ERP IMPLEMENTATION IN HIGHER EDUCATION INSTITUTION: CASE STUDY AT FACULTY OF INFORMATION TECHNOLOGY

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ABSTRACT

Enterprise Resource Planning (ERP) solution has been implemented in many companies. Its implementation in higher education institutions is still limited. In this study, an implementation of ERP in higher education institutions is presented. The implementation is performed at the faculty of Information technology based on the Odoo platform which is an open source ERP system. The analysis is performed based on the critical success factors.

Keywords: enterprise resource planning, ERP implementation, higher education institution, critical success factors.

1. INTRODUCTION

Enterprise Resource Planning (ERP) is a software solution that integrates and automates the business functions of an organization. Originally, the ERP was developed for manufacturing and production planning systems which was used in the manufacturing industry. In the 1990's, its scope was extended to other back-office functions including finance, human resources and production planning [1, 2]. Recently, ERP has integrated several other businesses including customer relationship, supply chain management, project managements, etc.

The main goal of ERP is to improve the efficiency of business processes and decrease the cost [3, 4]. It allows different departments and units to share the information in a single system, standardize processes and data within an organization with best practices [5]. The ERP system also allows improving the ability to utilize the information system functionality and reducing the maintenance costs [6]. Therefore, it has become the backbone of business intelligence for organizations.

As implementing ERP systems in the corporate sector has successes, the ERP implementations in the higher education institutions (HEI) is still limited. In this study, we investigate in the ERP implementation within universities. The challenges of ERP implementation in HEIs are discussed. The remaining parts of this paper are organized as follows. Section 2 describes the ERP implementation in universities, the ERP implementation

for the faculty of information technology is presented in the section 3, and the evaluation is presented in the section 4 and the last section is conclusions.

2. ERP IMPLEMENTATION IN UNIVERSITIES

The ERP was initially designed for the corporations. Although it provides several customization options, these options may increase the failure risk due to increasing the scope of work and implementation cost, and extending the implementation time. Recently, the ERP has been extended and the universities are pressuring to provide higher quality education services with low cost. Therefore, the ERP systems could be a choice for investments.

Unlike the corporate sector, the valuable assets in the university are students, staffs, and faculties. They may have different interests in the same organization. For students, the university is a place to learn, live, and entertain. For faculties, it is place to teach, write, and conduct research. For staffs, the university may share features with corporate work. However, there are still some fundamental similarities between the corporations and universities, especially for the autonomy universities, such as challenges in competitive environment, increasing needs to improve the efficiency and performance in administrative services. The increasing expectations of stakeholders, quality and performance requirements, and competitive requirements have encouraged the universities to provide the best opportunities for students, attain the competitive advances, and have a perfect administrative system [7 - 9]. The ERP is one of the adopted solutions for the universities or colleges to obtain these objectives.
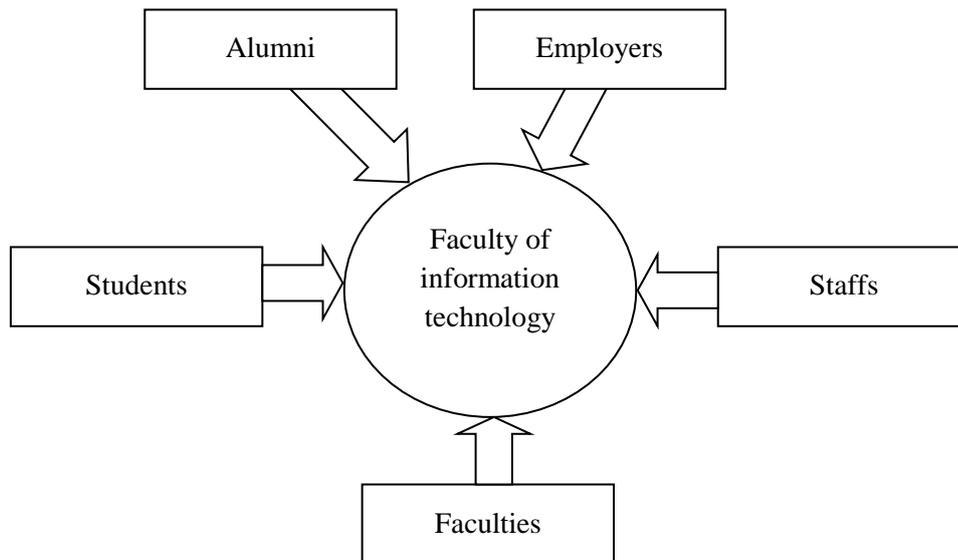

Figure 1. The stakeholders of the FIT.

