Exploring Enterprise Systems Adoption in Bahrain

Full Paper

Mazen Ali
University of Bahrain
mali@uob.edu.bh

Esra Wali
University of Bahrain
ewali@uob.edu.bh

Athraa Al Mosawi
University of Bahrain
aalmosawi@uob.edu.bh

Mohammed AR Siddique
University of Bahrain
msiddique@uob.edu.bh

Yousif Al Hinai
University of Sultan Qaboos
yalhinai@squ.edu.om

Abstract

Enterprise Systems (ES) are multi-million dollar systems that are adopted by organizations to improve their operations. However, implementation of these systems is not straightforward and challenging, as it requires changes in work practices and business practices. These systems become more complicated for organizations in developing countries as they are based on western assumptions. While there are studies that examine ES adoption in developing countries, there are still conflicting results. In this study, we examine the critical success factors in different stages of ES implementation using multiple case studies of three organizations in Bahrain. The findings show that there are different factors important in different stages of implementation. Some of these factors are important throughout the implementation and others are important in particular phases. This research has important implications for research and practice.

Keywords

Enterprise Systems, ERP, Developing Countries, Kingdom of Bahrain

Introduction

Enterprise systems (ES) are computer-based systems that integrate the complete set of an organization's business processes and data in a single information technology infrastructure (Davenport, 2000). Since the 1990s, companies have been adopting ES such as enterprise resource planning (ERP) suites, customer relationship management (CRM) and supply chain management (SCM) systems (Staehr et al., 2012). These systems provide organizations with benefits such as reduction in cost, improvements in productivity and quality, better resource management, and improvements in decision making and planning (Shang and Seddon, 2002; Hart and Snaddon, 2014).

Despite these benefits, the adoption of ES is challenging as it not only requires co-ordination among functional areas within an organization but also the commitment of employees (Davenport, 2000; Parthasarathy et al., 2007; Wang et al., 2006). Fan et al. (2003) argue that enterprise systems are less suitable for enterprises that do not have a uniform culture and nonhierarchical structures as the systems follow standard design rules and require maximum integration of information flows.

ES has been adopted by organizations around the world most of which are developed countries such as the US (Nah and Delgado, 2006; Bradley, 2008), Canada (Kumar et al., 2003) and UK (Loh and Koh, 2004). In general, the adoption of ES in developing countries is faced by challenges related to economic, cultural and basic infrastructure issues which are normally less affecting in developed countries (Huang

and Palvia, 2001). While there are some studies investigating ES in developing countries such as Malaysia (Nah et al., 2007), Saudi Arabia (Al Turki, 2011), Eygpt (Rasmy et al. 2005) and Iran (Dedzar and Ainin, 2011), these studies have provided conflicting results. For example, according to Albadri and Abdulla (2009), top management support is the most important factor in ES success, whereas Rasmy et al. (2005) argues that organization fit of ES software is more important than top management support. These results are conflicting because the studies did not examine these factors at different ES implementation stages where one factor may be more important in the project initiation stage and less important in the project maintenance stage (Shanks et al., 2000).

As such, there needs to be more process-based studies conducted in the context of developing/emerging countries to better understand ES adoption. To address this gap, we investigate ES adoption in the context of developing countries by using multiple case studies of three large organizations in Bahrain. The next section discusses the literature on ES, and then we present our research model. In the section after we discuss our findings and finally we present the conclusions of this study.

Enterprise Systems Adoption Literature

The adoption of enterprise systems is widely discussed in the literature. Researchers have investigated critical success factors (CSFs) and proposed frameworks of CSFs for ES implementation (e.g., Al-Mashari and Zairi, 2000; Akkermans and Helden, 2002; Al-Mashari et al., 2003; Brown and Vessey, 2003; Nah et al., 2001; Holland and Light, 1999; Olson and Zhao, 2007; Somers and Nelson, 2003; Jarrar et al., 2000; Bradford and Florin, 2003; Mabert et al., 2003; Parr and Shanks, 2000; Skok and Legge, 2002; Umble et al., 2003; Welti, 1999). These studies reported on ES implementation in developed countries. They studied the CSFs from different perspectives. Researchers, such as Nah et al. (2001) and Somers and Nelson (2001), have argued that top management support, project champion, ERP teamwork and composition, project management, and change management program and culture were amongst the main factors that affect ES implementation.

The review of the literature on the CSFs of enterprise systems' adoption shows that these factors can be group into managerial, organizational, project related, technological, and external factors. Following is a discussion of these factors, which are used in this research to explore the adoption of ES by organizations in Bahrain.

First, the managerial factors are factors that reflect the top management expectations and support, which in turn affect the adoption of enterprise systems. Top management's approval and support is important as the system implementation requires the allocation of valuable resources such as time, money, and personnel (Holland et al., 1999; Shanks et al., 2000; Somers and Nelson, 2001). Managers should establish new organizational structures, roles and responsibilities to support the adoption of the new system (Roberts and Barrar, 1992). Enterprise systems adoption should be clearly justified (Falkowski et al., 1998), the goals and benefits should be clearly stated and tracked (Holland et al., 1999) and the project mission should be related to the business needs (Roberts and Barrar, 1992). Organizations should also have a business plan that steers the direction of the enterprise system adoption. This is needed throughout the project to specify the benefits, resources, cost, risk and timeline (Wee, 2000).

