

CAMPUS ERP IMPLEMENTATION FRAMEWORK FOR PRIVATE INSTITUTION OF HIGHER LEARNING ENVIRONMENT IN MALAYSIA

RAJA MOHD TARIQI RAJA LOPE AHMAD
Faculty of Industrial of Information Technology
Universiti Selangor
Bestari Jaya Campus, 45600, Bestari Jaya, Selangor
MALAYSIA
rmtariq@gmail.com

ZALINDA OTHMAN, MURIATI MUKHTAR
Industrial Computing Department, Faculty of Information Science and Technology
Universiti Kebangsaan Malaysia
43600 Bangi, Selangor
MALAYSIA
zalinda@ftsm.ukm.my, mm@ftsm.ukm.my

Abstract: - Enterprise Resource Planning (ERP) systems are widely used by many multinational companies throughout the world. Recently, many institutions of higher learning have replaced their legacy systems to ERP systems as a means for integration advantages. Investment with this ERP system are representing the largest investment for institutions of higher learning, they invest millions of dollars and the time taken for the implementation sometimes takes two to three years, or even more. Without a solid history of successes and failures, implementers are at a disadvantage in knowing how best to implement ERP systems so that they will provide operational and strategic benefits to their owners. Due to these problems, this research is carried out in order to establish an implementation Campus ERP framework for Malaysia private institution of higher learning base on the hybrid framework.

Key-Words: - Campus Enterprise Resource Planning (ERP), Framework and Institution of higher learning.

1 Introduction

ERP systems have a tremendous impact toward to the organization, due to its broad scope and performance, making it an important area of study. The implementation of an ERP system needs the acceptance, compliance and commitment of the entire organization. As mentioned by [1] performing any ERP system solution not more on technology practices in fact it is a revolution for the organization. A comprehensive preparation before implementation is a key to success. However, it has been widely documented that ERP system implementation is a difficult task. Many companies have reported that they are facing many challenges during the implementation such as cost, time and etc.

There have been a few studies on ERP system implementation for institution of higher learning, but there is still more gap which needs to be studied.

Currently, most of the implementation framework studies are found in manufacturing and a few on service industries, and there are limited studies on establishing a framework in Campus ERP implementation. It has been know that implementation of an ERP system in institution of higher learning to be unique compared to other organization [2], so it is worth to carry out this study. The objective of this paper is to develop the implementation framework of the campus Enterprise Resource Planning.

2 ERP in Education

Enterprise Resource Planning (ERP) systems have been extensively used by many multinational companies worldwide. Recently, many institutions of higher learning have replaced their legacy systems to ERP systems as a means for integration advantages. The investment in ERP represents the

biggest ICT investment for institution of higher learning [3], they invest millions of dollars and the time taken for the implementation sometimes takes two to three years, or even more [4].

According to [5] ERP system was introduced to the IHL because of the outstanding demand by different industries especially from the manufacturing industries. Institutions of higher learning in US accept ERP system as a method to obtain high integration for their management system for the betterment of increasingly managing complex operations. ERP for institution of higher learning (IHL) was developed in the direction of support for key administrative and academic services. The module for this ERP system usually supports academic management which is inclusive of staffs, students, human resource management and finance management. The main advantages of ERP system for IHL are [6]; [7];

- 1) Improve information access for planning and managing the IHL;
- 2) Improve services for the faculty, staffs (Staff self-service environment) and students (Student self-service environment);
- 3) Enable higher availability of administrative systems;
- 4) Increase income and decrease expenses due to improve efficiency;
- 5) Lower business risks;
- 6) Integrated workflow, industry best practices, and reduce dependence on paper;

Integration all business functions in IHL environment representing academic, administration, human resource and finance. Previously it is used and supported by separate application systems. Single integrated database shared by different business function and consequently, different business modules of a single integral information solution is a key importance. Transferring of data can be between individual processes and various users in real time. The usage of the advancement technology of ICT (Web based technology, wireless, cellular and satellite) is an additional advantages for IHL communities.

Even though, implementation of ERP systems in the IHL is often described as difficult, risky and expensive, it is also sometimes unsuccessful or ineffective [8]; [9]; [10]. Chief Information Officer at George Washington University, stated that; *“Institutions, which are unlikely to switch to integrated information solutions, will find it difficult to retain their market share of students. They will, sooner or later demand services, offered by other institutions...”*

If an institution of higher learning is keen to adapt the ERP system, they must fulfil the following criteria [11];

- 1) Integration
Integration is important to ensure the quality of the service. The integration will not be limited to the inner applications of the institution of higher education, but will be extended to the national and international domain.
- 2) Flexibility
Managing the institution of higher learning (IHL) is too complex, so it is important for the IHL to be able to match the continuous development of their institution. Flexibility responds to changing business requirement, more informed management decision making and changes the way of doing business processes.
- 3) Support in decision making
The ERP system for institution of higher learning must provide the function of governance support processes and shows the data and analysis for the purpose of strategic planning and control.
- 4) Service evolution
The services must cover prospective student, existing student, academic staff, researcher, administration and support staff. These services should be a major priority and it should also be accessed from different locations.

