Abstract
Implementing Enterprise Resource Planning (ERP) systems allows organizations to achieve many benefits including the availability of integrated information, high responsiveness to customers' and suppliers' needs and the provision of timely information to decision makers. Another key benefit of ERP systems is the integration of information throughout the supply chain which leads to cost and inventory reductions and improved operating performance. This of course excels the performance of the functional areas within organizations. The major problems of ERP implementation are not technologically related issues such as technological complexity, compatibility, standardization, etc. but mostly about organization and human related issues like resistance to change, organizational culture, incompatible business processes, project mismanagement, top management commitment, etc.. Organizations in the corporate sector, particularly in more financially competitive environments than those in the non-profit sector, have experienced numerous benefits from ERP systems during the last two decades in spite of the challenges of implementing ERP systems. These successes have encouraged Higher Education Institutions (HEIs) to adopt ERP systems with the same goals that promoted corporate sector adoption such as increasing operational efficiency and decreasing costs. HEIs have made significant investments in ERP implementation to improve institutional business processes.

1. Introduction
ERP is an industry term for the broad set of activities supported by multi-module application software that help a manufacturer or other business manage the important parts of its business, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders. ERP can also include application modules for the human resources aspects of a business. Typically, an ERP system uses or is integrated with a relational database system.
Enterprise Resource Planning software systems (ERP) encompass a wide range of software products supporting day-to-day business operations and decision-making. ERP serves many industries and
numerous functional areas in an integrated fashion, attempting to automate operations from supply chain management, inventory control, manufacturing scheduling and production, sales support, customer relationship management, financial and cost accounting, human resources and almost any other data oriented management process. Enterprise resource planning (ERP) systems integrate internal and external management information across an entire organization, embracing finance accounting, manufacturing, sales and service, customer relationship management, etc. ERP systems automate this activity with an integrated software application. Their purpose is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections to outside stakeholders. Enterprise Resource Planning (ERP) systems can run on a variety of computer hardware and network configurations, typically employing a database as a repository for information.

2. Characteristics of ERP

Enterprise Resource Planning (ERP) systems typically include the following characteristics:

- An integrated system that operates in real time (or next to real time), without relying on periodic updates.
- A common database, which supports all applications.
- A consistent look and feel throughout each module.
- Installation of the system without elaborate application/data integration by the Information Technology (IT) department.

<table>
<thead>
<tr>
<th>SN</th>
<th>Features</th>
<th>Code</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financial Accounting</td>
<td>FI</td>
<td>General account payable Ledger, Account receivable and legal consolidation</td>
</tr>
<tr>
<td>2</td>
<td>Controlling</td>
<td>CO</td>
<td>Cost center accounting, Product cost controlling and activity based costing.</td>
</tr>
<tr>
<td>3</td>
<td>Asset Management</td>
<td>AM</td>
<td>Insurance, property value and depression of fixed assets.</td>
</tr>
<tr>
<td>4</td>
<td>Project System</td>
<td>PS</td>
<td>Project management, Project tracking and budget management.</td>
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<td>5</td>
<td>Human Resources</td>
<td>HR</td>
<td>Information relating personnel and personnel administration, planning and development.</td>
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<tr>
<td>6</td>
<td>Quality Management</td>
<td>QM</td>
<td>Quality Planning, Inspection processing, quality certificates, quality notification.</td>
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<td>7</td>
<td>Plant Maintenance</td>
<td>PM</td>
<td>Maintenance of technical object like equipment, functional location, Preventive maintenance, Service management and maintenance order.</td>
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<td>8</td>
<td>Production Planning</td>
<td>PP</td>
<td>Operation Planning, MRP, Shop floor control, capacity requirement planning.</td>
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<td>9</td>
<td>Material Management</td>
<td>MM</td>
<td>Inventory management, invoice verification, purchase management.</td>
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<tr>
<td>10</td>
<td>Sales and Distribution</td>
<td>SD</td>
<td>Sales order management, Delivery to customer, invoice verification.</td>
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Organizations need Information Technology (IT) to improve information flow across the entire organization, reduce costs, streamline business processes, offer product variety, establish linkages with suppliers, and reduce response time to customer needs and expectations (Beheshti, 2006) in order to remain successful and retain their competitiveness. Davenport (1998) stated that enterprise resource planning (ERP) systems may be the most important development in the corporate use of information technology. Hence, many organizations’ want to improve their competitive position by implementing ERP systems. ERP systems hold the promise of improving business processes and decreasing costs, as these systems facilitate communication and coordination, centralize the administrative activities, increase the ability to deploy new information system functionality and reduce information system maintenance costs.