Second, there are factors within the organization that affect the adoption of enterprise systems. Effective communication among stakeholders and within all levels of the organization is a critical success factor to ES implementation as it enables communicating the project scope, objectives, progress, activities and expectations (Nah and Delgado, 2006; Sumner, 2000). Moreover, users' engagement and collecting their feedback is highly recommended (Falkowski et al., 1998) as the adoption of enterprise systems will only succeed if it addresses users' needs and solves their problems (Nagi et al. 2008). Another important organizational factor is minimum customization. For organizations to take full advantage of enterprise systems, minimal system customization should be done which in turn increases the success chances of the adoption project and also opens the way for benefiting from future updates of the system (Davenport, 1996; Sumner, 2000). Change management is also important throughout ES implementation. Organizations should be willing to re-engineer their business processes to ease the adoption of the new system (Bingi et al., 1999; Somers and Nelson, 2004; Nah et al, 2003; Al-Mashari et al., 2003).

Third, the project setup affects the adoption of enterprise systems (Nagi et al., 2008; Shanks et al., 2000). The composition and competency of the project implementation team is significant in the success of an enterprise system adoption (Barki et al., 1993; Clemons et al., 1998). The team should have a leader (project champion) who facilitates between the different members and tracks the project progress and alignment in terms of schedule and plan (Sumner, 1999; Parr et al., 2000; Nah et al., 2003). The team should include representatives from the different departments in the organization as well as representatives from the vendor and consultants (Nagi et al., 2008). Researchers argue that it is necessary to include people with business and technical knowledge in the project team and they should be given the power to take decisions regarding the project (Shanks, 2000; Parr et al., 1999; Allen et al., 2002; Al-Sehali, 2000; Bingi et al., 1999).

Fourth, the adoption of enterprise systems is also affected by technological factors like the legacy systems used within the organization which users have been using and familiar with. The migration to a new enterprise system requires establishing architecture before implementation to ascertain the inclusion of all requirements in terms of data and processes which therefore eliminates reconfiguration at later stages (Wee, 2000) and provides a way to monitor and check against the project goals (Bingi et al., 1999).

Fifth, external factors affect the adoption of enterprise systems such as factors related to the vendor and consultant. The support provided by the vendor is key throughout the implementation process as well as post-implementation (Roberts and Barrar, 1992). In addition, consultants experience and knowledge has a major effect on the adoption project (Shanks et al., 2000).

The adoption of ES in developing countries

Despite the wide implementation of ES in developed countries, developing countries are lagging behind (Huang and Palvia, 2001; Rajapakse and Seddon, 2005). This has motivated major ES vendors like SAP and Oracle to focus on countries in Asia and Latin America (Huang and Palvia, 2001). The lack of adoption of ES in developing countries has been attributed to the design of enterprise systems that have embedded western assumptions about organizational practices that might cause culture clash when these systems are implemented in developing countries (Molla and Loukis, 2005). In addition, developing countries face specific difficulties that affect the implementation of ES, which are mainly economic, technical, organizational, and social (Soja, 2008). Of the most occurring difficulties faced are social difficulties related to the human resources involved in these projects namely employees' knowledge and education and lack of top management support and involvement (Soja, 2008; Dedrick et al., 2013). In addition, economical difficulties, like the high cost of the planning activities of the projects' implementation, are found to be more severe in developing countries than developed countries (Kamhawi, 2008; Seethamraju and Seethamraju, 2008, Dedrick et al., 2013) and especially for small and midsize organizations. Moreover, as Huang and Palvia (2001) argue, the adoption of enterprise systems in developing countries is affected by inadequate IT infrastructure, governmental policies, small size of companies, lack of IT/ERP experience and top-managers, and low IT maturity.

Many studies have reported on the adoption of ES in these countries (Middle East - Bahrain (Kamhawi, 2008), Saudi Arabia (Al-Fawaz et al., 2011), Oman (Maguire et al., 2010), United Arab Emirates (Albadri and Abdulla, 2009), Egypt (Rasmy et al., 2005) and Libya (Twati and Gammack, 2006)). Some of which (e.g. Albadri and Abdulla (2009), Al-Fawaz et al. (2011),) have investigated the critical success factors that were reported in the literature to affect the adoption of ES in developed countries focusing on the particularity in the developing country's settings. However, these studies have usually focused one or two of the factor groups but not all of them. In addition, these studies do not examine the ES adoption as a process where different factors may affect different stages of the system implementation. This paper aims to investigate this by using a process theory.

Research Model

Many of the studies investigating the CSF for ES implementation use a process theory approach as suggested by Markus and Tanis (2000) (e.g. Nah et al., 2001; Loh and Koh, 2004; Nah and Delgado, 2006; Markus and Tanis, 2000; Staehr et al., 2012; Shanks et al., 2000). This enabled studying the sequence of events leading to implementation completion highlighting the different factors that are

critical in different stages of ES implementation process. Process theory provides an insight on change management in organizations, which is a result of the introduction of new enterprise systems.

The four-phase framework of enterprise systems experience (Figure 1) proposed by Markus and Tanis (2000) was adapted to analyze the factors that affect the different phases of the ES adoption in the organizations in this study. The phases are:

Phase 1 – Project Chartering: in this phase the organization takes decisions that led to the adoption of an ES. This includes building a business case for enterprise system followed by selecting the software package, identifying the project manager and approving the project budget and implementation timeline.

Phase 2 – Project: in this phase the selected ES is up and running within the organization. This involves configuring, integrating and testing the ES. In addition, the required data conversion is done, training is provided to users and the new system is rolled out.

Phase 3 – Shakedown: in this phase the organization is running normal operations through the new ES. It may include bug fixes and rework, tuning the system performance, retraining users and staffing up to handle temporary inefficiencies.

