International Journal of Enterprise Information Systems
Volume 17 • Issue 4 • October-December 2021

User Acceptance of Enterprise Resource Planning (ERP) Systems in Higher Education Institutions:
A Conceptual Model

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ABSTRACT

Nowadays, many higher education institutions (HEIs) replace existing computer systems with new ones to cope with the changing demands. At the top of these systems is enterprise resource planning (ERP) systems that integrate HEIs' business processes, functions, and data to improve their overall productivity and effectiveness. However, many studies on ERP adoption have shown that organizations frequently face several barriers, and the failure rate is high. This research aims to explore the factors that affect the behavioral adoption and acceptance of an ERP system in HEIs. Based on literature and authors' observations of the PeopleSoft system (ERP) implementation at Yanbu University College in Saudi Arabia (SA), a conceptual model of users' acceptance of ERP systems has been proposed. The framework is based on the unified theory of acceptance and use of technology (UTAUT) model. The study offers a theoretical contribution by extending the UTAUT model, and according to the authors' knowledge, this is the first paper to address ERP users' adoption perspective in HEIs in SA.

KEYWORDS

ERP, HEIs, PeopleSoft, UTAUT

INTRODUCTION

Enterprise resource planning (ERP) is a recent information technology (IT) innovation that improves organizational efficiency by integrating many information systems performing different functions and existing on different management levels. ERP is considered one of the most significant information technology innovations in the last decade (Somers & Nelson, 2001). Using an ERP system in higher education institutions (HEIs) was intended to increase productivity among faculties and departments with minimum cost (Watson & Schneider, 1999). Also, ERP systems help HEIs to achieve a competitive advantage because of their ability to provide reliable, accurate, and timely information (Soliman & Karia, 2017). However, the significance of ERP system adoption in educational institutions was not realized because of the low number of successful projects (Abugabah & Sanzogni, 2010). According to the literature of ERP system adoption in HEIs, 60% to 80% of these system projects fail to provide

DOI: 10.4018/IJEIS.20211001.oa1

the expected results. Other ERP system projects did not improve the business process and overall performance (Abugabah & Sanzogni, 2010). A study by Abdellatif (2014) indicated that approximately 50% of ERP project implementations failed in Egyptian organizations, and Hellens et al. (2005) showed that few ERP projects succeeded in Austria. Although implementing an ERP system can be helpful to any organization, it should be maintained in a way that most benefits the organization. The cost of ERP system implementation includes installing software programs and transitioning from the old system to the ERP system as well as the cost of system maintenance and updates and staff training (Monk & Wagner, 2013). The literature showed that ERP system implementations in HEIs did not achieve the expected advantages because of barriers such as organization and people resistance (Bradley & Lee, 2007).

For the purposes of this research, the PeopleSoft system that is implemented in Yanbu University College (YUC) in Yanbu City, Saudi Arabia (SA), is taken as an example of an ERP system. Based on our initial observations, users of the system, teachers, and administrators have a negative attitude toward the PeopleSoft system. This study aims to explore and determine the factors that affect teachers' and administrators' acceptance and use of the PeopleSoft system. We are proposing a model using one of the technology acceptance theories with the addition of two factors that have been determined based on literature and initial observations—namely, the system's complexity and output quality. These factors were integrated in the model suggested for this paper. Identifying such factors would help HEIs to increase the positivity of users' intentions and improve their satisfaction.

The adoption and implementation of ERP systems in HEIs is growing rapidly, but such a sector receives little attention in scholarly publications (Rabaa'i et al., 2009). The majority of the ERP implementation in HEI publications focuses on the system's benefits, impacts on the business process, challenges, or technical aspects. The adoption and use studies of ERP in HEIs are scarce and in the immature stage (Soliman & Karia, 2017). To the best of the authors' knowledge, this is the first study in the domain of ERP in HEIs in SA that proposed a conceptual model for users' adoption.

BACKGROUND

Enterprise Resource Planning

Information systems are necessary nowadays because of the expansion of information and its size within an organization. The revolution of technology made implementing an information system a must for organizations and institutions. ERP is one of the information systems that have been used in many organizations. ERP is a software program that is used to automate and manage the business process and the integrated information within the business. It provides a large shared database for the organization in addition to a variety of management tools (Monk & Wagner, 2013). Gartner, Inc., the global research company, defined the ERP system in the context of higher education in the 1990s as having the following attributes: "(1) the system is multiple in scope, tracking a range of activities including human resources (HR) systems, student information systems, and financial systems. (2) it is integrated; when data is added in one area, information in all related areas and functions also changes" (Kvavik et al., 2002). ERP systems have been used for enhancing organizations' processes and therefore improving the organizations' efficiency. It helps management make faster decisions and create reports (Monk & Wagner, 2013). According to Gerón-Piñón et al. (2020), ERP systems in HEIs are designed to streamline almost every aspect of how schools and colleges operate. Some of HEIs' or universities' motives to adopt ERP systems include quality standards requirements, growing in students' numbers, higher students' expectations, global trends, and competitive education environment (Gerón-Piñón et al., 2020). Using and implementing ERP systems can be helpful to an organization of any size. Automating updates and providing real-time information are great features of the ERP system. The reasons for implementing an ERP system are the same; however, the system

can be customized to fit the organization's needs. Another great feature of the ERP system is usability. The system also helps to apply best practices within an organization (Monk & Wagner, 2013).