Various definitions and descriptions of ERP systems can be found in the literature. Beheshti, who defined enterprise resource planning (ERP) system as “a set of business applications or modules, which links various business units of an organization such as financial, accounting, manufacturing, and human resources into a tightly integrated single system with a common platform for flow of information across the entire business” A successful ERP system can be the backbone of business intelligence for an organization because it can give managers an integrated view of the processes involved within it. ERP system can link different areas of an organization, such as manufacturing, order management, financial systems, human resources, suppliers and customers, into a tight integrated system with shared data and visibility For instance, ERP system provide seamless integration of processes across functional areas with improved workflow, standardization of various business practices and access to real-time up-to-date data. Implementing ERP system successfully however is problematic, costly and complex, and often shows high failure rates or even abandonment due to lack of fit with the business or social culture.

ERP system is a combination of advanced technologies and best business practices. It enables an organization to achieve its specific business goals and gain a competitive advantage by providing a common platform to integrate all aspects of the business. Although the failure rate of these ERP implementation has been highly publicized, many companies are not reluctant to invest large sum of money on ERP system, since it is acknowledged that the failures are not caused by the incorrect coding of ERP. A company needs a big investment for adopting this system to gain a benefit for organization while implementing an ERP system requires a thorough strategic thinking that allows companies to gain better understanding of their business processes. ERP system is a software package that needs to be customized in order to meet with business need. The correlation among ERP implementation, strategically impact and tactical impact will also be identified. An ERP has the potential to integrate all processes and functions of a company, and functions of company and to present a comprehensive picture of the entire organization. ERP promises seamless integration of all the information flowing through the company by using a single database that enables the various departments within an organization to effectively share information and communicate with each other. The number of companies adopting ERP system is increasingly rapidly.

### 3 Challenges of ERP Implementation in Business

Companies may encounter a number of challenges while implementing ERP in spite of ERP’s significant growth from the late 1990s to the present day. Dillard and Yuthas (2006) stated that most multinational firms are using ERP and that more small and midsize companies have begun to adopt ERP. ERP’s promises to benefit companies and a substantial capital investment, but not all ERP
implementations have successful outcomes. ERP implementations commonly have delayed an estimated schedule and overrun an initial budget (Ehie & Madsen, 2005; Helo, Anussornmitisarn & Phusavat, 2008). Furthermore, ERP implementations have sometimes failed to achieve the organization’s targets and desired outcomes. Much of the research reported that the failure of ERP implementations was not caused by the ERP software itself, but rather by a high degree of complexity from the massive changes ERP causes in organizations (Scott & Vessey, 2000; Helo et al., 2008; Maditinos, Chatzoudes & Tsairidis, 2012).

These failures can be explained by the fact that ERP implementation forced companies to follow the principle of ‘best practices’ in most successful organizations and form appropriate reference models (Zornada & Velkavrh, 2005). According to Helo et al., (2008), the major problems of ERP implementation are not technologically related issues such as technological complexity, compatibility, standardization, etc. but mostly about organization and human related issues like resistance to change, organizational culture, incompatible business processes, project mismanagement, top management commitment, etc."

Huang, Chang, Li and Lin (2004) presented the top ten risk factors causing ERP implementation failure.

**Top ten risk factors of ERP risk factors**

i. Lack of senior manager commitment

ii. Ineffective communications with users

iii. Insufficient training of end-users

iv. Failure to get user support

v. Lack of effective project management methodology

vi. Attempts to build bridges to legacy applications

vii. Conflicts between user departments

viii. Composition of project team members

ix. Failure to redesign business process

x. Misunderstanding of change requirements

These risk factors illustrate various organizational considerations: organization fit, skill mix, project management and control, software system design, user involvement and training, and technology planning.

