

**FACTORS INFLUENCING ENTERPRISE RESOURCE PLANNING SYSTEM
IMPLEMENTATION IN HIGHER EDUCATION INSTITUTIONS; A CASE STUDY
OF DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY**

William Nderitu Maina

Dedan Kimathi University of Technology, Kenya

Zakary Muchiri Njoroge

Dedan Kimathi University of Technology, Kenya

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ABSTRACT

Enterprise Resource Planning is also business management system that comprises integrated sets of comprehensive software, which can be used, when successfully implemented to manage and integrate all the business functions within an organization. These sets usually include a set of mature business applications and tools for financial and cost accounting, sales and distribution, materials management, human resource, product planning and computer integrated manufacturing, supply chain, and customer information. The study focused on the factors influencing ERP system implementation in higher education institution which was conducted in Dedan Kimathi University of Technology. The study adopted descriptive research design. Both quantitative and qualitative data were used. The study established that the goals and the expectations during the ERP system implementation were clearly communicated to the campus community in a clear capacity. The findings indicated that the preparation of staff by the institution for change was very effective. Implying the staff was well made aware of the changes that might have occurred during the implementation of the ERP system. Moreover, the study established change as an important factor affecting the ERP system implementation. The study concludes that there exists a link or a connection amongst the goals and expectations communicates during the implementation, the change in work functionality during the implementation, the investment in the institution's and human resources and the steps and measures taken towards drawbacks, pitfalls and shortcomings to be experienced during the implementation.

Key Words: *Navision, Enterprise Resource Planning System, Modules, and Efficiency*

Introduction

The reliance and dependence on ERP systems have grown substantially since the early 1990s, and the purchase and implementation of ERP systems continues to be one of the fastest growing segments of the information technology sector (Lou & Strong, 2004). Within the software and application industry, no other segment comes close to competing with the sales of ERP systems (Sawyer & Southwick, 2002). Lou and Strong, "The reason behind this phenomenal growth is the promise that ERP systems can provide an integrated business

computing solution and improve a company's ability to compete in the marketplace". Swartz (2000) and Sawyer and Southwick (2002) stated that current purposes, emphases and reasons for ERP purchases and implementation are much more concrete now than ever before.

Furthermore, emphasis is placed on putting an ERP system in place to provide a self-service environment to the organizational customers and users via a web based technology that can be accessed on both local private intranets and the public internet. Although many reasons exist for the growth in ERP systems, the core emphasis on ERP system implementation focuses primarily on processes of re-engineering, business process analysis, best practice analysis, and utilization of transaction processing. Almashari (2003) specifically stated that the tools of business process re engineering and ERP system are closely united, which has resulted in an undeniable source of gains in productivity, effectiveness, and efficiency for the organization.

The bottom line is that organizations employ ERP systems to make important and critical decisions using vital and timely knowledge from a central repository of accurate data that cuts through the organization's functional departments and environments. A consequence of the growing trend to purchase and install ERP systems is the organizational financial commitment for implementing and maintaining the systems.

Organizations have spent millions of shillings implementing ERP systems, and the expenditure of budgeted and non-budgeted funds on ERP systems is regarded as the single largest investment made by organizations in the arena of technology (Holsapple & Sena, 2003). They further reported that between the years of 2000 and 2005 inclusive, annual ERP sales increased by over 150% each year, reaching a level of over \$31 billion in sales on ERP systems. Implementation of an ERP system is one of the single largest investments in shillings and human resources that institutions of higher education might ever make (Kvavik & Katz, 2002). Given the cost of purchasing, implementing, and maintaining ERP systems, institution leaders must strive to be good stewards of organizational funds and make wise decisions how best to utilize available and limited financial and personnel resources.

Many goals, expectations, and opportunities exist for ERP system implementations in higher education institutions. These goals, expectations, and opportunities frequently are very different from institution to institution; however, each of the goals, expectations, and opportunities are quite relevant to the way each institution of higher education conducts its business. Goals, expectations, and opportunities can range from being very specific in nature to global generalities. What is a primary goal, expectation, or opportunity of one institution's ERP system implementation may not even be a consideration in another institution's ERP system implementation.

The overarching goal of every organization however, is to successfully complete the ERP system implementation, which in general terms involves automation, standardization, and integration of shared common data and practices in a real-time mode across the entire organization (Fui-Hoon Nah, 2003). ERP packages are attracting increasing attention from both academic and industrial communities. No comprehensive review has been carried out on

development and the implementation of the ERP system. The implementation of the ERP system is an extensive, lengthy and costly process, typically measured in million of shillings. The investment is in both software itself and in related services such as consulting, training and system integration. Although an ERP system is a pure software package, it embodies established ways of doing business. Studies have illustrated that an ERP system is a pure software package to be tailored to an organization but an organizational infrastructure that affects how people work and it imposes its own logic on the company's strategy, organization, and culture.

Profile of Dedan Kimathi University of Technology

Dedan Kimathi university of technology (DeKUT) is a successor of former Kimathi University College of Technology (KUCT) that existed between 23rd August 2007 to 14th Dec 2012, which was itself a successor of the Kimathi Institute of Technology (KIT) .KUCT was a constituent college of JKUAT from 23rd August 2007 to 14th December 2012. The institution started offering degree programmes in 2006. As an accredited centre of JKUAT, it ran JKUAT degrees under supervision of JKUAT senate. There were about 20 students in the initial group of 2006. Kimathi institute of technology was founded in the 1970s and began as Nyeri district community initiative to serve as a technical base. From which the community would advance technologically to keep pace with the rest of the world and serve community needs. It espoused the spirit of self reliance and determination engrained in the community and demonstrated in the national struggle for Kenya independence, which was epitomized by the freedom fighter Dedan Kimathi after whom it was named.

DeKUT was awarded charter on the 14th Dec 2012 by former president Mwai Kibaki. This followed the commencement of the university Act 2012. DeKUT is located some kilometers from Nyeri town along the Nyeri-Nyahururu road. It is sited at the expansive grounds covering 864 acres. For the university to increase access to education and in recognition of the needs and constraints of the employed people, DeKUT has opened the Nyeri Town campus in the heart of Nyeri Town at Prestige Plaza and Pamki House. Here self sponsored students conveniently undertake their studies in the Central Business District of the Town. Nairobi CBD centre is located on the tenth floor of the Union Towers building which is at the junction of the Moi Avenue and Mama Ngina street. The centre is headed by an accomplished scholar, Dr. Peter Muchiri. The ERP system was established in the year 2010. The ERP software used in Dedan Kimathi University of Technology is known as micro dynamic Navision 2009.

Statement of the problem

The successful implementation of an ERP system can bring many benefits to a higher education institution which includes standardized business processes, improving procurement through ensuring compliance with procurement best practices, facilitating consolidation of financial data, promotion of relationship management, lowering cost of doing business, supporting global expansion, supporting proactive financial planning, enabling governance

and compliance and performance management. However, there are substantial challenges faced by the institution; the goals and expectations of implementing ERP system have not been clearly defined, there are problems associated with the huge costs for the institution's and human resources such as costs of training, consulting etc, Institutions have failed to fully implement ERP system as a result of changes that comes with the implementation of the system by the staff. In the implementation of an ERP system there are drawbacks, pitfalls and shortcomings, these may include but not limited to: failure to rely on best practices, lack of proper communication, and difficulty in maintaining of the ERP system that and may lead to failures. Hence, due to the challenges in the implementation of the ERP system, researcher has pioneered to conduct the research on factors influencing the ERP system implementation in higher education institutions and to bring a clear understanding in the realization for the successful implementation of the ERP system.