3 Literature Review

An ERP is a relatively new phenomenon within the software industry and its implementation framework is still developing and currently most of the implementation frameworks are based on the manufacturing industry and there are a few researches regarding this implementation framework which involves the service industry. There is also a research specifically focusing on the institution of higher learning but it is more on the evaluation framework. This research will be concentrating on the method and framework that was introduced by a number of authors and practitioners (such as [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [11], [35]).

Most of the studies are focused on the critical success factors for the successfulness of the ERP implementation. Some focus on the level of implementation such as strategic, tactical and operational, some scholars derived the implementation based on the traditional System Development Life Cycle (SDLC) methodology, prototyping model and application software package

model. There is also a framework focusing on developing a variable and decision base for the success of the ERP implementation.

Most of the framework covered in this research was developed from 1990 until 2010. This regards the review of literature made by [28], [29] where they implemented specific research on ERP system in general and there are also issues on ERP implementation. Most of the industries involved from the above research are in manufacturing industry and only a few research in service industry. Meanwhile, there was a research carried out in the education industry but somehow it only converge to framewok for system assessment for ERP system that has been already used in the institution of higher learning. There is no specific direction on quality assurance (QA) formation, such QA is very important for implementation of projects to ensure quality standard and requirement by the user is fulfilled.

3.1 Critical Success Factors for IHL

[35] claimed that with only one single critical factor by itself will not ensure the success of the ERP implementation process because it is mixture a few critical factor that will cause the desire decisions to be achieve, for an ERP perspective, CSF as a set of activities that need special consideration continuously for planning and implement the ERP system. There are many factors that have been identified inside literature which directly influence and guide the ERP system implementation and it have direct impact on implementation result. In this study the CSF studies from various industries, but in this case the researcher is just focusing on factors that are related with having impact towards the institution of higher learning. As mentioned by [2] organization system and work process in Institution of Higher learning to be unique, therefore it's very important for institutions of higher learning to overcome this uniqueness for the successfulness of ERP implementation process. Here is the CSF for private higher learning institution in Malaysia. The results are based on the research above and specific research for IHL that have been done ([2]; [10]; [36]; [35]; [7]);

3.1.1 Coordinating resources;

University is fundamentally different from business organization especially in decision making processes [37], Multi skill environment (Administrator from various backgrounds of disciplines), different level of staffs (Academic, Admin and Supporting (Technical and Non-Technical), facilities management (every faculties

and department traditionally manage all the facilities on their own), establish accurate and strong communication among faculties and departments within the institution of higher learning. To ensure the success of implementation, two things must be involved;

1) *Top Management and Academic administration (Senate Committee)*

Direct involvement by the highest level (Top Management) executives and senate committee in a specific project of an institution of higher learning is very important to ensure the success of the project's implementation. It's important in the sense of setting up and serving on a quality committee, formulating and establishing policies and objectives, providing resources and training, overseeing implementation at all levels of the institution and evaluating and revising the policy in light of results achieved.

2) *Change Management*

The aim of change management is to minimize resistance during the ERP implementation, through involvement of key players of the institution (form user to the top management of the institution). The change management concept refers how necessary the implementation team to establish officially a change to management strategy and the need to consider the implications of such projects [1]. Suggestion element for the change management strategy;

- Situational awareness – understand the and who is impacted
- Supporting structure – Implementation team and sponsor structure
- Strategy analysis – Risks, resistance level and establish special tactics.

3.1.2 Stimulating and facilitating organization among staffs and etc.

1) *Standardization of workflows among faculties and academic department;* A workflow consists of a sequence of connected steps; it is a depiction of a sequence of operation for the whole entity of the institution. Based on the previous research, the tradition workflow in the institution of higher learning is different within faculties and departments due to this. It is very important to standardize the workflows for optimizing the ERP system.

2) *Facilitating differentiations of demand among staff and etc.;* Differentiation of demand between faculties and departments in

institution of higher learning tend happen, hence it is very important to equate demand to ensure the success of the campus ERP implementation.

3.1.3 Integration activities;

- 1) Avoid Duplication of data, to ensure the speed of service hence reduces costs and the benefits from it start with increasing overall integrity and end with reducing overall data protection costs.
- 2) Business end to end must be defined to link and integrate the entire Student Module, Student finance module, Human Resource module and finance module.
- 3) Modification and upgrade of the existing system to cater for the new requirement ERP system. The existing database structure must be made available for modification.

