

Identification of Sense of Urgency as Critical Success Factor in Implementation of ERP for Educational Sector of Saudi Arabia: A Case Study

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Abstract— Enterprise Resource Planning (ERP) has significant role in operationalization of various activities of organizations in integrated mode. Now, the educational institutions are implementing Enterprise Resource Planning (ERP) practices to gain efficiency and effectiveness in a worldwide competitive environment. This research study highlights the literature on ERP implementation and reveals the sense of urgency as one of the critical success factor for effective and successful implementation of latest technological advancements within higher education institutions of Kingdom of Saudi Arabia. To measure EPR implementation, we have selected a case from Saudi Arabia, and this case will be an evidence of ERP implementation in Saudi Arabia. Project Management is highlighted among various success factors of successful implementation of ERP system in higher educational sector of KSA. This research study is contributing to academic research by providing an empirical evidence to support the theories of CSFs and ERP implementation success.

Keywords — ERP system, sense of urgency, critical success factors, case study.

1. Introduction

Diverse social set up encourages researchers to study the implementations of the technological phenomenon in various nations. Saudi Arabia is among the most attractive countries for researchers to explore social values in technological advancements prospective. Being an Islamic majority country, the attitudes and behaviours of Saudi people are largely shaped by Islam teachings and beliefs. In Saudi Arabia lack of support systems has made implementation of advanced technology like EPR system within the educational sectors a gay area. However, EPR is very new concept in Saudi Arabia and due to the rapid

technological advancement, most of the educational institutions are now adopting latest technologies instead of an old system. It is evident, the Saudi Arabian universities are replacing their old management system with a new digital system to compete in the world. Implementation of ERP has the main issue for technological advancement. Saudi King Abdullah was promotor of ERP educational planning empowerment. For the implementation of an ERP system in educational sector and relaxation was given in rules and regulation to implement the modern technological advancement, which is motivating factor of the study.

Rapid development in technology advancement and its adoption in competitors is having a significant effect on all service sectors including education service sector. Saudi Arabian government, as well asking Abdullah's, took more interest in the implementation of ERP in educational sectors. The government of Saudi Arabia focused on technological advancement and relaxed the rules and regulation for implementation of ERP, as government realized that technological improvement is more critical for educational institutions. ERP implementation is more helpful to reduce the cost of operation, reduction in human efforts and increase in effectiveness. So far ERP system is proved to be a successful system in mitigating excessive administrative and operational cost an efficient system in cost reduction of administrative work and reduction of human efforts within the educational sector. However, changing worldwide environment affecting Saudi Arabian educational sector.

The ultimate purpose of this research study is to explore the success factors in ERP implementation within the educational sector of Saudi Arabia. These factors encourage different educational institutions to adopt ERP system. Rapid development in technology advancement and its

adoption in competitors is having a significant effect on all service sectors including education service sector. Success factors of ERP education planning system within the public sector in Saudi Arabia is one of the prime concern of this study. Thus, the ultimate objective of the current study is to implement a successful ERP system in the educational sector of Saudi Arabia and to encourage the organizations to adopt latest technologies. Implementation of ERP system is not successful in delivering desired results, which has become a motivational factor to carry out this research to explore ERP success factors. The identification of ERP success factor will help to prevent future failures.

As there is urgent need to develop a comprehensive structure for curriculum development [1]. However, utilization of ERP education planning system within university sectors would foster a greater appreciation for this practice and would set good standards for other employees, especially in multinational firm [2]. In the Middle East political game, ERP education planning required more desirable results. The technological advancements adoption like ERP educational planning is not encouraging in numbers, the less number of leadership exists in the adoption of technology [3].

In past decade, the Saudi government has set Millennium Development Goals (MDG) to monitor the achievements in technology adoption. Most of the reports have emphasized on goal achievement and to overcome the challenges for proper MDGs utilization. However, ERP implementation in educational planning and to attain the full development potential considering discriminatory policies, as well as practices, was mostly ignored [4]. Further, gender appreciation is one of the challenges which hindered the achievement of Millennium Development Goals (MDG) in Saudi Arabia. Nevertheless, ERP educational planning as an economic growth contributor was not appreciated by the Middle East [5].

