

Promoting successful ERP post-implementation: a case study

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Abstract

Purpose – Despite the importance of post-implementation activities to support the success of an enterprise resource planning (ERP) system, there has been a lack of research into the factors that influences post-implementation success. Accordingly, this paper aims to present a case study on a public service organization operating in an emerging market economy, namely, the United Arab Emirates in the ERP post-implementation phase to understand the internal forces within the organization that influences ERP system success.

Design/methodology/approach – A qualitative method using focus group discussions (FGDs) was conducted based upon IT data from the firm and interviews with IT staff, business users and executive management to identify system users' perceptions in post ERP.

Findings – The authors posit that the internal organizational forces of ongoing support, system user interactions and stakeholder views significantly affect post-implementation capabilities and user satisfaction.

Research limitations/implications – IT professionals and stakeholders believe that identification of the factors determining post-implementation ERP capabilities and user satisfaction should not be limited to specific practices.

Practical implications – This study provides insights that can assist CIOs and ERP professionals in the service industry to examine the extent of obstructions to post-implementation capabilities that will impact system user satisfaction.

Originality/value – Use of FGDs to explore the impact of ERP capabilities upon system user satisfaction in the service sector. The study is one of the first that utilizes Technological frames of reference (TFR) theory in studying ERP post-implementation.

Keywords User satisfaction, ERP effectiveness, Technological frames of reference theory, Enterprise resource planning (ERP), Post-implementation

Paper type Research paper

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1. Introduction

Enterprise resource planning (ERP) systems are complex information systems that integrates information from all business areas within a firm, and many modern organizations are making significant investments in ERP systems (Althonayan and Althonayan, 2017). ERP project life cycle progress through four phases: conceptualization, planning, execution and termination (Rosacker and Olson, 2008). While The Post-ERP is a stage after the ERP system is implemented, and is concerned with the system usage, maintenance and continuous support and improvement (Hsu *et al.*, 2015). An ERP is an extended software system that integrates a number of business operations, such as supply chain, finance, sales, human resources, budgeting, customer service activities and manufacturing (Weinrich and Ahmad, 2009; Shatat, 2015; Saatcioglu, 2007). Optimal use of an ERP system is considered to represent one of the most important ways to enhancing a firm's competitive edge, productivity and performance (Barki *et al.*, 2008).

ERP provides decision makers an extensive range of information that assists them in the decision-making process, yielding competitive advantage. Because it integrates all aspects



of business operation, adopting an ERP system can be expensive, complicated and time-consuming during the post-implementation and sustainability phases (Pan *et al.*, 2011). More than two-thirds of ERP systems projects fail despite their potential benefits (Chang *et al.*, 2008). Firms are encountering serious technological, organizational and cultural challenges during the adoption and implementation of new IT (Dasgupta *et al.*, 1999). Previous reports on problems in ERP implementation clearly suggest that these problems are not only technical in nature but also encompass wider behavioural factors (Skok and Doring, 2001), and involving users in implementation process is one of the most effective methods for obtaining a successful and sustainable ERP implementation (Barki *et al.*, 2008). Accordingly, firms need to understand the system implementation from users' perspectives to prepare their employees to learn how to make good use of the new technology to gain tangible benefits and face potential challenges (Chang *et al.*, 2008).

Moreover, companies are still encountering numerous problems and challenges in the post-implementation phase (Peng and Nunes, 2017). Implementation of ERP systems in firms in emerging markets tends to encounter certain problems more often than in industrialized countries (Xue *et al.*, 2005). Thus, it is important to realize the influence of the different factors influencing the post-implementation success of ERPs in an emerging market such as the United Arab Emirates (UAE). While previous research has addressed the critical success factors for ERP during the implementation stage, little if any has identified the internal organizational factors affecting post-implementation made by the business users, IT staff, and top management in post-implementation in the context of a service company in the UAE and most has been limited to a certain organizational level. Based on a review of the existing literature, the present in-depth case study was conducted to identify the internal organizational factors affecting post-implementation made by the business users, IT staff, and top management in post-implementation in the context of a service company in the UAE. Indeed, investment in post ERP still poses challenges due to the missing links among user satisfaction, internal forces, and organizational performance.