Since ERP implementation inevitably causes organizational changes, it requires the engagement of senior management from across the organization that is able to resolve conflicts. ERP implementation has a high risk of failure without the commitment of senior management. In other words, due to changes in business processes across an organization, there can be resistance to adopting the ERP system. ERP connects and integrates all business functions within the organization. Therefore, it is critical that management staff be committed, and particularly that they equip employees who are using business functions influenced by ERP with clear channels of communication. Lack of end-user training increases risks by creating confusion and inaccuracy, thereby decreasing user satisfaction and the credibility of the system. Excellent project management is also needed for successful ERP implementation. Project teams should have clear guidelines to execute ERP implementation from their project objectives and work plan to their resource allocation plan. ERP implementation projects that are large in scale and must take place over longer time periods may end in failure without good project management. Furthermore, the composition of team members plays a crucial role in ERP implementation. ERP integrates diverse business functions across an organization into one single system, necessitating a complex and integrated software package. If a project team does not clearly
understand the changes in its organizational structure, strategies, and processes from ERP implementation, it will not be in a position to benefit from ERP’s competitive advantage. In order to best implement ERP, project team members should be selected with a balance between members with business experience within the organization and external experts with specialities in ERP. From the perspective of project management, the iron triangle can illustrate how important it is to balance the three corners of the triangle – scope, schedule and cost. (Lamers, 2002). ERP changes the entire organizational environment by reengineering the entire business process; thus, after implementation, it is not easy to revise previous processes. Therefore, ERP implementations need accurate estimation, preparation with a holistic view, and systematic management of the entire implementation process.

4 ERP in Higher Education Institutions (HEIs)

Organizations in the corporate sector, particularly in more financially competitive environments than those in the non-profit sector, have experienced numerous benefits from ERP systems during the last two decades in spite of the challenges of implementing ERP systems. These successes have encouraged higher education institutions (HEIs) to adopt ERP systems with the same goals that promoted corporate sector adoption (Fisher, 2006) such as increasing operational efficiency and decreasing costs. HEIs have made significant investments in ERP implementation to improve institutional business processes (Mehlinger, 2006). According to Abugabah and Sanzogni (2010), HEIs spent more than $5 billion in ERP investment during the last few years. Recently, ERP vendors have expanded their product scope to include new products in response to relatively new market needs. Examples of such products include student lifecycle management software from ORACLE and SAP. In spite of these additions, the implementation of ERP systems in HEIs has been described as challenging (Rabaa’i, Bandara & Gable, 2009). One study found that in 60 to 80 percent of higher education contexts, ERP implementation failed to meet expected outcomes and results of implementation were found unsatisfactory (Mehlinger, 2006). ERP was initially designed for corporate organizations. Although ERP provides numerous customization options, these options may increase the risk of failure by increasing the scope of work and cost of implementation, as well as delaying implementation schedules. Also, Pollock and Cornford (2004) described that ERP implementations create tension and affect the identity of universities raising reorganizational issues based on the perceived uniqueness of specific universities. Feenster (2000) described the difficulties experienced with an ERP system implementation in a U.S. college as “merging a system of decades–old databases and re-educating campus employees” and causing “enormous cost and pain”. HEIs have considered ERP adoption as a method of achieving greater integration of their management systems to better manage increasingly complex operations (Frantz, 2002). From decreasing government funding to increasing expectation by stakeholders, universities are currently under pressure to deliver higher quality educational services for lower costs. For these reasons, ERP systems can be very appealing to HEIs as a potential route to meeting these stands.

5 Review of Literature

ERP systems are being used in organizations to integrate their functional business processes (manufacturing and production, finance and accounting, sales and marketing and human resources), that have been implemented as scattered systems, into a single software system. This system facilitates the integration of information by utilizing a central data repository allowing effective use of information by different parts within an organization (Laudon & Laudon, 2012) ERP systems can be
defined as integrated software package composed of set of standard functional modules such as production, sales, human resources, finance, etc., It can be adapted to the specific needs of each organization (Nah & Lau, 2001; Botta-Genoulaz & Millet, 2006; Doom, et al., 2009). Currently, ERP systems are the most rapidly growing systems in organizations. ERP systems have emerged as a response to the enormous transformation in businesses caused by clients' demand of fast services, wider choices and lower prices. Other factors such as globalization, the need for process standardization and the highly changeable expectations of customers, have also participated in business transformation. ERP systems have been employed in both large and small-medium organizations because of these systems abilities to efficiently respond to these challenges (Botta-Genoulaz & Millet 2006, p. 204; Jacobson, et al., 2007).