Implementing the ERP in the university has advantages including (1) gaining the information access for planning and managing the faculty or university, (2) improving the services for the students, staffs, and faculties, (3) increasing the income and decreasing expenses due to the improved efficiency, and (4) lower business risks. However, the ERP solutions are not always appropriate for universities due to the difference between the corporate business industry and university environment. There are critical success factors (CSF) for ERP implementation

[10, 11], in which the top most frequently cited CSF have been reported including: top management commitment and support, change management, project management, business process reengineering and system customization, training, ERP team composition, consultant selection and relationship, communication plan.

3. ERP IMPLEMENTATION FOR THE FACULTY OF INFORMATION TECHNOLOGY

The faculty of Information Technology (FIT) is one of the big faculties in Industrial university of Ho Chi Minh city (IUH). The university is autonomous, while the current information systems and softwares are disconnected. This leads to the increasing requirements to investigate into an integrated information system to share and analyze data, and provide higher quality education services, from which can attract the stakeholders. Currently, the major stakeholders of the FIT include students, employers, alumni, faculties, and staffs as shown in Fig. 1.

On the analysis of activities in the faculty, the business activities and information support of students, staffs and faculties including dean and heads of department can be divided into groups as shown in Fig. 2.
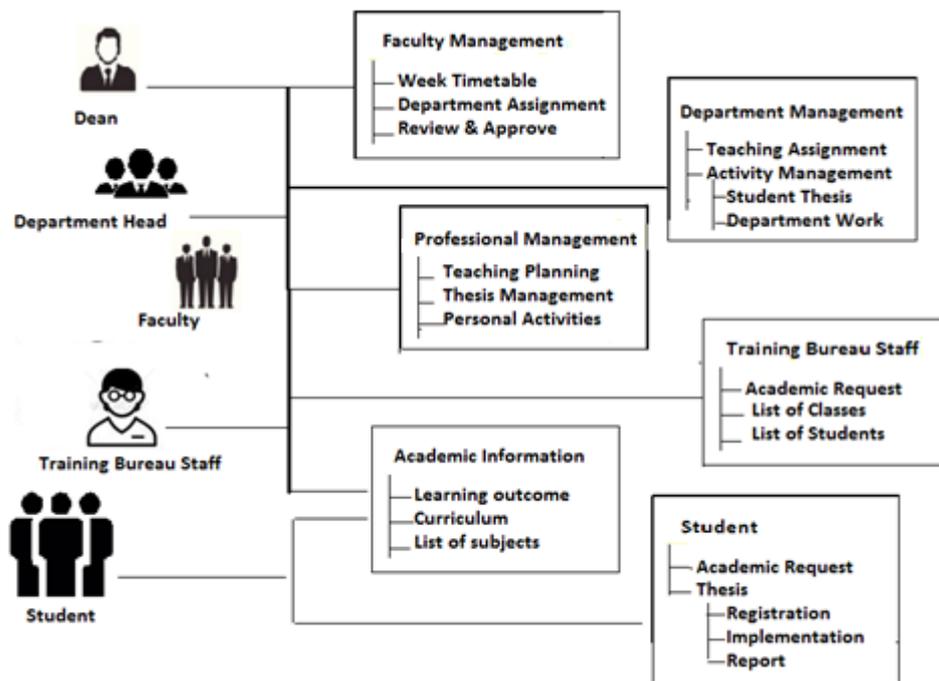

Figure 2. Business activities and information support.

In order to secure the systems, different stakeholders may have different granted access rights which are organized following by hierarchical mechanism. This hierarchism includes three levels. The management level has the reserved rights besides of all rights from the lower users. The access rights of students are lowest and they need to register to the system through their student ID. Faculties and staffs are granted automatically the default rights of normal users.

The most common function for all users is to access the information about training which includes learning outcomes, curricula, and the brief description of the major disciplines. Students can view the outline of all subjects; they can also access the syllabus and evaluation of the participated subjects.