There are many benefits to using the ERP system in HEIs. It can improve the accuracy and accessibility of the business's organizational process information, enhance the business's effectiveness and productivity, and provide better management tools and controls (Arunthari, 2005; Fisher, 2006; Swartz & Orgill, 2001). ERP systems in HEIs are utilized to manage resources allocation and faculty and staff interaction with the business activities, to fulfill students' needs for information and services, and to facilitate decision makers' interaction with information needed for policy formulation (Kvavik et al., 2002). According to research conducted at Dar Al-Uloom University, SA by Abdel-Haq et al. (2018) the benefits of implementing an ERP system may be grouped into three categories: strategic, operational, and managerial. The strategic benefits include managing suppliers and customers in terms of tracking and improving their satisfaction. The operational benefits include enhancing productivity and managing production and resources efficiently and effectively. Finally, enhancing communication within the organization is one of the managerial benefits (Abdel-Haq et al., 2018). According to Alloush & Mahendrawathi (2020) review of 18 papers on ERP systems in HEIs summarized the following advantages of ERP implementations in the context of HEIs: "(1) unification of the entire campus system. (2) increase the efficiency of the communications system. (3) eliminate manual operations. (4) smooth and fast data access in a timely manner. (5) enable the strategic decision-making process by analyzing strategic data. (6) increased growth in follow-up and planning capabilities. (7) establish and integrate self-service environments for students, staff, and faculty. (8) obtain an administrative system capable of providing quick and flawless services. (9) integration of the administrative and educational processes. (10) smooth data access in order to identify and coordinate the work of the organization's management. (11) improving the quality of university administration services, staff, and students. (12) reduce the cost of stationery. (13) increased access to results." (Alloush & Mahendrawathi, 2020).

At the same time, an ERP system has its weaknesses. Implementing such a large system takes time to install and get started. Sometimes it needs to be implemented as modules, which can take years (Monk & Wagner, 2013). Moreover, the ERP system is a costly software program to acquire and install. According to Kvavik et al. (2002), HEIs had invested $5 billion in administrative and ERP systems by the end of the twentieth century, and they will continue to invest in them into the twenty-first century. The amount includes the establishment and operating costs; the system updates and maintenance would be added to the cost (Al-Qirim 2011; Monk & Wagner, 2013). Kvavik et al.'s lengthy study on ERP system implementation and benefits in 258 HEIs revealed that 50% of these system implementations consumed more time than scheduled and more budget than planned. Moreover, 54% of the institutions experienced a short-term decline in productivity instantly after the ERP system was implemented. A recent qualitative study by Mahar et al. (2020) identified the issues, challenges, and critical success factors (CSF) for the implementation of ERP systems. Findings were derived from multiple interviews and a survey with the IT professionals, top management, ERP consultants, end-users, and other stakeholders. Besides, the study involved reviewing 30 papers written in the same domain. The research revealed that there are five categories for ERP challenges: stakeholders, process, technology, organization, and project management. Likewise, the top five CSFs are ERP software selection, selection or designing a customized ERP system, high integrity and complexity, selection of the ERP implementation team, and the availability of expert consultants (Mahar et al., 2020).

ERP systems are offered by many different vendors that serve different purposes and industries. There are different software types and applications of ERP systems that are implemented in different industries. In their book *Enterprise Resource Planning: Global Opportunities and Challenges*, Hossain et al. (2002) noted that there are five well-known ERP system providers in the market: SAP, Oracle, PeopleSoft, Baan, and J. D. Edwards. However, SAP and Oracle are the two largest and oldest providers in the market, and they offer a variety of ERP system software to organizations.

SAP started by offering manufacturing organizations an integrated system throughout the enterprise. SAP also offers many other types of ERP systems that target other parts of the organization than manufacturing, such as research and development (R&D), customer relationship management (CRM), and data warehousing (Hossain et al., 2002). Oracle is the main SAP competitor; it started initially as a database company. Oracle offered ERP software as the revolution of the ERP system started. It started initially by providing systems that are specialized in the financial sector and expanded from there to offer many different types of software that serve other sectors as well (Monk & Wagner, 2013). Another well-known ERP system provider that specializes in managing human resources is PeopleSoft. The advanced releases of PeopleSoft include supply chain planning and financial activities modules in their software (Hossain et al., 2002). PeopleSoft succeeded in providing excellent ERP software in the human resource planning and financing areas, which made the company a solid competitor for SAP and Oracle. PeopleSoft's success even made SAP adjust its software modules in human resources (Monk & Wagner, 2013). Finally, Oracle decided to acquire PeopleSoft, which they successfully achieved in 2004, and nowadays, PeopleSoft is known as a great software option for HEIs in managing human resources and financial activities (Monk & Wagner, 2013). In addition, many HEIs now use PeopleSoft as their main software, which is how it is used in YUC, for example. According to G2 (2020) reviews and ranking of top 10 higher education student information systems (SIS), Salesforce (Salesforce for Higher Ed), Oracle Higher Education Cloud, Oracle (PeopleSoft Campus Solution system), and SAP (SAP for Higher Education and Research) were ranked as the first (best), third, fifth and seventh respectively.

Technology Acceptance Theories

Human-computer interaction (HCI) studies how users interact with computers and evaluates how computers are developed for successful human interaction (Kendall & Kendall, 2011). Technology quality is highly judged by users' expectations for and satisfaction and experience with the system (Kim, 2015). Hence, the goal of HCI is to create usability designs in terms of designing simple, accessible, and useful technologies. HCI consists of three parts: users, computer or technology, and the ways they "fit" together. Therefore, HCI is utilized in this paper because we wanted to measure the fit between ERP systems and YUC faculty and staff using technology acceptance theories that could help in explaining users' willingness to accept the PeopleSoft system. According to the literature, theories that are available to measure user acceptance models include theory of reasoned action (Fishbein & Ajzen, 1975), social cognitive theory (Bandura, 1986), technology acceptance model (Davis, 1989), theory of planned behavior (Ajzen, 1991), the model of PC utilization (Thompson et al., 1991), the motivation model (Davis et al., 1992), combined TAM and TPB (Taylor & Todd, 1995), innovation diffusion theory (Rogers, 1995), and the unified theory of acceptance and use of technology (Venkatesh et al., 2003). Table 1 summarizes the models' information.

