R ² =0.2277 Number of obs = 213	.76685	1.36579	0.043	3.2413
2 Model: Logistic regression (logitf) log likelihood = 2.67432 Prob> chi ² = 0.03100 McFadden R ² =0.3372 Number of obs = 213	1.8192 ^b	2.67252	0.0323	4.7822
3 Model: Logistic regression (logitf) log likelihood = 4.27121 Prob> chi ² = 0.0201 McFadden R ² =0.3872 Number of obs = 213	1.86621	4.68034	0.0224	6.3617

Further, upon introduction of the interaction term at model 3, odds ratio changed from 3.2413 in model 1 to 4.7822 in model 2, before improving to 6.3617 in model 3 thereby providing a variation change of 3.1204 which is significant at 95% confidence level ($p=0.0224<0.05$). Further, the change in p-value in model 1 is 0.043 which changed to 0.0323 in model 2 and 0.0224 in model 3 upon introduction of interaction term. This implies that ERP implementation strategies have a significant moderating influence on the relationship between technological, organizational, environmental and user characteristics and adoption of ERP system in the healthcare facilities. Thus, the null hypothesis that ERP implementation strategies have no significant moderating effect on the relationship between technological, organizational, environmental and user characteristics and adoption of ERP system in healthcare facilities in Kenya was rejected.

This was guided by the following model; $Y = \alpha + \beta_1 X + \beta_2 M + \beta_3 X.M + \epsilon$

Where: Y is ERP system adoption

X is the composite of (technological characteristics, organizational characteristics, environmental characteristics and user characteristics)

M is ERP implementation strategies

X.M is the composite of (technological characteristics, organizational characteristics, environmental characteristics and user characteristics) and ERP implementation strategies (interaction)

ϵ = Error term

β = the beta coefficients of independent variables. After the logistic regression analysis results, the model became $\text{Logistf}(\text{ERP System Adoption}) = 1.86621 + 1.36579 (\text{Composite (TC, OC, EC and UC)}) + 2.67252 \text{ ERPIS} + 4.68034 \text{ ERPIS} (\text{Composite of TC, OC, EC and UC})$

The graphical representation demonstrating the moderating effect of ERP implementation strategies now becomes:

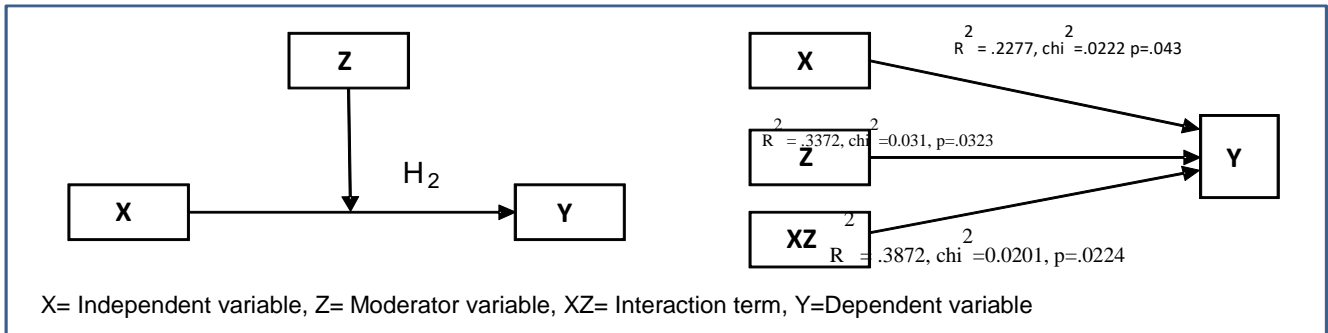


Figure 2: Revised Simple Moderation Model for composite, ERPIS and ERPSA

The revised representation diagram shows that in path a; (Composite (TC, OC, EC and UC) was regressed on ERP system adoption and the results show positive and significant relationship $R^2 = 0.2277$, $\text{Chi}^2 = 0.0222$ $p = 0.043$. In path b (Composite (TC, OC, EC and UC) and ERP system implementation strategies were regressed on ERP system adoption and the results show positive and significant relationship $R^2 = 0.3372$, $\text{chi}^2 = 0.031$, $p = 0.0323$. Further in path c, when an interaction term is considered the study also gives positive and significant results ($R^2 = 0.3872$, $\text{chi}^2 = 0.0201$, $p = 0.0224$) implying that ERP implementation strategies adds significantly to the relationship as a moderator. The moderation, therefore, is depicted in the model. The hypotheses that ERP implementation strategies have no significant moderating effect on the relationship between Technological, Organizational, Environmental and User characteristics and adoption of ERP system in healthcare facilities in Kenya was rejected.

CONCLUSIONS AND RECOMMENDATIONS

The study found the overall attained R^2 of the McFaddens static of model to fit the prediction of adoption of ERP system. Further the model showed statistically significant influence on the adoption of ERP system following the introduction of strategy implementation as the moderating variable. Further, upon introduction of the interaction term at model 3, odds ratio changed significantly from model 1 to model 3 therefore giving a significant variation change at 95% confidence level. Further

the change in p-value in model 1 to model 3 upon introduction of interaction term showed highest significance implying that ERP implementation strategies have a significant moderating effect on the relationship between technological, organizational, environmental and user characteristics and adoption of ERP system in healthcare facilities in Kenya. The null hypothesis therefore that ERP implementation strategies have no significant moderating effect on the relationship between technological, organizational, environmental and user characteristics and adoption of ERP system in healthcare facilities in Kenya was rejected.

The study confirmed an existence of a moderating influence of ERP Implementation Strategies on the relationship between the technological, organizational, environmental and user characteristics on adoption of ERP system. The study recommends a robust understanding of different implementation strategies to be adopted at each level of adoption process for the success in the facilities objectives. The study further recommends the choice of a strategy that allows for the total integration of information systems within a short time through adjusting to the characteristics of the system and not vice-versa, to give more impact on business processes. The study also recommends an approach which is less risky and allows incorporation of learning opportunities when the organization switches to the new ERP system and the performance goes to the bottom value, which takes a while for adjustment.

The study further recommends that implementation strategy must be strategic focused and not just business focused for more value to be realized in the competing spheres. This included considering parallel adoption which involves least risks in all ERP implementation methodologies. The study further recommends that each organization to have its own factors of ERP system database to reduce the risk of the installation, customization

and operation of ERP systems by reducing the scope of the implementation. The study also recommends that to handle ERP system value creation challenges, healthcare executives should start with maintenance and systems compatibility challenges by adopting hybrid strategies since they are flexible in adapting to the specific needs of the situation and industries can exclusively adjust implementations for their needs.

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