As for the student users, the system provides two main functions: Academic requirements and graduation thesis implementation. The business process diagram for processing the academic requests is shown in Fig. 3. There are eight academic request types which can serve to students. Some types are required the student signature such as the mark cancellation, changing class, result reservation, etc. Thanks to the two-way interactive features and automatic message, the staffs will be notified immediately. The system can help the staffs in tracking academic requests of both students and faculties. If any student violates the regulation such as sending same requests several times, the system will automatically register this student in the list; the dean and staffs can track the list and remove any student from this list. In the final academic year, students have the right to choose and register the graduation thesis topic according to his/her major from the system. Each student may only register one time, and may invite another student to make a group. The system will notify the advisor and the invited student. Both advisor and the invited student may reject or accept the invitation. If the invitation is rejected, the student may re-register. The invited students must respond the invitations within three days. During the thesis implementation, the student will receive tasks from the advisors and report his work frequently. Both advisor and student can track their progress.
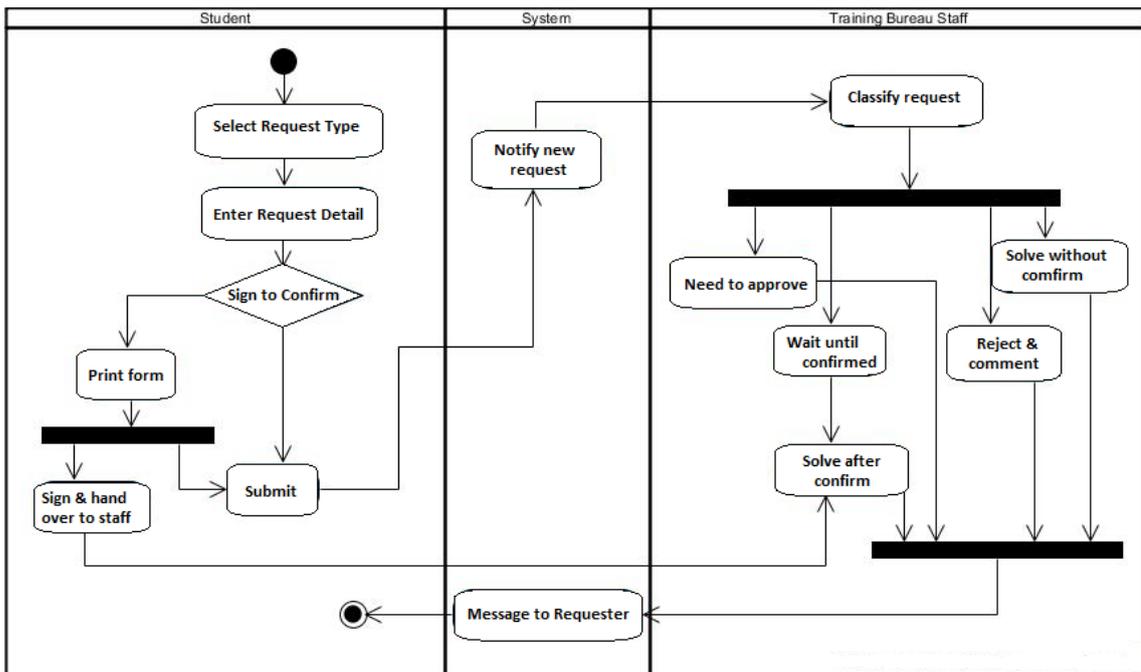

Figure 3. Business process diagram for processing the academic requests.

Besides processing the academic requests, the staffs can monitor the list of classes, subjects and students. These lists can be imported easily from the files which are exported from the common education system of IUH (Industrial University of Ho Chi Minh city) at the start of new school year. The dean can check the working efficiency of the staffs through the request processing results. For the faculties, the system provides following functions: manage the

teaching schedules, manage the progress of student thesis implementation, receive the task, organize and participate the events. Tasks can be assigned directly from the department head or from the dean. The system will support faculties in reporting the work results, tracking progress, and getting feedback from management. It also support the dean and department heads in tracking the level of completion of the tasks of faculties. Depending on the specialization, each faculty can register into some subject groups. Each subject has one leader who is responsible for the quality and resources of that subject. Group members can organize the professional activities, links with external business, or can perform some tasks assigned as an editor post practice, outline editing, writing curriculum, etc. The contribution of faculties in each subject should be recorded for the evaluation.

The system provides some functions which are reserved for the department heads. These functions include assigning the teaching tasks to faculties, reviewing and evaluating the effectiveness of the work of each faculty, planning the workshop, etc. For the new semester, the department head will make the teaching assignment to the faculties based on the list of theory classes which are imported by the staffs. The system provides information about the list of faculties of each subject group; the total hours are assigned to the faculties. The department heads will regulate the assignment in order to avoid the surplus or deficit of teaching hours of any faculties. The real teaching hours are converted based on training types including the class size coefficient. Some faculties are exempted from their positions, academic research or doing any special task.

The works that the department head will do in the management of thesis performance: requiring the faculties to update their thesis topics, approving topics, solving the issues of students, assigning the faculty reviewers, handling the deviation points.