However, implementing ERP systems require considerable time and cost, and it may take time before realizing the benefits of investment in ERP systems (Sumner, 2005). Botta-Genoulaz & Millet (2006) stated that ERP projects showed difficulties and even failure in implementation. The expected outcomes of ERP projects were rarely reached and costs were over budgeted. Davenport (2000), discussed the two reasons that leads to this failure: first, the technical complexity associated with the implementation process of ERP which requires a great deal of expertise. Second is the mismatch between the technical specifications of the ERP system and the business requirements of the organization.

The impact of ERP on a company can be tangible or intangible. Most researches on ERP implementation have focused on the tangible impacts since intangible impacts are more difficult to quantify. According to DeLone & McLean (1992; 2003), there are three kinds of impacts of ERP implementation, individual, workgroup and organizational impacts. Each impact has its own indicators. These indicators can be used to measure the overall impact of an ERP implementation. In their research, these individual, workgroup and organizational impacts act as one of the variables for measuring the success of ERP. Hunton et al. (2003) provide evidence on the impact of ERP adoption and overall firm performance by comparing return on assets, return on investments and asset turnover for ERP adopters and non-adopters. Their key results do not indicate a performance improvement for ERP adopters. However, they find that the financial performance of adopters has not declined during their test period, whilst the performance of non-adopters has declined during the same period. Wieder et al., (2006) conducted a field study to find the impacts of several aspects of ERP adoption using financial key performance indicators (KPIs) to measure overall performance. All these studies have substantially contributed, in that they advocated the importance of performance measurement for the improvement of business activities and they identified a number of metrics for the IS / ERP evaluation.

Nicolaou et al. (2003) compare financial data of companies adopting enterprise wide systems and of a matched control group of firms. The results from a unvaried analysis of performance differences across time periods show that firms adopting enterprise systems have significantly higher differential performance in their second year after the completion of the system than the control group.

Evaluation of ERP Implementation Successful ERP implementation has been influenced by ERP implementation approach and the Organization Maturity Level (Dantes & Hasibuan, 2010). Technology is only one aspect in ERP implementation other than people and process that have to be considered. ERP system will have high possibility of success, when the organization does the minimum change on organization’s business process and software. Prior literature on information technology investments suggests that strategic IT investment such as ERP give firms the ability to
gain tangible and intangible benefits that help sustain operational efficiencies in the long run (Nicolaou, 2004a; Kettinger et al., 1994; Mata et al., 1995). Furthermore, Nicolaou (2004a) has shown that these performance benefits typically accrue to ERP-adopting firms only after a lag of approximately two years from the date of original rollout. Professional literature also suggests that ERP implementations are typically not unitary and one-time events but involve a series of modular upgrades and enhancements to the original system (Holland and Light, 2001; Markus et al., 2000; O’Leary, 2000). While changes in the form of upgrades and enhancements are well documented, evidence also suggests that such implementations sometimes go awry and are followed by somewhat less publicized events such as switches to other ERP vendors and/or even total abandonments of such systems. Therefore the proposed study to question whether the firm performance (non)-effects surfaced by earlier studies of ERP implementation sustain over periods over which these same firms undertake ERP revisions/changes.

There is a small but growing literature on the impact of ERP systems; the majority of these studies are interviews, cases studies or a collection of case studies and industry surveys. McAfee (1999) studied the impact of ERP systems on self-reported company performance based on a survey of 101 US implementers of SAP R/3 packages. Participating companies reported substantial performance improvement in several areas as a result of their ERP implementation, including their ability to provide information to customers, cycle times, and on-time completion rates. Gattiker and Goodhue (2000) group the literature of ERP benefits into four categories:

1. Improve information flow across sub-units, standardization and integration facilitates communication and better coordination;
2. Enabling centralization of administrative activities such as account payable and payroll;
3. Reduce IS maintenance costs and increase the ability to deploy new IS functionality;
4. ERP may be instrumental in moving a firm away from inefficient business processes and toward accepted best of practice processes.

A model based on organizational information processing theory (Galbraith, 1974) has been developed to explain the costs and benefits of ERP impact and validated using two case studies. They argue that some successfully transformed firms (the “swans”) would enjoy these ERP benefits; however, others (the “ducks”) might not be able to benefit from such ERP implementation due to firm- and site-specific differences (Gattiker and Goodhue, 2000). The above studies on the impact of ERP systems suggest that there are potentially substantial benefits for firms that successfully implemented ERP systems, though there is little in terms of broad sample statistical evidence (Ragowsky and Somers, 2000). We note here the significance of ERP impact has started to attract more attention from the academics; a few special issues of leading academic journals have been edited or forthcoming.

