Why Switch to a New Vendor? Explore the ERP Upgrade Decision from UI/UX Perspective

Fan Zhao[1], Dallis Schaefer, Aden Katz, and Henderson De Leon
Florida Gulf Coast University
10501 FGCU Blvd. S., Fort Myers, FL 33965, USA
239-590-7326

Abstract

More and more companies are updating their current ERP systems now. With previous implementation experience, organizations tended to pay less attention to the upgrade projects. This could increase their failure rate and reduce the productivity of the systems. In this mixed-method study, we conducted both qualitative and quantitative research to explore hidden patterns from several large organizations that switched ERP vendors when they upgradedERP systems. We analyzed the reasons for switching vendorsand identified constructs influencing the decision-making of ERP upgrade package selection.We further studied the impact of UI/UX of ERP systems on operational performance from the end-users perspective. Combining the qualitative and quantitative studies results, we discussed key factors that top management concerned when they started ERP upgrade projects. These results supported our hypothesis that an ERP system with better UI/UX would improve user performance and further impact the adoption decisions for ERP upgrade projects.

Keywords: ERP, upgrade, performance, User Interface

Introduction

Enterprise resource planning (ERP) systems are used widely today across the biggest companies in the world. These systems provide solutions for companies, both large and small. ERP solutions can streamline processes, provide access to information across business segments, and create transparency throughout the business that was never thought of previously to ERP. However, the path to sustainable and successful use of ERP is dependent on a successful implementation. Following intricate and expensive planning, implementation, and deployment, the end result may not be what was originally anticipated. Throughout the implementation, business processes that were once simple can be reengineered to become more complicated in the new ERP. After we gain enough experience from the ERP implementation projects, researchers now focus their studies on the post-implementation of ERP systems. One of the most important steps in ERP post-implementation is ERP upgrade. More and more companies are updating their current ERP systems now.Typically, ERP upgrades will be easier and simpler if the organizations stay with the same vendor. However, instead of upgrading their current ERP systems from the same vendor, many organizations switch to either a cloud ERP or a non-traditional ERP system from their original ERP vendors, such as SAP and Oracle. This study wants to know why many organizations don't want to upgrade their systems from the same vendor.

ERP users can become resistant to the change from a lack of education, training, or simply communication. Instead of embracing the new technology, users can resist the change, and create problems for business, even if the initial implementation went without any issues. A poorly designed ERP system will negatively impact user performance and decrease user satisfaction. Users who have less training and less knowledge of the ERP system will indeed not perform to the expectations set by the implementation of the ERP. From the users' perspectives,we want to know how the users view the system, its design, how it has slowed down their work, and their satisfaction with the system.

Literature Review

While ERP should bring more intuitive communication and streamline processes within the business, this may not always be the case. Training may produce adverse effects on an implementation. If users either don't get training at all, receive inadequate training, or have a non-sustainable training schedule, they will not know how to use the program properly. When training is an issue, it is usually not apparent until it is too late to change. It can lead to bad habits in post-implementation, even if users learn the software after the implementation (Esteves, 2014). With this, process failures or shortcuts may be used by employees, which may not have the same intended effect as initially planned and may not align with the use case.

A rare and often overlooked dark side of implementing ERP in an organization is an overload of empowerment and data on users. The usual effects of empowerment bring data availability and fluidity to those who need it to perform their jobs (Ruivo et al., 2020). However, a sudden exponential increase in technology and data may be too much for some users to handle, and it may even decrease the performance of these individuals (Delpechitre et al., 2019). The sudden implementation of technology on these users may cause them to seize up. Additionally, from a user's perspective, instead of using the system for the given use cases for their positions, some users may feel like they have added control and power with the newly available data. When the users feel this power, they are more likely to use the system beyond their use cases. This can sometimes lead to innovation but often leads to overstepping of boundaries (Maas et al., 2018).