General objectives

To analyze the factors that influence ERP system implementation in higher education institutions.

Specific objectives

1. To determine the goals and expectations communicated to campus community during the ERP system implementation
2. To establish the steps taken to prepare stakeholders for the change in work functionality as a result of implementation of ERP system.
3. To examine the results of investing in the institution's and human resources of the institution into the ERP system implementation.
4. To establish the steps and measures taken to prepare for, protect against potential drawbacks, pitfalls, and shortcomings of the implementation of the ERP system.

Review of the theoretical literature

Goals and expectations

Organizations contemplating an ERP system implementation may set many different goals and expectations. Organizational goals can be mutually exclusive, tightly interwoven, or can overlap with one another (Fui-Hoon Nah, 2003). One institution may have only a few all-encompassing goals as each pertains to the ERP system implementation, while another institution may have a large number of very specific and pointed goals. The primary goals identified in the review of literature for an ERP system implementation are enhanced customer service, replacing legacy systems, implementation of best practices, and accurate and readily accessible information via a centralized relational database. Regardless of the goals, it is essential that institutional leaders define and clearly communicate those goals across all organizational boundaries.

One goal of ERP system implementation is enhanced customer service for institutional constituents, especially students, faculty, staff, and administrators. Providing better administrative and management tools through ERP system implementation for decision making, reporting, and making institutions more competitive is essential in any ERP system implementation. Hosapple and Sena (2003), reported that more demand than ever before is being placed on data retrieval and data manipulation, as institutional leaders must acquire knowledge to make informed decisions. It is now more critical that information be entered quickly and accurately into the ERP system, so that the desired information can be retrieved in a timely capacity. Higher education institutions are becoming more dependent and reliant on technology resources and the use of information (Arif, et al., 2004). Thus, the expectations of improved efficiency and effectiveness in the day-to-day functional activities of the institution, along with the other benefits brought to the organization, is an expected result of implementing an ERP system.

A second goal of an ERP system implementation, and perhaps one of the more traditional and most frequently stated of objectives, is to replace out-dated, cumbersome, and batch oriented legacy systems (Yakovlev, 2007).Yakovlev further stated that the biggest challenge for an institution undergoing an ERP system implementation is dealing with the consequences and impact of changes to the existing organizational business processes and practices that developed around the legacy systems. Users become engrained in existing processes without fully understanding the foundation and basis for the processes, even to the point when asked why they do something, the answer given is, “that is the way it has always been done.” Fui-Hoon Nah, et al. (2003) and Yakovlev reported that the more complexity associated with a legacy system, the greater the level of change in the technological and organizational environments as a result of an ERP system implementation.

A major problem with legacy systems is that many of the existing systems are no longer supported (Arif, et al., 2004). In addition, the cost to maintain the hardware that the legacy systems run on is increasing dramatically to the point it is more cost effective to purchase new hardware than to pay for maintenance support on that existing hardware (Lou & Strong, 2004). However, in many instances the legacy application systems may not run on new hardware. Another problematic concern with legacy systems is the inability to provide accurate information on a timely basis .Al-Mashari, (2007). Existing legacy systems frequently are so convoluted that it is difficult to obtain relevant information that should be used in decision making processes. In addition, Soh, et al. (2003) reported that information requested by administrative decision makers often is not available because the necessary data were never collected, not available, or were stored in ways that make it difficult, if not impossible, to retrieve.

Finally, the shift in how business is conducted in higher education is radically changing. The “green screen” and client-server processing are rapidly becoming terms of the past and replaced by web services via the internet and intranets. Addressing issues of growth and scalability, while providing appropriate constituent functional services in a timely capacity, are important factors in any ERP system implementation. Thus, in regards to legacy systems,

it is becoming more and more costly to maintain these legacy systems in terms of financial and personnel dollars. In addition, decisions are made without adequate information that impact current and future direction of higher education institutions. Finally, changes in technology lead institutions to more effective and efficient alternatives for conducting daily business when compared against legacy systems.

Another goal of ERP system implementation often associated with being a key selling point by vendors for their ERP package is the ability to enter, maintain, and keep information in a single relational common database that is accurate, available in a real-time capacity, and permits integration across the entire organization (Fowler & Gilfillan, 2003; Yakovlev, 2002). Both the day-to-day users of the ERP system and the decision makers of the organization must have access to accurate data that are available in a very timely fashion. Because of the integration of a relational database, ERP systems generally provide the ability for increased knowledge across departmental and functional lines that support cross-functional processes (Fowler & Gilfillan, 2003; Soh, et al, 2000). Thus, data common to multiple areas need to be entered only once, so that the data can be shared across all functional and departmental units of the institution.

In addition, when a data element must be changed, any functional or departmental area with appropriate access and permissions can make the change, which will immediately be available to all other functional and departmental areas. No longer do students need to go to multiple departments to change their current address, but rather an address can be changed from a single location and made available to all other areas. And because all data are in a common relational database, the changed data are immediately available across the organization.

Finally, the ability to create a report with information that crosses functional and departmental lines can be accomplished within a relational database (Luo & Strong, 2004). The result is that decision makers can now make those tougher decisions based on more meaningful data that are accurate and much more easily accessible on very short notice. In addition to the goals listed above, other goals and expectations, for higher education institutions that choose to implement an ERP system solution. Some of these goals include (a) the ability to provide better information for planning and management decisions, (b) increased productivity, (c) reduction of costs, and (d) integration of all campus departments and functions onto a single computer system to better serve those departments and functions (Kvavik & Katz, 2002; Swartz, 2000). Kvavik and Katz further reported that institutions can expect to lower their business risks and increase revenue opportunities as a result of an ERP system implementation.

Change in work functionality

Because an ERP implementation generally is the essence of a large-scale institutional change that involves many, if not all, of the institutional participants, the organization must recognize and address change management issues. Siau and Mesersmith (2003) reported that the more employees are involved in the issues of change management, the higher the success rate of

ERP system implementation. In addition, the social issues and cultural environments of the organization must be managed throughout the institution to build the foundation for a successful implementation of an ERP system (Sawyer & Southwick, 2002; Yakovlev, 2002). Fowler and Gilfillan further reported that cultural factors were more influential than not in the success of an ERP system implementation, and thus, should carry as much importance as the traditional technical and functional aspects of an implementation system.

The whole concept of change management is perhaps the most important single factor that needs to be fully addressed by any organization embarking on the journey to implementing an ERP system (Soh, et al, 2003). Many institutions do not realize the impact of an ERP system implementation on the culture, norms, values, traditions, practices, and communications of an institution (Yakovlev, 2002). Al-Mashari (2003) reported a major cultural shift for those higher education institutions implementing an ERP solution.

ERP system implementations will cause change, and institutions must be ready to address the many changes that will occur to the people who make up the institutional culture and into the traditional functional processes. Sawyer and Southwick (2002), and Wognum, et al. (2004) reported that ERP system implementation ask people to change how they do their jobs, which is very difficult for many people to accept and adapt to in their positions. Esteves and Pastor (2004) stated that ERP systems cannot be achieved without realizing and taking into account the impact on organizational context.

Furthermore, Morgan reported that organizational change implies cultural change, which is above and beyond changes in technology, rules, systems, procedures, and polices. Institutions cannot take these factors for granted. Trott, and Hoecht (2004) reported that one of the biggest mistakes of ERP system implementation is the failure to realize the impact of change on employees and processes. Stakeholders within the institution must be identified and made a part of the overall implementation. In the context of including employees in the ERP system implementation, Communication is a key element. Unfortunately, few institutions do communications well even in the best of circumstances and environments.