2. Literature Review

ERP system was first implemented by business sector organizations, as most of the business firms adopted ERP system for different operational activities and to gain different other benefits. The current trend has been seen that different educational institutes are adopting more technological system instead of an old system. Detailed studies have been published in the literature regarding the implementation and adoption of ERP system in business as well as educational sectors such as universities. Literature focused on different factors of success as well as failure in implementation of ERP system. However, ERP system implementation within the higher

educational institutes such as universities has gained the intention of various researchers, especially in the Saudi context.

2.1 Change Management

The globalization, not only has increased the competition but also caused a technological evolution. To compete in this highly competitive world organizations around the globe are adopting and impelling latest technologies. Technology has emerged as a competitive advantage for both production and service sector. Universities around the world to attract international students and improve ranking are adopting most advanced technologies

In case, management of an organization decide to adopt the latest technology, it faces different challenges like resistance from employees which have been seen in earlier studies [6]. For the systematic and smooth implementation of new system, management should adopt effective and appropriate change process in definite time and resources. Different complexities have found in management change such as psychology, behavioral, system think and re-engineering of the business process. However, business nature plays an important role in the success of the implementation of the newest system. Moreover, business operations of an organization, detail of change processes, as well as individual employees responsible for initiate and implement specific change, are vital. Furthermore, it is relatively important that related employee understands the need for change in technology adoption [7].

2.2 Enterprise Resource Planning (ERP)

According to [8], for efficient and effective working, various programs and components to be used in different business operations on several levels of diverse sectors should be well integrated. All these programs and components should be integrated into one system to accomplish all requirements of organization which derives a complex system known as Enterprise Resource Planning (ERP). Modification of a system according to the requirement enables ERP to improve its significance for the organization. Under-discussion software contributes in the informal decision-making process regarding the performance of an organization. ERP systems scope within organizations are broadly evident and accepted in assisting inventory management, product planning, debtors, creditors and costing [9]. Furthermore, ERP system is much supportive in synchronizing of several functions of an organization including risk management, accounting, HRM, finance, marketing, and sales. A real-time operational ERP system doesn't require to

be updated for all times. Further, to monitor different business activities and integration of various processes as well as activities within the boundaries of an organization are major objectives of ERP system [10].

2.2.1 Adoption of an ERP System

Integration of various business processes together in one system to acquire competitive advantage increase the effectiveness and efficiency, encourages an organization to implement ERP systems. Thus, implementation takes huge cost, time and significantly more complex system to adopt and implement. Though, a significantly effective and successful ERP system can generate enormous advantages that offset the organizational challenges. Numerous benefits and advantages are realized after the successful implementation of ERP, such as automation of system, integrated functions, real-time transactions, cost reduction of operations and empower an organization to develop a better network among different supportive industries and internal or external stakeholders. Primarily, large as well as a financially strong organization was pioneered to implement ERP system. To import workforce and production of oil/gas are the main dependencies of Arabic economy [11]. In case, a company wants to shift its manual system to advanced technology system, in initial level it requires to focus on the need for change. In the same direction, Kotter's model highlights the need for change in implementations of ERP system. According to Kotter's model, requirements and advantages of ERP implementations should be disclosed to all employees of an organization to gain the confidence. It would be very helpful for organizational management to foster ERP acceptability, the participation of employees and ensures the quicker as well as a smooth implementation of the change process. Within the Arabic nations, various service providers and manufacturers are available for implementation of ERP process [11]. However, there are many causes of ERP implementations failure. According to Arabic nations, resistance to change is one of the major reason of failure; understanding in sense of urgency for implantation of ERP system and to exercise the essential initial methods for successful implementation of ERP system [12].

In Arabic nations, social-cultural issues are more critical and most of the businesses are following social values, as these values are derived from Islam. legal system development based on the teaching of Islam, especially in the Arabic language. However, the Arabic language is one of the main barriers for developers and foreigners; it looks like a technical limitation [12]. Centralized

governance system, low interpersonal employee-manager relationship, authoritative leadership are driving the organizational structure as well as communication within the boundaries of an organization, however, employees are one of the resistant to innovate different changes [11].