User resistance is another commonly cited failure case when analyzing ERP implementations and post-implementations. A variety of issues can cause user resistance. These issues include a lack of user training, common fear/resistance to change, user expectations, and poor system design (Al-Taweel&Haithm, 2016). Reduction of user resistance can be mitigated by trying to counteract any of those issues, including a more robust training regiment, user involvement in the design, and support from top management (Haddara& Moen, 2017). All of these issues are critical success factors of a successful ERP post-implementation. User resistance may be one of the most prominent issuesin ERP post-implementation and usage, no matter how well of a job the original project managers do. Some employees may always be set in their ways and will continue to disregard new processes, even if they may be easier with the new ERP. While the normal channels of communication are the best way to change the minds of these employees, they may still resist and need to be dealt with in other ways.

It is overwhelmingly evident that the easiest way to avoid the risk and exposure of discovering unanticipated outcomes of system use is to vigorously plan ahead (Osnes et al., 2018). Multiple case studies have indicated that the best way to avoid these unseen and unanticipated results is to plan ahead, train and educate users, and most importantly, be in constant and clear communication with all stakeholders that are involved. By spending more time, more money, and having dedicated resources during the initial implementation of the chosen ERP, businesses will likely have fewer issues down the road. Problems that do arise should be easier to manage and mitigate, and will most likely never come to fruition if the proper steps are taken during initial implementation. It was found that many of the issues in post implementation were a result of a lack of continuing support following the deployment of the ERP in an organization. While change management is incredibly important during the initial implementation, some organizations fail to realize the dedicated resources and change management that must continue, even after the ERP is deployed. These organizations do not necessarily anticipate the scale of needed resources after implementation, which must be dedicated to updating the ERP safely, applying software fixes, and upgrading the ERP to integrate with innovative technology (Mahmood et al., 2019). While many organizations place most of this weight on the vendor of the ERP, dedicated resources internally need to be still present and familiar with the entirety of the ERP to efficiently work with the vendor regarding these issues and spearhead any other internal problems that may arise with the ERP. Therefore, this paper is to study organizations' ERP upgrade decisions from both ERP vendor design/technology and users' perspectives and answer the question of why many organizations switched from their initial vendors when they upgraded their ERP systems.

Research Method

A Mixed-methods design tries to utilize the advantages of both qualitative and quantitative research to provide a complete picture of a research problem (Creswell, 2002). This study uses one of the mixed methods designs in management information systems: sequential exploratory mixed methods design, which includes two distinct phases. First, a qualitative study wasconducted to build a proposed model for a successful ERP upgrade. Second, a quantitative study evaluated and improved the previous research model. An in-depth interview was the research method used in the qualitative study.

FourCIO/CTO/IT managers were interviewed in a semi-structured interview format to explore key success factors for ERP upgrades. Some documents related to ERP upgrades were also reviewed to complement the findings from the interviews from the qualitative study. In the second part of the study, a survey was designed and distributed to ERP system users to verify the model from qualitative research and improve the model based on the qualitative data. The priority in this design was focusing on the quantitative study because the procedure of hypothesis testing was emphasized in this study to develop a more accurate and better model to help future ERP upgrades. Integration of this design happened in the connection between the qualitative and quantitative stages. The qualitative stage was the prerequisite for the quantitative stage in order to reveal some predicting factors of the successful ERP upgrade and then validate the hypotheses in the quantitative stage.

Qualitative Study

FourCIO/CTO/IT managers from three 500 fortune organizations (a telecommunication company, a car rental company, and a clothing retail company) and a large US university were interviewed about their ERP upgrade projects. This paper will use IT managers to represent these four CIO/CTO/IT managers. All four organizations implemented ERP packages from large vendors, such as SAP and Oracle. Besides the ERP systems, multiple systems, such as Kronos, SalesForce, etc., were also adopted to perform specific functions to reach many of the business goals set in place. All the systems have APIs that facilitate communication with each other.

SalesForce has been a recent implementation to the sales tracking ecosystem in the telecommunication company. While SAP could have been used for sales, as the company grew its offerings to allow for customers to complete their own purchase orders, the need for a system that allowed both company employees to enter sales as well as customers while centralizing the data to keep track of commission payouts only for employee entered sales. The implementation of SalesForce happened much faster and with better user adoption due to the lessons learned while implementing SAP.