As part of the change management process, organizations must be ready and willing to make changes that align the organizational structure and ERP system implementation in context of the formal and informal interactions between each other. “ERP system implementations usually require people to create new work relationships, share information that once was closely guarded, and make business decisions they were never required to make” (Frantz). Consequently, ERP systems are implemented as opposed to installed, which basically requires a paradigm shift throughout the institution. Frantz, et al. (2002) and Wognum, et al. (2004), suggested that because organizational change will occur and the organization cannot fully define the structure of the overall ERP system implementation as it is started, the implementation process becomes a dynamic process between the ERP package, the organization, and all the organizational members.

Based on the experience of organizations that have gone through ERP system implementation, the more an organization can determine and prepare for the anticipated

change brought about by the ERP system implementation process, the better the organization will respond to and deal with the overall change process (Trott & Hoecht, 2004). Furthermore, Al-Mashari (2003), reported that change management needs to be a continuous activity of any higher education institution prior to, during, and after the ERP system implementation process. Finally, organizational changes need to be accompanied by transformational leadership behaviors as idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration so that those constituents highly involved in the ERP system implementation can develop a sense of trust, admiration, loyalty, and respect toward the administration and project management leadership. Clearly, organizations need to emphasize the organizational leadership actively addressing all the issues of change management brought on by an ERP system implementation.

Institution's and Human resources

It is no secret that the purchase, installation, and implementation of an ERP system are expensive in terms of both institution's and human resources costs. As reported by Dong-Gil Ko, et al. (2008), over \$31 billion were spent on ERP systems in 2008. Yet, the base purchase price of the ERP system application is only a part of the total cost of implementing an ERP package. Fui-Hoon Nah (2003), Haines (2003), reported that one of the biggest costs of an ERP system implementation is attributed to the cost of consulting fees. Sawyer and Southwick (2002) further reported that when an organization implements an ERP system solution, on the average between \$3 and \$5 will be spent on consulting fees for every \$1 spent on purchasing the application. A lot of time and dollars needed to train existing staff on the new ERP package (Siau & Mesersmith, 2003). Although different staff will be trained at unique levels, generally the technical staff supporting the ERP system will be trained at a high level.

One major consequence of ERP system implementation as it pertains to staff is the increase of staff turnover (often attributed to working too many hours during the implementation process and the lure of more salary at another organization) resulting in increased costs associated with replacing these key individuals. An additional factor that contributes to the cost of any ERP system implementation is the amount and level of customizations made to the system (Soh et al., 2003). Customizations can be costly on a number of fronts, which include the cost to conduct the customizations, the cost to maintain the customizations, and future costs to change updates to the ERP application that do not take into consideration customizations made at the organizational level.

Generally speaking, the costs associated with customization are very difficult to ascertain, and often are really not known until long after the customizations were conducted and put into production (Luo & Strong, 2004). From a historical standpoint, higher education institutions have difficulty in tracking information technology related expenses. In addition, real and perceived inequities arise regarding the funding of an ERP package, especially in light of the politics that are involved in an enterprise-wide ERP software implementation.

The absence of an implementation budget to cover all aspects of an ERP system implementation puts severe constraints on the institution's ability and effort to complete a successful implementation (Frantz, et al., 2002). Wognum, et al. (2004), stated that many ERP system implementations suffer greatly from budget and time over-runs even with the best of budget plans. Therefore, Siau and Mesersmith (2003), resource allocation through some type of organized budget is a very important component for successful ERP system implementation and controlling costs, which includes allocations for consultants, ERP system software and training.

Drawbacks, Pitfalls and Shortcomings

Not every ERP system implementation is 100% successful. Even though ERP system implementations often become operational, many of these ERP system implementations are completed at the expense of addressing any given number of issues and concerns that have undesired consequences and impact upon the organization (Fui-Hoon Nah, 2003). Many organizations report that the expected and anticipated benefits and advantages of purchasing and implementing an ERP system are elusive and may never be fully realized (Wognum, 2004).

The drawbacks, pitfalls, and shortcomings naturally associated with ERP systems implementation may not be an issue to every organization, but organizations must give attention to those factors that can prevent the successful ERP system implementation. Arif, et al. (2004), ERP systems are expensive to install, large and complex, difficult to maintain, and consume large blocks of time to install and make fully operational. Dong-Gil Ko, et al. (2009) identified some of the specific reasons causing less than successful ERP system implementations that include lack of in-house expertise and experience, poor employee retention, and difficulties keeping up with technologies (software and hardware).

The communication difficulties are a major impediment to ERP system implementations, especially when the different functional and departmental entities need to share knowledge and understanding of data and information requirements across the organizational infrastructure (Fowler & Gilfillan, 2003). Moreover, those individuals involved with the ERP system implementation may not be qualified to do what they have been tasked to do. Besides staff not being qualified for an ERP system implementation, often the number of individuals dedicated to implement the new ERP system is insufficient in a timely fashion and yet maintain existing systems (Al-Mashari, 2003). Attention must be given to that fine line of not over-tasking staff to implement a new integrated system while maintaining the existing system and doing so at a fair and equitable compensation. Other factors can impede an ERP system implementation.

Organizations do not realize that putting the ERP system application into production is not the end of the story, but rather just the beginning. It is not uncommon for benefits of an ERP system not to be realized until several years after the primary implementation (Gattiker & Goodhue, 2005). In addition, the initial implementation pertains to the main modules while

other minor systems and sub-systems are installed at a later time after the overall ERP system package has been in a production mode for a period of time.

There is also the need to stay on top of the constant major and minor updates and patches released for all the modules associated with the ERP system implementation. Organizations fail to understand and anticipate the on-going costs associated with an ERP system implementation. For example, accommodations for training are a constant requirement with any ERP system because of the many technical and functional changes that transpire in the life of an ERP package (Nicolaou, 2004). Another example is the annual cost associated with support and maintenance contracts, which allow organizations to maintain current version levels of all ERP system components, and obtain technical and functional support for the ERP package (Yakovlev, 2002). It is not uncommon for the cost of the support and maintenance to be a percentage of the price paid for the ERP system or a percentage of the current ERP list price. Fowler and Gilfillan (2003) reported that another unanticipated on-going cost is the expense associated to keep the ERP system fully functional.

With the technologies in place today and the continual changes in technology, replacement of servers occurs on a more frequent basis than in the traditional mainframe world. In addition, on-going direct and indirect costs are associated with developing interfaces and purchasing third party systems designed to work in conjunction with the core of the ERP system. Gattiker and Goodhue (2005) reported that as a result of the misalignment or misfit of organizational requirements and the functionality of the ERP package, it is not uncommon for departments to want more functionality with an internally developed interface or third party add-on product, which can be costly to maintain over the long run. Organizations often do not anticipate the dip in performance immediately following the initial implementation of an ERP system (Gattiker & Goodhue, 2005). Despite appropriate levels of training, the transition to a new system includes a level of overhead as users become acclimated with the new system.

The drop in performance varies from organization to organization, but can be compounded with any turnover in the technical and functional staff (Yakovlev, 2002). A contributing factor to the dip in performance is the expected impact and change on the organizational culture, norms, and values.