University context a university’s most valuable assets are faculty, students, and staff. Each has distinctive interests within the same organization. A university is a place to teach, conduct research, and write for faculty. For students, it is a place to learn, live, and entertain. It may share many features with corporate work, including management structure, hours, and HR practices for staff (Duderstadt, Atkins Van, 2002). Pollock and Cornford (2004) stated that university is “thought of as a band of scholars coming together in pursuit and dissemination of knowledge, governed by a more or less collegiate model of organization, based around a complex structure of committees and with a high degree of individual and departmental autonomy”. In this sense, a university has been regarded as a “unique” organization that is different from an organization in the corporate sector in the literature for several decades (Lockwood & Davies, 1985; Balderston, 1995; Pollock & Cornford, 2004). Studies
indicate that universities are as more than non-profit organizations. According to Lockwood and Davies (1985), universities have a certain combination of unique characteristics: complexity of purpose, limited measurability of outputs, both autonomy and dependency with regard to wider society, and diffuse structures of authority and internal fragmentation. This particular combination makes universities “unique”, while general corporations have one or more of these components (Pollock & Cornford, 2004). “Colleges and universities are organized along the lines of academic and professional disciplines, grouped into larger units such as a college of arts and sciences or a school of engineering, as well as into smaller subunits such as a department of history or an institute of biotechnology research (Duderstadt et al., 2002, p93).” The parallel structure divided into highly specialized academic units in universities makes decision-making processes different from those of corporations, which have formal and hierarchical communication structure. There are some fundamental similarities between universities and corporations, and chief among these is that both universities and corporations are facing the common challenges of survival in competitive environment: increasing needs to improve efficiency and performance in administrative services (Allen & Fifield, 1999). Enrollment in degree-granting institutions in universities in the U.S. has been increased by 11 percent between 1990 and 2000. Between 2000 and 2010, enrollment in degree-granting institutions in the U.S. increased 37 percent, from 15.3 million to 21.0 million. During the same period, the number of full-time students rose 45 percent. The number of students in universities has been increasing, similarly expectations on the part of stakeholders are rising (particularly students and the government). These are quality and performance requirements. More competitive federal and local research funding have encouraged universities to strive for administrative excellence. It is providing the best opportunities for students to attain competitive advantages (Allen & U.S. Department of Education, National Center for Education Statistics. (2012). As a result, in spite of their uniqueness, universities have been forced to adopt certain of the corporate sector best practices for efficiency and productivity in business. In addition to the competitive environment, rapid advances in information technology have reshaped university administrative practices (Duderstadt et al., 2002). For example, research and scholarship depend upon information technology such as virtual laboratories and digital libraries. Similarly, new technology has affected teaching, “freeing the classroom from the constraints of space and time and enriching the learning of our students through access to original source materials” (Duderstadt et al., 2002). Considering the significant influence of information technology in universities, it is not surprising that many have adopted ERP systems for development and reengineering of administrative systems as a route to improved performance (King, 2002; Abbugabah & Sanzogni, 2010).

6. ERP Benefits

ERP use in HEIs integrates administrative functions that have been supported by separate legacy systems3in the past (Zornada &Velkavrh, 2005). Separate legacy systems were “disparate” and have led to “duplicate resources and services” (Allen &Kern, 2001). ERP enables HEIs to consolidate disparate data and legacy systems and adopt best-of-breed processes and modern technology. As different departments across an institution share an integrated database, end users can access data in real time. Best-of-breed information technology such as web technologies, mobile phones, and on-line services offer additional benefits not only to the administration within an institution, but also to people who constantly interact with the institution –faculty, students, and staff (Murphy, 2004; Zornada &Velkavrh, 2005).
According to King (2002), the main advantages of ERP in HEIs are
(1) Improved information access for planning and managing the institution,
(2) Improved services for the faculty, students and staff,
(3) Lower business risks, and
(4) Increased income and decreased expenses due to improved efficiency. Sabau, Munten, Bologa, Bologa and Surcel (2009) provide ERP benefits for universities in terms of business and technical point of views (see Figure 2-1 below). A legacy system refers to an old method, technology, computer system, or application program. It may still be in use instead newer or upgraded versions for certain role. (Wikipedia, 2013)

The ERP implementation process in order to better understand the process of ERP adoptions, a number of researchers have developed conceptual ERP life cycle frameworks or process models. Ehie and Madsen (2005) suggested a five-stage ERP implementation process using various reviews of the previous literature: project preparation, business blueprint, realization, final preparation, “Go-Live”and support Project Preparation. It refers to a comprehensive planning phase that forms a project team with leadership roles, sets budget targets, and defines the project objectives and plan.