Various MDG reports were written in past by different Arab scholars as well as policymakers [4]. These reports did not reveal the root causes of the development program to implement ERP system; rather these reports focused on educations, economic, political, social and maternal health authorization of ERP system implementation. It is quite possible that discriminatory laws, as well as practices against an ERP education planning, may be one of the root cause, as a researcher has believed. From a period, Arab world faced different problems related to the gender appreciation. As there is less gender appreciation in the Arab world and lack to grasp the vital factors to facilitate ERP program. ERP education planning system needs more focus on equality and to appreciate the ERP successful implementation. ERP education related literacy and Knowledge level have potential within Arab nations, however, needed to acknowledge the man role within society perspective and it must be enough respected to have niche curved out for them like one is available naturally for men [4].

The Arab world should focus on technological advancement, appreciation of different new ideas as well as governance system. These points should be the area of concern for the Arab world. The Arab world should focus on competitive environment and should not lag in a current competitive global environment. On the other hand, the Western-world industrial sector has adopted the advanced technology and workforce of their organizations for implementation and utilization of ERP education planning. Nevertheless, their labor force has secured their occupation as managers within the new setup of an ERP education planning program during the past three decades [13]. There is a cultural difference within Arab nations, as it is very surprising to see a female appointed to a management post. The Cultural issue does not have relation with the qualification of ERP education planning, that is why these issues have a significant impact. To maintain the equality regarding ERP education among male and female is one of the major challenges of the Arab world. First, knowledge and education regarding ERP education planning should be provided to individuals and the highly qualified individuals should be appointed to the management posts which based on a neutral ground like proper competition [14].

For the purpose to implement ERP education planning system, Saudi Arabia invested in several

areas to accelerate efficiency and employment in a different operation. However, improvement required within Saudi Arabia and still challenges are not properly acknowledged. Because of the economy of Saudi Arabia is mainly depended on gas and oil. Kingdom's daring decision to expand from the inherited petroleum based economy will require the involvement, skills as well as the enthusiasm of most valuable assets. In Saudi Arabia, most part of labor force consists of male members. ERP education planning employment rate was four times more that of men.

Currently, Saudi Arabian government is focusing on enhancing employment in ERP education within nation economy sector. However, different threats are revealed while implementation of ERP education planning. These threats are including legal, social, vocational and educational issues. These issues hindered the contribution of Saudi Arabian ERP education planning within the formal sector of the employment market. Because of these issues, Saudi Arabian government is unable to gain complete economic benefits from ERP. The intervention of Saudi Arabian government in the implementation of ERP education planning, as well as creation of employment opportunities, insure the Kingdom transitions into a knowledge-based economy.

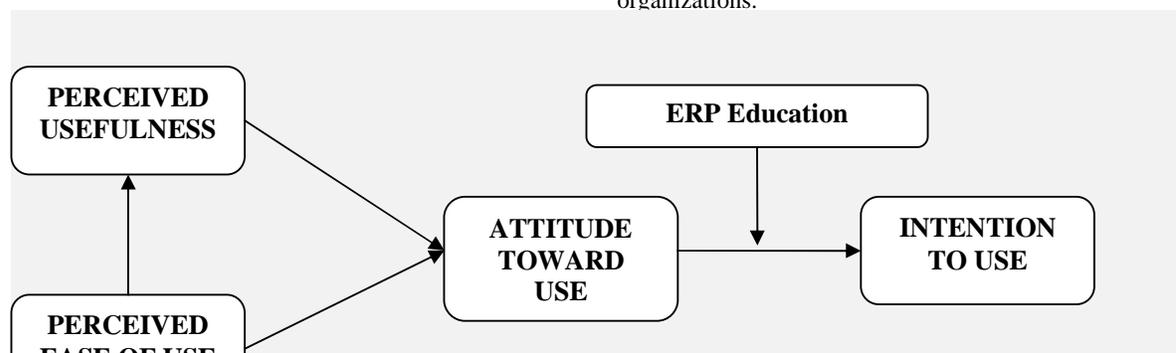
Primarily, the government of Saudi needs to concentrate on execution, authorization and implementations of laws which promote equality within the nation. Achievement of equality and a continuous effort to maintain this phenomenon is required for labor sector economy. The government should focus on ERP education planning by developing the policies to encourage employment. At the same time, the government should encourage and provide different institutional factors to promote well-being as well as success in schools on a priority basis. Employment promotion of ERP education planning should be completed in each group of workforces, meanwhile concerning the special dedication for gender equality. Furthermore, different labor-friendly practices should be generated for the workforce to promote their participation in the achievement of ERP education planning goals. For now, all needs to be done is the encouragement of research into the issue of ERP education planning participation in a labor force of the concerned nation.