Review of Critical Literature and Gap to be filled

Difficulty in enhancement of customer service

It would be difficult to analyze knowledge transfer and knowledge management during ERP system implementation to enhance customer service. User involvement and satisfaction are key in implementing ERP systems and far more likely to succeed when user involvement is high and when users have realistic expectations about the scope of the implementation and system functionality (Bonner, 2000).

This therefore has not depicted how then the goal of enhancing customer can be best attained. Kovacs (2003) stated that integration of all the data is only factor that makes ERP system

such an effective tool for improving customer service This study thus clearly shows how customer service can be enhanced, through efficient operation enabled by a good ERP system leads to an increase in quality, reductions in cost and more accurate delivery promises all of which add up to better customer service.

Replacement of the legacy systems

Valacich (2010) one of the major challenges posed to institutions that implement enterprise systems involve changing business processes and replacement of the legacy systems. To accommodate the manner in which hardware and software works, enterprise systems implementation are often used as a catalyst for overall improvement of underlying business processes. Not all enterprise vendors may be built on best practices into the application provide guidelines for management to identify business activities within the institution that need to be streamlined and legacy system to be replaced will go through implementation and future upgrades and will not go smoothly when companies change their best practices to fit the enterprise operates.

Scholars have not put it clear on why the legacy systems need to be replaced whereas we know this as an important goal of ERP system implementation. It is therefore impossible for the organization to maximize their benefits by taking advantage of the best practices only when the organization does make major modifications to their ERP software during implementation and replacement of the legacy systems. In this study on the there is great insight on the replacement of the legacy systems during the ERP system implementation,

The difficulties in the integration

To achieve high level of integration may be difficult if not impossible task, majorly by using a common database across departments (Reynolds, 2010). However department may give up functionality for overall benefit being integrated.

Enterprise resource planning implementations are so prevalent not merely because of the hype created in the market but to adopt the best practices to the operations. This also indicated that integration of data was the secondary goal of the ERP system implementation. Motiwalla (2009) identified the main goal of ERP implementation as to make information flow in an institution to be dynamic and immediate, therefore increasing usefulness and value of information.

The above scholars were not clear on this how integration can be of benefit and why institution should be looking forward to have integration in their departments whereas we know integration as a very important function therefore a gap exist. In an integrated system there is only one data base; data is added only once and there is no disagreement about which system has the right data. Everyone has instant access to the latest information so business processes focus on execution not data collection, works flows seamlessly between departments and decisions are more likely to be the correct and timely. This study has

elaborated on the benefits that accrue with the use of a common database as a goal in the ERP system implementation in the higher education institution.

Changes in the work functionality

Luvai (2000) discusses the changes before, and just after, the implementation. He examines changes in the implementing organization especially focusing on the effects of the finance function, Murella (2005) ERP's scope usually implies significant changes to staff work processes and practices. They did not indicate how change management can be done for successful implementation whereas know we it is important, generally, three types of services are available to help implement such changes consulting, customization, and support.

Implementation time depends on institution size, number of modules, customization, the scope of process changes, and the readiness of the customer to take ownership for the project. Modular ERP systems can be implemented in stages. This study broadly elaborates on the changes and how these changes can be managed and also the elements of change.

The costs for the ERP system

According to Reynolds (2010), the costs of typical ERP system implementation is overly high. He indentified five cost drivers for the ERP system implementation. These are the degree of the business process change expected will bring high cost of training and effort to overcome resistance to change, the degree of the customization required where the greater ERP system must be customized by the greater the costs and the number of implementation location. The other costs are the greater the number of site (which increases the cost), the scope of business to be impacted, the more the modules to be implemented the greater the cost, the degree of legacy systems where the more the legacy systems the greater the costs despite that did not bring to light the linkage to the institutions and human resources.

Basically the scholars in spite of the above failed to mention about areas that are usually overlooked and underestimated when setting the budget for the ERP system implementation these may include but not limited to: hardware upgrades, testing, data conversion, and consultants. Indirect costs includes the expense on consultants, maintenance, the time spend by employees on the process, the transportation and communication expenses. Motiwalla (2009) indicated that ERP system does not really require a substantive investment from the organization in terms of time, cost and people whereas we know no institution will be willing to invest in institution and human resources unless benefits outweigh costs.

This study provides a comprehensive insight on cost of ERP system implementation, it also depends on many constant and variable factors such as hardware, number of software license, implementation time, needed additional resources, add-on applications, training, and consultancy, integration to other applications, testing, customization, implementation and future costs. The expense on hardware and license are direct as well as fixed costs but the expense on customization, training, business process reengineering, maintenance and implementation are indirect costs and it can vary from case to case.

Failures of ERP system

George W. Reynolds (2010) there is several common factors that may be associated with failure of ERP system implementation. These are failure to gain senior management commitment and involvement, choosing wrong business partners to help, not adequately assessing the level of ERP customization that may be needed and lack of effective knowledge transfer. Thompson (2009) stated that the failures and the drawbacks may be a result of resources and time. Some failure cases have been reported; however, few scholars provide exactly these ERP system failure can be and have not identified what factors are most significant in the failure of these ERP systems.

This study provides a comprehensive overview of the drawbacks, pitfalls and shortcoming that are prevalent to any institution that might be embarking on a successful ERP system implementation. There are negative consequences for an organization when modifying the ERP System to match existing processes. Motiwalla (2009) if the organization decides to implement the ERP system, disruption will occur with the functioning of the institution, employees will have to be retrained in the new business processes that will generate resistance from the users, adding to training expenses for implementation. Thus management must pay close attention to organization consequences of modifying or not modifying the ERP software to match the institution business processes.

A wrong decision can bring down the entire organization whereas right decision can reap enormous benefits. Stamper (1999) points out the limitations of current ERP systems and introduces the principles on which the second generation could be built to achieve massive reductions in development, support, and maintenance costs

Communication difficulty

Communication is not the only important factor that should be considered for change to occur in the institution. Other factors should also be considered. (Mutiwalla, 2009).But also stated that it is important to continuously communicate with new users during the change process at all levels in the organization. Scholars have deviated much from linking the ERP system implementation with the communication. Employees who are affected by the new system need to be informed of its progress so their expectation will be set accurately. People need to be notified many times about change.

The study on the ERP system implementation has provided an insight on that so that a clear linkage between ERP system and communication can be realized. Communication is key towards managing expectations, when expectation are set to high people tend to frustrated, upset disappointed with the results. Sandra (2009) when communication are set ,people may have difficult in adapting or be surprised about the extent of change .Thus to allow people time to accept and fully use new system, a vigorous communication program should be adopted. Lack of communication will create tension and resistance to system. There is a difference of seeing the necessity for change and be able to make the change itself. Therefore

this study has tried to explain the need for important elements of change in an institution by having in of change management.

Reynold (2010) reported that change is expected in roles and responsibilities for employees across the institution. These changes include modification in the employees do their work and interact with others. Further many institutions see implementation as a way of cutting costs through elimination of workers and thus people fear they will lose their jobs. It is human nature to resist changes. Organization resistance manifest in many ways e.g. valuable employees may resign from the organization rather go through transition. In this study communications has been identified in the review of literature as an important component to any ERP system implementation.

Communications are by default assumed to be addressed through the defined structure of the ERP system implementation as a whole and by each component of the ERP system implementation plan. It is one thing to say communication methodologies and processes will be defined and conducted for the ERP system implementation, but it is quite another thing to ensure the methodologies and processes are fully implemented, utilized, and supported. Motiwalla (2009) stated it is essential to develop, understand and communicate return on investment, business processes and need for change. Rarely do systems fail due to hardware or software not working appropriately.