Phase 4 – Onward and Upward: in this phase the organization continues normal operation and ascertains the benefits sought of implementing the ES. This could lead to replacing the ES by an upgrade or a new system. This phase includes making business improvements, building users skills and assessing the post-implementation benefits.
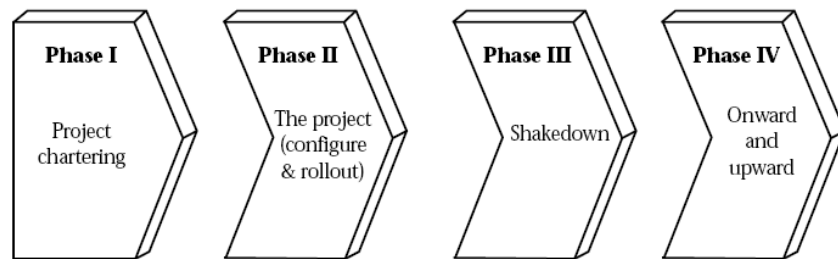

Figure 1: Enterprise System Experience Cycle (Adapted from Markus and Tanis (2000))

The following CSFs were identified from the literature and were investigated for each phase of the model:

Organizational	**Managerial**
Communication	Top management support
Culture/change management	Business plan and vision
User involvement	
User training	
Minimal customization	

Project Related	**Technological**
Project team composition	IT infrastructure
Project champion	

External Factors

Vendor

Consultant

Research Method

Case study was chosen as a method because of its ability to explain phenomena in its natural context (Yin, 2003). For the purpose of this study, a multiple case study was used as it enabled collecting rich information from various large organizations regarding the success factors in each of the four phases of the ES implementation life cycle. Three organizations were invited to participate in this study. These organizations were chosen because they typical examples of leading large organizations in their respective industry.

Three participants from each organization were involved in this study. The respondents were chosen based on their involvement in the ES implementation. This included IT manager, project manager and ES specialist or manager. Semi-structured interviews were conducted with each participant. The interviews lasted for approximately two hours and were audio recorded for analysis. There were also follow up interviews with participants. The data was transcribed and was analyzed using pattern-matching logic to find common themes (Yin, 2003). The data was triangulated by reviewing project reports and other system-related documents.

Case Description

The three organizations chosen for the study are large organizations. Company A and C have over 3000 employees and Company B has over 1500 employees. Table 1 provides details of the companies.

	Company A	Company B	Company C
Description	Company A is one of the largest industrial companies in the Middle East and is one of the top 10 largest aluminum producers in the world. This company has been the pioneer and leader in the adoption of ES in Bahrain. Company A has been assisting other companies in Bahrain in their ES implementation for the benefit of the county.	Company B is the leading integrated communication services provider in Bahrain known for innovation and superior customer experience.	Company C is the prime company responsible for production, transmission, distribution, and provision of customer services relating to Electricity and Water to more than a million residents of Bahrain.
Products	This company produces a range of aluminum products, which include billets, liquid metal, standard ingots, rolling slab, propertzi and others.	This company provides integrated communication solutions with a comprehensive range of products and services, to meet the demands of its residential, business and government segment customers.	Company C is responsible for the production, transmission and distribution of electricity and water services in Bahrain.
Number of Employees	Approximately 3000	Approximately 1500	Approximately 3000
Application uses	SAP-production planning, sales and distribution, HR; Material Management, Quality Assurance and Production Planning;	Corporate back office system: SAP (ERP) - financial systems, Oracle – HRMS. Company B also has a Customer Care	Company C has various applications such Customer Relationship Management, Asset Management, GIS system, SAP systems.

	Enhancement Packages and Support Packages: e-recruitment, e-banking, travel management.	System, which is used for fixed lines. This company uses other applications such as IP Billing, which is used to bill broadband customers; Business Support Services and Operating Support Services.	

Table 1: Case Studies Description

Findings

In this section, we present the findings from the case analysis. Our study reveals that the three companies had the same success factors throughout the phases of ES implementation. We present a detailed discussion of the findings in Table 2 below based on the research model presented in the earlier sections. The findings in the table have been structured into the four phases including the success factors in each phase. It is also important to note that based on the data analysis, we further divided some of the phases into sub- to highlight the important of success factors. The phases are categorized as Phase I: project chartering, which includes (a) drivers (b) planning and (c) project initiation; Phase II: project, which includes (a) technical implementation and (b) change management; Phase III: shakedown and Phase IV: onward and upward.

Phase 1: Project Chartering

Drivers

All three companies adopted ES to be more competitive and efficient. However, each company had other reasons to adopt ES. The main reason for Company A to move to SAP was because of the Y2K problem. The top management was worried that their legacy systems would not cope with the Y2K and decided to embark on the ES project. Company B had a change of strategy because of competition. Their existing systems were inefficient and not capable to respond to competition or market changes. This was one of the main reasons for adopting ES. Company C had changes in ownership and management. This entity was under the umbrella of a government ministry and was using the systems of the ministry. Once they became independent, the management of Company C decided to implement ES to manage their work.

Planning

The data indicates that the participants from the three companies believe that (a) strong business case, (b) top management support, (c) business plan and vision and (d) using a consulting company to choose vendor were critical (See Table 2). The participants have argued that as ESs are expensive, it is important to have a strong business case to justify implementation of these systems. In relation to top management support, all respondents from companies A, B and C have indicated that support is critical not only at the start of the project but throughout the life of the project. Furthermore, all these companies have used the services of consultants to help them in choosing software package and defining their requirements of the ES. In addition, Company A has assisted companies B and C not only in selecting the vendor but also in the implementation of the system.