ERP Acceptance Studies

Since the mid-1990s, information systems researchers concentrated their research efforts on improving and testing models that aid in exploring IS in various organizational environments. Consequently, several models have emerged and been proposed for studying, explaining, and anticipating users' behaviors toward the new system's adoption and use. Exploring users' behavior towards a new technology is important to improve their acceptance and intention to use it (Bamufleh et al., 2020). To achieve a successful ERP project implementation, it is critical to have a deep understanding and thorough knowledge of its innovation process, which includes ERP system adoption and use (Laukkanen et al., 2007). This section of the paper provides some examples of ERP system implementations in regular organizations and HEIs. (Table 2)

An empirical, quantitative study was carried out by Rajan and Baral (2015) to determine the factors influencing the usage of ERP systems and its impact on end users. The study sample included different organizations in India that implemented any of the following ERP systems within a time

Table 1. Technology Acceptance Models and Constructs

Author/Year	Model	Construct & Definition	Reference
Katz et al. (1973)	The Uses and Gratification Theory	**Diversion:** "Escape from routine and problems; an emotional release." **Personal Relationships:** "Social utility of information in conversation; substitution of media for companionship." **Personal Identity: "**Value reinforcement or reassurance; self-understanding, reality exploration." **Surveillance: "**Information about factors which might affect one or will help one do or accomplish something."	(Katz et al., 1973)
Fishbein and Ajzen (1975)	Theory of Reasoned Action (TRA)	**Behavioral Intention (BI):** A "function of both attitudes toward behaviour and subjective norms toward that behaviour which has been found to predict actual behaviour." **Attitudes:** A "sum of beliefs about a particular behaviour weighted by evaluations of these beliefs." **Subjective Norms:** The "influence of people in one's social environment on his behavioural intentions and beliefs, weighted by the importance one attributes to each of their opinions that will influence one's behavioural intention."	(Fishbein & Ajzen, 1975)
Bandura (1986)	Social Cognitive Theory (SCT)	**Outcome Expectations – Performance:** "The performance-related consequence of the behaviour." **Outcome Expectations – Personal:** "The personal consequence of the behaviour." **Self-Efficacy:** The "judgment of one's ability to use technology to accomplish a particular job or task." **Affect:** "An individual's liking for a particular behaviour." **Anxiety:** "Evoking anxious or emotional reactions regarding performing a behaviour."	(Bandura, 1986)
Davis (1989)	Technology Acceptance Model (TAM)	**Perceived Usefulness (PU):** "The degree to which a person believes that using a particular system would enhance his or her job performance." **Perceived Ease of Use (PEOU):** "The degree to which a person believes that using a particular system would be free of effort."	(Davis, 1989)
Ajzen (1991)	Theory of Planned Behaviour (TPB)	**Attitude Toward Behavior:** "An individual's positive or negative feelings (evaluative effect) about performing the target behaviour." **Subjective Norm:** "The person's perception that most people who are important to him think he should or should not perform the behaviour in question." **Perceived Behavioral Control:** "The perceived ease or difficulty of performing the behaviour."	(Ajzen, 1991)
Thompson et al. (1991)	Model of Personal Computing Utilization (MPCU)	**Job-Fit:** "The extent to which an individual believes that using technology can enhance the performance of his or her job." **Complexity:** "The degree to which an innovation is perceived as relatively difficult to understand and use." **Long-Term Consequences:** "The outcomes that have a pay-off in the future." **Affect Toward Use:** "The feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated use by an individual with a particular act." **Social Factors:** "The individual's internalization of the reference group's subjective culture and specific interpersonal agreements that the individual has made with others, in specific social situations." **Facilitating Condition:** "The provision of objective factors in the environment that observers agree make an act easy to accomplish."	(Thompson et al., 1991)
Moore and Benbasat (1991)	Innovation Diffusion Theory (IDT)	**Relative Advantage:** "The degree to which an innovation is perceived to being better than its precursor." **Image:** "The degree to which use of an innovation is perceived to enhance one's image or status in one's social system." **Compatibility:** "The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters." **Complexity:** "The degree to which an innovation is perceived as relatively difficult to understand and use." **Result Demonstrability:** "The tangibility of the results of using the innovation, including their observability and communicability." **Ease of Use:** "The degree to which an innovation is perceived as being difficult to use." **Voluntariness of Use:** "The degree to which use of the innovation is perceived as being voluntary, or of free will."	(Moore & Benbasat, 1991)

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Table 1. Continued

Author/Year	Model	Construct & Definition	Reference
Davis et al. (1992)	Motivation Model (MM)	**Extrinsic Motivation:** "The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions." **Intrinsic Motivation:** "The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se."	(Davis et al., 1992)
DeLone and McLean (1992)	DeLone and McLean (D&M) IS Success Model	**System Quality (SQ):** "The desired characteristic of the information system itself which produces the information." **Information Quality (IQ)**: The "desired characteristic of the information system itself which produces the information." **Use/User Satisfaction:** "The interaction of the information product with its recipients, the users and/or decision makers." **Individual Impact:** "The influence which the information product has on management decisions." **Organization Impact:** "The effect of the information product on organizational performance."	(DeLone & McLean, 1992)
Taylor and Todd (1995)	Combined TAM and TPB (C-TAM-TPB)	**Attitude Toward Behavior:** "An individual's positive or negative feelings (evaluative effect) about performing the target behaviour." **Perceived Behavioral Control:** "The perceived ease or difficulty of performing the behaviour." **Perceived Usefulness:** "The degree to which a person believes that using a particular system would enhance his or her job performance." **Subjective Norm:** "The person's perception that most people who are important to him think he should or should not perform the behaviour in question."	(Ajzen, 1991) (Davis, 1989) (Ajzen, 1991)
Goodhue and Thompson (1995)	Task-Technology Fit (TTF)	**Technology Characteristics:** "The traits of technological devices or services used by users in order to fulfil their tasks." **Task Characteristics:** "The actions that might move a user to rely more heavily on certain aspects of information technology." **Task-Technology Fit:** "The degree to which technology assists an individual in completing a task and user evaluation of 8 factors: data quality, locatability, authorization, compatibility, ease of use/training, production timeliness, systems reliability, and relationship with users." **Utilization:** "The behaviour of employing technology towards completing needed tasks." **Performance Impact: "**The accomplishment of a portfolio of the tasks by an individual."	(Goodhue & Thompson, 1995)
Venkatesh and Davis (2000)	Technology Acceptance Model 2 (TAM2)	**Subjective Norms:** The "person's perception that most people who are important to him think he should or should not perform the behaviour in question." **Image:** "The degree to which use of an innovation is perceived to enhance one's image or status in one's social system." **Output Quality:** "The tasks a system is capable of performing and the degree to which those tasks match their job goals or job relevance, people will take into consideration how well the system performs those tasks." **Job Relevance:** "An individual's perception regarding the degree to which the target system is applicable to his or her job." **Result Demonstrability:** "The tangibility of the results of using the innovation."	(Venkatesh & Davis, 2000)
Venkatesh et al. (2003)	The Unified Theory of Acceptance and Use of Technology (UTAUT)	**Performance Expectancy (PE):** "The degree to which an individual believes that using the system will help him or her to attain gains in job performance." **Effort Expectancy (EE):** "The degree of ease associated with the use of the system." **Social Influence (SI):** "The degree to which an individual perceives that important others believe he or she should use the new system." **Facilitating Conditions (FC):** "The degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system."	(Venkatesh et al., 2003).