Conceptual Framework

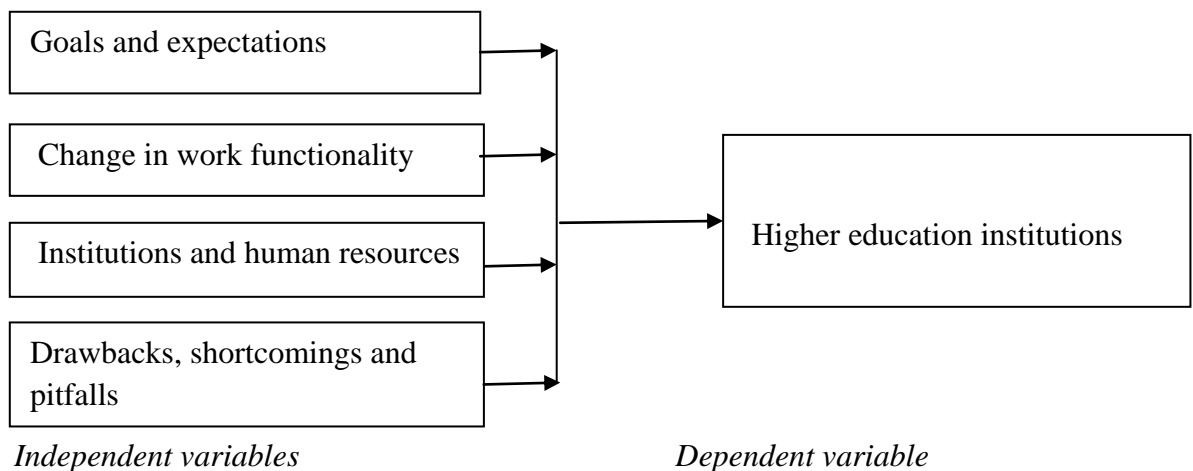


Figure 1: Conceptual Framework

The above conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate this, (Mugenda, 1999) .It tries to explain the relationship between dependent variable i.e. higher education institutions and the four independent variables i.e. goals and expectations, institution’s and human resources, change in work functionality, and the drawbacks, pitfalls and shortcomings.

Dependent variable

Higher education institutions

ERP system implementation in higher education institution must be evaluated differently, what is important in one institution may or may not be important to another institution. Each organization must evaluate all the different attributes of an ERP package. There are many attributes associated with and affect the enterprise resource planning implementation process. These key attributes include, but not limited to: knowing and understanding of; goals and expectations, change in work functionality, the value and outcomes of investing on institutional and human resources, drawbacks pitfalls and shortcomings. Therefore for successful implementation the implementation would depend on those factors.

Independent variables

Goals and expectations

Any institution engaging in an ERP system implementation must have clearly defined goals and the expectations known. However, even when organizations take all the correct steps to clearly define and communicate goals, there are reports that organizations failed to partially, and in some cases fully, implement ERP packages into a production capacity. Appropriate considerations must be given to the institution define and communicate the goals of the ERP system implementation to the campus community. This would greatly contribute to the successful implementation of the ERP system.

Change in work functionality

The very nature of an ERP system implementation suggests change, which must be accommodated within the scope of the overall ERP system implementation in order to raise the chances of success. The impact and consequences of change management elements are overlooked and ignored. A number of elements are associated with change management, including organizational realignment, idealized influence, individualized consideration, inspirational motivation, and intellectual stimulation.

Fundamental elements of change management simply cannot be underestimated. Although change can be considered a fixture in any organization, people typically are resistant to change. As changes in business processes and practices are reviewed, updated, and realigned throughout the implementation process of an ERP systems so must appropriate changes be implemented in the organizational, management, and information. Otherwise, as reported by, ineffective change management will result in an extended dip in productivity, and potentially, failure of the overall ERP system implementation. Simply put, no aspect of an ERP system implementation can be taken for granted. For the successful implementation of the ERP system the change in the work functionality should be closely determined.

Institutions and human resources

Implementation of an ERP system is one of the single largest investments in shillings and human resources that institutions of higher education might ever embark upon. Yet, many higher education institutions have already implemented ERP solutions, or are in the implementation of an ERP system, or are contemplating ERP system implementation. Given the overarching costs associated with implementation of ERP systems, it is important to understand the interest and investment of institution's and human resources by higher educational institutions into the implementation of any ERP system. This affect the ERP system implementation in that for any successful ERP system there are values for that, it also enables to determine whether results and outcomes are worth commitment of institution and human resources.

Drawbacks, Pitfalls, and Shortcomings

There are potential obstacles to any ERP system implementation. Institutions are unique, any one, potential negative impacts to the overall success of an ERP system implementation include, but are not limited to the following: Consequences and unplanned misalignments between ERP system features and the organization requirements and failure to rely on best practices of the ERP system which are the results of vendor contact with existing customers. Others are; lack of preparation for the organizational and cultural transformation and change that comes with ERP system implementation, deficiencies of available and unavailable pre-defined reports, costs associated with training, consultants, and testing, not allocating proper time frame for implementation, lack of appropriate knowledge transfer from consultants and trainers to organizational staff, employee turnover during implementation, difficulty of changing, modifying, and maintaining an ERP system, over reliance on ERP vendors and providers to conduct installation and implementation without core understanding by institutional members, the complexity and largeness of the implementation. Therefore, it is important to know what organizations must do to prepare and protect themselves from drawbacks, pitfalls, and shortcomings of ERP system implementations.

Research Methodology

Research design

The researchers used descriptive study design because it would be aimed at gathering quantitative data and qualitative data which was used to determine report and reveal the way things are about the factors influencing the ERP system implementation in higher education institutions. Therefore it enabled a detailed and comprehensive study. In 2009, Kombo stated that descriptive study is undertaken in order to ascertain and be able to describe the characteristics of the variables of a situation. He further reported that the goal of the descriptive study is to offer the researcher to describe relevant aspects of a phenomena of interest from an institution or organization or other perspective. Descriptive research, it is concerned with conditions or relationships that exists, options that are held, processes that are going on, effects that are evident, or trends that are developing.

Target population

The target population for the study was drawn from departments in Dedan Kimathi University of Technology. These personnel were from procurement department, finance department, human resource department and ICT department.

Sample design

Kombo (2009) defined the term sampling design as that part of the research that indicates how cases are selected for observation sample is a unit in a population which has been selected for the study. He stated sampling to be the systematic selection of limited number of elements out of a theoretically specified population of elements. A sample size of 50% of the population was taken to give a total sample of 20 members out of the targeted population of 40 members; indeed 50% of the sample population is required as the sample size; because it would be convenient and manageable for the study (Kadam, 2004). The researchers used purposive sampling to select the four departments. The power of purposive sampling lies in selecting information rich cases for in depth analysis related to the central issues being studied. Stratified random sampling which is a type of probability sampling was used where a sample size of 50% was taken from each department (strata). Stratified random sampling was used because it ensured inclusion, in a sample, which otherwise would have been omitted entirely by other sampling methods because of their small numbers in the population. (Mugenda, 1999). The goal of stratified random sampling is to achieve a desired representation from the various subgroups in the population.