Initiation

As shown in Table 2, all three companies during the initiation of the project required (a) Top management support; (b) user involvement before project implementation; (c) project team composition; (d) project champion; (e) communication and (f) consultant. The data indicates that top management in terms of a strong sponsor is important to set the tone of the project. All three companies had users involved with the start of the project to get maximum commitment for the project. In terms of team composition, the participants from the three companies have stated that there needs to a balance between IT and business people. A project champion with experience was also critical for the success of the project. The participants have argued that communicating the project plan and goals was important for the success of

the project. All three companies appointed experienced consultants in ES to assist them in understanding the requirements and implementation of the project.

Phase II: Project

Technical implementation

In terms of technical implementation, the respondents considered two important success factors. There was no or little customization to avoid technical issues and had to do an intensive data cleansing and data migration exercise during the implementation.

Change management

All the interviewees of the three companies have indicated that user acceptance was the most critical aspect of the project success. In terms of culture, everyone in the organizations was made aware that they had to change their work practices to use the system. The top management played an important role to indicate the importance of the ES project. These companies also conducted various seminars, workshops and meetings to communicate the deliverables of the project. The project team composition and project champion were other aspects that were considered important factors in this phase. In addition, all three companies had their user involved and engaged in the implementation of the ES. These respondents also argued that experienced capable vendor was another important factor.

Implementation Phase/Common CSFs	Company A	Company B	Company C
Project Chartering (Drivers of project)	**Inefficient systems** In around 1998, this company was having performances problems because their old systems could not handle additional applications. They also had redundant data in various systems, which require more than 50 IT persons to handle. **Y2K issue** *"The other reason was that the top management was concerned of the impact of Y2K on their systems. They were motivated to look for systems that could prevent this issue."*	**Environment pressure and strategy** Until 1999, this company was the only service provider in Bahrain. Once Telecommunication Regulatory Authority (TRA) decided to give licenses to other telecommunication companies, they want to improve their services. In 2000, there was a push from top management to revamp the systems to improve the performance of the company. This company then decided to implement ES. *"It was basically the competition. That became the business need. When the competition came, there were a lot of things we couldn't do because of the systems in place."*	**Environmental factors** Previously this company was under the ministry to finance. They had to use the application of the ministry. However, a decree was passed to transform this company to an independent entity and therefore needed to have their own applications and services to manage their financial. *"The ministry was transformed into an independent authority, which means that you have to manage your financial resources independently. Therefore, the decision was to go for SAP in order to do the implementation as we have the need for (managing) our own resources."*

Project Chartering (Planning) **Common CFSs:** Strong business case Top management support Business plan and vision Consulting company to choose the vendor and to assist with requirements definition	**Preparation of RFQ** This company prepared an RFQ with the assistance of a consulting company. In total, five major ES companies presented their quotations. **Vendor selection** was based on market benchmark and site visits to overseas manufacturers. *"We studied each one of them. And I think it was very clear that the only one which was adopted by other manufacturers around the world at that time was SAP. And we found other cases that were in Australia, Canada, France and South Africa who had adopted SAP."*	**Preparation of RFP** This company made a request for proposal and around six companies presented their bids. **Vendor selection** was based on criteria of the bid such as technical requirements, functionality and site visits other local and international companies. *"The site visit is very important. We went locally and regionally. We talked to [deleted for anonymity] who had Oracle; we talked to Company A who had SAP."*	**Decision was to select a particular vendor** This company was convinced that SAP would be the best solution for their financial. They wanted to use SAP for their modules such as billing, financials and HR. They did not want to implement two different systems similar to other government organizations. The management of this entity believed that SAP would be the best solution and they went through a long process convincing the ministries. *"It was not a simple one, because we went through a very long justification process to the government and the governor of the country in order to be able to select SAP as a single source."* **Vendor selection** was based on market study and site visits locally and internationally. *"We visited some of the utilities which had already implemented the system (site-visiting) in order to see what others are doing. And then we sat with the local companies such as company A who had just started to implement such systems to get to know about their views or how did they approach SAP in order to do it so."*

Project Chartering (Project initiation)	**Formation of steering committee and project team**	**Formation of steering committee and project team**	**Formation of steering committee and project team**
Common CFSs: Top management support (strong sponsor) User involvement Project team composition Project Champion Communication Consultant	The company formed a steering committee, which was led by the general manager responsible for the functional area of the system. As this company implemented the system in phases, they would change the sponsor of the project. *"We picked the manager of the area to be the sponsor for the team."* The project teams consisted of IT and business together. The team was led by a project manager from IT. *"We had all teams, IT and Business together."* **Communication** Management communicated the importance of the systems to staff through emails and face-to-face meetings. *"There were workshops and envisioning sessions all around the company. We started very casually, by just talking to them, giving them food and making it fun. The good thing about us is that we are one big family; we try to establish one goal at the end. That was one of the key things."* ***Consultant*** *This company hired consultant to assist them with ES implementation*	This company also had a steering committee was led by Finance General Manager, the second person in charge of the company. *"A steering committee had representation of HR, Finance and IT. This steering committee steered the project from the beginning, pre-implementation, implementation and post-implementation. This committee was actually a body on top of the project management team."* The project team consisted of a project manager and members from IT and business. *"The project team is from business, from IT, people from marketing team, from delivery team, from mobile team network."* **Communication** Project expectations were communicated via department heads to their staff. *"It started from a very early stage. It started with the pre-implementation stage, you invite people to talk about it from various levels of management. Then when you select, you announce again. Then when you kick-off the project, the COO comes and talks about it to a very big audience. And this is how it happened. This project*	The steering committee included all the top executives including the CEO and vice presidents. *"Steering committee that is chaired by the CEO of the organization and it contains the Vice Chief and has the representatives of all the concerned directorates."* Similar to the other two companies, this company also ensured that business people were involved in the execution of this project and was part of the project team. *"You cannot form a team with just one department. Since the system was being implemented for the business, I needed to have the business people with me. At the end of the day, I could make a decision from a project management perspective or from an IT perspective, but I cannot take business decisions. Some decisions, you need to take it with business people esp. when they are the concerned people."* **Communication** This company was using a portal to communicate to their employee. *"The expectations of the project were clearly communicated to us. And not just to us, but to our internal communities of our*