Figure 1: The Technology Acceptance Model. Source Davis et al., 1989

Additionally, other different critical factors of cultural environment regarding ERP education planning in private sector of nation's employment also need to be considered. The government should minimize the social conflicts and further overcome current challenges that limit the implementation of ERP education planning system. Saudi policymakers need to focus on labor training and educational system on urgent basis. Furthermore, policymakers should minimize the weaknesses, so the improved labor and educational system will make employees enough capable of implementing a good ERP system for the workforce. Educational programs should be introduced to motivate the employees and minimize the burden of destructive gender issues. The government should take effective steps towards the implementation of a good ERP systems within educational sector through taking urgent consideration to above-said issues.

2.2.2 Technology Acceptance Model

Assessment trend of global market increasing the worldwide competition. The basis of competition has changed due to rapid change in technological advancement. Therefore, to meet the requirements of the rapidly changing environment, organizations are trying to maximize their profit through implementation of different advanced technologies in their operation. Organizations are needed to adopt advanced technologies in their supply chain process to minimize the cost, to enhance effectiveness, to increase efficiency and to improve performance for the achievement of strategic goals, and to sustain competitive advantage globally as well as locally [9]. Use of advance hardware's and software's should be mandatory for all district levels with small and large organizations to sustain competitive advantage. Enterprise Resource Planning (ERP) is one of a good example of information process, which is required by various organizations.



To identify the relationship between adoption of latest technology and user information system is one of the basic concern. [15] draw a model, namely, technology acceptance model (TAM). The purpose of this model was to analyse the relationship of workforce and technology adoption. [16] theory or Reasoned Action focused user's behaviour in a certain condition. Davis developed TAM from Fischbein & Ajzen's TRA to identify the user behavior regarding acceptance of the technology. TAM model suggested checking the link of two variables namely, Perceived Usefulness and Ease of Use.

2.2.3 Kotter's 8-Stage Model of Change

Various models and theories are available to implement any amended process to minimize the employee resistance and to avoid the failure in

installation. These models are including, McKinsey 7-S model, Whelan-Berryisntance, the Kotte's 8 step change model and Lewin's change model. In this current study, Picked Kotter's model is selected for implementation of ERP in the market of Saudi Arabia. The 8-step Kotter's model tries to highlight the need of change process to employees as well as managers of the organization. Furthermore, according to Kotter, 75% of overall organization employees need to buy the change process for the successful implementation [17].

Model of Kotter advocates about vision creation, strategy for change process and understanding the urgency of the change process. Furthermore, the model assumes to reveal the reason for the change to the employees, empowerment of illegible and ethicist staff to overcome and minimize the obstacles, and documentation of significant milestones for the change process. Finally, maintaining the change process consistent until it meets the main objectives and also confirms that this change is permanent. Further, it also confirms that culture should be aligned with goals and change process. Model further highlights, it should be confirming that employees are involved and accepted the change process, and they accept the change process positively. Nevertheless, evaluation as well as monitoring always remains vital for change success.