Data Collection and Instrumentation

Data collected for this study was obtained primarily from use of questionnaires. The questionnaire comprised of both open-ended and close ended questions. Close ended or structured questions refers to questions which are accompanied by a list of all possible alternatives from which respondents select the answer that best describes the situation. Unstructured questions or open ended questions refer to questions which gives the respondent complete freedom of response. These free response questions permit an individual to respond in his or her own word. The questions were designed to obtain information from the sample population specific to the research questions. Contingency questions were also used with the purpose to probe for more information in which they were close ended and open ended where the respondents were required to give some explanation in a subsequent question. (Mugenda, 1999)

Data analysis and presentation

Data collected using the questionnaires was analyzed. The questions were aimed to allow targeted respondents to express their views and their opinions freely on the implementation of the ERP system in their various departments of the university. The data was analyzed using percentages and presented using tables and pie charts. These helped to summarize and present

data in a form that made it easier to understand and identify trend and patterns. The intent of the data analysis was to provide a complete picture of the implementation of the ERP system in higher education institutions.

Research Results

What were the goals and expectations communicated to campus community during the ERP system implementation?

On the surface this research question is quite simple, yet the foundation as to why an ERP system implementation is being conducted should be firmly established with all institutional constituents. The key component to this research question pertained to defining and communicating appropriate goals and expectations of engaging in an ERP system implementation to the campus community. The intent was to determine if the component had more critical impact upon chances of the overall success of the ERP system implementation. The questions focused on the definition of the goals of the ERP system implementation and other allowed respondents to provide their specific input on the definition and communication of the ERP system implementation, goals and expectations.

In the findings it was clear indication that out of the respondents sampled, 10% indicated that goals of the ERP system implementation were not clearly defined, 5% indicated that the goals of the ERP system implementation were not defined, 5% of the respondents indicated that the goals were neither defined nor not defined, 60% indicate that the goals of the ERP system implementation were defined and 20% indicated that the goals of the ERP system implementation were clearly defined. From the findings it was clear that the goals of the ERP system implementation were defined and there stakeholders knew what they were to aim at in the realization the goals of the successful ERP system implementation. The data indicated that largest percentage of the respondents indicated that the goals were defined and data strongly agreed the overall perception of the goals of the ERP system implementation was very important to the success of the ERP system implementation.

The intent of the question on the level of customer service was to gather information on how satisfactory services offered through the ERP system implementation can be. The rating was from very low to very high. No respondent indicated the level of customer service was very low, 5% of the respondent indicated the level of customer service was low, 45% indicated the level of customer service was medium, 35% indicated the level of customer service was high and 15% indicated the level of customer service was very high. Over 95% of the respondents indicated at there were some level of customer service. The findings indicated that the level of customer service was medium therefore need for improvement. This was one the goals of the ERP system implementation and this shows that there was success in the implementation of the ERP system this was indicated by the provision of quality services as and when they could be required.

The intent of the question on the use of a common database was to get insight on how the departments of the university were integrated with the use of the common database and

communication between departments is facilitated. No respondent indicated the use of a common database was very effective, 5% of the respondent indicated level of use of a common database was ineffective, 10% of the respondent indicated the use of a common database was neither effective nor ineffective, 75% indicated the use of a common database was effective, 10% indicated that the use was very effective. The findings indicated that use of a common database was effective in the ERP system implementation in the institution. This also represented 95% of the respondents who rated the use of a common database as effective. This goal of the ERP system implementation could be realized and it also meant that there was successful ERP system implementation in the institution where departments could be integrated with one another.

Last question asked “were the goals and expectations communicated during the ERP system implementation?” 65% indicated that the goals and expectations were communicated during the ERP system implementation, 35% indicated that the goals and expectations were not communicated, the comments indicated greater emphasis were on better services to students, comprehensive integrated system, improved accuracy/central repository database and use of newer technology. The data indicated that the goals and the expectations during the ERP system implementation were clearly communicated to the campus community in a clear capacity. The data strongly suggested that the overall perception of the goals and expectation of the ERP system implementation were important to the success of ERP system implementation. The goals and the expectation were comparable to ones in the literature review.

What were the steps taken to prepare stakeholders for the change in work functionality as a result of the ERP system implementation?

Two questions were designed to answer the research question number two .One question asked “How would you rate the degree of change when comparing how activities were done before and after the ERP system implementation in your institution?” On a 5 point scale ranging from extremely no change to extreme change out of the twenty respondents, 5% indicated that there was extremely no change no respondent indicated that there was no change, 20% indicated there was moderate change, 50% indicated there was change and 25% indicated there was extreme change. The findings indicated that there was change in comparing how activities were done before and after the ERP system implementation. This meant with successful implementation tremendous changes have been realized especially because change is a continuous activity in a higher education institution. The respondent clearly revealed that change was a definite by product of the ERP system implementation with over 95% of the respondents that perceived there was moderate change to extreme change to work operations after the ERP system implementation as compared to before.

The second question asked “how you would rate your institution in preparing the staff for change during the ERP system implementation?” The rating was on a 5 point scale ranging from very ineffective to very effective. Out of the twenty respondents, 10% indicated the institution rate in preparing the staff for change was very ineffective, 15% indicated that it

was ineffective, 30% indicated that it was neither effective nor ineffective, 40% indicated it was effective and 5% indicated it was very effective. The findings indicated that the preparation of staff by the institution for change was very effective. Implying the staffs were well made aware of the changes that might have occurred during the implementation of the ERP system, therefore it was evident that 75% of the respondents perceived there was a level of effectiveness by the institution for preparing the staff for change in the organization structure and culture during the ERP system implementation.

What were the results of investing the institution and human resources of the institutions into the ERP system implementation?

Three questions were designed to answer the research question on what were the results of investing in the institution and human resources in the institution. The first question targeted the institution's resources i.e. financial, software; hardware etc. the second question targeted the human resources. The other question was seeking for specific respondent input on the value and the benefit for investment on the institution and human resources. On the ERP system implementation based on the literature review, the purchase, installation and implementation of the ERP system is expensive in terms of both institution and human resources cost. The foundation of this research question is that the more the institution can know, prepare for and address the issues of institution's and human resources, the higher the likelihood of successful ERP system implementation.

The first question asked "How would you rate the investment on the institution's resources against the outcomes and results of the ERP system implementation?" none of the respondent indicated very low value of the investment of institution's resources, 5% indicated there was low value in investment of the institution's resources, 55% indicated moderate value in investment of the institution's resources, 35% indicated high value of the investment of the institution's resources, while 5% of the respondent indicated there was very high value in the investment of institution's resources. The findings indicated that the investment of the institution's resources against the results and outcomes was of moderate value. The statistical information of over 95% of the respondents perceived at least some value and importance in investment on the institution resources as it relates to overall success in the ERP system implementation. This was commitment on the hardware resources, software etc. to ensure successful implementation of the ERP system implementation.

The second question was investment on human resources as opposed to the one outlined above on the institution's resources and the question asked "How would you rate the investment of the human resources against the results and outcomes of the ERP system implementation?" Out of the twenty respondents, none indicated the investment on human resources was of very low value, 15% indicated the investment on the human resources was of low value, 30% indicated the investment on human resources was moderate value, 50% indicated the investment on human resources was high value and 5% indicated the investment on human resources was of very high value. The findings indicated that the investment on institutions human resources was of high value. This clearly showed that the employees play

important roles in the ERP system implementation and therefore great need for the investing in them for the better results and outcomes of the ERP system implementation as was the case with investment in the institution resources the data strongly indicated respondents perceived the investment on the human resources was of significant value in regards to overall success of the ERP system implementation.