frame of less than 5 years of the research: SAP, Oracle, and Ramco Systems. The study model was based on TAM that suggested an individual's behavioral intention to use a system is determined by perceived usefulness (PU), perceived ease of use (PEOU) (Davis, 1989). TAM predicted that external variables are likely to have an indirect impact on technology acceptance behavior by affecting beliefs, intentions, or attitudes (Szajna, 1996). In their study, Rajan and Baral found the usage of ERP had a significant positive impact on users' performance and a significant influence on users' empowerment. Besides, there was an increase in both control and empowerment through the usage of ERP due to the clarity of information provided by the ERP (Rajan & Baral, 2015).

Likewise, the following study used TAM in an attempt to take part in the development of knowledge of ERP success, or ERP acceptance, especially. Govindaraju and Indriany (2007) collected the data needed through a questionnaire distributed to 200 SAP end users who worked in a large company in Indonesia (TelCo) that had implemented SAP/R3, and 176 usable responses were received. The model used in this study was an extended TAM that included the following constructs: PU, PEOU, attitude, compatibility, business fit, symbolic adoption, computer self-efficacy, personal innovativeness of IT, shared belief in the benefit of the ERP system, the argument for change, and facilitating conditions. This study found that end users' acceptance of ERP adoption in a mandatory context is directly influenced by perceived compatibility and attitude and indirectly influenced by the PU and ERP business fit. The findings also supported that shared belief in the benefit of the ERP system had a major direct impact on PU and an indirect impact on attitude. In addition, the personal innovativeness of IT had a major direct impact on PEOU (Govindaraju & Indriany, 2007).

From the usability attributes perspective, Al-Adwan & Habahbeh (2020) research explored how usability attributes influence ERP end users' acceptance. The study model designed to measure the influence of usability attributes (task support, presentation, navigation, learnability, and memorability) on TAM constructs (PU and PEOU) and continuous intention to use (CIU). To validate the model, a survey was conducted from Dawacom Pharmacies, which is the largest pharmacy chain in Jordan. The survey population included 200 users of the ERP system implemented in Dawacom Pharmacies. The findings declared that users' intentions to use ERP systems were affected by presentation, navigation, learnability, memorability, PU, PEOU, and CIS. On the other hand, task support did not have a significant impact on PU and PEOU (Al-Adwan & Habahbeh, 2020).

Another recent study by Uddin et al. (2020) explored ERP system adoption through the inclusion of moderators and a mediator. The study aimed at investigating the factors that have a leading impact on ERP systems adoption and implementation and identifying the mediator and moderators that triggered ERP implementation in the context of developing countries. The study proposed a framework based on UTAUT model, which was tested over 225 employees working in manufacturing organizations where ERP is extensively used. The study's results validated the hypothesized direct relationships between intention to use ERP and performance expectancy, effort expectancy, social influence, and facilitating conditions. Moreover, the intension to use ERP influenced the actual use directly and indirectly as a mediator between facilitation conditions and actual use of ERP. However, the study showed no influence of facilitating conditions on the actual use of the ERP system. Similarly, users' education and firms' size moderators had no impact on the intention to use and actual use of ERP (Uddin et al., 2020).

Focusing on HEIs, the main factors that differentiate the ERP systems implemented at HEIs from those at other organizations are the inclusion of student information systems (Althonayan & Papazafeiropoulou, 2011), the different nature of the academic processes, and faculties' and students' needs (Abugabah & Sanzogni, 2010).

Abugabah et al.'s (2015) study suggested combining TAM (Davis, 1989), TTF (Goodhue & Thompson, 1995), and D&M (DeLone & McLean, 2003) models to evaluate the impacts of ERP systems on user performance (UP) in HEIs. Every model concentrated on different aspects and had various perspectives on the impacts of IS on users. Constructs from these models were integrated to provide a further exploratory investigation because neither of these models alone had reached a

universal acceptance regarding comprehensiveness and appropriateness. Also, these models provide the needed theoretical foundation for exploring the factors that clarify IS utilization and impacts on UP (Dishaw & Strong, 1998; Kobelsky, 2000). A quantitative questionnaire was used to gather data from ERP systems' users in six large universities in Australia. The findings indicated that system quality (SQ), task technology fit, and information quality are the most essential factors that could improve end UP. In particular, SQ is the most beneficial predictor of UP because it helped users to enhance the efficiency by expanding the quality and the quantity of the work accomplished. Users minimized the errors occurring in their performance through ERP systems and corrected those that did occur by providing accurate information. Users are supported by ERP systems to generate ideas related to their job and improve creativity by providing adequate information that meets users' needs and task requirements (Abugabah et al., 2015).

Another quantitative study conducted by Mudaly et al. (2013) aimed to improve ERP system usage in universities by adapting TAM 2, which was extended to include more factors related to IT usage—that is, training, management support, perceived behavioral control (PBC), and technical support. Also, the study intended to investigate the effect of the IT usage factors in improving ERP implantation and use them in a university context to study the interaction effect of gender, experience, and age on ERP system usage. The sample of the study included 312 academics that used the ERP system Integrated Tertiary Software at Durban University of Technology in South Africa. The results showed that only training, technical support, and PBC directly influenced ERP system usage. In contrast, the management support did not influence ERP system usage. In addition, the results of gender, experience, and age did not affect all IT usage factors on ERP system usage (Mudaly et al., 2013).