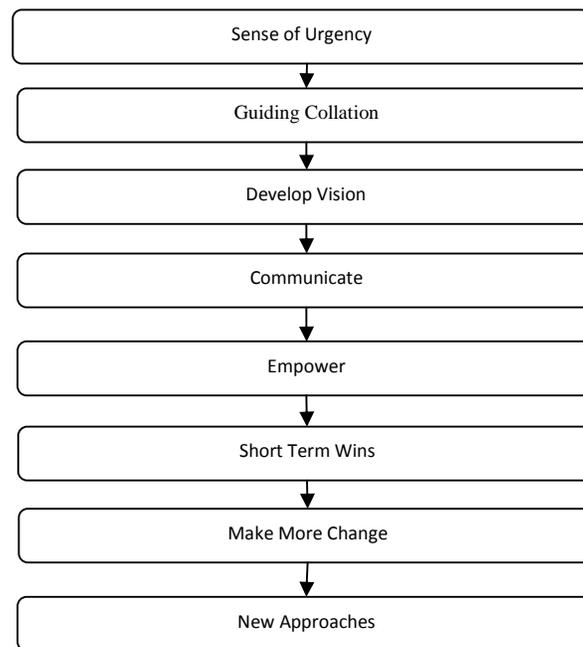


Figure 2: Kotter's 8-stage model of change

2.2.4 ERP Critical Success Factors

From 30 years, Critical success factors (CSF) method was acknowledged by several researchers. According to [18], successful competitive performances confirm if the satisfactory outcomes of CSF in a certain area are identified (as cited in [19]). Critical success factors (CSF) are needed to

confirm the successful ERP implementation, as identified by [20] (as cited in [21], p2). Regular identification of CSFs is given in the previous literature, especially in [22]. In the context of the current study, success factors are given in Table 1.

Table 1: The Critical Success Factors for technical perspective

SR#	Critical Success Factors (CSFs)	Meaning
1	The commitment and support of Top Management	There is adequate support from first level managers and commitment of resources
2	Change management	There is a structured approach to shifting/transitioning the university from a current state to the desired future state
3	Project management	Skills and knowledge use in coordinating the scheduling and monitoring of defined activities to ensure those project objectives of are achieved
4	Business process reengineering and customization	There is some change in work process comes with implementing the ERP System
5	Training	There is effective training for users
6	Clarity vision/ goals & objectives	There is a clear picture of the future state

So that select the most manipulating factors in Higher Education sector in Saudi Arabia, our case study was showed in Madar as elucidated in next section.

3. Madar Case Study

3.1 Background

Market Research Paper (2014) indicates that Saudi Arabia has a huge information technology (IT) market among all the Gulf States. The estimated worth of this market was US\$ 3.4bn in the year of 2008 and it was expected that this market will increase up to US\$ 5.6bn in 2013. Because of this expectation, many benefits in Kingdom can be attained to strengthen electronic business (e-business) world. Communication structure, population construction, geographical location and free economic strategy can take various benefits for KSA. In 2004, a research study by [23] revealed that organizations of Saudi Arabia are speedily adopting the ERP packages. Hence, figure proved that 69% of Saudi Arabian organizations adopted ERP.

Recently, Saudi Arabia government has developed a new strategy and invested almost US\$ 3.1bn to improve the current education system. Saudi Arabia government focusing on adoption of high technology in education sectors to enhance the efficiency and effectiveness. Similarly, a separate distribution of SAR 2.4bn has been reserved to pay for training for 400,000 instructors. Out of twenty-four universities, twelve universities are using ERP packages in Saudi Arabia [24], [25]. These universities include Qassim University (2007), King Saud University (KSU) (2007), Al-jouf University (2008), King Fahd University of Petroleum & Minerals (2007), Hail University (2010), King Saud Bin Abdulaziz University (2011), King Abdullah University (2010), Taibah University (2011), King Abdulaziz University in

Jeddah (2011), Islamic University in Almadinah (2011), Shaqra University (2011), King Faisal University (2011) and Northern Border University (2013). Universities of Saudi Arabia started to adopt ERP systems Since 2007 and now the numbers are increasing.