	"We did hire consultants. In this region, there were no such services (for SAP). They still haven't brought much offshore services. When we started adopting it, we could only do it through the hiring of consultants. So we had professional Project Management people working with us at that time and it was their responsibility to get the consultants to make things work."	*(Finance, SAP) was done in a very structured way, very professionally done. That is why it finished in 9 months."*	*organization. The message was that we would like to implement a system that integrates our financial receivables to our financial payables and a system that is capable of running the future needs of smart metering... We do have site within the SharePoint that is dedicated to the project and shows what our progress in the project is and where we are within the project."* **Consultant** This company hired consultant for area which lacked knowledge. *"There are some areas for which you lack the knowledge and experience, therefore you need to get some third parties which can provide you with the required knowledge for your support."*
Project (change management) **Common CFSs:** Culture/change management Top management support Communication Project champion Project team User involvement Vendor	The project team of this company understood that to successfully implement the ES project they had to change people working practices and their mindset. This company was engaged in an intensive change management program throughout the implementation. *"There were workshops and envisioning sessions all around the company. We started very casually, by just talking to them, giving them food and making it fun."*	The general manager of this company took a more coercive approach. He mandated people to start helping and using the system. The message of this top management was that the implementation is a priority. *"They had to use the systems because it was the second man in charge of the company. When he says you do it, you will do it. No one resisted no matter the change."*	Similar to company A, the users were enlightened on the benefits of the new systems. The project team would involve them in vendor meetings. These users would then convince their colleagues on the benefits of the systems, which would increase buy-in. *"Bring in people from the business, give them the knowledge of the new system, let them see the benefits of the new system, make them understand how the system will help them in order for them to do their job and then those*

Incentives

Employees of this company were motivated to support and join the project team. As some employees were promoted to higher positions because of their active involvement in the project and acceptance of the systems, other people would do better so as to get promoted as well.

"So the idea was to bring such people in, you give them their tasks and they also got promoted to higher positions which made other people do better so as to get promoted as well. We didn't have to push other people to do better because they started to come in themselves."

Project teamwork

Project team were from different area within the company

"We had key users from different functionalities of the system. And along with that there was a Group Leader as well. We picked the manager of the area to be the sponsor for the team."

Meeting with stakeholders: The project team would regularly meet on a daily basis to assess the progress of the project.

This company considers communication with the vendor as an important factor

"We had a very good communication with SAP itself globally

Meeting with stakeholders: There were continues meetings during the week in the implementation phase.

Project manager of the vendor: The IT manager considers the vendor to be a critical aspect to the success of the implementation of the project.

"It is critical to have a good project manager of the vendor- if the project manager is junior, you are in trouble."

Project teamwork

This company team were mix of consultants, vendors and internal staff

"In the back-office ERP, there were four members of the project team sitting full time in the office only working on this project; these members were from Vendor, Implementer, IT and Business. They sat for a period of 9 months to finish this."

people will help you by convincing their colleagues of the value of services added by the system."

Meeting with stakeholders: Similarly to companies A and B, there were continuous meetings during system implementation.

"If you don't get people's buy-ins, forget it. You need to get the people in, let them share the responsibility, let them feel with you the design and incorporate their requests. Let them feel that they are important and that their feedback is important."

Vendor

This company considers working closely with the vendor is important during the implementation

"You need to work closely with the vendor because at the end of the day, the vendor knows what they are supposed to implement. They know the application, but they don't know the business. So you need to tell them how the business is running."

	through service support OSS."		
Project (technical implementation) **Common CFSs:** Minimal customization IT infrastructure	This company had to replace their old system completely with SAP. They had to replace their whole infrastructure, which was a big job. *"We had to replace the infrastructure and peoples' thinking."* **Customization**: This company did not allow any customization because they wanted to change their process to achieve best practices. *"No, for the FI, PM and MM, we did not allow customization. We asked them to use it and practice it as it is."* **Data cleansing**: This company had to clean data to avoid redundancy. This process required defining data structures, creating new master data and so on. *"The most challenging project is the data cleansing exercise."*	This company also had to do a lot of changes to their infrastructure to support the system. They had to acquire new hardware and network devices to support this implementation. *"We have to have changes in the IT infrastructure. We shall be having new hardware; new set of skill set will be required and so on. So there will be a high impact on the infrastructure."* **Customization**: They changed their existing business practices so they did not need to customize the system. *"We are going to take out the business processes from the system and we will be asking our HR employees to analyze and change our business processes"* **Data cleansing**: This company also had to clean their data to avoid problem in the system. *"Yes, major data cleansing. There was a lot of inventory. It took us around 3-4 months with a big number of users just cleansing the data."*	This company also required addition hardware and networking devices to support the new implementation. *"We had to make some changes in the infrastructure to support the hardware and software esp. for the implementation of the ERP. But for the CRM, we are just adding resources."* **Customization**: This company also understood that customization would not be good for system support from the vendor. However, they had to do some customization for critical areas. *"We tried to maintain the standardization in order to minimize the customization. But in certain areas when there was no option, we decided to customize them because this is a business critical aspect and we couldn't say that maintain it as a standard. So in some areas, we did customization but for the majority we did not."*
Shakedown **Common CFSs:** User involvement Vendor support User Training Project Champion	This company performed a phased approach. They followed the lifecycle for every module of the implementation. For example, they started with Material Management and then Finance. *"We only went live after*	This company was testing and addressing any integration issues with the users. This was not a big step but testing was considered an important step in the process. This company involved and trained the users even before going live. The	Similarly, this company had performed tests for customers to verify that the configurations and any customizations meet the user needs are free from bugs. This company was also involved in training the users. They provided