A research was carried out by Hasan (2017) at the University of Toledo, USA, where a different model was used to study ERP system users' acceptance. According to Hasan, most studies in the context of ERP system use and acceptance used TAM, which focuses mainly on the behavioral part of users' acceptance and use of the ERP system. For this reason, the study integrated different measurements from TRA, the uses and gratifications theory (UGT), and information science theory to gain more insights into and better knowledge of ERP acceptance and use. The proposed research model consisted of four constructs: informativeness, enjoyment, attitude, and satisfaction. Informativeness and enjoyment of the ERP system were the first two constructs in the research model, which were obtained from the UGT theory and employed to explore their relationship with users' satisfaction and attitude toward the ERP system. Attitude was derived from TRA, which proposes that attitude is a critical factor that affects an individual's behavior. The model was tested and verified by surveying 87 graduate business students. The results showed that 73% of system users' satisfaction and 41% of users' attitudes toward an ERP system are directly impacted by the ERP system's informativeness and enjoyment. These results support the information science theory, which states that information provided by the system to help users work effectively determines the user acceptance of the system. Moreover, research results have shown that the enjoyment of the ERP system has a great effect on users' satisfaction with and attitude toward the system (Hasan, 2017).

Considering the high failure rate in HEIs' implementation of ERP systems, a quantitative study conducted by Batada, Duang-Ek-Anong, & Achwarin (2020) emphasized on the need for a customized ERP system that suited HEIs' needs and requirements. The study investigated the impact of customized ERP systems in academic institutions in Pakistan and proposed a framework for its adoption. The model was derived from TAM and the DeLone and Mclean models and encompassed the following constructs: instructor quality, course quality, top management support, information quality, system quality, perceived usefulness, and user satisfaction. The study population encompassed 100 faculty staff and 200 students who used the ERP system. The study revealed that top management support had significant influence on ERP system quality and subsequently improved the perceived usefulness. On the other hand, top management support had insignificant direct, and significant indirect relationships with perceived of usefulness and user satisfaction. The research found that the information quality

of ERP system had significant impact on users' perceived usefulness. Finally, the results of the survey reported that instructor quality (both technical skills and pedagogical skills), course quality, system quality had significant effect on ERP user satisfaction. Lastly, ERP information quality was positively correlated with user satisfaction and perceived usefulness (Batada, Duang-Ek-Anong, & Achwarin, 2020).

Widjaja et al. (2019) study evaluated the implementation of the ERP system in Human Capital Management (HCM) in higher education institutions in Indonesia. The study model was based on DeLone and Mclean model and the ERP quality model by Deshmukh et al. (2015). The model contained seven independent measurements: information quality, system quality, vendor quality, training, hardware and software, top management support, skills of the workforce, and project management. Also, the model included two dependent variables: perceive ERP benefits and ERP system success. The model was tested using questionnaires that were distributed to 32 respondents. The study results proofed the proposed model validity and reliability (Widjaja et al., 2019).

Althunibat et al. (2019) conducted a study to determine the main factors that affect the acceptance of using an ERP system in Jordanian universities. The main objective of the study was to identify the factors that affect the acceptance of ERP systems in order to get the expected benefits and to investigate whether Jordanian universities were willing to accept ERP system implementation. A quantitative questionnaire was used to collect data from 28 universities. The sample size of the questionnaire was randomly selected, and it was calculated separately for each university, and the online questionnaire was sent to 500 university lecturers and managers. The results showed that UTAUT determinants (i.e., PE, EE, SI, and FC) were found to be significant in predicting perceived behavioral intention of ERP software. Besides, SI was the most influential factor on users willing to adopt ERP software (Althunibat et al., 2019).

Using a mixed approach of quantitative and qualitative methods, Al-Harthi & Saudagar (2020) identified the success drivers for implementing ERP systems from people, processes, data, and technology perspectives. The study focused on one of the primary ERP systems deployed in the ministry of education, which is the Financial and Administrative Resource Information System (FARIS). The data collection was done using a diversity of methods: observation, interview, questionnaire, and literature review. The survey population included 171 users and experts of the FARIS system, and the interviews targeted the system experts. The research hypothesized a list of success drivers for implementing ERP systems in Saudi Arabia, which were classified into four perspectives. First, people success drivers include: "train and educate system users, involving top management and getting their support, effective communication, coordination and teamwork, and project team competency." Second, the data perspective involves the following success drivers: "old data management, data accuracy, and data conversion and migration." Third, process drivers consist of: "alignment between information system and business strategies, project management, change management, and business process reengineering." Finally, technology success drivers incorporate "having a solid technology infrastructure, IT service management, and vendor support." The study model relates the constructs of ERP success (process, correspondence, expectation, and interaction) to ERP success drivers. The study findings proofed all success drivers' contributions in ERP success except for business process reengineering. Furthermore, the study findings highlighted the foremost three unique and effective drivers in ERP success implementation, which are: "old data management," "alignment between information system and business strategies," and "IT service management" (Al-Harthi & Saudagar, 2020).

Gerón-Piñón et al. (2020) conducted a qualitative study to recognize the human factors of ERP successful implementations in HEIs. The study involved interviewing twenty-three experts who had contributed to successful implementations of ERP systems at HEIs in Latin American countries. The interviewed experts performed different roles, such as IT managers, project managers, implementation team members, technical users, consultants, and final users. Based on the interviews, eight human factors were identified for successful ERP implementations in HEIs: "(1) top management

engagement and support; (2) a committed multidisciplinary team; (3) project communication and change management; (4) efficient decision making; (5) project manager with experience and decision-making capabilities; (6) identify who will operate the new system; (7) project governance; and (8) specialized external consultants support." Furthermore, the research results determined five key barriers for ERP implementations in HEIs along with the human factors that act as moderators of each barrier. The barriers are "resistance to change, lack of a single team properly acquainted with the processes, lack of top management and institutional commitment, the ERP implementation is not positioned as an institutional project led by the president, lack of a well-positioned project leader," and the corresponding human factor for each barrier respectively are: "project communication and change management, a committed multidisciplinary team, with experience in the institution and its processes, top management engagement and support (executive sponsor with decision making power, project communication and change management, and project manager with experience and provided with decision-making capabilities." (Gerón-Piñón et al., 2020).