3.1.4 Self service environment;

- 1) Student self service (add-drop, credit transfer, fees payment, registration of subjects and etc.) by establishing a student portal, where it will be running to implement all matter related to student.
- 2) Staff self service (leave management, attendance, performance appraisal, payroll and etc.) by establishing a staff portal, where it will be running to implement all matter related to staff.
- 3) Single sign on environment (involving integration of databases and system application). With this facility a user log in once and gains access to all systems without being prompted to log in again at each of the different systems.

3.1.5 Developing skill and knowledge

An ERP system project involves many employees in various departments and faculties; lack of knowledge and skill could influence the success level of implementation and could also contribute to the resistance from the employees. Due to this situational the institution must implement specific program to ensure the success of the Campus ERP project implementation.

3.1.6 Project Management

Project management is the discipline of planning, organizing, securing and managing resources for the success of completion of the project goals and objectives. Therefore an effective project management is essential for a successful ERP implementation [33]; [38]. An effective project

management must contain the definition of project objective and scope clearly, work development, resource plan and tracking of the project progress [35].

3.1.7 BPR and System's Customization

[35] and [29] stated that there are two strategic approaches for the implementation an ERP system. In the first approach, organizations need to re-engineer the existing work process which can adapt ERP system package's functionality. The second approach is that the customization of the ERP system package should be avoided or at least minimized as much as possible, in order to achieve the full benefits of the ERP system. As mentioned by many researchers, if too much customization involves, chances for the implementation to fail could happen because it will prolong the project time, ruin schedules, introduce new bugs into the system, and make the upgrade to the vendor's new released software difficult.

3.1.8 Communication

[39] mentioned, strong communication between departments and faculties in the University is the main factor for the success of the implementation. Communication is one of the most challenging and difficult tasks in any ERP implementation project [14].

Therefore, it is important to include a comprehensive communication plan throughout the ERP implementation project. During implementation, users should be apprised of the project status, as well as how and when the rollout will effect them. They also should know when they can expect to be trained, convert to new system and most importantly they should be informed how their existing business processes and day to day works will change.

3.1.9 Quality Assurance (QA)

QA are applicable to present problem and suggestion in resolving the issues of the ERP implementation [40]. QA refers as a systematic monitoring and evaluation of the Campus ERP implementation project to ensure the standards of quality are being met. Two principles of QA; the project should be suitable for the intended purpose and mistakes should be eliminated. In the case for this Campus ERP implementation, the quality is determined by intended users making sure of its conforms to specific requirements and complies with established plans.

4 ERP CAMPUS FRAMEWORK

The suggestion framework here is based on the hybrid framework developed by previous scholars (books, case study, published ERP research articles were reviewed for the implementation), the constraints mentioned for the institution of higher learning as a unique environment, our own case study on the Campus ERP implementation that has been developed base on the private institution in Malaysia environment, research output on the perception and barriers for the Campus ERP implementation throughout 50 private university in Malaysia and finally, the first author provided first hand information based on his experiences as a key member on campus ERP implementation over a period of three (3) years. All the above information have been gathered then systematically unified to identify phases, critical success factors, deliverables and responsibilities. This framework has four phases where every phase will be having a combination of critical success factors (CSF's), deliverables and responsibilities (refer to fig.1, table 1and table 2).