Communication Top management support	*the users tested the system with the project team."* The users were trained extensively on using the system. Even though this company had implemented the ES for more than 15 years, they are still providing training to their users. *"Until today, we run SAP courses to train people. Every individual who joins the company has to learn SAP. They use it, they get familiar with it."*	sessions were given throughout the system implementation. *"In a very structured manner. We did it from the very beginning of the project; we told the user piece by piece. We taught them about the user level area and then the functional areas at different levels; the management level, the middle management, senior management, and the normal users."*	regular training session to get people to use the system. *"You need to bring the people out of their frozen state because they are frozen at a certain way of doing things and certain processes. You need to bring them out of the state, teach them and let them learn the new processes (then refreeze them). During the time when you teach them on how to use the new system, you need to tell them about the benefits of the new system and the value added by the system. As they continue to learn, you'll find their beliefs in the new system have started to increase."*
Onward and upward **Common CFSs:** Vendor support User involvement and training Top management support Communication Project champion	Vendor support was considered important for the success of the project. *"So if we had an issue, it first went to SAP Arabia, but if they couldn't come up with a solution, the problem was then transferred to the SAP centers which were working around the clock. But the minute you get the license, SAP provides the best support for you. They have very firm rigid methodologies from their side to make sure that they follow up with you and that everything is okay"*	This company also considers building a good relationship with the vendor is important for the system. The support is import of the success of the system. *"Yes they don't [have an office in Bahrain], their office is located in Dubai. But they are willing to visit anytime here. Their physical attendance is not really mandatory. Because they can easily support us virtually"*	One of the challenges faced by this company is that the governance committee would not approve the vendor, as they did not have an office in Bahrain. The vendor had to open an office in Bahrain to obtain the project from this company. This company regards working with the vendor a very critical factor for the success of the project. *"Because you are going to run the system for your business and they will be away. You don't want to be left alone with no support after they are gone; therefore you need to work with them and be with them step-by-step."*

Table 2: Multiple Case Studies Findings

Phase III: Shakedown

At this stage, testing and integrating the system to existing applications was important. This was reiterated by the respondents. Similar to the previous two phases, top management support, project champion, communication, training, user involvement and vendor support are critical factors for its success. The user involvement and vendor support helped these organizations to remove bugs to make the system ready for use.

Phase IV: Onward and upward

The participants have indicated that after implementation, there needs to be a reliable vendor support for the project. The vendors are expected to maintain a high level of service. User training is conducted even after going live as new employees or training existing staff is a continuous process for these companies. It was also found that top management support, communication and project champion are important in this phase.

Discussion and Conclusion

The overall analysis shows that there were common success factors for the three organizations in each phase. This finding conflict with some of the other studies (see for example Shanks et al. 2000) where they found some factors are more important in one of the cases than the other case. This perhaps may be different because Shanks et al. (2000) used one case from China and the other from Australia. The difference in environment and culture could have attributed to this difference.

Factors like top management support, communication, project champion and user involvement were clearly important in all cases throughout the ES adoption phases. This is consistent with Nah et al. (2001) and Shanks et al. (2000).Project champion was critical in the three cases as this person leads the project and has to be involved throughout. The participants from these three organizations emphasized the involvement of users from the start to the end of the project as they want to get their buy-in and reduce resistance. Moreover, communication was clearly essential as the ES adoption project has to be communicated to different stakeholders both at the managerial and users levels.

Vendor support was found in this study to be more important in the project, shakedown and onwards and outwards phases. Whereas Nah et al. (2001) indicated that vendors are critical players throughout the ES adoption project. User training is also important in the onwards and outwards phase as users might require retraining on using the updated versions of the system as well as training new comers to the organizations. The project team composition and competencies plays a major role in the ES project during the project chartering and project phases where the team has to involve users both IT and business. Minimal customization and IT infrastructure such as hardware, network and data cleansing are important within the project phase. Taking the advice of consultants and referring to other organizations that have similar systems plays a major role in the project chartering phase where the organization is making decisions on the ES selection. Business plan and vision is also important in the project chartering phase. Culture and change management is important during the project phase where individuals within the organization are required to change working practices to adapt to the new system.

In this study, we explored ES adoption in the context of Bahrain through multiple case studies involving three organizations. Guided by the ES process implementation approach of Markus and Tanis (2000), this study illustrates the success factors in each of the phases of ES implementation. This study is consistent with other studies that argue that these factors are more critical in certain phases than other phases (Shanks et al., 2000).

To complement and improve our findings, future studies are needed to include other organizations from other industries. This will help in validating our observations. In addition, more studies are required to investigate ES adoption by SMEs using a process approach. These studies could compare ES adoption between developed and developing countries. This would further improve our understanding of ES adoption in developing countries.

Acknowledgements

REFERENCES

Akkermans, H. and Van-Helden, K. 2002. "Vicious and virtuous cycles in ERP implementation: A case study of interrelations between critical success factors," *European journal of information systems* (11:1), pp. 35–46.

Albadri, F. A., Abdallah, S. 2009. "ERP Training and Evaluation: ERP Life-Cycle Approach to End-Users' Characterization and Competency Building in the Context of an Oil & Gas Company," *Ibima business review* (3:2).

