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Critical Success Factors (CSFs) of ERP in Higher Education Institutions

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Abstract— Recently, ERP implementation has been transformed from the business side into educational side. The failure implementation of ERP in higher education is referred to many factors. In addition to the increment of the level of risk that invoked on the study of ERP, the study of critical success factors has great effects on making system fail or success in implementation. Despite of efforts that had been done to enhance the implementation of ERP; it still suffers from failure, especially in higher education. The present study investigates that ERP system will succeed if we employ a set of factors such as clear vision and objectives, top management support and commitment, clear business process, information flow and organizational structure, budget size and cost, integrated department and solve the problem of human resources management, project management, training and education, careful change management and effective communication and connection in ERP higher education system. According to the preliminary results of this study, these factors help in successful implementation of ERP in higher education.

Keywords— ERP, CSFs, Higher education, Successful ERP implementation, institutions.

I. INTRODUCTION

1990s has been witnessed the birth of a new concept into a computer world which called Enterprise resource planning (ERP) which is created by Gartner Group[1]. Multiple definitions were suggested to define this new concepts such as "One database, one application and a unified interface across the entire enterprise"[2]. ERP is also defined as "comprises of a commercial software package that promises the seamless integration of all the information flowing through the company financial, accounting, human resources, supply chain and customer information"[3], "ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization"[4]. "ERP systems are computer-based systems designed to process an organization's transactions and facilitate integrated and real-time planning, production, and customer response" [5].ERP systems are "a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company"[6]. ERP systems are preparation information system packages that combine information and information based processes within and across functional areas in an organization[7]. ERP is about functional structure that contain sets of functional units and each functional unit work separated to achieve their own goal and objectives[8] and they can incorporate all the data and related processes of an organization into a unified information system [9]. All the data within an organization's business process that related to functional areas come together to represent business application which called ERP[10].In spite of all these definitions about ERP we find that we can briefly define ERP as a software, a concept, a system or a package that integrate multiple modules as a separated functional area and each functional area includes a set of business processes with flowing data into a central database (integrated DB) and this database could be uploaded locally or into the cloud. It is possible to be implemented on a small, medium, or big business area regardless this business area is profit or non-profit.

In the new era, ERP becomes an essential part in management of multiple fields not only in business field but also in higher education field [11]. The advantages of using an ERP appear in enhancing information accessing and management processes, in addition to have the ability to plan and manage the organization as well as upgrade services for students, staffs and also employees. Ideally, Implementation of ERP system in higher education is an indicator to a new technology revolution in that country and it's valuable for higher education institutions instead of legacy administration and management systems. [12].

ERP is used in many countries around the world such as Austria, United States, India , China , Brazil and some Arabian countries such as Egypt and Bahrain in the higher education sector in consequence to benefits that back to this sector and to those countries [13]. Whereas increasing the level of risk and failure of ERP implementation, CSFs faced this failure and risk and they become a critical rule for success and also it's the foundation for having implantation of successful ERP [14, 15]. However, researchers of this work have studied multiple studies about CSFs in the higher education sector and suggest the most factors that used to take into consideration before implementation of ERP to assure successful ERP implementation.

II. RELATED WORK

As a matter of fact, CSFs in institutions systems help in deciding if the implementation of the ERP system will be a success or not. To the best of our knowledge, ERP system is one of those systems which rely on CSFs as a major point of implementation. It is popularly believed that budget size , cost, business process, information flow and project objectives are considered as an ERP CSFs [16].

Whereas there are 51 CSFs, the most frequent factors cited from 2000 to 2013 are: top management support and commitment, training and education, project management, clear vision and objectives of the ERP system, careful change management and interdepartmental communication to the successful implementation of ERP systems[17].

Typically, Indonesian public universities have an experience with ERP and they believe that there are eight CSFs that effect Indonesian universities and they are: shared services and facilities, incubator governance, entry and exit criteria, mentoring and networking, funding and support, governance support and protection, university regulation, and system infrastructure[18] .

Though,[19]classifies CSFs into thirty-seven factor in HEIs. The result with most CSFs are those factors which are top management support, management of expectations, business process reengineering, project team composition and competence, education and training of users, interdepartmental cooperation and communication, involvement of users in systems development and integration, culture of resistance within an organization, vendor and consultant support to users.

Guarantying the suitability of an ERP universities system by identifying the following CSFs in implementation: top management support, comprehensive energy management team, stockholder involvement, awareness and risk management[20].

Regarding Arabian countries, the ability to implement ERP in their education system is a little different. As an example, Cihan university in Iraq is affected by similarities of the education system with other universities around the world. Therefore, their most CSFs are commitment and support of top management, project management, user training and education, business plan and vision, technological infrastructure, departments (Stakeholder) participation, change management, and communication[21].

Obviously, accessing the organization's needs by an integrated ERP system is described in[22]. In order to achieve a higher degree of implementation success, it is said to use some common CSFs such as: top management, change management, project management, business process re-engineering, IT infrastructure, communication, and user training.

