User Requirements in Enterprise Resource Planning Systems Adoption: A Case of Botswana's Higher Institutions

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Abstract

ERP systems are the largest software applications adopted by universities, along with quite significant investments in their implementation. However, unlike other applications, limited research has been conducted regarding the application of this system in higher education in Botswana. This study aims to identify user requirements in the adoption of enterprise resource planning (ERP) systems in Botswana's higher education institutions. This study was conducted in three higher education institutions in Botswana. This study adopted the quantitative methodology of using surveys to understand ERP adoption in higher education and proposed a model that could be used to guide business information systems requirements to appropriate ERP systems in a higher educational environment. Based on the findings, the study proposed a conceptual model of ERP system adoption in higher education institutions using six success dimensions. The six success dimensions are user requirements, user satisfaction, information quality, service quality, institutional impact, system quality, and faculty/management impact. Only information quality was rejected from the model. The six success dimensions are the basis through which a higher education institution can understand user requirements in implementing an effective ERP.

Keywords: Botswana, ERP adoption, Higher education institution

1. INTRODUCTION

Higher Education Institutions (HEIs) are hugely influenced by world developments to adopt new technologies to handle today's emerging environment by replacing the old systems, as governments globally have mandated higher institutions to increase performance and efficiency [1]. Enterprise Resource Planning (ERP) technologies are used by higher education institutions to manage business processes' effectiveness and efficiency. Thus, the selection criteria for ERPs is very important for higher educational institutions as it gives these institutions a competitive advantage over each other. ERP system helps higher educational institutions to achieve their daily activities in a quicker way so that focus can be redirected to important matters such as research, teaching, and learning. In the olden days, things were done manually, and it was difficult for the

process to be achieved in a few days since the files were moving from one office to another but lately, everything has changed for the better, with great thanks to the digital changing technology that is applied to ERP [2]. The purpose of this study was to review the user requirements and ERP systems adoption by higher education institutions. Goldberger and Hynes [3] highlighted that there is a huge number of failures and improper ERP systems implementation in higher education.

According to Kvavik, Katz, Beecher, Caruso, Ernst, King, Voloudakis and Williams [4], EDUCAUSE carried out a collection of research to evaluate ERP structures for tertiary establishments and established that approximately 50% of those projects had been affected by fewer budgeting and scheduling. Research showed that from 60% to 80% of the entire ERP structures fail because of loss of assembly anticipated effects and loss of overall performance enhancement, with customers articulating dissatisfaction regarding overall performance [5]. According to Goh (2006), ERPs are at the heart of HEI functions, and thus, understanding them is critical, which is the central systems that link all departments and can serve in three main capacities within an institution:

1) Operational – Improvement by enabling employees to access student information, and institutional information that supports day to day running of a business.
2) Tactical – Improved institutional processes and service delivery among internal stakeholders.
3) Strategic – Institutional documents that guide management, by improving planning and building good relationships with other stakeholders.

In Botswana, research conducted by Eyitayo [6] shows that ERP implementation cuts across different institutions such as the Government of Botswana, Botswana Post offices, Water Utilities Corporation, banks, and universities. Brown and Mooketsi [7] support the above statement by revealing that few universities in Botswana have implemented ERP systems to manage the operational processes; among them is the University of Botswana which is a public university. Even though ERP systems help HEIs to improve efficient service delivery and productivity to their stakeholders, they can also pose problems when it is poorly implemented. Despite these studies, Tobie, Etoundie and Zoa [9] highlight the need for more research into the implementation and adoption of ERP systems in Botswana HEIs, as very little had been done in this regard. This deployed quantitative research method through the use of a self-determined online involving 269 respondents in a university institution in Botswana. The study proposed six success dimensions that can assist higher education institutions in understanding user requirements in the design or adoption of ERP. Thomas [8] showed that students and lecturers at the University of Botswana face some problems accessing information on ERP systems at the beginning and at the end of the semester.

1.1 Background of The Study

This study was conducted in three identified Higher Public Learning Institutions in Botswana. All these three institutions are governed by the Ministry of Tertiary Education, Research, Science and Technology funding them and ensuring that they all comply with the set standard made by regulating bodies. Higher public learning institutions are rapidly growing and adopting ERP systems to assist their value chain. The Botswana Qualification Authority which is an educational regulator has enforced the use of ERP systems in HEIs in Botswana for easier accessibility of information by different stakeholders in real time [7]. It is on this background that now most HEIs in Botswana are transitioning from traditional systems to adopting ERP systems to assist in their daily operations in order to gain a competitive edge and enhance productivity [7, 6, 8].

The dependence on ERP systems has grown considerably and the use of information systems in order to run daily business activities has increased drastically. Nowadays, every business is using information technology tools to achieve its mandate for business. Most organizations nowadays prefer to run their business at any time or any location, they prefer to serve their clients wherever they are. Information systems play a huge role in companies being able to serve their clients. As a result, ERP's remain the most rapidly growing fragments of the information technology sector [10]. Solutions brought by ERP systems helped different companies to achieve their objectives through integrated systems which gave them a competitive edge in the marketplace [10]. Recently, universities are increasingly adopting ERP systems tailored to their environments [11]. ERP system integrates all functions of the university to be one big unit; it comprises all departments so that the sharing of information should be easy.

According to Goldberger and Hynes [3], 1 in every 5 ICT projects globally, is successfully rolled out within its budget, with the rest experiencing budget overruns. Goldberger and Hynes [3] assert that a high number of ERP system implementation projects fail in HEIs. Despite the limited research conducted in Botswana, it has been revealed that institutions use parallel systems (both manual and ERP systems) to manage their information flow even after the implementation of the ERP system which simply means the system is not utilized to its full capabilities [7, 6, 8]. The researchers further indicated that the ERP system implementations are not only related to the complexity of technology, standardization, and compatibility but are more related to resistance to change, incompatible business processes, organizational culture, mismanagement of projects, and lack of buy-in by executive management [12, 6].

A recurring theme in the body of information systems literature over the past three decades is bridging the gap between the world of business and information technology (IT). The consequences of this gap have been felt. Many of the IT

projects often go over budget, over time estimate and when ultimately developed, often fail to satisfy user requirements. Over the years, a small number of IT projects have been completed successfully, with the majority of the projects either challenged or failed. In most cases, it is evident that ERP systems and off-the-shelf software systems fail to meet their business needs as they are not aligned with the business information systems requirements [1, 13].

Enterprises that implement ERP systems fail because of different issues that cannot be associated with implementation processes [14]. It is unclear why some companies are completing ERP implementation initiatives at the same time, while different companies that adhere to the same primary recommendations and methodology demonstrated unsuccessful implementations. However, it was important to realize the benefit of redefining organizational imagination and foresight as this would affect ERP implementation initiatives and the cost of redesigning business tactics at entirely different organizational structures for the successful implementation of the ERP project. ERP system integrates all the internal functions of the organization and simplifies access to related information, it also improves access to information systems of an organization which aids performance in decision-making and incurs commercial business costs, which makes it easy to gain a competitive edge [14].

An ERP implementation model is considered critical to the success of any project undertaking such as ERPS implementation, and HEIs stand to benefit from a structured approach to ERP implementation [15]. Based on these researchers' views, this seeks to understand user requirements towards the adoption of ERP systems in Botswana higher education institutions. This study further proposed a conceptual model as a way of addressing some of the problems and gaps identified by other studies.

1.2 Research Motivation

The higher public learning institutions are rapidly growing and adopting ERP systems to assist their value chain. The Botswana Qualification Authority which is an educational regulator has enforced the use of ERP systems in HEIs in Botswana for easier accessibility of information by different stakeholders in real time [7]. It is on this background that now most HEIs in Botswana are transiting from the traditional systems to adopting the ERP systems to assist in their daily operations in order to gain a competitive edge and enhance productivity [7, 6, 8]. Abugabah and Sanzogni [16] proved that there is little research conducted about ERP systems adoption in higher educational learning environments as compared to other environments. This study will contribute a model that will be used to bridge the gap between business needs or user requirements and ERP systems adoption in Botswana higher education institutions. The intention of this study was to help Botswana higher educational institutions minimize the failure rate of

ERP systems implementation. It will save costs for companies since they will be able to implement their ERP system successfully, which will result in bridging the communication gap between business personnel and IT personnel.