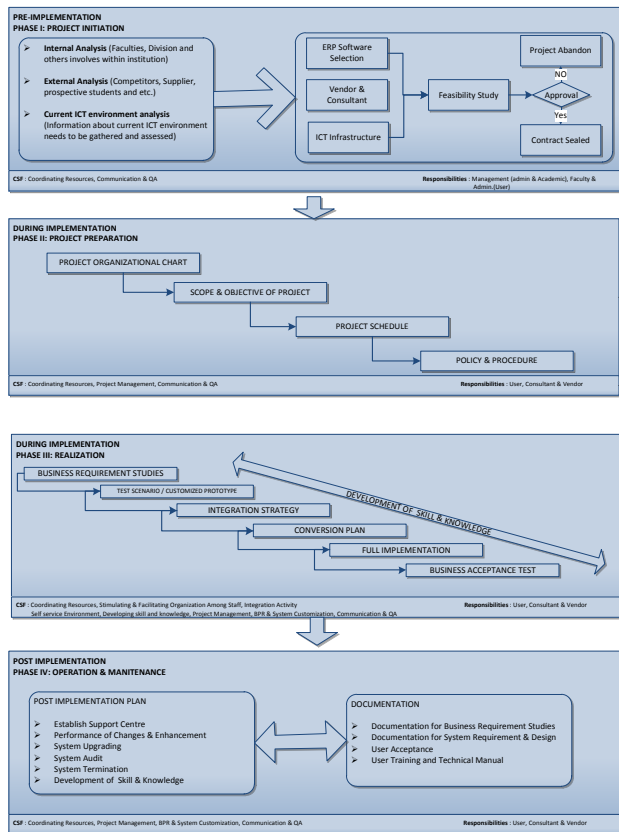


Fig1: General Campus ERP Framework

Table 1: Detail Campus ERP Framework

PHASE	DELIVERABLES	RESPONSIBILITIES
1	Project Initiation a. Analyse business environment b. Internal analysis c. External analysis d. Current ICT environment analysis e. Selection process	<i>Management, IT Division, Faculty members, Academic department, Student Affair department, Finance division, Human Resource Division and Admin Division -User -</i>
2	Project Preparation a. Scope and Objective of Project b. Project schedule c. Project organizational chart d. Policy and procedure	<i>User, Consultant and Vendor</i>
3	Realization a. Business requirement studies b. Test scenario / Customized prototype c. Integration strategy d. Conversion plan e. Developing skill and knowledge f. Full implementation g. Business acceptance test	<i>User, Consultant and Vendor</i>
4	Operation and Maintenance a. Establish post implementation plan b. Documentation	<i>User, Consultant and Vendor</i>

Table 2: CSF for Each Phase

PHASE	DELIVERABLES
1	a. Coordinating resources; b. Communication c. Quality assurance (QA)
2	a. Coordinating resources; b. Project management c. Communication d. Quality assurance (QA)
3	a. Coordinating resources; b. Stimulating and facilitating organization among staffs and etc. c. Integration activities; d. Self service environment; e. Developing skill and knowledge f. Project management g. BPR and system's customization h. Communication i. Quality assurance (QA)
4	a. Coordinating resources b. Developing skill and knowledge c. BPR and system's customization d. Communication e. Quality assurance (QA)

4.1 Project Initiation Phase

First phase inside this framework is project initiation and it involves two activities. First activity; analyze business environment where it has three levels which are institution's internal analysis, institution's external analysis and institution's ICT current environment's analysis. For internal and external analysis the study will be entirely carried out at all work processes which involve inside and outside of the institution, such as functions for every entity within the institution, business issues, opportunity and result from present process. The primary objectives carried out from this analysis are:

- 1) Clarify and document the institution corporate and individual business objectives, strategy and capabilities.
- 2) Build and refine a strategic framework which documents and links institution objectives, business strategies and strategic initiatives.
- 3) Understand the current market relevance to institution's nature of business.

Internal analysis focusing on the internal environment of the institution such as faculties, division and others involves within the institution and for external analysis, more on the external parties involves with the institution such as competitor, supplier, prospective customers and etc. The Need to keep and increase current ICT environment analysis may become a main constraining factor in developing ICT strategy for an institution. Information on the current ICT environment needs to be gathered and assessed. After all analysis has been done, then report can be carried out which focus on the viability of an idea, emphasis on identifying potential problems and attempts to answer the question and also will the idea work and should you proceed with Campus ERP implementation or not [12]. The analysis is done by all the members within the institution (Management, IT Division, Faculty members, Academic department, Student Affair department, Finance division, Human Resource Division and Admin Division).

On the second activity; Selection has several processes and the objective of this activity is to identify the most appropriate ERP package and the technological infrastructure involved for the institution and also when the decision to implement components from several ERP packages. If additional external human resources are needed, the selecting of consulting company (or outsourcer) firm also should be suggested in this activity ([12]; [16]). The suggestion for Selection activities are base on these studies ([16]; [12];[35]; [41]; [42]);

1) *ERP selection*

This will base on the specific core modules that define the main business processes of the institution, the core module are academic, finance and human resource. As mentioned earlier, implementation of ERP for institution of higher learning (IHL) is unique. The reason being so is because of the selection of the ERP module such as academic module is very important for the IHL environment [2].

2) *Collection of Vendor and Consultant information*

Consultant plays an important role in campus ERP implementation. They can help project team, help back-fill position, and help for project management, project audit, also function as the main contractor, and serve as the one stop information centre for trouble shooting ([4]; [35]).

A request for proposal (RFP) is sent to the prospective vendor and consultant and additional information is also collected from others sources (professionals, research organization, conferences and etc.). After receiving responses to the RFP, meetings are held with vendors and consultant separately. Here, they can present their proposal and solutions to convince the user. For vendors, if they have any track records with previous customers, arrangement for side visit is a must.

3) *Collection of information on technology infrastructure*

Data collection for ICT infrastructure very important, this to ensure the ERP system can fulfil the criteria such as wanted by the ERP systems [43]. This activity is performed by the IT Division, an RFP is sent to the system integrator (SI) vendor and additional information is also collected from other sources (professionals, research organization, conferences and etc.), and this for searching possible technology solutions compatible with the ERP vendors responses to the RFP sent to them. At the end of this step, this information is kept for future analysis during feasibility studies.

4) *Feasibility study*

The objectives of a feasibility study are to find out and analyze all the information and alternatives from the ERP and technology vendors and consultants. The analysis focuses on four aspects; Operational, technical, Economic (Cost benefits analysis) and

Schedule (Constraints on the project schedule and whether they could be reasonably met). At the end of this process, the result is submitted to the ICT steering committee to decide whether to proceed with the project or reject it. The report includes recommended alternatives and the rationale for continuing the project, re-evaluating it, or terminating it. If the decision is to continue the ERP system, the infrastructure technology and the consulting firm are selected.