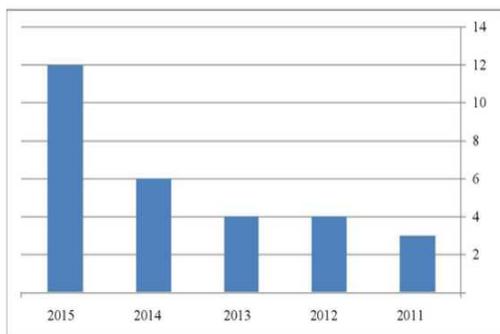


Figure 1: Number of universities Saudi Arabia adopting ERP system

Government base educational sector of Saudi Arabia consist of 05 research centers, 12 colleges and 03 campuses in different places. It also consists of a large-scale university, namely Northern Border University (NBU). Furthermore, NBU also consist of medical college having 2 hospitals. Control of different resources by managers is an important element of successful execution of different operational activities in ERP. Therefore, NBU is one of the leading university who has is implementing ERP system. University has also faced different challenges such as lack of talented users because of limited university budget provided by the government [26].

In 2013, the ERP system which was adopted by NBU called Madar, having twelve administrative systems, namely, inventory control system, administrative system, financial system, payroll system, HR system, communication system, warehouse system, purchasing system, employee self-service portal, authorities and confidentiality system, budget and planning system, scholarship and training system, and Recruit system [27], [28].

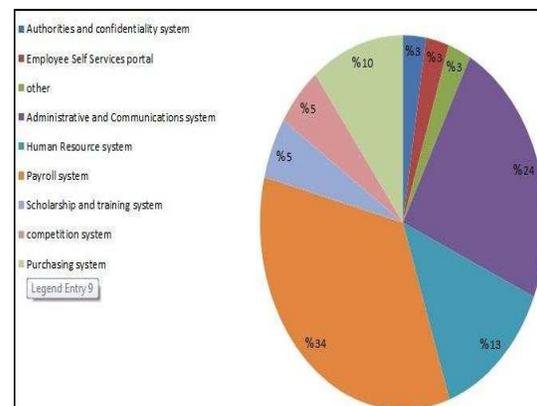
4. Methodology

For data collection, two questionnaires were used and data was collected from Madar System and end-users. Respondents consisted of all staff members in twelve directed administrative systems. Questionnaires were distributed by the help of e-mail. However, few questionnaires were also distributed in hard copy.

The first questionnaire was designed to measure the CSFs from a technical potential. The sample size was consisting of eight employees from all Madar team members and 5-point Likert scale was used as

rating scale (1=extremely satisfied, 5=extremely dissatisfied).

To compare the effectiveness of all CSFs, sample t-test method was used, in which the null hypothesis H_0 was considered:



$\mu < 3$ and the alternative hypothesis $H_1: \mu \geq 3$. The statistic test was

$$t = \frac{\bar{x} - \mu}{s / \sqrt{n}}$$

As discussed earlier, the second questionnaire was measured the user satisfaction. The purpose behind this questionnaire was to measure the perceived acceptance of ERP system. [29] developed an instrument to identify the user satisfaction into technical as well as organization category as given in Table 2. E-mail was used as a source for questionnaire distribution and total 130 questionnaires were distributed, however, few were distributed manually to end-users of Madar system in KSA. Out of 130 questionnaires, the response rate was 31%. SPSS were used to analyze the data. Responses from different Madar sub-systems shown in figures 2.

5. Results and Findings

The results are presented in the following figure 3 and table 3:

According to the ERP technical perspective, in higher education sector of Saudi Arabia, there are two important factors namely, 'Project Management' and 'ERP system Selection.' As shown in Table 3 and Figure 3. In the implementation of ERP system, these two factors are more influencing. However, all other effective CSFs of ERP implantation in higher education institutes are stated as under:

Figure 2: Response rate from different sub-systems in Moderators

- | | |
|------------------------------------------------------|--------------------------------------------|
| (1) Project management | (6) ERP team composition |
| (2) ERP system selection | (7) ERP systems integration |
| (3) Departments(Stakeholder) participation | (8) Choosing of the supplier & its support |
| (4) Business process reengineering and customization | (9) Scope of implementation |
| (5) Top management commitment and support | (10) Consultant participation |