1.3 Problem Statement

According to Tambovceva and Tambovceva [13], universities and colleges have unique characteristics as compared to standard organizations, and it is this that has led to a misalignment of ERP implementations in HEIs. Further research has shown that this uniqueness of HEIs is a contributing factor to the failure of ERP implementation. The gap between the ERP functionality offered, and the organizational functionality requirements is a key factor for this unsuccessful implementation [17, 18]. Botswana, as a developing country, is faced with a lot of challenges in the successful implementation of ERP systems, primarily in HEIs. With public institutions dependent on the government for subventions and funding, budgetary constraints mean any project implementation is reliant on this. As inflation has risen, chipping away at a subvention figure that has not increased over the years, funds that could be dedicated to the implementation of projects have been rendered scarce [19]. A lack of skilled technical expertise, as well as limited infrastructure availability for both implementation and support of large-scale ERP systems, is also a recurring problem, resulting in most projects running over budget, as well as over the estimated schedule. Pandey, Morris and Mishra [20] assert that decentralized institutional systems make information sharing difficult, resulting in inefficient service provision, a problem that most HEIs in Botswana have to grapple with. Furthermore, HEIs hardly invest in defined change management processes, and this, coupled with a lack of inter-departmental process cohesion, further complicates the implementation and subsequent adoption of ERP systems [12]. All of the issues mentioned herein have resulted in the failure of implementation and adoption of ERP systems in HEIs in Botswana. This study therefore seeks to focus on user requirements and system adoption, while proposing a 3-tier conceptual model that can assist in determining factors contributing to ERPS usage at three distinct layers of HEIs being, organizational, department, and end user.

1.4 Research Objectives

The main objective of this study is to review the user requirements in Enterprise Resource Planning (ERP) systems adoption and thus propose a model that will guide business information systems requirements to appropriate ERP systems in a higher educational environment.

To achieve the main objective, the following sub-objectives have been set:
1) To assess challenges faced in the adoption process of ERPs by Botswana's higher institutions

2) To understand the functionalities and capabilities of ERPs adopted by these higher institutions.
3) To determine the gap between the user requirements and the features of the adopted ERPs. To present a conceptual model that represents the adoption of ERPs at Higher institutions in Botswana.

2   RESEARCH METHODOLOGY

For purposes of this study, the positivism philosophy was used to gather knowledge on user requirements in enterprise resource planning systems adoption in Botswana, preferred due to its ability to make use of both past and present knowledge in order to determine future events [43, 45]. Kirongo and Odoyo [44] believe that the deductive approach uses structured research, by describing relationships that generate and use quantitative data to employ different physical or statistical controls to allow testing of the hypotheses. This approach was selected as it provides baseline information for the study, and hence a conceptual framework for enterprise resource planning system adoption was designed to test it. It was considered more appropriate to adopt a deductive reasoning research approach, and this allowed the researcher to collect related literature on research objectives of ERP systems adoption in HEIs [45].

The survey strategy was employed to gather information about the research objectives. Data were collected from employees in three identified higher education institutions to understand the respondent's views on user requirements and adoption of an enterprise resource planning system using a structured questionnaire [46]. The sample of the population was selected from the entire population of the three identified institutions. Considering that this study delivers a statistical measure of the variables and factors relating to user requirement and change management that influence the adoption of ERP systems in HEIs, the quantitative research approach was embraced, where numerical or statistical data is collected and analyzed to draw conclusions from the subject to describe characteristics or test hypotheses [47, 48]. A cross-sectional study approach was adopted due to the nature of the study. This study allowed the researcher to study the phenomenon within a short period at once due to time constraints and costs [49].

Primary data was collected using online survey questionnaires from employees of three higher institutions in Botswana. Of the several methods used to collect survey data, the study used a close-ended questionnaire to collect data from employees at the three respective institutions [50]. The target population for the three institutions is approximately 430 employees who are using enterprise resource planning and have a clear knowledge of the systems. The sample size of the study was 269 respondents in all three identified institutions. The population of the institutions was influenced by the number of respondents to be selected.

Krejcie and Morgan [51] assisted the researchers in computing the sample size using a formula. The convenience method was used to identify three institutions to participate in the study based on their accessibility, while purposive sampling was used to identify the key respondents of the study. Respondents were chosen based on their knowledge and skill in using the system regarding the topic of the study [52]. A self-administered online questionnaire was sent to respondents via email to give their responses which used a five-point Likert scale. The targeted population for this study was 269 respondents. 350 questionnaires were sent to the respondents and 287 responded to the questionnaire which was used for analysis.

Quantitative data from the survey were summarized and analyzed using Excel and SPSS packages. Descriptive statistics were also used to describe the sample characteristics of the study. Further, correlation and regression statistical methods were used to test the association between user requirements and ERP adoption in Higher Educational Institutions in Botswana. Finally, after all the findings had been done, prescriptive analysis was used by the researcher to make some recommendations to the trio higher public learning institution's management [53].

2.1 Validity and reliability

Reliability, dimension validity, and content validity were assessed for the questionnaire design, and with a number of items ranging from 81, the tested reliability of the questionnaire of the study was found to be an Alpha of 0.844, which is above standard 0.70, indicating good questionnaire reliability.

2.2 Descriptive and inferential statistics

2.2.1 Correlations

Person's coefficient correlation was used in order to understand the relationship between different variables in the study [54]. Normally a number that is close to +1 displays a strong positive correlation while a number close to -1 points to a strong negative correlation. Hence, a correlation below 0.40 indicates a weak correlation between two variables while 0.40 to 0.50 indicates a moderate correlation and them [55].

2.2.2 Regression analysis

Multiple regression analysis was employed in this study to test the hypotheses to determine whether one independent variable would have an impact on one dependent variable [54]. A dependent variable is one that is influenced by the dependent variable, but an independent variable is one that the researcher manipulates because it is a potential cause of something [56]. The goodness of fit

of a regression model is indicated by the coefficient of determination R^2. R^2 measures the proportion of the dependent variable's variance that can be accounted for by changes in the independent variable [57]. When R^2 equals 1, the regression model accurately represents the data, and when R^2 equals 0, no variation in the dependent variable can be attributed to variation in the independent variable [54]. For instance, if R^2 is 0.729, then the variance in the independent variable accounts for roughly 73% of the variation in the dependent variable. When the significance value was less than 0.05, the hypotheses were accepted, and when it was greater than 0.05, they were rejected.

2.3 Literature Review

This section gives a detailed view of existing literature on user requirements and ERP systems adoption in Botswana Higher Education Institutions. In relation to the evolution and development of ERP research in Botswana's HEIs by identifying gaps related to improvements in usage in the academic process.

On that note, ERP systems have the potential to assist HEIs in this changing environment because existing administration and management systems have been replaced by ERPs in these institutions. Al-Mashari [21] and Rabaai [22] mentioned that the changes need effective management processes in Botswana HEIs which professed to adopt ERP systems.

2.3.1 ERPs in ERPS Context

The uniqueness of HEI environments suggests that the risks and challenges demand a specific industry implementation and evaluation approach to make sure that the following is met; competitive educational environment, governmental support, quality, and adherence to user expectations. Actual ERP use includes acceptance and its effects on individuals and organizations, as well as user attitudes and views that represent adoption patterns and degrees of ERP satisfaction. Legacy ERP systems address simple operational and managerial functions such as marketing, finance, logistics, operations, and human resources but this day's systems are tailor-made to suit higher educational institutions to service unique services like admissions, student administrations, programmes, and course management, assessments linked with additional features [23].

2.3.2 ERPs om HEIs Africa

ERP systems adoption and implementation has been described as a challenging process in HEIs. Alhajaj [24] stated that there are a number of high risks and expenses associated with the implementation of ERP in HEIs, with medium to long return on investment. Feemster (2010) also confirms that there are many difficulties associated with the implementation of ERP systems in African institutions due to integrating old databases and training employees in HEIs thus

causing huge costs and pain. Von Hellens et al. [25] also highlight one major problem ERP systems introduce for HEIs including their packaging, with these not originally designed to fit HEIs business processes [26], leading to them having to redesign their business processes. There is ongoing research on ERP system limitations, drivers, user satisfaction, culture, characteristics, and information systems. This is evidenced by a study conducted over two institutions across two countries (Australia and Saudi Arabia), which sought to investigate the influence of national culture on the acceptance of ERP systems. There were no conclusions drawn from this study, on a sample of users who use the same system, work for the same institution, have the same job responsibilities as well and work for the same functional area, but differ in authoritative power, collectivism, individualism, and uncertainty avoidance, as well as how they interact with the system.

2.3.3 ERPs in HEIs Botswana

Brown and Mooketsi [7] say while examining the benefits and challenges of implementing ERP systems in university settings, minimum attention has been directed to the experiences of internal stakeholders, when these systems go live. The largest university in Botswana paid a huge sum of money for an ERP system and has invested a lot of resources in implementing it there. Internal stakeholders execute some work using the ERP system and periodically switch to the manual system, so the institution finds itself running a parallel manual system. Thus, the university may not be making the most of the ERP system's capabilities. While ERP literature indicates that institutions rely on less than 70% of ERP system functionality, this observation is made at a time when less than 70% of ERP system capabilities are used [27]. However, just a few researchers have looked into the factors that influence ERP user adherence in higher education institutions, particularly in Botswana.