5) *Contract*

The final stage in the selection process is developing a contract negotiation strategy. The contract must meet the institution corporate goals and objectives; successful contract negotiation means that both parties look for positive benefits in every area while achieving a fair deal. A signed contract that benefits both parties will provide a firm foundation to build a long lasting relationship with your vendor / consultant. The following contract negotiation objectives may use as assessment:

- Explain clearly all essential prerequisites, terms and conditions
- Services to be provided are unquestionably defined
- Compensation is clearly stated: Total cost, payment schedule, financing terms
- Acknowledgement of: Effective dates, completion/termination dates, renewal dates
- Identify and address potential risks and liabilities
- Define and set reasonable expectations for this relationship currently and into the future

4.2 Project Preparation Phase

1) *Scope and Objectives of projects*

Literature has frequently mentioned clear scopes and objectives as critical factors for successful ERP project implementation. Therefore, setting clear projects scopes and objectives should be developed to fit within specifically the institution of higher learning (IHL) to ensure the successful of the ERP implementation ([9]; [35]).

This activity is performed by the joint team of management, IT Division, faculty members, Academic Division, Student Affair Division, Finance Division, Human Resource Division and Admin Division in cooperation

with consultants and vendor. There are two deliverables for scope of where it is specifically for the user and the vendor.

2) *Project Schedule*

The schedule is a key part of the project management. The schedule tells you when each activity should be done, what has already been completed, and the sequence in which things need to be finished. Because of the uncertainty involved, the schedule is reviewed regularly, and it is often revised while the project is in progress. A schedule helps do the following;

- They provide monitoring and controlling project activities
- Help in allocation resources and these can achieve project goal
- Help in assess how the delay will impact the project
- Provide a basis to help in tracking project progress

3) *Project Organizational*

Project organizational serves a very valuable role for the project management team in the process of keeping a thorough and careful organizational record of the work processes. For the Campus ERP implementation, the project organizational must comprises of two committee; Project Steering committee and Project Working committee and both of these committees must comprise of the Management, IT Division, Faculty members, Academic department, Student Affair department, Finance division, Human Resource Division and Admin Division, consultants and vendor.

Project Steering Committee represents top management level, the critical stake holder in the overall governance of the project. The Chairman will usually be the project sponsor. The Steering Committee is responsible for approving major changes to the project scope, objectives, timeline, costs and other key attributes.

Project Working Committee represents middle management level and must be an expert for their divisions or units and head / project director for this committee will be the project champion. The person in charge must be an individual who has the authority to use resources within or outside an institution for completion of a given project. They will be involved in project initiation, planning, execution, control and closing the project. The Working Committee shall work within

the boundaries of the authority given to them for the proper management of the project to ensure that the project meets their goals and objectives.

4) *Policy and Procedure*

Policy and procedures are a set of instructions that describe a project management and implementation for the operation and the procedures of the overall project. They are often initiated because of certain requirements, such as governmental regulations.

4.3 Realization Phase

This is the main phase of the ERP implementation. The objective is integrating the institution business processes with the ERP system ([12]; [16]). Contents for this phase are described as below;

1) *Business Requirement Studies*

A series of workshops known as 'Business Process Requirement Studies (BRS)' took place, which involved academic and non-academic members, consultants and vendor. The academic and non-academic members of the university are selected as they are the main user of the application. This study considers the various business processes within the scope of the project. During this exercise, user will highlight all the issues relating to the propose ERP system and the existing business processes.

2) *Test Scenario / Construction of a prototype*

a) *Test scenarios* are test cases which are conducted to ensure that all business process flows are tested from end to end. Test scenarios are designed to present both typical and unusual situation that may occurs in an application.

b) *Construction of a Prototype* facilitates the testing of the new workflows and the constraining of users' expectation concerning the designed processes. It also reduces risks by reflecting the final model of operation in a relatively early stage. The typical process of this prototype model is iterative. It is also recommended to build the prototype in conjunction with continuing design of new processes.

3) *Integration Strategy*

System integration will reduce systems/IT total cost of ownership by up to one-third. It also will maximize investments in existing systems. Besides that, they can increases responsiveness by integrating new applications and business processes. It will

provide global enterprise visibility of information and business processes as well as reduce the total cost of building, maintaining and supporting application interfaces. The integration strategy will be the following:

- To evolve around the ownership and reusability of the data to ensure no duplication.
- Business end to end must be defined to link and integrate the entire Student module, student finance module, Human Resource module and finance module.
- Modification and upgrade of the existing system to cater for the new requirement from financial and academic system. The existing database structure must be made available for modification
- For single-sign on, integration via database view must be provided (Fig. 2).