The clothing retail company implemented Kronos as a way to keep track of time for employees who timestamp using the company Avaya phones. This system was designed to save time by automatically keeping track of all timestamps and sending the information to Oracle to facilitate finance with employee payroll. This replaced employees manually entering their time in the ERP system, with frontline leaders required to audit the time entered with a timestamp report. The implementation of Kronos was also smoother than introducing Oracle. The rollout of Kronos was only met with issues regarding technology compatibility with legacy Avaya phones still in use and with the API passing the information accurately between Oracle and Kronos. Within weeks the issues with the rollout were fixed, and the adoption process was almost immediately completed.

Even though all four ERP implementations were successful, the IT managers found issues during the post-implementations. Among all the issues, the critical one that the change management teams from all four organizations concernedwas that many users did not use the system as intended. While ERP created a centralized place for all the data needed for the business, many users did not fully adopt the systems unless they had no other option than to use the ERP systems. For example, users would export ERP data to an Excel spreadsheet and utilize the data without further updating it from the ERP systems. These actions resultin issues that the systems were supposed to specificallyresolve redundant data and out-of-date/incorrect data. Additionally, although the ERP systems have the convenient functions to analyze the data for business decisions, many users still export all the data from the ERP systems and analyze the data using Microsoft Excel.

According to the IT managers, inappropriate use of the ERP system also includes the use of data within the system has led some people to forgo proper data handling procedures. This has forced all the organizations to actively scan all attachments in company email, disable USB storage on all company equipment, and create yearly training on proper data handling so that sensitive customer, supplier, and employee records.

All four organizations switched their vendors when they upgraded their ERP systems from either SAP or Oracle to Workday or Microsft Dynamics. The IT managers gave their reasons for these decisions. Although the upgrade to SAP S4/HANA or the latest Oracle system improved some usability issues, some issues persisted. The organizations believed that replacing SAP/Oracle with Workday/Dynamics would overcome many of these hurdles still present.

The first issue that all organizations were concerned about was the time needed to develop improvements and deploy upgrades. Compared to Workday/Dynamics, both SAP and Oracle required a much longer development time to work with the upgraded systems. Furthermore, the training features/functions from Workday/Dynamics are more convenient, efficient, and user-friendly. For example, a new feature is directly implemented within Workday called WalkMe, which gives on-demand training embedded into the tool functions. There will no longer be a need to have site experts answer questions about the system or the use of the system. However, intensive training programs were required by both SAP and Oracle from their upgrades. This would absolutely increase the cost of training, and, according to their previous experience, the efficiency of these training programs typically would not reach the organizations' expectations. Lastly, some new usability features/functions from Workday/Dynamics would improve many business processes with higher productivity and improve end users' performance. For example, there are tedious steps needed to maintain and enter data into SAP/Oracle. In many cases, there is a list of specific codes needed to be entered to record data to the appropriate location accurately.

That requirement will now be gone with Workday, cutting down the time required to enter inventory data. Responsibility will also be shifted to frontline leaders to handle things that directly impact the leader's agents, such as corrective actions and even terminations. Many departments will also become centralized instead of segmented, and while this may cut down on overall workforce needs, many employees will be re-skilled to fit into new roles. As some employees move on to new positions, the possibility will exist that the role will not be backfilled, and the reduction needed to the workforce number will be achieved.

From our qualitative study, user resistance does play an important role in ERP upgrade decisions. This is in line with many previous studies (Alzahraniet al., 2021; Lissillour& Wang, 2021; Salih et al., 2013;). However, according to the IT managers we interviewed, this user resistance could be reduced by adopting an ERP system with better UI/UX.The UI/UX of an ERP system has become a critical factor influencing organizations' decisions for their ERP upgrades because end users' performance would be improved by adopting an ERP system with better UI/UX. However, while performing our literature review, there was a lack of work on the relationship between the ERP UI/UX and user performance. Many academic studiesfocused on user performance using ERP systems, the impact of the implementation process on user performance, and how the system fits the business and its impact on user performance and satisfaction, but very little worked on the relationship between the UI/UX of an ERP system and user performance.Therefore, in this study, our hypothesis will be: an ERP system with better UI/UX would improve user performance and further impact the adoption decisions to ERP upgrade projects.