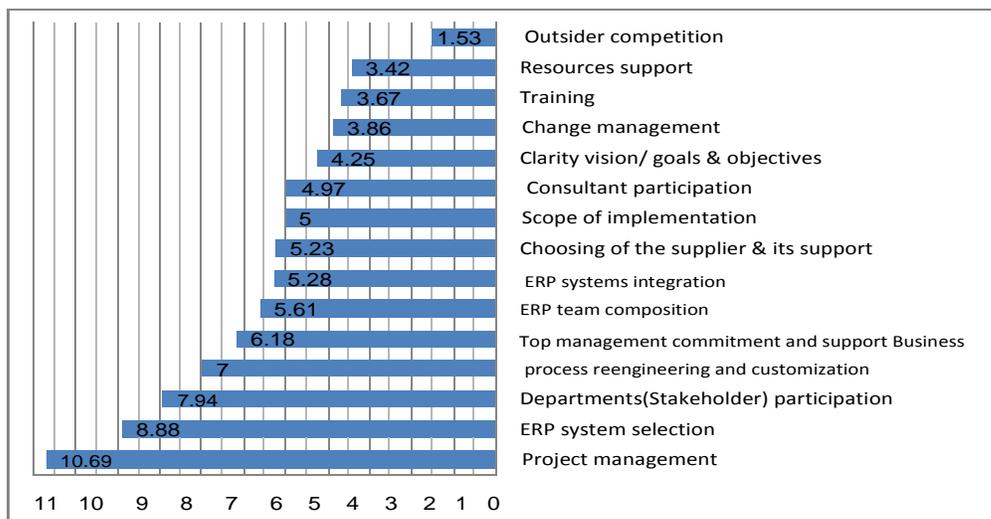


Figure 3: Success Factors by Degree of Importance in ERP Implementation from technical perspective

Table 3: Success Factors by Degree of Importance in ERP Implementation from technical perspective

SR#	Critical Success Factors (CSFs)	Mean	STD	t -degree
1	Top management commitment and support	4.6	0.8	6.19
2	Change management	3.8	0.7	3.88

3	Project management	4.9	0.6	10.70
4	Business process reengineering and customization	3.8	0.5	8.00
5	Training	4.2	1.3	3.57
6	ERP team composition	4.3	0.7	5.60
7	Clarity vision/ goals & objectives	4.2	0.8	4.35
8	Consultant participation	4.1	0.6	4.97
9	Departments(Stakeholder) participation	4.5	0.6	7.95
10	ERP system selection	4.7	0.7	8.89
11	ERP systems integration	4.5	0.9	5.18
12	Resources support	3.3	1.00	3.40
13	Scope of implementation	4.3	0.7	5.00
14	Supplier Selection & its support	4.4	0.7	5.23
15	Competition of Outsider	4	1.9	1.53

Questionnaire based result are given in figure 5. According to the 65% respondents, training provided in the implementation of ERP was very helpful. 55% of participants could express their opinion about the system. According to the response of 60% respondents, functions of ERP was useful to gain efficiency and effectiveness. The respondents in both questionnaires were asked to estimate a percentage regarding the level of success attained in ERP implementation (Madar). The results are shown in Table 4.

Table 4: Level of success of ERP implementation

Group	Average Level of success
Technical's perspective	87.63%
Users perspective	61%

At the end, additional comments were taken from the employees of Madar system to suggest the improvement in ERP implementation. They included following suggestions:

- Integration with internal as well as external stakeholders such as integration with all essential government departments.
- Madar system is considered as one of the qualitative leaps for the university.
- Purchase section, payroll, finance department and inventory sections should be closely integrated to retain smooth running of the organization and to achieve all potential benefits.

6. Conclusion and Discussions

In the current study, various success factors are identified, however, sense of urgency has a clear contribution to the implementation of ERP system in higher education of Saudi Arabia. Current study support organizations in different countries through identification of important success factors and enrich the knowledge in implementing the ERP systems. Successful implantation of ERP is now

higher because of huge investment in different resources as proved by previous literature. In this study, researcher selected Madar for successful implementation of ERP system as case study to observe critical factors. The study encircles complete prospects from ERP team members and users (i. e., technical and user perspective). The case which is selected for this research is contributed in academic research by postulating empirical evidence to support the theories of CSFs

and ERP implementation. For future study, this study should be carried out in different universities of KSA through the different opinion of users as well as their experiences.

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