The third question pertained to attaining input on the value and worth of the investment institution and human resources. The research question asked “Are the results of the ERP system worth the commitment on the institution’s and human resources?” Out of the twenty respondents, 80% indicated that the results are worth the commitment on institution and human resources, 20% indicated that the results are not worth commitment on the institution and human resources?”. The data indicated positive values and benefits to the investment of institution and human resources as they relate to the ERP implementation. Further data analysis indicates the value and worth of the institution investment on the ERP system implementation. The respondents greatly emphasized on these categories of improved functionality, efficiencies, increased communications, increased productivity, integrated system, replace old /obsolete system and services to students and staff. Comments indicated there were inadequate programs for the training of the staff on the use the ERP system during the implementation. The data collected for the research question indicated that respondents perceived great value and worth towards commitment of the institution’s and human resources on the ERP system implementation, overall data suggested that the investment on the institution and human resources is a key factor in determining the success of the ERP system implementation. The data further indicated more value appeared to be associated with the investment on institution resources than the human resources as related to the overall success of the ERP system implementation but not by a large margin.

What were steps and measures taken by the institution to prepare for the potential drawbacks, pitfalls and shortcomings?

Two questions were designed to bring insight on whether the measures were effective or not. The first research question was based on a scale of 1 to 5 which ranged from very ineffective to very effective. The drawback, pitfall and shortcomings were listed and the respondent was supposed to tick against each, rating them. “How do you rate the steps and measures taken against lack of preparation for institutional, cultural and transformational change?” in this question, 10% of the respondents indicated that steps and measures against lack of preparation for institutional, cultural and transformational change were very ineffective, 20% indicated they were ineffective, 10% indicated the steps and measures were neither effective nor ineffective, 50% indicated that steps and measures were effective and 10% indicated the steps and measures were very effective. Therefore findings indicated that the steps and measures taken against lack of preparation for the institutional, cultural and transformational change were effective. These may include the steps and measures to deal with old ways of doing things and changing to new ways. The data clearly suggested that 60% of the respondents perceived steps and measures taken were effective so as to achieve the overall success of the ERP system implementation.

The other question was “How do you rate the steps and measures taken against lack of preparation in dealing with the consequences of installing the ERP system implementation?” on the scale ranging from very ineffective to very effective. Out of the twenty respondents, 15% indicated that steps and measures taken against lack of preparation in dealing with the consequences of installing the ERP system were very ineffective, 20% indicated that they were ineffective, 15% indicated that they were neither effective nor ineffective, 40% indicate that they were effective and 10% indicated that they were in very effective. The findings indicated that steps and measures taken against lack of preparation in dealing with consequences of installing the ERP system were effective. These consequences may include the maintenance and repair costs. This was to ensure overall success of the ERP system implementation. A response rate of 65% clearly shown that the steps and measures were effective. But more still needs to be done in dealing with consequences of installing of the ERP system implementation.

The other question was “How do you rate measures taken against improper allocation of human and physical resources?” On the scale ranging from very ineffective to least effective 10% indicated that steps and measures taken against the improper of human and physical resources were very ineffective, 15% of the respondents indicated the steps and measures were ineffective, 20% indicated that the steps and measures were neither effective nor ineffective, 45% indicated the steps and measures were effective and 10% indicated the steps and measures were very effective. Thus the findings suggested that steps and measures taken against improper allocation of the human and physical resources were effective. Through proper allocation it would ensure successful implementation of the ERP system. The data clearly suggested 55% of the respondent rate indicated that steps and measures taken were effective though this implied more needed to be done in order to ensure overall success in the ERP system implementation.

The other question was “How do you rate the costs associated with training, consultancy and contracted services?” On the scale ranging from very ineffective to least effective it was evident that, 10% indicated that the steps and measures taken against costs associated with training, consultancy and contracted services were very ineffective, 15% indicated that the steps and measures were ineffective, 20% indicated that the steps and measures were neither effective nor ineffective, 15% indicated that steps and measures taken were very effective. The findings indicated that the steps and measures taken against costs associated with training, consultancy and contracted services were effective. Sometimes it may be costly to the institution in terms of consultancy and training but when necessary steps are taken this can indicate successful ERP system implementation. The data suggested 55% of the respondent indicated that steps and measures were effective this implied that more needed to be done to deal with costs associated with training consultancy and contracted services.

The other question asked “How would do you rate the steps and measures taken against difficulty in changing, modifying and maintaining ERP system?” on the scale ranging from very ineffective to very effective. The finding indicated that, 10% of the respondents indicated that the steps and measures taken against difficulty of changing, modifying and

maintaining the ERP system were very ineffective, 5% of the respondents indicated that steps and measures were ineffective, 25% of the respondents indicated that they were neither effective nor ineffective, 45% indicated that the steps and measures were effective and 15% indicated that steps and measures were very effective. The findings indicate that the steps and measures taken against difficulty of changing, modifying and maintaining of ERP system were effective. Data suggested 60% of the respondents indicated that the steps and measures taken were effective but still more needs to be done to ensure overall success of the ERP system.

By combining the data from the questions it was clear that impact in the work place had resulted from the ERP system implementation. The other major question was “Are there steps and measures taken for any potential drawback, pitfall and shortcoming of engaging in ERP system implementation?” 65% of the respondents indicated that there were steps and measure taken against the potential drawbacks, pitfalls and shortcomings, 35% indicated that there were no steps and measures against the drawbacks, pitfalls and shortcomings, the data indicated that the respondents perceived the steps and measures were taken by the university to prepare for change brought about by the ERP system implementation that included access to real time and accurate data, access to training, assigning data ownership, change of position and duties, regular meetings and communication and staff to be encouraged. The data also indicated some level of dissatisfaction from small group of respondents regarding steps and measures to protect against to protect against the potential drawbacks, pitfalls and shortcomings of the ERP system implementation, which include increased workloads not addressed, no consideration for staff, not enough done on problems that arise due to fail of the system, and preparations not provided. The staff needed to be trained on the use of the ERP system. Overall the findings supported the claim that a key relationship exist between preparing for a wide assortment of change from the potential drawbacks, pitfalls and shortcomings brought about by an ERP system and its overall success level of the ERP system implementation.

Conclusions

The first research question for this research project was, “What were goals and expectations of the ERP systems implementation were defined and communicated to the campus communities?” The data confirmed the goals and expectations of the ERP systems implementation that were defined and communicated to the campus communities and included automation of business processes, better and faster access to data, better service to students, comprehensive system integration, improved accuracy and central database, on time and on budget, and new technology. The data further suggested that the campus and project leadership was more than effective in defining and communicating the goals and expectations for engaging in the ERP system implementation to the campus community.

The data supported the premise of a significant link exists between the definition and communications of the goals and expectations for conducting an ERP system implementation and the overall success obtained from completing the implementation. In other words, the

level, depth, and breadth of definition and communication on the goals and expectations for engaging in an ERP implementation did drive the level of success achieved. The data also suggested a link appears to exist between the work efforts system expended by the individuals of the implementation and the overall success of the ERP system implementation. From the change management perspective, leadership must take the appropriate steps to communicate to the campus community about the potential changes that result from any type of ERP system implementation.