Quantitative Study

Before conducting our quantitative study, we did another literature review about system UI/UX theories. Many different factors contribute to a successful implementation of an ERP system and its positive impact on an enterprise's operations. They are made to benefit the enterprise and increase productivity but failed ERP implementations have led to financial difficulties (Mekadmi andLouati, 2018). One that should not be overlooked is the user interface (UI) and the user experience (UX) of working with a well-designed UI. A poorly designed ERP system will only lead to not being approved by employees and slower performance. The features of the ERP system will not be put to their best use if the UI/UX is poorlydesigned, and employees cannot navigate and utilize the system properly (Ng, 2013). The design of the UI in ERP systems is GUI-based and should be able to enhance the usability of ERP systems. (Siriginidi, 2000).

The user interface is the visual aspect of how users interact with the ERP systems. The purpose of user interface designis to make sure the visual elements and screens of the ERP systems are well organizedto work coherently with the end-user experience. UI and UX are commonly used together, but they are two individual design models. UI is the graphical layout of an application that shows the user interactions with the system, commands, and techniques of the application. The UX is the overall experience that an individual gains from using the system or design (Joo, 2017). UX focuses on the product tasks, whereas UI focuses on the appearance of the product. Both are used together in order to create an overall appealing system for potential users of the system. UI/UX style of system design will not solely focus on the tasks or visual appeal of the system, but it will focus on both aspects of design. This will allow an ERP system to not only function properly but also catch the user's eyes and keep the users engaged in using the products.

Kurosu and Kashimura (1995) introduced a theory that the visual aesthetics of an interface are more important than the functionality and other qualities of a system (with regards to UX). Aesthetic Usability Effect theory refers to users' tendency to perceive a product (such as a mobile game, as is the case in this report) with a minimalistic and aesthetic design as more usable and visually appealing (DurãesDourado& Dias Canedo, 2018). It states that users tend to mainly tolerate minor usability issues; if such a design can also provide positive feedback for a user, they will instinctively conclude that the system design operates smoother, with fewer errors, and will want to utilize the specific design feature repetitively. Basically, users are more likely to overlook its flaws if it looks pretty. This Aesthetic Usability Effect theory suggests that visual design can impact a user's perception of an interface's functionality (Tuch et al., 2012).

User interface (UI) design is vital to conveying the look and feel of the system to the user. A good UI makes the user's interaction with the system a pleasant experience where interactions go efficiently and are as straightforward as possible.The theory of comprehensibility requires vendors to create an easily understood system layout for the users (Bhaskar et al., 2011). If the user needs to complete a task, the steps to complete that task should be obvious or simple.Therefore, the system designers should avoid unnecessarily complex UIs in the system design. When faced with two options, a designer might choose the simpler option to guarantee that a UI is made as simple as possible unless necessary (DurãesDourado& Dias Canedo, 2018).

The schema theory suggests that information that does not fit into the schema is not comprehended correctly or may not be comprehended at all (Widmayer, 2004). This means that users will better understand an interface that is user-friendly and not as complex. This can be used in UI and UX design by ensuring the design is nice to look at and easy to use for users. The design should use the icons, symbols, or themes that most users are familiar with to reduce the unfamiliarity of the system to the users. This will make the UX of the system increase because if everything is structured nicely, users can find everything they need easily and without problems.

From the above UI/UX theories in the literature, we found the theoretical evidence to support ourhypothesis that an ERP system with better UI/UX would improve user performance. To support our hypothesis that an ERP system with better UI/UX would further impact the adoption decisions for ERP upgrade projects, we conducted two surveys among top management level and end-users in all four organizations we interviewed before.

Survey

In the quantitative study, we developed two surveys. The survey instruments were designed and evaluated by a group of experts for content validity. Six experts from two universities and four organizations were asked to read the survey and decide whether, in their opinion, it measured what its name suggested. The survey items measured the factors reflecting the benefits and challenges of upgraded ERP solutions identified from the literature and our qualitative study. The survey questionnaires were improved according to comments from the experts. The final surveyswere returned to the experts and approved before being emailed out to the organizations' employees.