2.3.4 Role of importance of ERPs in HEIs

In recent years, ERP systems have been adapted to new institutional environments (for example, higher education, public sector, financial services, and healthcare). Therefore, the HEI industry as a government segment has been influenced by world developments to adopt new technologies. HEIs began to implement ERP systems to replace old systems to save costs as a way of overcoming identified limitations and supporting the entire organizational business processes to improve efficiency. Koc and Teker [28] agree by saying that by integrating workflows across different parts of an institution and streamlining the flow of information across them, a university can boost its operational efficiency. While it is tempting to think of HEIs as unique institutions [29], there are many similarities and differences between HEIs and business organizations, hence HEIs would be faced with many problems common to most modern business corporations, including coordinating

resources, stimulating, and facilitating the enterprise among staff, and controlling costs [3].

2.3.5 Benefits of ERP adoption

Eyitayo [6] stated the advantages of ERP system implementation in HEIs as follows; decreased expenses and increased revenue due to high efficiency, timely shared real-time information via integrated database across all departments, minimal business risks, quality service for the students, faculty, and employees. Furthermore, Eyitayo [6] categorized the ERP benefits of higher education institutions into two types which are business and technical viewpoints. The business benefits include; integration of business functions, improved business internal communications, reduced manual processes, enhanced decision-making and planning, online self-service environment for internal stakeholders, administrative systems available at all times, business data analytics for decision making, decrease in paperwork and best industry practices to automate business processes.

The technical benefits include; no backup systems needed, business processes re-engineering and continued improvements, timely management of data, user-friendly and accessible services, high reliability, validity, and data integrity, high confidentiality and secure information, and a single database for business process streamlining to deliver education accessibility in real-time.

2.3.6 Challenges of adopting ERP systems

Three main challenges are associated with ERP systems failures as follows; change management, lack of top management support, poor management, and planning. Furthermore, AL-Sabaawi [17] summarized the challenges faced by HEIs in adopting ERP systems as follows; lack of clearly defined strategic goals, lack of support from top management, organisational culture, lack of training of users on ERP system, lack of change management and adaptation, lack of multiple sites resolution issues, inaccurate data and poor constitution of team members. Thomas [8] also highlighted that Botswana HEIs faced challenges that are not technological but are human issues as the following, resistance to change, organizational culture, lack of executive buy-in, and mismanagement of projects.

2.4 ERP model of information system implementation

DeLone and McLean [30] outlined the six elements that have proven to be the best success model in Information Systems as shown in Figure 2 below. All these components play an integral part in higher education institution's settings when implemented according to the institution's needs. The IS Success Model outlined below, though widely cited, has proven unable to be implemented in the local

setting. While it was deemed a success upon its formulation, gaps still remain regarding its suitability for every environment. It also argues that all these elements are key to the success of an IS project, it says very little when an environment lacks any one (or more) of these elements. Most if not all HEIs in Botswana are faced with a similar set of problems: financial constraints, technical expertise, and the unavailability of quality infrastructure [31, 32, 33]. Based on the model, it is clear that the System and Information Quality impact user satisfaction, and Botswana being a developing country, is faced with limited raw materials (skills as well as infrastructure), therefore implementing an ERP system, solely on this model, will most likely lead to a failure.
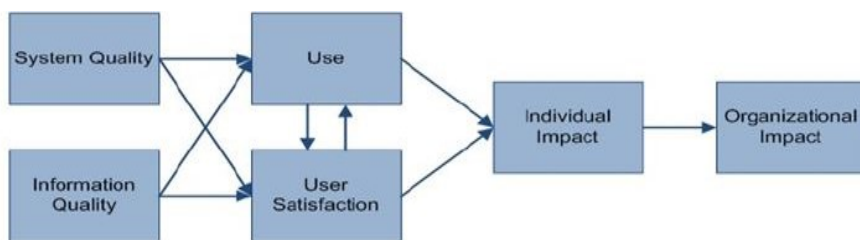

Figure 2. Modified ERP Model of Information System Implementation Adopted from DeLone and McLean [30]

2.5 ERP features for HEIs

Two broad categories with variables that analyzed ERP implementation as follows:
  1) Critical Success Factors: treated as independent variables that safeguard successful ERP implementation in higher educational institutions in Botswana.
  2) Success Dimensions: treated as dependent variables from Figure 3 below identifying the model of evaluating Information System Implementation [30].

DeLone and McLean's [30] model outlines success factors that affect the ERP system's implementation and adoption. A conceptual framework of this study is derived from this model which shows all dependent variables affecting Botswana's Higher Educational Institutions. Figure 3 below is a model that shows the proposed components which are interlinked to achieve the institutional goals in higher public educational institutions. The ERP system enables interaction with other systems; the interaction has to be clearly defined. System quality, information quality, and service quality jointly affect the user requirement and user satisfaction component, whereby user requirement and user satisfaction affect each other. These components have an effect on the faculty/management performance which affects the overall impact of the institution [15].
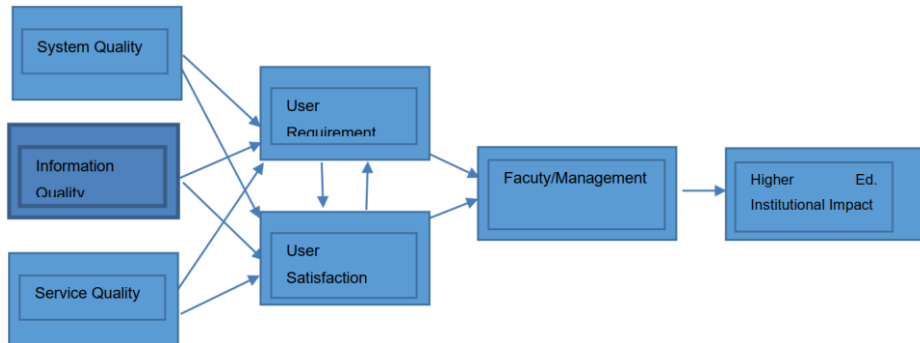
Figure 3. ERP Success Dimensions Adapted from DeLone and McLean [30];
Myers, Kapperlman, and Prybutok [34]; Shaiti [15].

However, most of these ERP systems need to be customized to suit the institution's environment and culture, whether it is accepted and applied to the HEIs as institutions differ in management and operations, thus resulting in user requirements seen as this stage of customization and is illustrated in Figure 2.6 above. These dimensions, which are mostly adopted from DeLone and McLean's [30] framework, are discussed as follows:

i. **System quality:** The focus here is on different attributes such as system usability, maintainability, reliability, interoperability, and agility, and discusses the importance of clear user requirements [35]. This component checks and balances the system that promotes a healthy environment for the system as well as the end-users as the level of errors will be highly minimized, leading to user satisfaction by meeting the expected user requirements [36].

ii. **Information quality:** This is the desirable characteristic of the system outputs that form the degree of accuracy of information. This is the process of transforming data into an understandable form to make informed decisions to be able to manage services and accountability [37]. Information quality is considered to be of quality if it has the following components: useful, good, current, and accurate which is perceived and used by its stakeholders [38].

iii. **Service quality:** is the level to which customers perceive whether their requirements have been met or exceeded [39]. It needs to be considered when measuring the implementation or adoption success of an ERP system as it captures the service quality an information system provides to an institution [40].

iv. **User satisfaction:** is considered very useful in information systems as it has a positive effect on the ERP system performance, improved productivity, and effectiveness as well as promotes informed decision-making within faculties, ultimately leading to the achievement of faculty objectives. If the system does not provide information that the end-users need, it can promote dissatisfaction [41] and end up leading to system hesitance.

v.   **User requirement:** Considered at the initial stage of the system development lifecycle where an assessment is conducted to identify all factors that can contribute to the successful implementation of the system. The following are some of the contributors to UR [42]; task of each organizational unit and its roles, accurate job specifications for the current business processes, alignment and familiarization with new IT development, acquisition of relevant information about data flow, identification of limitations and problems of the current system, clear knowledge and understanding of ERP system requirements, verification and validation of system users based on the system design.

vi.   **Faculty/Management impact:** Each faculty has its processes within the institution therefore system quality, information quality, service quality, user requirement, and user satisfaction components have to be interlinked to promote informed decision-making within the faculty as they are drivers. If all these components are successful in the implementation or adoption of the ERP system then there will be a positive impact as the faculty objectives will be achieved [15]. This component is adapted from DeLone and McLean's [30] framework.

vii. **Institutional impact:** The institutional goal is driven by faculty outcomes; each faculty has to be able to meet its objectives which are drawn from institutional strategic goals. The proper implementation or adoption of an ERP system will drive the success of the institutional strategy [15]. This component is adapted from DeLone and McLean's [30] framework.