In University

In the business blueprint phase, the current business process is analyzed in detail in order to select an appropriate ERP system. A project team then is trained on functionality and configuration of the selected ERP system. An understanding of the selected ERP system allows a project team to gain insight to reengineering its business processes.

**Business Benefits**
- Campus wide integration on a common system;
- Improve internal communications;
- Reduce or eliminate manual processes;
- Enhance strategic decision making and planning capabilities;
- Establish a self-service environment for employees;
- Improve self-service environment for students and faculty;
- Enable higher availability of administrative systems;
- Support sophisticated data analyses for use in decision-making;
- Integrated workflow, industry best practices, and reduced dependence on paper;

**Technical benefits**
- Reduce or eliminate the need for backup or shadow systems;
- Platform for re-engineering business practices and continued process improvements;
- Develop and maintain consistent data definitions;
- Provide accessible, user-friendly administrative and student support services;
- Increase data integrity, validity and reliability;
- Assure system wide security and protection of confidential information;
- Create a more seamless integration between technology and education delivery by providing a single platform based on new technologies;
- Access to data in real time.
Realization Phase

In the realization phase, a project team concentrates on implementing an ERP system including modification, development of interfaces, and data conversion. At the same time, each process design is tested on a conference room pilot.

Final Preparation Phase

In the final preparation phase, the entire process is fully integrated and tested throughout the organization with full data and various scenarios. End users are trained in this phase as well. Finally, in the “go-live” and support phase, the ERP system is constantly stabilized and may have extensions for competitive advantage. A conference room pilot refers to a software acceptance testing to validate a software application to meet business requirements and expectations for end-users of the software. (Wikipedia, 2013)

7 Challenges of ERP implementation in University

Heiskanen, Newman and Similä, (2000) suggest that ERP software, which incorporates best practices from the corporate business industry, is not appropriate for universities, since universities have unique structures and decision-making processes. Organizational culture heavily affects ERP implementation. Tsichritzis (1999) indicates that today’s universities have been forced to admit that “education is a business and students are the customers”. ERP implementation encourages universities take a more business-like approach to education, resulting in cultural changes including “the use of managerial language and techniques” (Allen, Kern & Havenhand, 2002). There can be resistance to ERP implementation at universities because it involves not merely the adoption of a new information system, but a holistic change in organizational culture. While there are diverse forms of management hierarchy from university to university, Birnbaum & Edelson (1989) describes that there exist two sources of authorities within a university: administrative authority and academic authority. ERP implementation is believed to reinforce administrative authority as a model of governance. This may lead to fear that use of a new system that results in increased transparency of their transactions would result in a loss of control for academics. On the other hand, administrative staff may fear for their job security when redundant processes are eliminated work functions are automated across a university (Allenet al., 2002). Moreover, Pollock and Cornford (2005) argue that ERP, as a “generic type of solution” from the corporate industry, could be a high-risk strategy for universities. Despite HEI’s needs for unique business functions, ERP solutions limit their choices and encourage adopting a “generic solution”. Since there have been few discussions and considerations regarding the challenges that universities might face from generic ERP system adoption, there is little assurance that the process will be successful. Also, as ERP systems are “large integrated packaged solutions” with dynamic complexity, it may cause difficulties with implementation for management and IT staff in universities, even those who might have comprehensive understanding of their own organizations (Pollock & Cornford, 2005). This is because universities have expanded a range of systems many of which have sometimes competing functions whenever they had particular needs (Pollock & Cornford, 2005). In the worst case, universities do not always have management or IT staffs who is well-versed in organizational functions. Standardization and integration, both of which are key features of ERP systems, limit flexibility in university systems. This loss of flexibility may lead staff to create ‘workarounds’ in which workers attempt to carry on their previous processes. This response to new ERP systems may ultimately increase staff workloads and create a data gaps between the system mechanisms.
8 Critical Success Factors for ERP Implementation