The first survey was sent to all the top management managers in the four organizations and asked them to evaluate the importance of each construct and rank the key factors influencing the ERP selection for upgrade projects that we found from the literature review and the qualitative study. A total of 9 out of 33survey responses, including 4 CIOs and 5 IT and department managers, were obtained(male: 67%, female: 33%).We listed 9 factors of the new ERP system in the survey. UI/UX, functions/features, vendor support, time needed for upgrade, budget, training, consultants' suggestion, data migration, and customization requirements.

The second survey was sent to 200 end-users working at 6 departments in the four organizations and asked them to evaluate the importance of each construct and rank the key factors that impact their performance during ERP operations. UI/UX, enough training, cheerleader, communications, help desk support, and key user support are listed in the survey.

A total 82survey responses were obtained after removing 6 incomplete questionnaires. The distribution of the respondents was as follows: gender (male: 61%, female: 39%). A wide variety of departments were represented in the responses as shown in Table 1.

Table 1 Survey Responses Department Summary

Department	Number of Employees
Operations	20
HR	8
Sales & Marketing	12
Finance & Accounting	10
Service	26
Warehouse	6
Total	**82**

Data Analysis and Discussion

1. *ERP Upgrade Package Selection*

According to the average ratings in Table 2, the results indicate that there are top three factorsidentified by the top management facing the ERP upgrade selection solutions which are extremelycritical and important with importance evaluation over than 4.0when they make selection decisions: Time needed for upgrade, Budget, and Functions/features of the new system. The second group, which is critical and important with over 3.0 importance value, includes four factors: UI/UX, Vendor support, training, and data migration. The two last factors, customization requirements and consultant's suggestion, received lower ratings from the top management.

Table 2. Constructs Relative Importance from Top Management

Constructs	Average Importance (1 – 5 scale)	Rank
Time needed for upgrade	4.8	1
Budget	4.75	2
Functions/features	4.48	3
UI/UX	3.96	4
Vendor support	3.73	5
Training	3.69	6
Data Migration	3.08	7
Customization requirements	2.90	8
Consultants' suggestion	2.72	9

When discussing the concerns of ERP upgrade, the first thing that the ICOs talked about was the amount of time for the project. With a long project duration, it would take away from work productivity. This was one of the main reasons they decided to switch vendors for their upgrade projects. Additionally, the modification and setup processes for either SAP or Oraclewere time-consuming becauseof the complexity of the systems and potential errors or mistakes generated from the systems.In this case, they decided to switch to a vendor package that does not take much time for implementation and setup.

Another concern that the CIOs discussed during the interview was the budget required for the implementation. The cost of upgrading with current vendors with SAP or Oracle was much more than switching to a new vendor. The implementation of upgrading the current systemwas a high-cost and challengingproject that placed tremendous demands on corporate time and resources.

When the four organizations made their decisions on the upgrade projects, they all did a gap analysis to compare the upgraded ERP systems between the current vendor's package and the new vendor's system. Their gap analysis results showed minimum differences that they could stand.

AlthoughUI/UX was only ranked #4 in the list, all CIOs recognized the usability issues of their current systems and tried to improve them by selecting a new system with a better UI/UX design. This was another important reason they chose either Workday or Dynamics because most of their employees were familiar with the new systems' user interface, navigation, and operation logic.

Vendor support represents an important factor with any packaged software, including extended technical assistance, emergency maintenance, updates, and special user training (Barth and Koch, 2019). Therefore, ERP systems need a long time commitment with the vendors.All CIOs criticized their vendors' services from SAP or Oracle and showed satisfaction with their current vendors, Workday and Dynamics.

The lack of user training and education has been one of the significant determinants of many ERP systems failures (Ma'arif andSatar, 2018). End users will become frustrated and refuse to use the system if they do not know what happens in the processes (Chauhan and Jaiswal, 2016). CIOs further stated that the full benefit of ERP systems could not be realized until end-users use the new system properly.Therefore, early acceptance from the end-users would ensure the success of the upgrades and enhance their performance. Both Workday and Dynamics need less training because of their usability design and advanced self-training programs.

A fundamental requirement for ERP system effectiveness is the availability and timeliness of accurate data (Günther et al., 2019).Data problems could cause severe implementation delays, and as such, the management of data entering the ERP system represents a critical issue throughout the implementation process (Tarigan et al., 2020). CIOs pointed out that data from their bolts-on system could be tough to be migrated to the upgraded SAP or Oracle systems. However, Workday and Dynamics are more flexible in handling the data migration. This is an additional reason they eventually chose to switch.