2.6 Hypothesis

Based on Figure 4 below, the ERP success dimensions model is important whether a system is accepted or rejected by looking at the satisfying the conceptual framework success dimension for the ERP system to be adopted as follow.

H1: System quality positively impacts ERP user satisfaction and user requirements.
H2: Information quality positively impacts ERP user requirements and user satisfaction.
H3: Service quality positively impacts ERP user satisfaction and user requirements.
H4: User satisfaction and user requirements are positively related to each other.
H5: Faculty/Management positively impacts on institutional performance.
H6: Institutional impact positively relates to the ERP system's success for institutional performance.
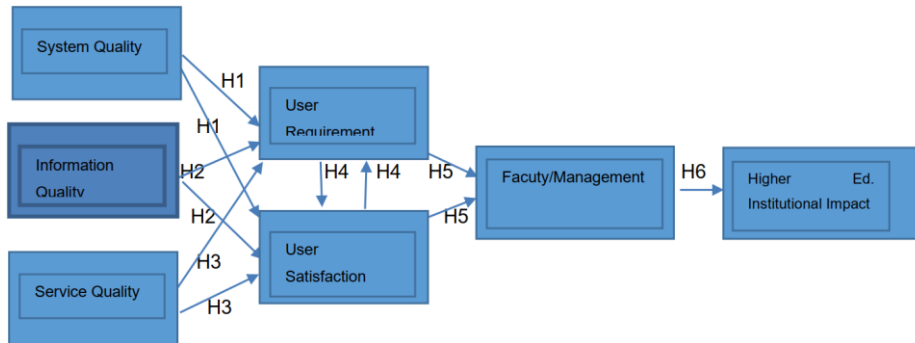
Figure 4. ERP Conceptual Framework with hypotheses

3   DATA ANALYSIS AND DISCUSSIONS OF THE FINDINGS

3.1 Descriptive statistics and frequencies

Frequencies and descriptive statistics are discussed in this section. The targeted population for this study was 269 respondents. 350 questionnaires were sent to the respondents and 287 responded to the questionnaire. 82% of the respondents responded to the questionnaire which means the sample size for the study is 287 (N=287).

3.1.1 Demographic statistics

The demographic data in this study included institutions, age, gender, size of institutions, and qualification level.

Table 1 below summarises the demographic information for the study. Out of 287 respondents who took part in the study, 56% of the population were male and 44% were females. In qualification level, 68% of respondents were master's holders while 6% were diploma holders. Among the three institutions that participated in the study, the majority of the respondents came from institution 1 with 60%. Lastly, the findings indicated that the majority of the respondents came from faculties (science, commerce, humanities, education) with 68%.

Table 1. Demographic information

Variable	Percentage
Male	56%
Female	44%
Diploma	6%
Bachelor	10%
Masters	68%
PhD	17%
Institution 1	60%
Institution 2	21%

Variable	Percentage
Institution 3	9%
Faculties (science, commerce, humanities, education)	68%
Support service (ICT, maintenance, finance, housing & residence, human resource, student affairs, research office, library)	18%
Administration (student registration, exams, records)	8%
Management (Deans, HROD, senior managers, managers)	6%

3.2 Challenges in ERP usage and application

This section discusses the challenges faced when adopting an ERP system within higher education institutions. The challenges were summarised in three categories as follows; ERP user perception, system use and implementation, and external factors. The user perception was looking at how the employees perceive the ERP systems. However, the system use and implementation were looking at how employees engage with the system and implementation of the ERP system. Additionally, external factors influence the ERP systems adoption in higher education institutions.

3.2.1 ERP user perception

Figure 5 below illustrates how respondents perceive ERP systems in their respective institutions. Generally, respondents are of the view that a lot has to be done for institutions to properly implement ERP systems in HEIs. The findings indicated that the majority of the respondents perceived that there were challenges when adopting ERP systems within higher educational institutions.
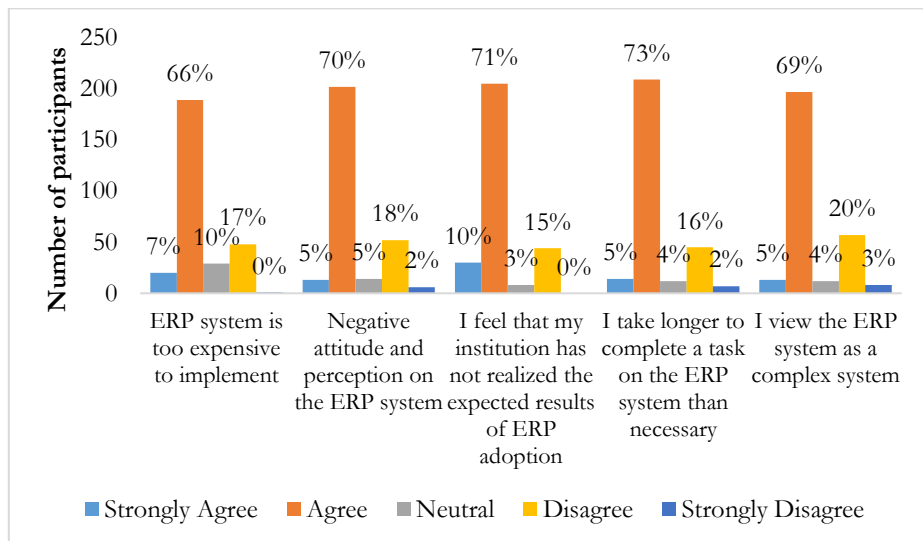

Figure 5. ERP user perception

3.2.2 System use and implementation

Figure 6 below summarises challenges faced by respondents from different institutions. Most of the respondents indicated that their institutions are not doing enough to provide the necessary support to ensure a smooth rollout of the ERP system. Over 70% of the respondents agree that they had challenges with system use and implementation which made it difficult to adopt ERP systems in higher education institutions. The findings of this study indicated the majority had faced challenges during system use and implementation in higher education institutions. Bhat and Banda (2003) also concurred that ERP system usage and implementation are affected by many factors such as failure to engage end users at the initial stage, leaving key stakeholders out during system requirements, and in the development phase.
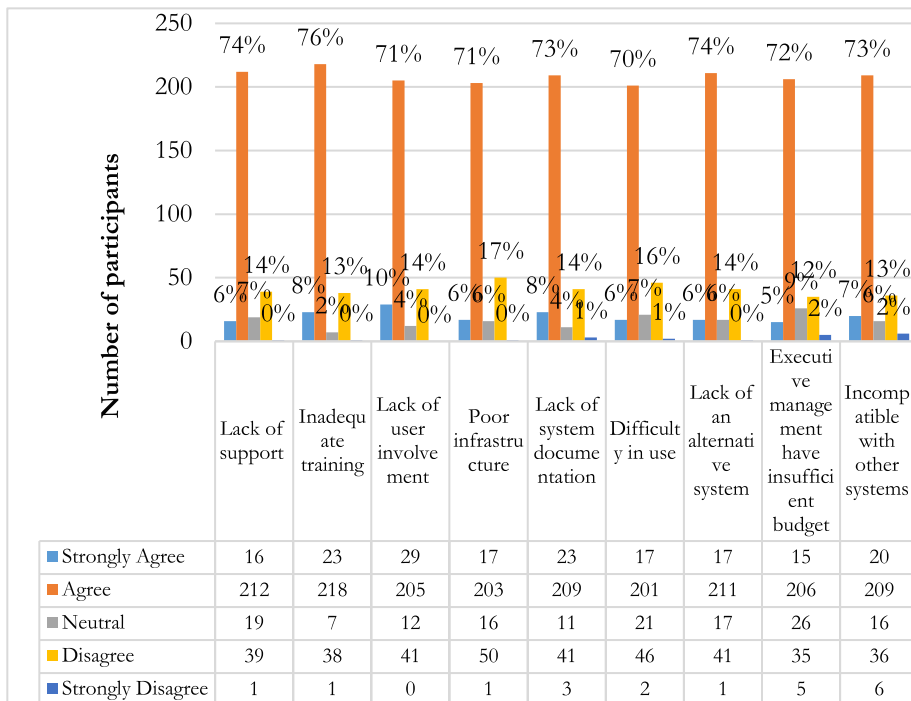