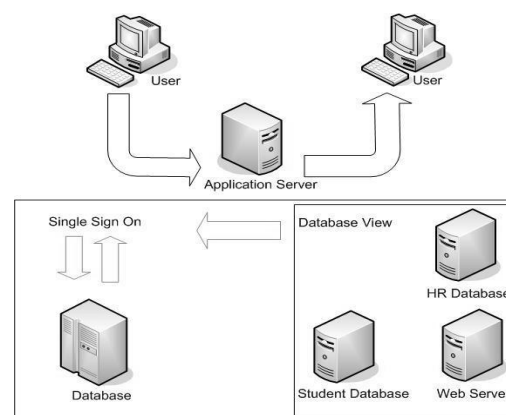


Fig.2: Integration Architecture

4) *Conversion Plan*

Before Go-Live in the production environment the required master data, the open transaction data and the historical transaction data need to be imported from the old legacy system to new system. Since data structure and data design in legacy systems are different from those of new application, data needs to be converted satisfying the new business rules, where existing data from the old system is extracted, cleansed, formatted and installed into a new system and the process can be manual or automated.

5) *Developing skill and knowledge*

No ERP implementation can succeed without employee training [4]. Because ERP implementations entail significant change to the way of traditional employees work process, training must be an integral part of a large system deployment. The key users play

an important role, so teams must be formed by considering all the key functional areas of the institution application, ICT infrastructure, security and downstream application (integration with key application), and each of the team must support between one another.

Training can be done formally (specific lectures programs) or/and by on job training while working with the implementation teams. Since training cost is very high, it is advisable to conduct a proper training plan that will provide an overall control of the activities. This activity will take place in all the phase of realization.

6) *Full Implementation*

Checklist for “Go-Live”;

- Physical infrastructure and application process is complete
- All issued address during implementation are taken care by the implementer
- Documents and modifications are tested thoroughly
- Executives, Staff and Department heads are fully trained
- Vendor and Consultant is available for Go-Live day
- Users will have assistance during first live transactions.

7) *Business Acceptance test*

Fall into four types of testing;

- **Unit Testing**
Individual units of source code are tested to determine if they are fit for use. It is the smallest testable part of an application. In procedural programming, a unit may be an individual function or procedure.
- **System testing**
The testing conducted on a complete, integrated system to evaluate the system's compliance.
- **SIT Testing**
System integration testing (SIT) is a testing phase that may occur after a unit testing. The SIT takes multiple integrated systems that have passed system testing as input and tests required interactions.
- **UAT Testing**
User acceptance test (UAT) is a process to obtain confirmation by a subject matter expert (SME), preferably the owner or client of the subject under test, through trial or review, that a system meets mutually agreed-upon requirements. UAT

is one of the final stages of a project and often occurs before client accepts the new system.

4.4 Operation and Maintenance Phase

1) *Establish post implementation plan*

By establishing reliable plans for the support of the ERP system, it can protect the system and ensure the user happy. By following a prearranged program, you can avoid costly repairs due to neglecting and it also involves changes to the ERP system in order to correct defects and deficiencies found during field usage as well as the additional new function of the work processes.

This is the longest phase of the ERP life cycle. Base on the [12] there are five steps which are;

- *Establish of support centre*; it is responsible for Application system support, maintenance and user training tool for ongoing operations.
- *Perform changes and enhancements*; these are needed over time due to organizational policy changes, business strategy, technological and environmental changes. They can be handled by adding new processes to the system or by expanding existing ones.
- *Upgrading the system*; it also provides notification of ERP module updates and upgrades.
- *System Audit*; Similar to other life cycle models, the objective is to verify whether the system meets users' needs. This audit is performed periodically.
- *System termination*; Due to the strategic importance of an ERP system and its relationship with organizational processes, it seems that replacing the system is much more complex and difficult than replacing conventional applications.

Here are other additional steps that are considered important to ensure success continuity of the ERP system;

- *Employee retention program*

To retain the employee is one of the greatest challenges especially one that has an experience with the ERP implementation, therefore the institution has to establish a proper employee retention program to get full benefits of institution investment in workforce and support [4]. Employee retention programs

vary, because every organization has unique set of employees so it needs its own set of retention programs. For best result, the management should survey staff to find out what they value most.

2) Documentation

For project documentation, it is categorized into four (4) components;

- Documentation for Business Requirement study
- Documentation System requirement and design
- User Acceptance
- User, Training and Technical manual.

5.0 CONCLUSION

This paper has developed a proposed Campus ERP implementation framework that base on the hybrid framework developed by previous scholars, the constraints mentioned for the institution of higher learning as a unique environment, field research of 50 private institutions of higher learning in Malaysia, a case study on the Campus ERP implementation and finally, the first author provided first hand information based on his experiences as a key member on Campus ERP implementation over a period of three (3) years. The framework has four phases which are project initiation, project implementation, realization and operation and maintenance and every phase will be having a combination of critical success factors (CSF's), deliverables and responsibilities and this combination as unique features for the private institution of higher learning in Malaysia environment. For future research, it can be expanding towards to the verification of this Campus ERP implementation framework.