Al-Fawaz, K., Eldabi, T., and Kamal, M. 2011. "Investigating factors influencing the decision making process for ERP adoption and implementation: An exploratory case study," in *Proceedings of the European, Mediterranean and Middle Eastern Conference on Information Systems*, May 30-31 2011, Athens, Greece.

Allen, D., Kern, T., and Havenhand, M. 2002. "ERP critical success factors: an exploration of the contextual factors in public sector institutions," in *Proceedings of the 35th Annual Hawaii International Conference on IEEE*, pp. 3062-3071.

Al-Mashari, M. and Zairi, M. 2000. "Information and business process equality: the case of SAP R/3 implementation," *The Electronic Journal on Information Systems in Developing Countries* (2:4), pp. 1-15.

Al-Mashari, M., Al-Mudimigh, A., and Zairi, M. 2003. "Enterprise resource planning: A taxonomy of critical factors," *European journal of operational research* (146:2), pp. 352–364.

Al-Sehali, S. H. 2000. "The factors that affect the implementation of enterprise resource planning (ERP)," *in the international Arab Gulf States and United States companies with special emphasis on SAP software (Saudi Arabia)*, University of Northern Iowa.

Al-Turki, U. M. 2011. "An exploratory study of ERP implementation in Saudi Arabia," *Production Planning and Control* (22:4), pp. 403-413.

Barki, H., Rivard, S., and Talbot, J. 1993. "Toward an assessment of software development risk," *Journal of management information systems*, pp. 203-225.

Bingi, P., Sharma, M. K., and Godla, J. K. 1999. "Critical issues affecting an ERP implementation," *IS Management* (16:3), pp. 7-14.

Bradford, M. and Florin, J. 2003. "Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems," *International journal of accounting information systems* (4:3), pp. 205–225.

Bradley, J. 2008. "Management based critical success factors in the implementation of Enterprise Resource Planning systems," *International Journal of Accounting Information Systems* (9:3), pp. 175–200.

Brown, C. and Vessey, I. 2003. "Managing the next wave of enterprise systems: Leveraging lessons from ERP," *MIS Quarterly Executive* (2:1), pp. 65–77.

Clemons, C. 1998. "Successful implementation of an enterprise system: a case study," in *Proceeding of the Americas Conference on Information Systems* 1998, 39.

Davenport, T. H. 2000. *Mission critical: realizing the promise of enterprise systems*, Harvard Business Press.

Davenport, T.H. 1996. "Holistic Management of megapackage change the case of SAP," in *Proceedings of the Second Americas Conference on Information Systems*, Phoenix, AZ, pp. 51a–51c.

Dedrick, J., Kraemer, K. L., and Shih, E. 2013. "Information Technology and Productivity in Developed and Developing Countries," *Journal of Management Information Systems* (30:1), pp. 97-122.

Dezdar, S., and Ainin, S. 2011. "The influence of organizational factors on successful ERP implementation," *Management Decision* (49:6), pp. 911-926.

Falkowski, G., Pedigo, P., Smith, B., and Swanson, D. 1998. "A recipe for ERP success," *Beyond Computing* (6:3), pp. 44–45.

Fan, M., Stallaert, J., and Whinston, A. B. 2003. "Decentralized mechanism design for supply chain organizations using an auction market," *Information Systems Research* (14:1), pp. 1–22.

Hart, C. A., and Snaddon, D. R. 2014. "The organisational performance impact of ERP systems on selected companies," *South African Journal of Industrial Engineering* (25:1), pp. 14-28.

Holland, C. P., and Light, B. 1999. "A critical success factors model for ERP implementation," *IEEE software* (16:3), pp. 30-36.

Holland, C. P., Light, B., and Gibson, N. 1999. "A Critical Success Factors Model for Enterprise Resource Planning Implementation," in *Proceedings of the 7th European Conference on Information Systems* (1), pp. 273-287.

Huang, Z., and Palvia, P. 2001. "ERP implementation issues in advanced and developing countries," *Business Process Management Journal* (7:3), pp. 276-284.

Jarrar, Y. F., Al-Mudimigh, A., and Zairi, M. 2000. "ERP implementation critical success factors-The role and impact of business process management," in *Proceedings of the 2000 IEEE International Conference on IEEE*, pp. 122–127.

Kamhawi, E.M. 2008. "Enterprise resource-planning systems adoption in Bahrain: motives, benefits, and barriers," *Journal of Enterprise Information Management* (21:3), pp. 310-34.

Kumar, V., Maheshwari, B., and Kumar, B. 2003. "An investigation of critical management issues in ERP implementation: Empirical evidence from Canadian organizations," *Technovation* (23:10), pp. 793–807.

Loh, T. and Koh, S. 2004. "Critical elements for a successful enterprise resource planning implementation in small and medium sized enterprises," *International journal of production research* (42:17), pp. 3433–3455.

Mabert, V., Soni, A., and Venkataramanan, M. 2003. "Enterprise resource planning: managing the implementation process," *European journal of operational research* (146: 2), pp. 302–314.

Maguire, S., Ojiako, U., and Said, A. 2010. "ERP implementation in Omantel: a case study," *Industrial Management and Data Systems* (110:1), pp. 78-92.

Markus, M. L. and Tanis, C. 2000. "The enterprise systems experience - from adoption to success," *Framing the Domains of IT Research: Glimpsing the Future through the Past* (173), pp. 207-173

Molla, A., and Loukis, I. 2005. "Success and failure of ERP technology transfer: A framework for analysing congruence of host and system cultures," *University of Manchester. Institute for development policy and management (IDPM)*.