	Lack of support	Inadequate training	Lack of user involvement	Poor infrastructure	Lack of system documentation	Difficulty in use	Lack of an alternative system	Executive management have insufficient budget	Incompatible with other systems
■ Strongly Agree	16	23	29	17	23	17	17	15	20
■ Agree	212	218	205	203	209	201	211	206	209
■ Neutral	19	7	12	16	11	21	17	26	16
■ Disagree	39	38	41	50	41	46	41	35	36
■ Strongly Disagree	1	1	0	1	3	2	1	5	6

Figure 6. System use and implementation

3.2.3 External factors

In Figure 7, the study identified two external factors that contributed to the adoption of ERP systems within their institutions, and these are pressure from competitors and strict regulatory requirements and corporate governance. 62% of respondents agreed that strict regulatory requirements and corporate governance

compelled their institutions to adopt ERP systems while 25% disagreed. Hence, 67% of the respondents agreed that pressure from competitors contributed to ERP system adoption within their institutions and 21% of the respondents disagreed with the statement. The findings of this study indicated that most of the respondents agree that external factors influence the adoption of ERP systems in higher education institutions.
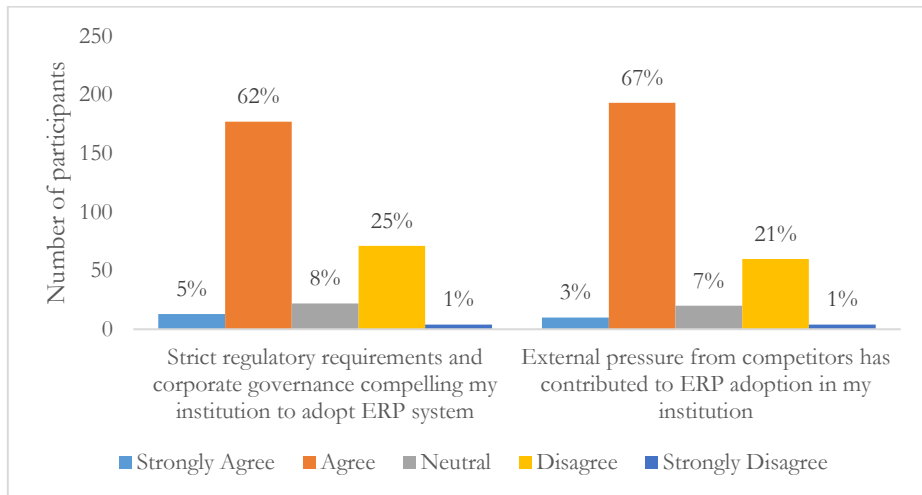

Figure 7. External factors

3.2.4 Inadequate training

Poor knowledge transfer – training sessions are done in a testing phase not on actual go-live operation and errors differ in these two platforms, whereas consultants don't train users to use or navigate the system smartly. Respondents agreed by illustrating 76% with the statement above.

Poor quality of testing – thus if testing did not go live, testing is a clear indicator of readiness of the ERP system to the relevant institution because it needs to be tailor-made to suit the requirements of the system. Users must be involved from the initial stages of implementation of the ERP system, as respondents felt that there is a certain division in involvement. The findings of this study showed most of the respondents agreed that they were not trained during ERP system adoption which made it difficult to adopt ERP systems in higher education institutions. Most of the findings of this study also established that some of the challenges that were discussed by AL-Sabaawi [17] in the literature review are also coming out clearly in this study as major challenges that contribute to ERP implementation failures.

3.2.5 User involvement

71% of respondents indicated that lack of user involvement from the initial stage negatively affects the expected results of the ERP system implementation and adoption. However, the training of users was the training of users were classified in levels of usage whereas some functionalities involve all users. Moreover, with this separation, training, and documentation will differ thus support or error tracking becomes difficult to troubleshoot, resulting in a negative attitude of users as it becomes difficult to manipulate the system. In saying that, this results in the following;

1) **Overreliance on customization –** due to dividing users into groups software mismatch in customization of some operational faculties or service departments and if it is not done right might cause project delays, the un-reliable system as well unnecessary budget spending.
2) **High turnover rate –** user if not trained or system delays or errors will suffer high workload stress when copying with implementation due to insufficient ERP knowledge in performing their daily tasks.

3.3 Benefits of implementing ERP in higher institutions

As per Figure 8 below respondents replied that few benefits that they experienced in ERP in their respective institutions, and 76% of the respondents agree that ERP helps in eliminating duplication while 70% agree that ERP integrates the core business of HEI by offering more access to data. In addition, 63% - 75% agree by saying that ERP offers overall improvement to the performance as well as the supply chain with better customer service. The findings of this study indicated that most respondents agree that ERP systems benefit when implemented and adopted within higher education institutions. The findings of the study are also supported by Shaiti [15] that ERP systems offer better coordination of business processes between different departments which is at 63%.
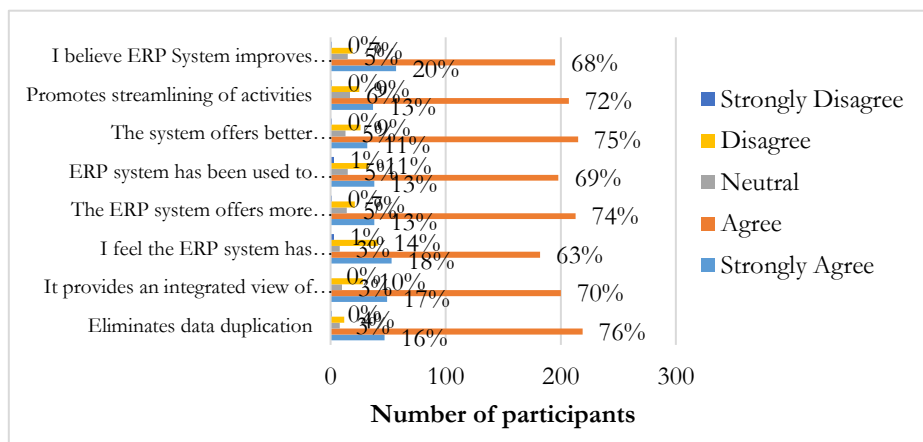

Figure 8. Benefits of ERP

By elaborating on Figure 8 above results show that there are specific benefits that come out of ERP system adoption in Botswana's higher institutions, as follows:

1) **Increase daily productivity –** A higher education ERP system guides in organizing institutional data by giving administrators more clarity on how to allocate more operational elements and manage them better.
2) **Improved workflow in multiple faculties and departments –** ERP allows administrators and management to organize operational and approval processes to be done in reduced time and effort spent on HEI's integrated platforms.

3.4 Gap between user requirement and information systems adoption in higher educational institutions

3.4.1 Systems gaps

Figure 9 below summarises the gaps between user requirements and information systems adoption in higher education institutions. 83% of the respondents agreed that there was inadequate communication between departments while 7% disagreed with the statement.
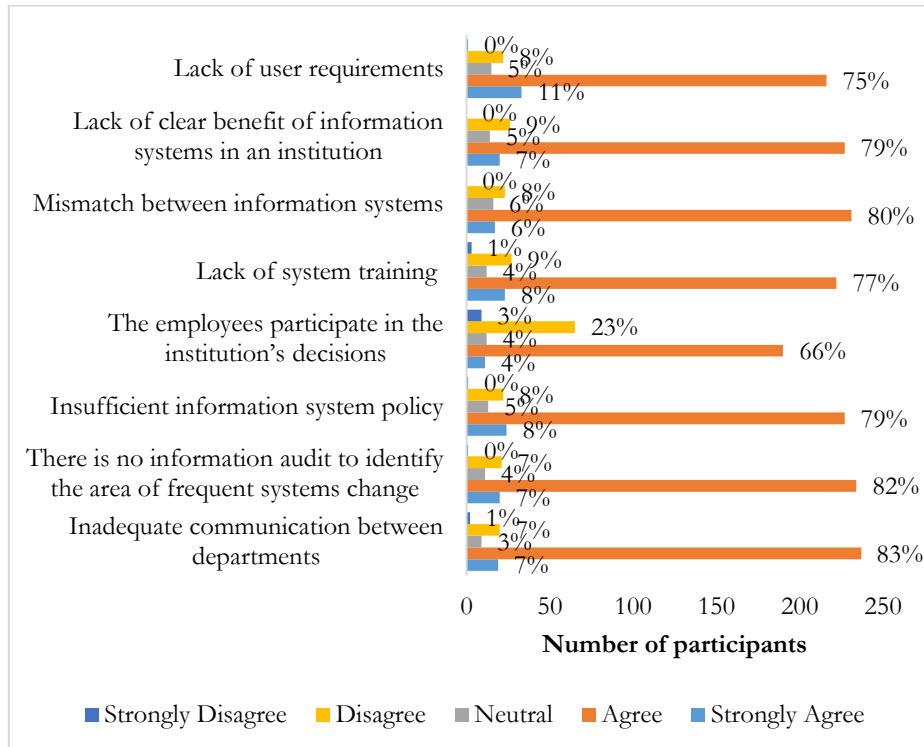

Figure 9. Systems gaps

82% of the respondents agreed that there is no information audit to identify the area of frequent systems change while 79% agreed that there is insufficient information system policy. 80% of the respondents agreed that there is a mismatch between information systems even though 66% of the respondents agreed that the employees are engaged in the institution's decision-making. 77% of the respondents agreed that there is a lack of system training while 79% of the respondents agreed that there is a lack of clear benefit of information systems in an institution. However, 75% of the respondents agreed that there is a lack of user requirements. The findings of this study indicated that most of the respondents agreed that there were systems gaps with the exception of 66% agreeing that employees participate in the institution's decision which means it was not a system gap when adopting and implementing ERP systems in higher education institutions.