1.1 Significance of the study

The results of the present study may assist firms adopting ERP systems to maximize the value of their functional ERP systems. In recent years, there has been increased research interest regarding ERP implementation, but the existing research lacks insights into the post-implementation phase (Singh *et al.*, 2010). The present work partially fills this gap by researching the factors affecting the post-implementation value of ERP systems. This study includes a post-implementation study of a recently implemented ERP system to ascertain its efficiency and sustained competitive advantage from the users' and stakeholders' points of view, but goes beyond merely identifying how ERP systems can benefit an organization.

Moreover, the significance of our study lies in exploring how the perceptions and attitudes of key players in the organization influence the post-implementation success of ERP systems, by considering all influential factors (i.e. technological, organizational and individual factors) in the post-implementation phase. This research has implications for CIO's and organizations. Also, this study can help decision makers to explore the possible risks that may influence the implementation and suitability of ERP systems.

1.2 Research question

The purpose of this qualitative case study research was to identify factors that may influence the post-implementation quality of an ERP system for executive management at a service organization. This study was driven by exploring and assessing the potential

challenges that firms may encounter during the ERP post-implementation phase. With a view to addressing this research aim, the following research question was formulated:

RQ1. What are the success factors that promote the post-implementation of an ERP system?"

2. Theoretical background

The TFR theory offers guidance related to changing frame structure and its implications for technology stabilization and organizational outcomes. The technology stabilization occurs when the technology users begin to think about the new technology and understand what the new technology might be used for (Davidson, 2006). This will result in an increasing the users focus on certain features and simplifying the frame content and increasing certainty among technology users about the meaning and implications for practice of the technology (Lusignan, 2002). When technologies have a central role in organizational change, understanding how organization members and technology users make sense of technology is critical to influencing their actions toward achieving the planned outcomes. Therefore, The TFR theory has been cited across a wide range of researches and has formed the basis of studies on the interpretive aspects of Technology and organizational change (Orlikowski and Gash, 1959/1993; Orlikowski, 2000).

In this study, we build on and extend research into the cognitions and values of ERP users by proposing a systematic approach for understanding the expectations, and knowledge that people have about technology. Such interpretations of ERP technology (which we call technological frames) are central to understanding technological success in post ERP, use and change in organizations. We suggest that the technological frames of key groups such as ERP users, management, technologists are significantly different. Therefore, we argue in this study that technological frames offer a useful analytic perspective for explaining and promoting post ERP success meanings that are not easily obtained with other theoretical lenses. Furthermore, we identify new framing effects that facilitate and allow for an extension of TFR theory to support decision makers in optimizing and promoting the Post-ERP and demonstrate the applicability of TFR models for the post ERP process from multiple perspectives and gain new insights into the roles and perspectives of ERP stakeholders. Based on the TRF theory, we propose a new extension stems from FGDs and describes three frames of internal forces of organizational influences: ongoing support, system user interactions and stakeholder views. Therefore, we outline the new internal organization frames that could facilitate TFR theory and examining the internal organizational forces of post-ERP implementation.

2.1 An overview of post enterprise resource planning

ERP investment continues to grow as organizations search for sustained competitive advantages. ERP is used to provide a single data repository and unified platform to increase corporate competitive advantages (Shatat, 2015; Barki *et al.*, 2008). While Post-ERP activities can transform the way that firms do business and enhance the overall performance [Shkurti (Perri) *et al.*, 2014] and influencing the realization of business value (Uwizeyemungu and Raymond, 2012). The proper ERP implementation has a positive impact on company performance; however, poor implementation negatively impacts performance among ERP users in post ERP (Motwani and Sharma, 2015).