The second research question asked, “What steps were taken to prepare stakeholders for the changes in work functionality as a result of the ERP system implementation?” The focus of this research question was on the stakeholder changes that transpire with the functional operations resulting from the ERP system implementation. The underlying principle is that a key relationship existed between the steps taken to prepare for the many different types of changes brought about by the ERP system implementation and the overall success of the ERP system implementation. One constant factor of ERP system implementation is that change will occur within the organization at many different levels. The whole concept of change, and managing that change, is perhaps the most important single factor that needs to be fully addressed by any institution embarking on the journey to implement an ERP system. Thus, the more campus constituents can know about and be prepared for anticipated change, the higher the chances and degree of success of the ERP system implementation. According to the data, Steps taken to prepare campus stakeholders for change included administrative support, appropriate implementation time lines, appropriate levels of funding and staffing, building project document and planning, invested hard work, regular meetings and communications, teamwork and joint efforts, testing, training, and use of dedicated consultants

The data showed that some respondents perceived a few areas of weakness in preparing the campus environment for the operational changes resulting from the ERP system implementation. In addition, the data also suggested that some respondents perceived not enough was done to prepare for change at desired levels. When considering the reported success of the ERP system implementation from the respondents perspective and the overall data for the research question, properly managing the changes brought about the ERP system implementation had a positive impact upon the success of the ERP system implementation. Therefore, the data supported the existence of a key connection between the implementation of change management methodologies for an ERP system implementation and its overall success.

The third research question asked, “What were the results of investing the institution’s and human resources of the institution into the ERP system implementation?” The foundation of this research question was that a key connection existed between the institutions and human resource costs and the overall success of the ERP system implementation. The data indicated the respondent’s perception was that a number of initial and ongoing costs were associated with an ERP system implementation, which included initial cost of the application, consulting services, backfilling, overtime, turnover, support and maintenance, training, and hardware.

However, the data showed a small segment of the respondents perceived additional measures should have been taken to accommodate the ERP system implementation team members to ensure a successful implementation of the ERP system, but no specifics were provided. The quantitative data and the qualitative data both strongly supported the foundation that a key connection existed between the success of an ERP system implementation and the investment of institution and human resources. An ERP system implementation consumes large amounts of time from those individuals that make up the implementation teams, and institutions must adequately prepare for and address effectively the institution and human resources costs to ensure a successful implementation.

Implementation of ERP systems continues to involve major financial commitments by higher education institutions. There is little room for error in order to achieve a successful, efficient, and effective ERP system implementation given the financial investment. In addition, any knowledge and information pertaining to the ERP system implementation process that can be obtained from the experience of other higher education institutions can be of great value and benefit for institutions that have not gone through the process.

The fourth research question was, “What were the steps taken to prepare for, protect against potential drawbacks, pitfalls, and shortcomings of the ERP system implementation?” This research question was based on the fundamental belief that change can and does occur as a result of an ERP system implementation. The premise was that a significant connection existed between an implementation and how institutional leadership prepares the campus constituents for the known and unknown drawbacks, pitfalls, shortcomings, and other changes encountered during the ERP system implementation and the overall success of the ERP system implementation. The data collected from the respondents indicated significant changes were incorporated in the functional operations of day-to-day work activities when comparing work responsibilities prior to and after the ERP system implementation. The data further supported the premise of a key connection existing between addressing change and the overall success of an ERP system implementation by indicating communication transpired between all campus constituents to adequately prepare for the many different drawbacks, pitfalls, and shortcomings of the ERP system implementation and the natural changes that accompany such a system. The qualitative data also supported the connection between preparing for change and ERP system implementation success.

The data indicated a small group of respondents perceived that not enough was done to prepare against the negative components encountered during the ERP system implementation however, the data strongly indicated it was important to prepare and plan for the issues and concerns associated with the different drawbacks, pitfalls, and shortcomings of an ERP system implementation. When considering all the data, the data supports the fundamental belief that a connection exists between the success of an ERP implementation and the ability to address the changes associated with the drawbacks, pitfalls, and shortcomings of an ERP system implementation.

Recommendations

The researchers recommend that there should be clear goal definition and communication in the institution and hence the institution will embark on the enhancement of customer service, this leads to increased customer satisfaction and motivation to all the stakeholders. The use of the common database that would help to integrate all the departments involved greatly in the ERP system implementation in the institution.

The research recommends that as part of introducing change in the work functionality in the institution that training be organized at least once per year for both existing and new employees of each department. The researcher also recommends that the ERP software upgraded from micro dynamic Navision classic of 2009 to the new version of 2013 this would ensure the institution is up to date with new technology. The researcher recommends that more ERP system experts be employed in the institution so as to help in the overall success in the ERP system implementation. The researcher recommends that incase of change in the institution the communicated should be made to all stake holders. The management should consider forming a strong implementation team as the institution continues to expand in growth and as it realizes the changes.

The research recommends that there is great need to take care of new and existing staff through compensation and benefits. One tool necessary to take care of the existing staff is to back-fill positions so that existing staff can be dedicated to the ERP system implementation. It is one thing to expect employees to buy into the ERP system implementation, but it is another issue to expect employees to continue to do all existing work and still find the time to implement an ERP solution. Taking care of employees is critical.

The researcher recommends that the institution should concentrate areas regarding employees is the amount and type of training provided by the organization. Adequate money, time, and effort should be spent on training. It is too easy to underestimate the true need and cost of training prior to the start of an ERP system implementation. Training is the most underestimated cost and need for any ERP system implementation. It is essential for knowledge transfer to occur between the vendor implementation training team and the institutional staff through training. Finally, because successful ERP system implementation require change in and to organizational participants, it is imperative that the ERP system implementation project be treated as a people project.

There is a great need for the institution to ensure proper planning is done for the use of both institution's and human resources so as to obtain maximum value from these resources. Proper budgeting should be done and these can be included in the budget ERP vendor licensing, software licensing, database licensing, hardware costs, ERP system vendor implementation training, change management cost, staffing costs and maintenance and miscellaneous costs this would ensure inclusion of all costs required for the implementation. Given the cost of purchasing, implementing, and maintaining ERP systems, institution leaders must strive to be good stewards of organizational funds and make wise decisions how best to utilize available and limited financial and personnel resources this would ensure that

the results and outcomes are worth commitment of the investment on both institutional and human resources.

This study recommends that proactive steps and measures should always be taken to counter drawbacks, pitfalls and shortcomings. Proper preparation need to be done for institutional, cultural and transformational change this can be done through proper communication in the institution on these changes, the institution need to be aware of the consequences of installing the ERP system. This can be done through consultation with the well established and with experienced institutions using the ERP system. The researcher recommends that proper allocation of the human and the physical resources would amount to great efficiency and effectiveness in the processes and the systems to be adopted.

The researchers recommends that for higher education institutions who have conducted ERP system implementations there should be actual contract between the institution and the selected vendor. Everything associated with the ERP system implementation must be in writing and clearly understood by all parties involved. Contracts should address issues such as the cost of the base product, add-ons, consultants, services, support contracts, training, fines, additional fees, etc. One contract option to consider is the use of a fix-price contract for the aforementioned items. Generally speaking, contract responsibilities should be left to individuals skilled in contract negotiations and to the legal staff to ensure a quality contract.

The institution should make sure tests for the scalability of a proposed ERP solution before the implementation starts. Institutions need to have a solid understanding of the direction of the ERP implementation prior to starting the implementation as opposed to once the implementation is underway. Scalability is one of the primary causes for ERP system project difficulties. With the strong emphasis on web enabled services, and also should make sure workstations and servers are configured to execute the web interfaces and core applications. It is not a good thing to prepare for the deployment of an ERP solution only to find that workstations on the desk of users will not execute the applications. Successful ERP system implementations must have appropriate levels of hardware at the server and workstation levels.

The researchers recommend use of fully developed and adequate project plans for the ERP system implementation. In addition, it is important for the institution to choose the right consultants for the ERP system implementation project with the expectation that the skill, experience, and knowledge of consultants will be transferred to organizational participants.

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