3.4.2 Inadequate communication

More respondents agreed on how communication is between departments and information handling in the institution, where 83% indicated that there is a problem or inadequate communication between departments because of silo systems. The findings of this study indicated that most respondents agreed that inadequate communication between departments is one of the huge system gaps. In addressing these issues by offering users ERP training and effective use of the system they will have:

1) **Better communication in institutions –** ERP facilitates excellent communication between management, administrators, lecturers, and students.
2) **Improved protection of sensitive information or financial information –** better security in managing data in the institution, with more sophistication on data analysis and decision-making data instruments.
3) **Mismatch in an Information system –** due to a mismatch between supply and demand in the ERP industry workforce might have difficulties adopting HEI's operations.
4) **ERP Automation in operation –** minimize administrative paperwork for the service department and faculty's real-time work as some inexperienced users will do things manually.

Respondents were asked whether there is a lack of training and whether they needed to participate in the institution's decision-making process on the implementation of ERP, 77% agreed that both are vitally needed in the implementation and development thereof, with minimal disagreement of 9%. The findings of this study indicated that most respondents agreed that inadequate training is one of the system gaps that make it difficult to adopt ERP systems in higher education institutions. Eyitayo [6] supports that inadequate communication between departments leads to ERP systems failures within higher education institutions.

The study presented an exception of 66% of the respondents agreeing with the statement which indicated that most of the employees took part in the institution's decision thus leading to the success of ERP adoption. Koc and Teker [28] support that when employees participate in the development and adoption of ERP systems will lead to its success. The results analysis of this question (employees participate in the institution's decision-making) presented unexpected results as it shows this is not part of the system gap.

3.5 Discussion of results and conceptual model

This section of the study discusses the results of the main dimensions of the conceptual framework of enterprise resource planning success dimensions adoption. Correlations and regressions are also discussed.

3.5.1 Components of a conceptual model

1)   User requirements
Table 2 summarises the user requirements for conceptual model adoption in higher education institutions in Botswana for ERP systems adoption. 69% of the respondents agreed that the ERP system's applications that are used satisfy their needs while 68% agreed that the user requirements of departments were achieved. Therefore, 62% agreed that the user requirement component should be considered when developing an ERP conceptual model for higher education institutions while 55% agreed that employees were involved when developing or introducing a new ERP system. The findings of this study indicated that most respondents agreed that user requirements were met which made it easier for ERP system adoption in higher education institutions. However, most respondents agreed that the user requirements component be considered in developing an ERP conceptual model for higher education institutions.

Table 2. User requirements

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The ERP systems applications that are used satisfy my need	7%	69%	5%	17%	15%
The user requirements of the department were achieved	6%	68%	7%	16%	2%
The institution involves employees when it develops or introduces a new ERP system	8%	55%	8%	25%	4%

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I think user requirements should be considered in developing an ERP conceptual model for higher public educational institutions	35%	62%	2%	0%	0%

2) Faculty/Management impact

Table 3 summarises the management impact perspective which is one of the critical components in building a conceptual framework for higher education institutions in Botswana. About 75% of respondents believed that when ERP systems are successfully adopted by management, it is more likely to reduce the amount of time to complete a single task, with a least 9% that is against the said statement. Having 71% of respondents responding positively to the quality of the decision-making, ERP system awareness and learning, and creativity, this analysis indicates that management is aware and knows the importance of fully utilizing the ERP system. Less than 15% of all the questions disagree with the above-discussed questions.

The findings of this study indicated that most respondents agreed that faculty/management impact was successful as the performance was high. However, most of the respondents agreed that the faculty/management impact component should be considered in developing an ERP conceptual model for higher education institutions.

Table 3. Faculty/management impact

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The quality of the decision-making	11%	71%	6%	13%	0%
Awareness	7%	71%	9%	11%	1%
Learning and creativity	7%	71%	9%	12%	0%
Reduces the time required to complete individual tasks and duties	9%	75%	6%	9%	1%
I think faculty/management should be considered in developing an ERP conceptual model for higher public educational institutions	31%	63%	5%	1%	0%

3) User satisfaction

Table 4 summarises user satisfaction with conceptual model adoption in higher education institutions in Botswana for ERP systems adoption. 72% of the respondents agreed that the ERP system supports adequately their area of work while 71% agreed that it provided reports that exactly matched their departmental tasks. 70% of the participants that ERP systems provided sufficient information and 68% agreed that were efficient. 68% of the respondents agreed that user satisfaction should be considered in developing an ERP conceptual model for higher education institutions. 64% of the respondents agreed that ERP systems were effective while 56% agreed that it satisfied them as a whole a system. The findings of this study indicated that most respondents agreed that user satisfaction was met. However, most of the respondents agreed that the user satisfaction component should be considered in developing an ERP conceptual model for higher education institutions.

Table 4. User satisfaction

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Our ERP supports adequately my area of work	7%	72%	6%	13%	1%
Our ERP is efficient	9%	68%	6%	16%	1%
Our ERP is effective	9%	64%	6%	20%	2%
Our ERP provides sufficient information	8%	70%	6%	15%	0%
Our ERP provides reports that exactly match my work	8%	71%	6%	13%	2%
Our ERP satisfies me on the whole	8%	56%	6%	27%	3%
I think faculty/management should be considered in developing an ERP conceptual model for higher public educational institutions	29%	68%	2%	2%	0%

4) Service quality

Table 5 summarises the service quality for conceptual model adoption in higher education institutions in Botswana for ERP systems adoption 78% of the respondents agreed that the ERP system delivered quality service and 76% agreed that it was able to perform the promised service dependable and accurately which meant it was reliable. 75% of the respondents agreed that they were well-informed and trustworthy which meant they were assured while 72% agreed that support provided the service with personalized attention. 71% agreed that support was providing fast sincere assistance in problem-solving while 67% agreed that service

quality should be considered in developing an ERP conceptual model for higher education institutions. The findings of this study indicated that most respondents agreed that service quality was of a high standard. However, most of the respondents agreed that the service quality component should be considered in developing an ERP conceptual model for higher education institutions.

Table 5. Service quality

Construct	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Our support staff are well-informed and trustworthy	7%	75%	6%	12%	1%
Our support provides the service with personalized	6%	72%	7%	14%	1%
Our support delivers quality service to users	6%	78%	7%	9%	0%
Our support is able to perform the promised service	7%	76%	6%	9%	2%
Our support provides fast and sincere assistance in	7%	71%	7%	14%	1%
I think service quality should be considered in developing an ERP conceptual model for higher public educational institutions	29%	68%	2%	2%	0%

5) Information quality

Table 6 summarises the information quality for conceptual model adoption in higher education institutions in Botswana for ERP systems adoption. 77% of the respondents agreed that the ERP system provided information for users while 75% agreed that it provided understandable and relevant information. 73% of the respondents agreed that the ERP system provided usable information and 66% agreed that it provided concise information. 65% of the respondents agreed that information quality should be considered in developing an ERP conceptual model for higher education institutions while 59% agreed that it provided well-formatted information. The findings of this study indicated that most respondents agreed there was quality information. However, most of the respondents agreed that the information quality component should be considered in developing an ERP conceptual model for higher education institutions.