ERP implementation is a strategic activity; it is a complex process of technology innovation that influences the entire organization (Aloini *et al.*, 2012). ERP success can be

complex and difficult to measure (Kronbichler *et al.*, 2010). Thus, measuring the success of ERP systems has been a focus of many ERP studies (Ram and Corkindale, 2014; Ram *et al.*, 2013; Kronbichler *et al.*, 2010; Azadeh *et al.*, 2012). According to several definitions of the ERP lifecycle, the ERP post-implementation phase consists of the shakedown phase (routinization) and the onward-and-upward phase (infusion). In the shakedown phase, after the ERP system goes live, the ERP system is performance-tuned and integrated into normal use (Law *et al.*, 2010). In the onward-and upward phase, the organization uses the ERP system for day-to-day operations and works to use it effectively to its maximum potential (Law *et al.*, 2010; Velcu, 2010). According to Esteves, the dimensions of ERP benefits are interconnected, and the realization of ERP benefits is a continuum cycle along the ERP post-implementation axis (Esteves, 2009).

Although a rich and extensive body of research exists on the adoption and implementation success of ERP systems (Addo-Tenkorang and Helo, 2011; Grabski *et al.*, 2011; Haddara and Zach, 2011), fewer studies have examined the post-implementation phase. Most of the post-implementation studies identified in the literature review identified critical success factors of ERP at the project, organization and managerial levels. Thus, a broad perspective on post ERP-systems evaluation is needed. Therefore, we consider both internal forces and the point of view of the system users, aiming to fill the gap in the literature by introducing the factors affecting the post-implementation value of ERP systems. The previous literature on ERP includes four distinct research areas, as summarized in Table I.

The most frequently reported risk factors for ERP implementations are:

- inadequate selection of application;
- ineffective strategic thinking and planning strategy;
- ineffective project management techniques and bad managerial conduct;
- inadequate change management; and
- inadequate training (Aloini *et al.*, 2007; Bradley and Lee, 2007).

Areas	References
Comprehensive overviews of ERP systems	These articles cover aspects such as research agendas, motivations and expectations, and proposals on how to analyse the value of ERP systems (Gupta, 2000; Chen, 2001); Payne, 2002; Kerbache, 2002; Esteves and Pastor, 2001)
Details associated with ERP implementations and their relative success and cost	The articles in this area include topics such as implementation procedures, critical success factors, pitfalls and complexities in ERP implementations, and successful strategies for effective ERP implementation (Saumyendu and Mirosław, 2010)
Theoretical research models	This research area covers aspects such as the application of modelling tools to ERP contexts, new business modelling approaches, and comparisons between processes (Saumyendu and Mirosław, 2010)
Classification of publications related to the implementation phase	Esteves and Pastor (2001) classified these publications into four main topics: implementation approaches, implementation success, other implementation issues, and implementation case studies (Esteves and Pastor, 2001)

Table I.
ERP Focus areas

Other documented management practices correlated with implementation success are explicitly defined information technology strategy, strategic alignment and management commitments (Bernroider, 2008).

Readiness for change was found to be enhanced by two factors: organizational commitment and perceived personal competence (Kwahrk and Lee, 2008). Finally, ERP implementations usually consume more time and money than expected; the average implementation time of an ERP project was between six months and two years and that the average cost is US\$1.3m and ranges from 2 to 6 per cent of annual sales (Aloini *et al.*, 2007; Enterprise Resource Consulting, 2014; Panorama Consulting Solutions, 2017; (Ehie and Madsen, 2005). These high percentages indicate that importance of such a critical research area.