Finally, focusing on students' perspective, a quantitative study by Grandón et al. (2020) validated TAM to understand students' intention to use an ERP system. The study was conducted at two public universities in Chile and Colombia, where students were exposed to and experienced the implementation and integration of business processes while studying SAP/R3 ERP system. The data collection was done in two stages. 70 students participated in the first stage, and 89 students participated in the second round. The survey results showed that perceived ease of use and perceived usefulness could predict students' behavioral intentions, and perceived usefulness was the most influencing factor for students' intention to use an ERP system.

METHOD AND HYPOTHESES DEVELOPMENT

Research Framework

The Unified Theory of Acceptance and Use of Technology (UTAUT) is the proposed model for this research. It was initially formulated to merge information technology acceptance models into a unified theory (Venkatesh et al., 2003). Eight existing technology acceptance models were used to create the UTAUT model: the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), the social cognitive theory (SCT), and the combined model of TAM and TPB (C-TAM-TPB; Venkatesh et al., 2003). This model was used in many of the technology acceptance studies to explain the intention and behavior of users toward using and accepting an information system (Sirikitsathian et al., 2016). As mentioned earlier, the UTAUT model has four primary constructs and four key moderators that affect the impact of the primary constructs. The primary constructs are PE, EE, SI, and FC. The moderators are experience, age, gender, and voluntariness (Venkatesh et al., 2003).

We chose the UTAUT model for this research for several reasons. First of all, it is the most recent model found among the aforementioned models in the literature. Formulated in 2003, it combines many existing technology acceptance models (Venkatesh et al., 2003). Second, as stated earlier, ERP systems at HEIs are accessible and used mainly by three users: administrative staff, faculty, and students. Each category of these users is composed of different age groups, experience levels, and voluntariness to use the system. Unlike the other models, the UTAUT includes moderating measures that could provide more insights into understanding ERP system users' behavior, especially in the HEI context where, for example, users' experience and system voluntariness could change the study's conclusions. Third, the literature proves the extendibility of the UTAUT model by integrating more constructs. As previously described, two measurements were integrated with UTAUT constructs: complexity and system quality. These constructs were considered based on the authors' observations and previous research findings. The ERP system is a complex system, and that makes it difficult to understand or use (Monk & Wagner, 2013). Many staff and faculty at YUC reported that PeopleSoft

Table 2. Summary of ERP Implementation Literature

Author/ Year	Objective	Country	Methodology	Model/ Theory	Sample Size	Key Findings
Mudaly et al., 2013	Study the effect of IT system usage factors in improving ERP usage in universities and to study the effect of gender, experience, and age on ERP system usage.	South Africa	Quantitative questionnaire	TAM2	312 academics	- Training, technical support, and PBC directly influenced by ERP system usage. - Management support has no influence on ERP system usage. - Gender, experience, and age did not affect all IT usage factors on ERP system usage.
Rajan and Baral, 2015	Finding the impact of the usage of the ERP systems on the end user.	India	Quantitative questionnaire	TAM and TRA	154 respondents	- The usage of ERP had a significant positive impact on users' performance and a significant influence on users' empowerment.
Govindaraju and Indriany, 2017	To contribute to the development of knowledge on ERP success or ERP acceptance especially.	Indonesia	Quantitative questionnaire	TAM	176 respondents	- End users' acceptance of ERP adoption in a mandatory context is directly influenced by perceived compatibility and attitude and indirectly influenced by the PU and ERP business fit. - Shared belief in the benefit of the ERP system has a major direct impact on PU and an indirect impact on attitude. - The personal innovativeness of IT has a major direct impact on PEOU.
Abugabah et al., 2015	Evaluate the impacts of ERP systems on user performance (UP) in HEIs.	Australia	Quantitative questionnaire	TAM, TTF, and D&M models.	387 ERP users in 6 universities	- The system quality, information quality, and task technology fit are the most critical factors that lead to better end user performance.
Hasan, 2017	Understand the user acceptance of the ERP system from a different perspective than the behavioral part.	US	Quantitative questionnaire	TRA, UGT, and Informing Science Theory	134 graduate business students	- The attitude and satisfaction of ERP users have been strongly impacted by the informativeness and enjoyment of using an ERP system. - Users' satisfaction has a strong impact on the users' intentions to use the ERP system.
Althunibat et al., 2019	Identify the factors that affect the acceptance of the ERP system in the HEIs in Jordan.	Jordan	Quantitative questionnaire	UTAUT	28 universities	- The acceptance of the ERP system among Jordanian universities was determined by the four factors of the UTAUT model. - SI was the strongest influence on users' intention to accept and use ERP systems.
Mahar et al., 2020	Determine the challenges and critical success factors of ERP implementation.	Pakistan	Qualitative-(interviews, a survey, and a review of 30 papers)	NA	Top management, IT professionals, ERP consultants, end-users, and other stakeholders	- There are five categories for ERP challenges: stakeholders, process, technology, organization, and project management. - The top five critical success factors for ERP implementations are: ERP software selection, selection or designing a customized ERP system, high integrity and complexity, selection of the ERP implementation team, and the availability of expert consultants