Table 6. Information quality

Construct *Our ERP*	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
provide information for users	9%	77%	3%	10%	0%
provides usable information	8%	73%	6%	12%	1%
provides understandable information	7%	75%	5%	14%	0%
provides relevant information	8%	75%	5%	12%	1%
provides well-formatted information	8%	59%	6%	26%	1%
provides concise information	6%	66%	9%	17%	1%
I think service quality should be considered in developing an ERP conceptual model for higher public educational institutions	31%	65%	2%	1%	0%

6) Systems quality

Table 7 summarises the system quality for conceptual model adoption in higher education institutions in Botswana for ERP systems adoption. 71% of the respondents agreed that the ERP system allowed them to easily find the information they were looking for while 70% agreed that it was easy to navigate and use. 67% of the respondents agreed that 2the ERP system offered appropriate functionality and thought system quality should be considered in developing an ERP conceptual model in higher education institutions. 64% of the respondents agreed that ERP has good functions and features while 61% agreed that it offered comfortable access to all the business applications they need and 56% agreed that it meets the user's requirements. Finally, 54% agreed that the user interface can be easily adapted to one's approach and was fully integrated. The findings of this study indicated that most of the respondents agreed that there was system quality. However, most of the respondents agreed that the system quality component should be considered for developing an ERP conceptual model for higher education institutions.

Table 7. System quality

Construct *Our ERP*	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
is easy to navigate and use	8%	70%	6%	14%	1%
allows me to easily find the information	7%	71%	6%	14%	2%

Construct *Our ERP*	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
offers appropriate functionality	8%	67%	8%	15%	2%
offers comfortable access to all the	8%	61%	8%	22%	1%
is fully integrated	8%	54%	6%	28%	4%
the user interface can be easily adapted	9%	54%	0%	22%	5%
meets the users' requirements	8%	56%	6%	26%	4%
has good functions and features	8%	64%	8%	17%	3%
I think system quality should be considered in developing an ERP conceptual model for higher public educational institutions	29%	67%	3%	1%	0%

7) Institutional impact

Table 8 summarises the system quality for conceptual model adoption in higher education institutions in Botswana for ERP systems adoption. 75% of the respondents agreed that the ERP system helped to meet the strategic roadmap as well have improved the outcomes and outputs. 73% of the respondents agreed that the ERP system reduced the operational and staff costs while 67% agreed that it supports e-government or e-business. 56% of the respondents agreed that institutional impact should be considered for developing an ERP conceptual model for higher education institutions while 40% strongly agreed to the statement. The findings of this study indicated that most of the respondents agreed there was an institutional impact on ERP adoption. However, most of the respondents agreed that institutional impact should be considered for developing an ERP conceptual model for higher education institutions.

Table 8. Institutional impact

Construct *Our ERP*	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
have improved the outcomes and	9%	75%	7%	8%	0%
supports e-government/e-business	11%	67%	9%	12%	1%
the system reduces the operational and	10%	73%	7%	9%	1%
helps to meet the strategic road map	9%	75%	7%	8%	0%

Construct *Our ERP*	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I think system quality should be considered in developing an ERP conceptual model for higher public educational institutions	40%	56%	4%	0%	0%

The research objective determines if the conceptual framework should be used to guide the successful adoption and implementation of ERP systems in higher education institutions. Most of the respondents agreed that the dimensions should be considered in developing a conceptual model for higher education institutions in Botswana. The findings of the study showed that over 90% of the employees agreed that the dimensions should be considered in the conceptual framework to be adopted by higher education institutions for the ERP system's success. Shaiti's [15] findings respond to the results of this study that dimensions should be considered in the conceptual model for ERP dimensions success by higher education institutions.

3.5.2 Correlations

This section discusses the inter-item correlations between the dimensions of the conceptual framework and inter-item correlations. Normally a number that is close to +1 displays a strong positive correlation while a number close to -1 points to a strong negative correlation. The correlations were measured at a below 0.05 level of significance and supported the literature discussion of correlations [54, 55].

1)   Inter-item correlations between the conceptual framework dimensions
The results showed that there is a strong positive correlation of 0.816**, 0.61**, 0.815**, 0.751**, 0.637**, and 0.593** between system quality and the six dimensions of information quality, service quality, user satisfaction, user requirements, faculty impact, and institutional impact. A strong positive correlation of 0.596**, 0.723**, 0.652**, 0.651**, and 0.625** between information quality and the five dimensions of service quality, user satisfaction, user requirements, faculty impact, and institutional impact. A strong positive correlation of 0.634** and 0.620** between service quality and two dimensions of user satisfaction and user requirements. However, a moderate positive correlation was 0.535** and 0.491** between service quality and two dimensions of faculty impact and institutional impact. A strong positive correlation of 0.863**, 0.707**, and 0.665** between user satisfaction and the three dimensions of user requirements, faculty management, and institutional impact. A strong positive correlation of 0.713** and 0.665** between user requirements and the two

dimensions of faculty impact and institutional impact. Finally, a strong positive correlation of 0.826** was found between faculty impact and institutional impact. These findings of the correlations mean that in this study, firstly, over time there is a 99% strong positive relationship existing between system quality and six dimensions of information quality, service quality, user satisfaction, user requirements, faculty impact, and institutional impact. Secondly, over time there is a 99% strong positive relationship existing between information quality and the five dimensions of service quality, user satisfaction, user requirements, faculty impact, and institutional impact. Thirdly, over time there is a 99% strong positive relationship existing between service quality and two dimensions of user satisfaction and user requirements. However, over time there is a 95% moderate positive relationship existing between service quality and two dimensions of faculty impact and institutional impact. Fourthly, over time there is a 99% strong positive relationship between user requirements and two dimensions of faculty impact and institutional impact. Lastly, over time does 99% positive relationship exists between faculty impact and institutional impact.

2) Regression analysis for H1, H2 and H3

The R^2 of the model is 0.602 meaning that 60.2 of the variation on the dependent variable user requirements is explained by the variation in the independent variables, service quality, information quality, and system quality. All the hypotheses H1 and H3 were accepted as they have p-values below 0.05 while H2 was rejected as it has a p-value above 0.05. These findings mean that in this study service quality and system quality influence user requirements. The findings of this study correspond with the results by Delone and McLean [30], and Shaiti [15] that system quality positively impacts ERP user requirements. The information quality does not affect user requirements. Delone and McLean's [30] and Shaiti's [15] findings do not support this study that information quality does not positively impact two dimensions of user requirements.

3) Regression for H1, H2 and H3

The model summary for H1, H2, and H3. The R^2 of the model is 0.694 meaning that 69.4 of the variation on the dependent variable user satisfaction is explained by the variation in the independent variables, service quality, information quality, and system quality. All the hypotheses H1 and H3 are accepted as they have p-values below 0.05 while H2 is rejected as it has a p-value above 0.05. These findings mean that in this study service quality and system quality influence user satisfaction. Delone and McLean's [30] and Shaiti's [15] findings similarly support this study that system quality positively impacts ERP user satisfaction and user requirements. The information quality does not have an effect on user satisfaction. Delone and McLean's [30] and Shaiti's [15] findings do not support this study that information quality does not positively impact two dimensions of user satisfaction.

4) Regression analysis for H4

The model summary for H4. The R^2 of the model is 0.744 meaning that 74.4% of the variation in the dependent variable user satisfaction is explained by the variation in the independent variable user requirements. Hypothesis H4 was accepted as it has p-values below 0.05. These findings mean that in this study user satisfaction and user requirements positively influence each other. The findings of this study correspond with the results by Shaiti [15] that user satisfaction and user requirements are positively related to each other.

5) Regression analysis for H5

The R^2 of the model for H5 and H6 is 0.538 meaning that 53.8% of the variation on the dependent variable faculty/management impact is explained by the variation in the independent variables, user requirements, and user requirements. The model is also significant because of its p-value of 0.000. Hypothesis H5 was accepted as it has p-values below 0.05. These findings mean that in this study user requirements and user satisfaction influence faculty impact. The findings of this study correspond with the results by Shaiti [15] that user satisfaction and user requirements positively impact faculty/management performance. The findings of this study correspond with the results by Shaiti [15] that user satisfaction and user requirements positively impact faculty/management performance.

6) Regression analysis for H6

The R^2 of the model for H6 is 0.681 meaning that 68.1% of the variation on the dependent variable institutional impact is explained by the variation in the independent variable faculty/management impact. The model is also significant because of its p-value of 0.000. Hypothesis H6 was accepted as having p-values below 0.05. These findings mean that in this study faculty impact influences institutional impact. The findings of this study correspond with the results by Delone and McLean [30] and Shaiti [15] that faculty/management performance positively relates to the ERP success for institutional performance.