4. EVALUATION

The system was implemented based on an Odoo, a popular open source ERP, which offers a variety of modules to meet the most business requirements of small and medium organizations. Human resources and project modules are appropriate basically for the management of education activities. The outstanding inherent features of ERP including automatic messaging, the effective interaction among business-related parties, and the decentralized security are quite good for customizing the system. However, the common database is used for both own system data and the storage data of organization. Due to the tight structure and constraints among the tables, especially m-n relationships, the inheritance and new creation from the built-in classes also must comply with these constraints. Importing the data into m-n tables from the CSV files are quite difficult. The system forms are applied too rigidly so difficult in the customization.

The system is convenient for the students in sending educational requests and receiving feedback from the staffs without going to the office, in receiving tasks and reporting their work to the advisors. The dean and department heads can monitor and evaluate quantitatively the work of the staffs and faculties.

The implementation of ERP at FIT in IUH is also evaluated on critical success factors including the top management commitment and support, change management, project management, business process reengineering and system customization, training, ERP team composition, consultant selection and relationship, communication plan:

Top management commitment and support: the successful ERP implementation is depended on the top management commitment and support which can lead to the overall commitment across an organization. In the faculty of information technology, the deans of

faculty are already to prepare for challenges that may be faced. This can result in the successful ERP implementation in the faculty.

Change management: The ERP implementation may face the resistance from the employees, the trade of between effectively managing employees and technology in the change process is a key for the successful ERP implementation. In the faculty, the staffs and faculties are encouraged to change which can improve the processing performance. In addition, some business processes are already to reengineer. These changes can lead to the successful ERP implementation.

Project management: It was found that "a lack of proper understanding of the project needs and the inability to provide leadership and guidance to the project" is one of the main factors which lead the fail ERP implementation. This risk does not occur in our implementation, because the project manager is the leader of the department of information system, who are well-informed about all of the business processes in the faculty.

Business process reengineering and system customization: In ERP implementation, the business processes is reengineered or the ERP system is customized. Researches indicate that the ERP customization should be avoided or minimized to obtain the full benefits offered by ERP systems. However, the ERP system was initially designed for the corporations. Although it has been extended into several areas; the implementation of ERP in universities needs customization. This may lead to the limitations of ERP implementation in the educational areas.

Training: The end user training plays an important role for the ERP implementation; it can maximize the ERP benefits and increase user satisfaction. In the faculty, the staffs and faculties are either in the information technology majors or having good IT skills. Hence, they can understand the system easily which can maximize the benefits of the ERP system.

ERP team composition: the ERP team composition is an important factor for the successful implementation; it should consist of representatives from the function units. The team members in this study include the experts who are representatives from all function units in the faculty.

Consultant selection and relationship: Consultants play a critical role in ERP implementation; they can help members, staffs, faculties, and may have the responsibility for project management. The limitation of this study is the lack of the consultants for the ERP implementation in the education field. We have a consultant for the ERP implementation in corporations; however the experiences in corporations may not be applied for the education field.

Table 1. Summary of CSF evaluation.

CSFs	Descriptions	Level
Top management commitment and support	- Top management initiative for ERP implementation - Clear project goal and objec tives.	Strong
Change management	- The staffs and faculties are encouraged to change whic h can improve the processin g performance. - Business processes are alre ady to reengineer.	Strong

Project management	- The project manager is the leader of the department of information system, who are well-informed about all of the business processes in the faculty.	Strong
Training	- The staffs and faculties are either in the information technology majors or having good IT skills.	Strong
Business process reengineering and system customization	- Significant gaps between FIT and Odoo's worldview. - Substantial amount of customization.	Weak
Communication plan	- The communication in the entire faculty during the implementation process.	Strong
Consultant selection and relationship	- The lack of the consultants for the ERP implementation in the education field.	Weak
ERP team composition	- The team members in this study include the experts who are representatives from all function units in the faculty.	Strong

Communication plan: The communication in the entire faculty during the implementation process is strong, which increase the success for ERP implementation. Table 1 describes the summary of CSFs of ERP implementation. The above critical factors are one of the major conditions leading to benefits from the ERP implementation.

5. CONCLUSIONS

There are existing systems in the FIT but they are disconnected and do not utilize the resources of university. The merging these existing systems are difficult and they are not easy to develop. The ERP systems have been considered as an appropriate solution. With the introduction of ERP solutions, the faculty has to organize and standardize the business activities. It differs from that of traditional information system due to its integrated nature which causes dramatic changes on the work flows, organizational structure and on the way people do their jobs. The ERP implementation shifts the key focus from a heavy emphasis on technical analysis and programming towards business process design and human elements. The analysis results demonstrate that the ERP implementation in FIT has some strong CS factors. However, there are still few weak CS factors that are the business process reengineering and system customization and the consultant selection and relationship.

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