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Table 2. Continued

Author/ Year	Objective	Country	Methodology	Model/ Theory	Sample Size	Key Findings
Al-Adwan & Habahbeh, 2020	Explore how usability attributes influence ERP end-users acceptance.	Jordan	Quantitative questionnaire	TAM and usability attributes	200 users of the ERP system used in Dawacom Pharmacies	- The study model designed to measure the influence of usability attributes (task support, presentation, navigation, learnability, and memorability) on TAM constructs (PU and PEOU) and continuous intention to use (CIU). - Users' intentions to use ERP systems were affected by presentation, navigation, learnability, memorability, PU, PEOU, and CIS. - Task support did not have a significant impact on PU and PEOU.
Uddin et al., 2020	Identify the factors that have a direct influence on ERP systems adoption and implementation and recognize the mediator and moderators that triggered ERP systems implementation in the context of developing countries.	Developing countries (South Asia)	Quantitative questionnaire	A modified model based on UTAUT	225 employees working in different manufacturing organizations that extensively used ERP system.	- There were significant relationships between the intention to use ERP and performance expectancy, effort expectancy, social influence, and facilitating conditions. - The intension to use ERP influenced the actual use directly and indirectly as a mediator between facilitation conditions and actual use of ERP. - No influence of facilitating conditions on the actual use of the ERP system - Users' education and firms' size moderators had no impact on the intention to use and actual use of ERP.
Batada, Duang-Ek-Anong, & Achwarin, 2020	Investigate the impact and adoption of customized ERP systems in academic institutions.	Pakistan	Quantitative questionnaire	TAM and the DeLone and Mclean models	100 faculty staff and 200 students who used the ERP system	- Top management support had a significant influence on ERP system quality and subsequently improved the perceived usefulness. - Top management support had significant indirect relationships with perceived usefulness and user satisfaction. - The information quality of the ERP system had a significant impact on users' perceived usefulness. - Instructor quality (both technical skills and pedagogical skills), course quality, system quality had a significant effect on ERP user satisfaction. - Information quality was positively correlated with user satisfaction and perceived usefulness
Widjaja et al., 2019	Evaluate the implementation of the ERP system in Human Capital Management (HCM) in higher education institutions.	Indonesia	Quantitative questionnaire	DeLone and Mclean model and the ERP quality model by Deshmukh et al. (2015)	32 respondents	- System quality, information quality, vendor / consultant quality, training, hardware and software, top management support, skill of workforce and project management can measure perceived ERP benefits and perceived ERP benefits measures ERP system success.
Grandón et al., 2020	Explore students' intention to use an ERP system.	Chile and Colombia	Quantitative questionnaire	TAM	Students who experienced the implementation and integration of business processes while studying SAP/ R3 ERP system.	- The survey was conducted in two stages. 70 students participated in the first stage, and 89 students participated in the second round. - Perceived ease of use and perceived usefulness predict students' behavioral intention - Perceived usefulness was the most influencing factor for students' intention to use an ERP system.

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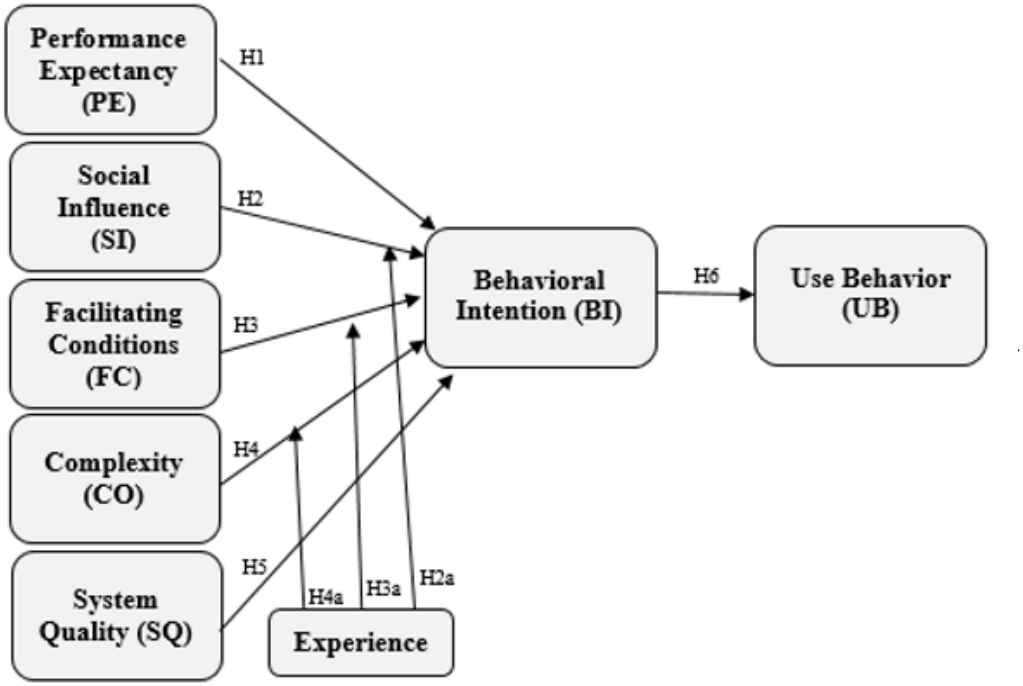
Table 2. Continued

Author/ Year	Objective	Country	Methodology	Model/ Theory	Sample Size	Key Findings
Gerón-Piñón et al., 2020	Identify the human factors of ERP successful implementations in HEIs.	Latin American countries	Qualitative-(interview)	NA	23 experts (IT managers, project managers, implementation team members, technical users, consultants, and final users) who had contributed to successful ERP implementations in HEIs.	- Eight human factors for successful ERP implementations in HEIs: "(1) top management engagement and support; (2) a committed multidisciplinary team; (3) project communication and change management; (4) efficient decision making; (5) project manager with experience and decision-making capabilities; (6) identify who will operate the new system; (7) project governance; and (8) specialized external consultants support." - Five critical barriers for ERP implementations in HEIs: "resistance to change, lack of a single team properly acquainted with the processes, lack of top management and institutional commitment, the ERP implementation is not positioned as an institutional project led by the president, lack of a well-positioned project leader,"
Al-Harthi & Saudagar, 2020	Identify d the success drivers for implementing ERP systems from people, processes, data, and technology perspectives.	Saudi Arabia	Quantitative and Qualitative	A model that relates the constructs of ERP to ERP success drivers	FARIS ERP system users and experts	- FARIS is an ERP system implemented in the ministry of education in Saudi Arabia - The success drivers for implementing ERP systems in Saudi Arabia, which were classified into four perspectives. - People: "train and educate system users, involving top management and getting their support, effective communication, coordination and teamwork, and project team competency." - Data: "old data management, data accuracy, and data conversion and migration." - Process: "alignment between information system and business strategies, project management, and change management" - Technology success drivers incorporate "having a solid technology infrastructure, IT service management, and vendor support."

Figure 1. Proposed Research Model



and effectiveness. Therefore, PE has a strong impact on user intention to accept a new system, and it continues to be significant at all the points of measurement in both mandatory and voluntary environments (Venkatesh et al., 2003). In the scope of this study, PE is contextually defined as the degree to which PeopleSoft is useful and helps faculty and staff to attain productivity benefits in their job. Hence, the following hypothesis is proposed:

H_1: Performance expectancy will have a positive impact on behavioral intention to accept using the PeopleSoft system.