3.6 Conceptual Framework Dimensions

The research objective determines if the conceptual framework should be used to guide the successful adoption and implementation of ERP systems in higher education institutions. Most of the respondents agreed that the dimensions should be considered in developing a conceptual model for higher education institutions in Botswana. The findings of the study showed that over 90% of the employees agreed that the dimensions should be considered in the conceptual framework to be adopted by higher education institutions for ERP systems success. Shaiti's [15] findings respond to the results of this study that dimensions should be considered in the conceptual model for ERP dimensions success by higher education institutions.

To answer the research objective of a conceptual model that represents the adoption of ERPs at higher education institutions in Botswana, several articles were reviewed. Correlations and regression analysis that was used to examine the relationship between different conceptual model dimensions to meet the research objective.

Table 9 below illustrates the hypotheses tested and the ones that were accepted in the conceptual framework proposed. The results of this study confirm that employees perceive that system quality positively impacts ERP user satisfaction and user requirements. These results were also influenced by the fact that there is a strong positive relationship existing between system quality and two dimensions of user satisfaction and user requirements. The findings of this study correspond with the results by Shaiti [15] that system quality positively impacts ERP user satisfaction and user requirements. Delone and McLean's [30] findings similarly support this study that system quality positively impacts ERP user satisfaction and user requirements.

The findings of this study established that information quality does not positively impact ERP user requirements and user satisfaction. These findings are influenced by the correlation significance of 0.45 which is above 0.05 and thus is not significant to the study even though there is a strong positive relationship existing between information quality and two dimensions of user requirements and user satisfaction.

The findings of this study confirm that employees perceive service quality as positively impacting ERP user satisfaction and user requirements. These results are influenced by the fact that there is a strong positive relationship existing between service quality and two dimensions of user satisfaction and user requirements. The findings of this study correspond with the results by Shaiti [15] that service quality positively impacts ERP user satisfaction and user requirements. The findings of this study confirm that employees perceive that user satisfaction and user requirements are positively related to each other. These results are influenced by the fact that there is a strong positive relationship between user satisfaction and user requirements. The findings of this study correspond with the results by Shaiti [15] that user satisfaction and user requirements are positively related to each other.

The finding of this study confirms that employees perceive that user satisfaction and user requirements positively impact faculty/management performance. These results are influenced by the fact that there is a strong positive relationship existing between user requirements and user satisfaction and the faculty/management impact dimension. The findings of this study correspond with the results by Shaiti [15] that user satisfaction and user requirements positively impact faculty/management performance.

The finding of this study confirms that employees perceive that faculty/management performance positively relates to the ERP success for institutional performance. These results are influenced by the fact that there is strong positive relationship existing between faculty/management impact and the institutional impact dimension. The findings of this study correspond with the results by Shaiti [15] that system quality positively impacts ERP user satisfaction and user requirements.

Table 9. Summary of the study hypotheses results

Code	Study hypotheses	Status
H1	System quality positively impacts ERP user satisfaction and user requirements	Accepted
H2	Information quality positively impacts ERP user requirements and user satisfaction	Rejected
H3	Service quality positively impacts ERP user satisfaction and user requirements	Accepted
H4	User satisfaction and user requirements are positively related to each other	Accepted
H5	User satisfaction and user requirement positively impacts Faculty/Management performance	Accepted
H6	Faculty/Management performance positively relates to the ERP system's success for institutional performance.	Accepted

3.7 Revised proposed model

Figure 10 shows the ERP system adoption for higher education institution model to guide higher education institutions during the implementation and adoption of ERP systems in order to be successful. This model could be used in successful implementation and ERP systems adoption in HEIs. The arrow shows the relationship between the components of the newly developed conceptual model. The arrows show the impact of one component on another. The arrows point to the direction of the impacted component.
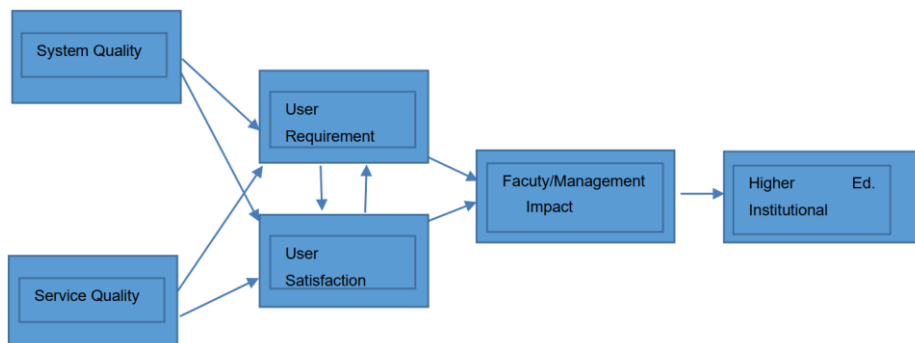

Figure 10. ERP system for higher education institution model

Figure 10 below illustrates that the relationship between the model components is interlinked which means in order for one component to be successful it depends on another component that is linked to it. Both system quality and service quality are independent variables which means they do not depend on any variable of the model but positively influence dependent variables such as user requirement and user satisfaction. There is a relationship between user requirements and user satisfaction that influences each other which means they depend on each other. Faculty/management impact is a dependent variable that highly depends on user requirements and user satisfaction outputs. Lastly, institutional impact depends on faculty/management impact which means it is directly influenced by the faculty/management component. For ERP system adoption in higher education institutions to be successful all the inputs from all models in Figure 9 below should be achieved.

3.8 CONTRIBUTION TO THE BODY OF KNOWLEDGE

This study's focus was to review the gap between user requirements and delivery of ERP and thus propose a model that will guide business information systems requirements to appropriate ERP systems in a higher education institution environment. The findings obtained from this could be used to add to the existing body of knowledge on information systems as a point of reference as limited research has been done on the user requirements in enterprise resource planning systems adoption in higher education institutions. The conceptual framework (success dimensions of ERP systems) developed and validated could be extended or reused by other researchers to aid in the development of other frameworks that test the adoption and implementation of ERP systems. Therefore, the government, private sector institutions, and other decision-making bodies may use the findings of this study to understand the factors that influence the user requirements and ERP system adoption of higher education institutions as the end user of ERP systems. This study will also help in making strategic policies and decisions.

The findings of this study could be used by other researchers to further understand user requirements and ERP system adoption in HEIs. The information obtained from the study could form the basis for the theoretical aspect of other researchers. Practically, the HEIs could use the conceptual model developed and validated to better improve service provision, and delivery and bridge the gap between user requirements and ERP system adoption. Lastly, this study provides a practical example in management information systems research on how exploratory study findings can be used in a primary questionnaire survey to address research problems and questions adequately. The study employed quantitative methodology to tackle the survey problems and also contributed to the body of knowledge at different levels.

3.9 Recommendation and Future Study

Similar studies in the future may use a combination of qualitative and quantitative methods to investigate the user requirements and ERP adoption in higher education institutions to get more depth insight. Some other sampling methods and techniques could be used in carrying out a similar study. Future research could further retest the proposed model. On the other hand, other sets of respondents from higher private education institutions may also be presented if the ERP success dimensions framework could be used to adopt ERP systems.

3.10 Implication of The Study

The findings of the research indicated that there are several challenges faced by HEIs during ERP system implementation and use. These include lack of support from management, inadequate training of users, lack of user involvement before system adoption and implementation, poor infrastructure, and lack of system documentation. These findings recommend that HEI management should always engage relevant stakeholders during ERP system implementation and adoption. This will benefit the institution in making a better choice during ERP system selection and adoption. The finding of the research indicated that ERP's six success dimensions of a proposed conceptual model for this study are very critical and need to be considered in developing the ERP system implementation and adoption by higher educational institutions. The findings of the study further indicated that proper implementation of the ERP system offers better and improved services to customers and other stakeholders of the institution. The study, therefore, recommends that HEIs should adopt the proposed model as it will guide them during the ERP system implementation and adoption process.

4   CONCLUSION

According to this study, understanding user requirements in the design or adoption of ERP in higher education institutions is a challenge. Then the study aimed to address this challenge by proposing six success dimensions. This study developed a conceptual framework for ERP systems success dimensions adoption for higher education institutions which was tested by hypotheses. This study concluded that system quality and service quality positively impact user requirements and user satisfaction while information quality did not positively impact user satisfaction and user requirements. However, user satisfaction and user requirements positively impact each other. User requirements and user satisfaction positively impact faculty/management performance. Hence, faculty/management positively relates to the ERP system's success in institutional performance.

There were most of the challenges of ERP system adoption which makes it difficult for higher education institutions to adopt and implement ERP systems. One of the challenges was the lack of training on ERP systems which makes it difficult for employees to adopt and implement ERP systems. On the other hand, most of the employees agreed with the benefits of the adoption of ERP systems in higher education institutions which offers overall improved performance to the performance as well as supply chain with better customer service.

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