References:

- [1] 1999. Bingi, P., Sharma, M., & Godla, J. K. Critical Issues Affecting An ERP Implementation. *Information Systems Management*, Vol.16, No.3, pp.7-14.
- [2] 2004. Pollock, N., & Cornford, J. ERP systems and the university as a "unique" organization. *Information Technology & People*, Vol.17, No.1, pp.31-52.
- [3] 2005. Zornada, L., & Velkavrh, T. Implementing ERP Systems in Hogher Education Institution. *27th Int. Conf. Information Technology*, 20-23 June, 2005. Cavtat, Croatia. pp. 307-313.
- [4] 2001. Swartz, D., & Orgill, K. Higher Education ERP: Lesson Learned. *Educause*, Vol.24, No.2, pp.21-27.
- [5] 2006. Fisher, M. D. Staff perception on enterprise resource planning implementation: A case study of three Australian Universities. *PhD Thesis*. Queensland: Central Queensland University.
- [6] 2002. King, P., Kvavik, R., & Voloudakis, J. The Performance of ERP System. *Educause*, Vol. 2002, No. 22, pp.43-48.
- [7] 2009. Bologa, R., Bologa, A.-R., & Sabau, G. Success Factor for Higher Education ERP's. *International Conference on Computer Technology and Development*, 13-15 November, 2009. Kota Kinabalu, Malaysia. pp. 28-32.
- [8] 1998. Davenport, T. H. Putting The Enterrpise into The Enterprise System. *Havard Business Review*, Vol. 76, No.4, pp.1-11.
- [9] Holland, C. P., & Light, B. (1999). A Critical Success Factor model for ERP implementation. *Software, IEEE*, Vol.16, No. 3, pp.5-22.
- [10] 2001. Beekhuyzen, J., Goodwin, M., Nielsen, J., & Uervirojnangoorn, M. *ERP Implementation At Australian Universities*. Technical Report, Griffith University, Brisbane, Australia.
- [11] 2009. Sabau, G., Munten, M., Bologa, A., & Surcel, T. An Evaluation Framework for Higher Education ERP Systems. *WSEAS Transactions on Computers*, Vol 8, No.11, pp.1790-1799.
- [12] 2002. Ahituv, N., Neumann, S., & Zviran, M. A System Development Methodology For ERP Systems. *Journal of Computer Information Systems*, Vol. 42, No. 3, pp.56-66.
- [13] Al-Mashari, M., & Al-Mudimigh, A. (2003). ERP implementation: lessons from a case study. *Information Technology & People*, Vol. 16, No.1, pp.21-33.
- [14] 2001. Al-Mudimigh, A., Zairi, M., & Al-Mashari, M. ERP software implementation: an integrative framework. *European Journal of Information System*, Vol.10, No.4, pp.216-226.
- [15] Holland, C. P., & Light, B. (1999). A Critical Success Factor model for ERP implementation. *Software, IEEE*, 16 (3), 5-22.
- [16] 2004. Deepinder, B., Joseph, G., & Mooney, T. An Integrative Framework for the assimilation of enterprise resource planning systems: Phases, Antecedents, and outcomes. *Journal of Computer Information Systems*, Vol. 44, No. 3, pp.81-90.