Social Influence

Individuals are exposed to the pressures of social interactions and will take into account not only their perception but also the opinions and perceptions of others, particularly individuals whom they consider to be important in a given context, such as in the social context of the workplace (Venkatesh et al., 2003). Social influence (SI) was found to be the most effective factor for users' intention to use ERP systems in HEIs according to Althunibat et al. (2019). According to Venkatesh et al. (2003), the effect of SI increased when the users have little experience in using that technology. In the scope of this study, SI is contextually defined as the degree to which having positive social support to use the PeopleSoft will increase faculty and staff's acceptance of and intention to use PeopleSoft. Hence, the following hypotheses are proposed:

H_2: Social influence will have a positive impact on behavioral intention to accept using the PeopleSoft system.

H_{2a}: The relationship between social influence and the behavioral intention to accept using the PeopleSoft system is moderated by users' IT experience.

Facilitating Conditions

Facilitating conditions (FC) mean the user believes that existing technical and organizational infrastructure supports the use of the system (Venkatesh et al., 2003). According to UTAUT, FC is assumed to impact actual use directly due to various aspects of FC, such as training and support provided, that would be freely available within an organization and constant across users (Venkatesh et al., 2012). FCs such as top management support and users' training were the foremost barriers to successful ERP system implementation (Botta-Genoulaz & Millet, 2006). In the scope of this study, FC is contextually defined as the degree to which faculty and staff believe that getting technical support from college will facilitate their usage of the PeopleSoft system. According to Venkatesh et al. (2003), users with more extensive IT experience were less dependent on external support. Henceforth, the following hypotheses are proposed:

H_3: Facilitating conditions will have a positive impact on behavioral intention to accept using the PeopleSoft system.

H_{3a}: The relationship between facilitating conditions and the behavioral intention to accept using the PeopleSoft system is moderated by users' IT experience.

Complexity

As we know, the ERP system name is coined with complexity because it is a huge system that integrates many IT components. According to previous studies that discussed the complexity of technology use, it has been identified that complexity has a negative impact on behavioral intention to use the technology (Thompson et al., 1991). Also, a study showed that the more complex the technology is, the less users are willing to use the system (Pituch & Lee, 2006). Complexity was reported as one of the reasons behind ERP system failure in HEIs (Abugabah & Sanzogni, 2010). Complexity is defined in the scope of this study as the degree to which faculty and staff found using the PeopleSoft system to be difficult to understand and use. According to authors' observations, staff and faculty with prior experience in using IT and IS solutions perceived the ERP system (i.e., PeopleSoft) as less complex than those with less experience did. Therefore, the following hypotheses are proposed:

H_4: Complexity will have a positive impact on behavioral intention to accept using the PeopleSoft system.

H_{4a}: The relationship between complexity and the behavioral intention to accept using the PeopleSoft system is moderated by users' IT experience.

System Quality

System quality (SQ) refers to the quality of information processing itself, which is characterized by adaptability, availability, reliability, response time, and usability of the system (Delone & McLean, 2003). According to Lin and Lu (2000), system quality has a significant influence on users' intentions to use the system. For example, many users may resist using the system because of the lack of system accessibility, poor system design, slow response time, or high Internet traffic. Therefore, system quality is considered necessary in affecting behavioral intention. Hence, the following hypothesis is proposed:

H_5: System quality will have a positive impact on behavioral intention to accept using the PeopleSoft system.

Behavioral Intention

Behavioral intention (BI) refers to the degree to which a user intends to use a particular technology (Ajzen, 1991). According to Venkatesh et al. (2012), BI has a significant positive effect on the actual

usage behavior. Therefore, BI is contextually defined as the degree to which faculty and staff intend to use the PeopleSoft system that directly affects their actual usage. Hence, the following hypothesis is proposed:

H_6: Behavioral intention will have a positive impact on user behavior to accept using the PeopleSoft system.

Use Behavior

Actual usage behavior was described as the real behavior of users when they are using technology, which can be measured as the rate of how many times users are using technology (Venkatesh et al., 2003).

Based on the provided hypotheses, an acceptance model is proposed and depicted in Figure 1.

Conclusion

The implementation of ERP systems in HEIs improves the quality of the provided services to students, faculty, and staff (Abugabah & Sanzogni, 2010). They improve the HEIs' efficiency, effectiveness, and end-user satisfaction and reduce business risks. Conversely, ERP system implementations consume enormous time, energy, and money and are not free from challenges, which include users' resistance to use the system (Kvavik et al., 2002). This study aimed at proposing a conceptual framework for the factors that could influence ERP system users in the context of HEIs. The model was based on UTAUT and was extended with two additional constructs: complexity and system quality. The present study makes a theoretical contribution by extending the UTAUT model to provide a richer understanding of users' adoption behavior of ERP systems in the context of HEIs. In addition, the majority of ERP systems literature has focused on manufacturing-based industries rather than on educational institutions (Althonayan & Papazafeiropoulou, 2011). This study is one of the few studies to address a user adoption perspective of ERP systems. To the best of the authors' knowledge, this is the first paper to narrow the scope to HEIs in SA. For future works, HEIs are continuously upgrading their systems; therefore, it is expected that they will renew or adopt other types of enterprise-wide systems in the future (Nielsen, 2002). A systematic review paper on the digital transformation in HEIs emphasized the importance of understanding the changes in organizations' processes, activities, structure, and automation as a result of adopting or implementing a new technology such as ERP system. The review also highlighted that 95% of the articles considered and involved students and teachers as the main actors in the digital transformation process in HEIs (Benavides et al., 2020). Conversely, a successful implementation of ERP systems requires the involvement of more users that only students and teachers due to the enterprise-wide changes it causes to the business processes. More studies and research are recommended to be done in the area of multiple users' acceptance of the ERP system, particularly in the education field. The proposed model needs to be validated and tested in an HEI environment. Also, student users could be considered, and more constructs could be integrated into the model, such as attitude, autonomy, and trust.

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