It is noted that in Egyptian organizational culture case, the operation of sharing information is restricted in the level of mangers instead of the organization as a whole. The other levels depend on experience rather than accurate data; the communications are happening through telephone calls and personal meetings rather than using modern communication technologies. These are among the reasons to hinder implantation of ERP in HEIs in Egypt. It is believed that trying to overcome these problems will change the future of ERP in HEIs in Egypt [23].

Thinking of replacing, the local ERP into SAP ERP in a large Saudi Arabia university is a decision based on CSFs study. The success will be demonstrated if it have an integrated department and solve the problem of human resources module[24].

Oman institutions experiment in ERP was demonstrated by visiting 35 enterprises with 10 CSFs to assure success in implantation. The CSFs are: top management support, user involvement, clear goals & objectives, strategic IT planning, user training & education, vendor support, teamwork & composition, project champion, monitoring & evaluation of performance, and education on new business processes[25].

Based on all mentioned and searched studies, it is found that top management commitment and support, change management, project management, project champion, system customization, business process reengineering (BPR), ERP implementation team, consultant selection and relationship, effective communication plan, active partnership with vendor, ERP system selection, System integration, post-implementation evaluation and management are the main CSFs from 2002 until 2015 which help to reduce the failure occurs previously in higher education section[26].

Recently, CSFs represent an important factor in enhancing the ability of ERP work. According to[27] in Australia business process alignment, budget and meet customer needs, improved data access ,an increase in new customers, and reduced conversion time were recognized as CSFs.

According to[16-22, 24-27], because of similarities of institutions nature of HEIs in Yemen and most universities around the world also, because there are no public university that use ERP in Yemen, we can say that economic, culture and infrastructure issues are the reasons for success or failure of ERP system implementation. Consequently, the most CSFs affecting Yemen culture and organization to ensure ERP implementation in public Yemeni universities are as follows top management support and commitment, training and education, project management, clear vision and objectives of the ERP system, careful change management, budget size , cost, business process, information flow ,integrated department and solving the problem of human resources module, Monitoring & Evaluation of Performance, meet customer needs, reduced conversion time, effective communication. These are the factors based on most literature CSFs studies.

In brief, this study confirms that ERP is suitable for any group of organizations that have same organizational structure, data flow, business process structure, and industry. Yemeni government should start thinking to provide the HEIs system of their public universities through the integrated ERP to reduce the cost, increase control on university's operations, and effective process management. As a matter of fact, implementation of the dimension of ERP is a difficult task however it should be measured with these factors to show how much it is working and how these factors are implemented.

III. METHODOLOGY

There are many aspects related to the enterprise resource planning (ERP) implementation. Although the literature provided relevant information on the critical success factors that have been supported to effect on the success of ERP implementation projects. ERP implementation in one institution may or may not be in another institution. In fact, those specific factors expect to help in a successful ERP implementation project. Thus, this research project was created.

IV. DATA COLLECTION

To study and discover the Critical Success Factors that help in implementing systems of ERP in higher education institutions in Yemen, a literature has been reviewed for this study to investigate the importance of these factors in ERP system implementation. There was no special tool used to extract the CSFs but information collection was based on literature review process which collected the most important studied to cover this point. Around 12 articles studies included two articles about summaries of CSFs from 2000 to 2015 have been reviewed to signify the importance of CSFs and its benefits to the organizations.

V. DATA ANALYSIS

Whereas, ERP systems are difficult in its nature during the implementation, it's one of the most suitable ways of measurement the CSFs. It is marked from the literature that some factors must be considered seriously during ERP system implementation for the organization's success. Thus, this work focused on exploring the CSFs to measure the success of ERP model implementation.

VI. DISCUSSION

The study and identification of the critical success factors are based on a study of the literature review. The recognized critical success factors are: clear vision and objectives, top management support and commitment, clear business process and information flow, budget size and cost, integrated department and solving the problem of human resources management, project management, training and education, careful change management, and effective communication and connection. Most of the mentioned literature in this study agreed with the same factors which are critical for the successful ERP implementation as shown in table 1 and these factors effect on Yemeni public universities.

Table (1) CSFS for ERP in Higher Education in Yemeni Public Universities, Source[16-22, 24-27]

No.	Critical Success Factors for ERP in higher education in Yemeni public universities
1.	Clear vision and objectives.
2.	Top management support and commitment.
3.	Clear Business process, information flow and organizational structure.
4.	Budget size and cost.
5.	Integrated department and solve the problem of human resources management.
6.	Project management, Training and education.
7.	Careful change management.
8.	Effective communication and connection.

VII. CONCLUSIONS

Having the ability to implement an ERP system in higher education doesn't mean that we are successful; it just means we should guard this success by set of critical success factors. These factors concluded from multiple studies and in conclusion we find that these factors are: clear vision and objectives, top management support and commitment, clear business process, information flow and organizational structure, budget size and cost, integrated department and solving the problem of human resources management, project management, training and education, and careful change management and effective communication and connection in ERP higher education system. The impact of these factors defiantly appears in performance and efficiency of higher education institutions.

It is suggested that each of these 8 factors is at great degree of importance to enrich efficiency of higher education system. It is at relation to say that these factors will be related to the study of ERP system at the initial stages of implementation as well as at advanced stages of implementation. Future research is suggested to examine the impact of an ERP system for HEI's in Yemen.

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