- [17] 2005. Zhang, Z., Lee, M. K., Huang, P., Zhang, L., & Huang, X. A framework of ERP systems implementation success in China: An empirical study. *International Journal Production Economics*, Vol. 98, No. 1, pp. 56-80.
- [18] 2008. Ibrahim, A. M., Sharp, J. M., & Syntetos, A. A. A Framework For The Implementation Of ERP to Improve Business Performance: A Case Study. *European and Mediterranean Conference on Information Systems (EMOIS2008)*, 25-26 May. Dubai. pp. 1-10.
- [19] 2005. Marnewick, C., & Labuschagne, L. A Conceptual model for enterprise resource planning (ERP). *Information Management and Computer Security*, Vol. 13, No. 2, pp.144-155.
- [20] 2003. Al-Mashari, M., Al-Mudimigh, A., & Zairi, M. Enterprise Resource planning: A taxonomy of critical success factors. *European Journal of Operation Research*, Vol. 146, No. 2, pp.352-364.
- [21] 2002. Stirling, M., Petty, D., & Travis, L. A Methodology for Developing integrated information systems based on ERP Packages. *Business Process Management Journal*, Vol. 8, No. 5, pp.430-446.
- [22] 1999. Brown, C., & Vessey, I. ERP Implementation Approaches: Toward A Contingency Framework. *20th international conference on Information Systems ICIS '99*, 13-15 December, 1999. North Carolina, USA. pp. 411-416.
- [23] 2008. Kemp, M., & Low, G. ERP innovation implementation model incorporating change management. *Business Process Management Journal*, Vol. 14, No. 2, pp.228-242.
- [24] 2008. Klos, K., & Krebs, I. Methodology of ERP System Implementation - A Case Study of Project-Driven Enterprise. *EurOPT-2008*, 20-23 May, 2008 Neringa, Lithuania. pp. 405-409.
- [25] 2004. Basu, V., & Lederer, A. L. An Agency Theory Model of ERP Implementation. *SIGMIS conference on Computer personnel research: Careers, culture, and ethics in a networked environment*, 22-24 April. Tucson, Arizona. pp. 8-13.
- [26] 2004. Dalal, N. P., Kamath, M., Kolarik, W. J., & Sivaraman, E. Toward an Integrated Framework for Modeling Enterprise Processes. *Communication of the ACM*, Vol. 47, No. 3, pp. 83-87.
- [27] 2003. Soffer, P., Golany, B., & Dari, D. ERP modeling: a comprehensive approach. *Information Systems*, Vol.28, No.6, pp.673-690.
- [28] 2008. Yan, X., Rahmati, N., & Lee, V. C. A Review of Literature on Enterprise Resource Planning System. *International Conference on Service System and Service Management*, 30 June- 2 July. Melbourne, VIC. pp. 1-6.
- [29] 2004. Shebab, E., Sharp, M., Supramaniam, L. S., & Spedding, T. Enterprise Resource Planning: An integrative review. *Business Process Management Journal*, Vol.10, No. 4, pp. 359-386.
- [30] 2005. Moller, C. ERP II: a conceptual framework for next-generation enterprise systems. *Journal of Enterprise Information Management*, Vol.18, No. 4, pp.483-497.
- [31] 2004. Magnusson, j., Nilsson, A., & Carlsson, F. Forecasting ERP Implementation Success - Towards A Grounded Framework. *European Conference on Information Systems*, 14-16 June, 2004. Turku, Finland. pp. 75-83.
- [32] 2001. Somers, T. M., & Nelson, K. The Impact of Critical Success Factors across the stages of Enterprise Resource planning Implementations. *Proceeding of the 34th Hawaii International Conference on System Sciences*, 3-6 January, 2001. Maui, Hawaii. pp. 1-10.
- [33] 2006. Nah, F. F.-H., & Delgado, S. Critical Success Factors For Enterprise Resource Planning Implementation and Upgrade. *Journal of Computer Information Systems*, Vol.47, No. 1, pp. 99-113.
- [34] 2010. Al-Mudimigh, A., Zairi, M., & Al-Mashari, M. *ERP Implementation: An Integrative Methodology*. <http://www.ecbpm.com/index.php>. (Retrieved on 26 November 2010).
- [35] 2009. Rabaa'I, A., Bandara, W., & Gable, G. ERP Systems in the Higher Education Sector: A Descriptive Case study. *20th Australian Conference on Information Systems*, 2-4 December, 2009. Melbourne, Australia. pp. 456-470.
- [36] 2007. Davis, M. ERP in Higher Education: A Case Study of SAP and Campus Management. *Issues in Information Systems*, Vol. 8, No. 1, pp. 120-126.
- [37] 2000. Heiskanen, A., Newman, M., & Samila, J. The Social Dynamics of Software Development. *Accounting, Management & Information Technologies*, Vol. 10, No. 1, pp.1-32.
- [38] 2003. Umble, E. J., Haft, R., & Umble, M. M. Enterprise Resource Planning: Implementation Procedures and Critical Success Factors. *European Journal of Operational Research*, Vol. 146, No. 2, pp.241-257.

- [39] 1999. Mahrer, H. SAP R/3 implementation at the ETH Zurich: A higher education management success story. *Proceeding of the 5th American Conference on Information System*, 13-15 August, 1999. Milwaukee, WI. p. 272.
- [40] 2009. Kumar, M., Vijaya, P., Suresh, D. A., & Prashanth. Analyzing the Quality Issues in ERP implementation: A case Study. *Conference on Emerging Trends in Engineering and Technology, ICETET-09*, 19-21 November, 2010. Nagpur, India. pp. 759-764.
- [41] 2001. Bernroider, E., & Koch, S. ERP Selection process in midsize and large organizations. *Business Process Management*, Vol. 7, No. 3, pp.251-257.
- [42] 2000. Stefanou, C. J. The Selection Process of Enterprise Resource Planning (ERP) Systems. *Americas Conferance on Information Systems (AMCIS)*, 10-13 August, 2000. California, USA. pp. 988-991.
- [43] 2005. Ehie, I. C., & Madsen, M. Identifying critical issues in enterprise resource. *Computers in Industry*, Vol. 56, No.6, pp.545-557.