Customization and consultants were assessed with a minor impact on the ERP upgrade selection. To gain prompt marketing and operational reactions with sufficient efficiency and effectiveness, more and more organizations reduced their level of customization in the ERP systems (Hustad et al., 2016; Parthasarathy and Sharma, 2017). In addition, most of the current large organizations have adequate experience in ERP implementations. Therefore both technical and managerial assistance from consultants become less important than other factors.

2. *End-users Perspective on Operational Performance*

From the data in Table 3, the results indicate that there are top three factors identified by the end-users which are extremely critical and important with importance evaluation over 4.0 influencing their operational performance in ERP: UI/UX, Enough training, and Help desk support. The second group, which is critical and important with over 3.0 importance value, includes two factors: Key user support and Communications. The last factor, cheerleader, received lower ratings from the end-users.

Table 3. Constructs Relative Importance from End-users

Constructs	Average Importance (1 – 5 scale)	Rank
UI/UX	4.65	1
Enough training	4.37	2
Help desk support	4.01	3
Key user support	3.85	4
Communications	3.14	5
Cheerleader	2.45	6

When an ERP system has usability issues such as poor navigability and lack of task support, it will lead to frustration from the users. Users' opinions of an ERP system are influenced by factors such as the complexity of the system, cooperation, and user training (Xu and Topi, 2017). If the ERP system is heavily customized and more complex, it will require more training and be more challenging to use and navigate. Additionally, end-users would find another way to operate the system if the process workflow in the stems is not easy to use, which typically causes mistakes.

Hwang and Grant (2011) argued that usability and familiarity of GUIs to the end-users at the systems specification level are essential factors of ERP performance. This is supported further by Ng (2013) thattop management needs to pay particular attention to the ERP usability quality in terms of ease of use and ease of learning because this crucial variable impacts end-users performance.When the system provides information in a format that is easy for users to understand and has a convenient interface, users will be more satisfied. When users are satisfied with the ERP system, their performance will increase due to the lack of frustration and the easy-to-use UI that allows them to complete their work faster. Users will always trend toward using ERP systems with simple and straightforward mechanics, making the work more routine and easier to accomplish (Ratcliffe andPuthusserypady, 2020). The results of our second survey are in line with the literature that, from the users' perspective, UI/UX is the number 1 factor influencing their performance in ERP operations.

Overall, selecting ERP software that best matches organizational information needs and processes is critical to ensure minimal modification and successful implementation and use (ValipourKhatir et al., 2018). The results of our study from both qualitative and quantitative perspectives support our hypothesis that an ERP system with better UI/UX would improve user performance and further impact the adoption decisions to ERP upgrade projects.

Conclusions

How ERP is utilized in organizations has changed over recent years. New ways of upgrading ERP systems are on the rise, where many organizations are switching to vendors with more efficient and effective usability and compact ERP systems (Ruivo et al., 2020).This study aims to improve the understanding of ERP upgrade projects. Through both qualitative and quantitative studies, the paper recognizes a series of critical issues that must be carefully considered to ensure a successful implementation of an ERP upgrade.In essence, from CIOs' perspectives, these factors, time needed for upgrade, budget, functions/features of the new system, UI/UX, Vendor support, training, data migration, customization requirements, and consultant's suggestion, are teamed together to build a complete picture toward the decision-making of ERP upgrade package selection.

The results of this study provide organizations with valuable knowledge that might prompt them to make significant changes in their next ERP upgrade. Fromusers' perspectives, UI/UX was ranked #1 in the list, influencing their performance in ERP. This gives the ERP vendors a hint that improving the usability of an ERP system may increase the organization's continuance usage of their EPR package. The findings also have important theoretical implications. This paper is the first study focusing on relative importance of all the constructs in ERP upgrade package selection. Researchers can build more studies on this initial research.

Limitations of this study include the small and convenient sample size and the limitednumber of organizations that participated in the study. We will expand the quantitative study for our next research. We will statistically test the relative importance of all the constructs and provide more precise results from quantitative analysis.

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