Rabaa’i (2009) researched previous studies identifying critical success factors (CSFs) for ERP implementation. This research presents the top 12 most frequently cited CSFs from previous studies: Top management commitment and support, change management, project management, business process re-engineering and system customization, training, ERP team composition, visioning and planning, consultant selection and relationship, communication plan, ERP system selection, ERP systems integration, and post-implementation evaluation measures. 20 Top management commitment and support successful ERP implementation depends on management to prepare for challenges that might be faced (Motwani, Mirchandani, Madan & Gunasekaran, 2002), as well as senior management who are involved in overall strategy of the company and are not familiar with technical aspects (Yusuf, Gunasekaran & Abthorpe, 2004). Also, top management commitment and support leads to overall organizational commitment across an organization. It results in the successful ERP implementation (Umble & Umble, 2002).

- **Change management**

Ehie and Madsen (2005) stated that ERP implementation involves more than changing software or hardware systems. Ideally, by reengineering business processes, ERP implementation can help an organization to benefit from higher levels of efficiency and improved performance. Therefore, ERP implementation may cause changes that lead to resistance among employees (Glover, Prawitt & Romney, 1999). Consequently, balancing conflicts between staff and technology and effectively managing employees in the change process are key elements for the successful ERP implementation (Ash & Burn, 2003).

- **Project management**

Effective project management is critical for the successful ERP implementation (Umble, Haft & Umble, 2003; Nah & Delgado, 2006). Bingi, Sharma, and Godla (1999) found that “a lack of proper understanding of the project needs and the inability to provide leadership and guidance to the project” are the main factors when ERP implementation fails. Thus, effective project management should define clear project objectives, develop a work and resource plan, and carefully track the project’s progress. Business Process Re-engineering and system’s customization there are two approaches to implementing ERP systems in an organization: reengineering business processes and ERP customization (Shehab, Sharp, Supramaniam & Speedling, 2004).

- **Business Process Reengineering**

Business process reengineering creates deep changes in organizational processes in order to fit them to ERP functions. On the other hand, when an organization wishes to maintain its existing processes using an ERP system, it can customize ERP functions. However, many researches indicate that ERP customization should be avoided or minimized in order to achieve the full of benefits offered by ERP systems (Shanks, Parr, Hu, Corbitt, Thanasankit & Seddon, 2000; Light, 2001; Bajwa, Garcia & Mooney, 2004).

- **Training End User**

Training has been recognized a critical factor for ERP implementation (Bajwa et al., 2004). Due to the complexity of the integrated ERP system, end user training is essential for a robust understanding of how the system works and how to use it. Consequently, appropriate end user education and training will maximize ERP benefits and increase user satisfaction.

- **ERP Team Composition**
Since ERP covers diverse functional areas across an organization, ERP team composition is also important for the successful ERP implementation; an ERP project team should consist of representatives from all functional units related to ERP.

- **Consultant Selection and Relationship**
  ERP consultants play a critical role in ERP implementation. Consultants can be essential knowledge resources for ERP’s hardware, software, and personnel. They also can help staff, have responsibility for project management, and audit the project. On the other hand, in order to be successful system maintenance after post-implementation, knowledge transfer from consultants is crucial for the organization.

- **Communication Plan**
  Strong communication within the entire organization during the implementation process increases success for ERP implementation. It allows the organization’s stakeholders to understand the goal and the expected benefits of the project as well as to share the progress of the project.

- **Open Information Policy**
  An “open information policy” protects the various communication failures for the project. (Al-Mashari, Al-Mudimigh, and Zairi, 2003) While the critical success factors can lead to success of ERP implementation, they do not guarantee it. Al-Mashari, Al-Mudimigh, and Zairi (2003) state that the delivery of the critical success factors is one major condition to lead to benefits from ERP implementation, and they suggest that IT projects can be considered successful as according to the following terms:
  
  - Correspondence success, which occurs when there is a match between IT systems and the specific planned objectives.
  - Process success, which occurs when IT project is completed within time and budget.
  - Interaction success, which occurs when users’ attitudes towards IT are positive.
  - Expectation success, which occurs when IT systems match user’s expectations.

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