Nah, F. and Delgado, S. 2006. "Critical success factors for enterprise resource planning implementation and upgrade," *Journal of Computer Information Systems* (46:5), pp. 99–113.

Nah, F. H. F, Zuckweiler, K., and Lau, J. 2003. "ERP implementation: Chief information officers' perceptions of critical success factors," *International Journal of Human-Computer Interaction*. (16:1), pp. 5–22.

Nah, F. H. F., Islam, Z., and Tan, M. 2007. "Empirical assessment of factors influencing success of enterprise resource planning implementations," *Journal of Database Management*, (18:4), pp. 26–50.

Nah, F. H. F., Lau, L. S. J., and Kuanget, J. 2001. "Critical factors for successful implementation of enterprise systems," *Business process management journal* (7:3), pp. 285–296.

Ngai, E. W., Law, C. C., and Wat, F. K. 2008. "Examining the critical success factors in the adoption of enterprise resource planning," *Computers in Industry* (59:6), pp. 548-564.

Olson, D. L. and Zhao, F. 2007. "CIOs' perspectives of critical success factors in ERP upgrade projects," *Enterprise Information Systems* (1:1), pp. 129–138.

Parr, A. and Shanks, G. 2000. "A model of ERP project implementation," *Journal of information technology* (15:4), pp. 289–304.

Parr, A. N., Shanks, G., and Darke, P. 1999. "Identification of necessary factors for successful implementation of ERP systems," *New information technologies in organizational processes*, Springer US. pp. 99-119.

Parthasarathy, S., Anbazhagan, N., and Ramachandran, M. 2007. "An exploratory case study on performance enhancement of ERP projects," *INFOCOMP Journal of Computer Science* (6:2), pp. 1–8.

Rajapakse, J., and Seddon, P. 2005. "ERP adoption in developing countries in Asia: a cultural misfit," in *Proceedings of the 28th Information Systems Seminar in Scandinavia*, Kirstiansand, pp. 6-9.

Rasmy, M. H., Tharwat, A., and Ashraf, S. 2005. "Enterprise resource planning (ERP) implementation in the Egyptian organizational context," in *Proceedings of the EMCIS International Conference*.

Roberts, H.J. and Barrar, P.R.N. 1992. "MRPII implementation: key factors for success," *Computer Integrated Manufacturing Systems* (5:1), pp. 31-8.

Seethamraju, R. and Seethamraju, J. 2008. "Adoption of ERPs in a medium-sized enterprise - A case study," in *Proceedings of the 19th Australasian Conference on Information Systems,* pp. 887–896.

Shang, S., and Seddon, P. B. 2002. "Assessing and managing the benefits of enterprise systems: the business manager's perspective," *Information Systems Journal* (12:4), pp. 271-299.

Shanks, G. 2000. "A model of ERP project implementation," *Journal of information technology* (15:4), pp. 289-303.

Shanks, G., Parr, A., Hu, B., Corbitt, B., Thanasankit, T., and Seddon, P. 2000. "Differences in critical success factors in ERP systems implementation in Australia and China: a cultural analysis," in *Proceedings of European Conference on Information Systems 2000*, pp. 53.

Skok, W. and Legge, M. 2002. "Evaluating enterprise resource planning (ERP) systems using an interpretive approach," *Knowledge and Process Management* (9:2), pp. 72–82.

Soja, P. 2008. "Difficulties in enterprise system implementation in emerging economies: Insights from an exploratory study in Poland," *Information Technology for Development* (14:1), pp. 31-51.

Somers, T. M. and Nelson, K. G. 2001. "The impact of critical success factors across the stages of enterprise resource planning implementations," in *Proceedings of the 34th Hawaii International Conference on System Sciences,* pp. 1–10.

Somers, T. M. and Nelson, K. G. 2003. "The impact of strategy and integration mechanisms on enterprise system value: Empirical evidence from manufacturing firms," *European Journal of Operational Research* (146:2), pp. 315–338.

Somers, T. M., and Nelson, K. G. 2004. "A taxonomy of players and activities across the ERP project life cycle," *Information and Management*, 41(3), 257-278.

Staehr, L., Shanks, G., and Seddon, P. B. 2012. "An explanatory framework for achieving business benefits from ERP systems," *Journal of the Association for Information Systems* (13:6), pp. 424-465.

Sumner, M. 1999. "Critical success factors in enterprise wide information management systems projects," in *Proceedings of the 1999 ACM SIGCPR conference on Computer personnel research,* pp. 297-303.

Sumner, M. 2000. "Risk factors in enterprise-wide/ERP projects," *Journal of information technology* (15:4), pp. 317-327.

Twati, J. M., and Gammack, J. G. 2006. "The impact of organisational culture innovation on the adoption of IS/IT: the case of Libya," *Journal of Enterprise Information Management* (19:2), pp. 175-191.

Umble, E. J., Haft, R. R., and Umble, M. M. 2003. "Enterprise resource planning: Implementation procedures and critical success factors," *European journal of operational research* (146:2), pp. 241-257.

Wang, E. T., Klein, G., and Jiang, J. J. 2006. "ERP misfit: country of origin and organizational factors," *Journal of Management Information Systems* (23:1), pp. 263-292.

Wee, S. (2000), "Juggling toward ERP success: keep key success factors high," *ERP News*, available http://www.erpnews.com/erpnews/erp904/02get.html.

Welti, N. 1999. *Successful SAP R/3 Implementation: Practical Management of ERP Projects*, Addison-Wesley Longman Publishing, Boston, MA.

Yin, R. K. 2003. *Case study research design and methods third edition. Applied social research methods series, 5.*