2.2 User participation and satisfaction

User satisfaction is an evaluation mechanism for determining ERP success (Liu *et al.*, 2011). In any implementation process (before, during and after), the human aspect is the cornerstone. Users' satisfaction and interaction with the system is a strong indicator of implementation success. System users will be harnessing the ERP system to enhance performance, and firms can improve ERP assimilation at the individual level (Liu *et al.*, 2011). Participation has been defined as the process that enables the system users to have more control over their daily activities in work environment (Wagner and Newell, 2007). System users develop feelings of owning the product when they participate effectively in the adoption (Barki *et al.*, 2008).

Users' participation has been divided into two categories: participation in requirement gathering and definition for the ERP, and participation in the implementation phase (Jameel Qureshi and Abdulkhalaq, 2015). This study extends the scope of user participation to include post-implementation of the ERP system. Employee position in the organization such as, age, educational background, education level, gender and experience affects participation, perception and satisfaction level toward a system (Longinidis and Gotzamani, 2009). More precisely, user satisfaction refers to the extent to which users perceive that the ERP system available to them meets their requirements (Somers *et al.*, 2003). In fact, user satisfaction has an impact upon ERP systems' success (Longinidis and Gotzamani, 2009).

The main factors that might influence the level of ERP user satisfaction:

- (1) System users' interactions with information technology employees; and
- (2) ERP adaptability and pre-implementation processes (Longinidis and Gotzamani, 2009).

The system users' participation during the system adoption will always improve system user satisfaction (Ji-Tsung and Marakas, 2006). System interaction is very important for continued support of the ERP system in the post-implementation phase. In summary, system user participation will lead to more system-user interaction, greater commitment and user satisfaction (Pei-Hung *et al.*, 2016). ERP users are an integral part of the ERP environment and can influence the success of the ERP system (Dery *et al.*, 2006). A study conducted by Chung (2007) reports that more than 65 per cent of executives believe that ERP's have at least a moderate chance of hurting their businesses due to the user satisfaction and implementation problems. The significance of this paper lies in its exploration of how internal forces in the organization influence post-implementation to mitigate the challenges and digest the complexity of post-implementation ERP.

2.3 Sustainability of enterprise resource planning system is a shared responsibility

Through the use of the ERP system capabilities, knowledge leverage is achieved by capitalizing on the competencies and expertise of system users, partners, and participants in the organization supply chain (Beheshti and Beheshti, 2010). Coordination among the different units in the organization, through the ERP system and the streamlined IT infrastructure, is critical to create a differential business advantage that is flexible and responsive to diverse and changing customer needs (Nikookar *et al.*, 2010). The ERP system represents a shared responsibility that integrates the functions of all business units in a firm, simulates each other business unit and hosts the data in one data repository system that can be accessed by all business units (Abdolvand *et al.*, 2008). Implementing an ERP system is not an easy task, but represents a complicated and long process that leads to considerable change in corporate business processes; it requires radical changes at all organizational levels, and the use of human and financial resources (Ip, 2010).

Post-implementation is the last phase in the ERP project cycle and it usually involves independent parties who are responsible in making the practical determinations regarding how the ERP system will be involved in running the business. In addition, the pre-implementation stage, which is highly correlated with the post-ERP stage, and is also considered a key factor of system's users' satisfaction. Many factors significantly affect the level of ERP, such as "ERP adaptability" and "interaction with the information technology department" (Longinidis and Gotzamani, 2009). However, there is still continued user resistance to adopting the new systems in firms due to the number of employees continued to use their preferred manual system (Maheshwari, 2008), the most important barrier is changing to the new from old system (Saatçioğlu, 2009).

This study captures a holistic understanding of ERP post-implementation, different groups have varied perspectives on the usefulness, importance and value of technological artefacts and that these different lenses or viewpoints are very important in organizational perceptions of noncompliance (Davidson, 2002; Davidson, 2006; Sanford and Bhattacharjee, 2008; Orlikowski and Gash, 1994). This is in line with the notion of technological frames theory which emphasises the need to capture the interactions among members of relevant social groups, while examining the assumptions, knowledge and expectations expressed through language, visual images, metaphors and stories held collectively by organizational members (Orlikowski and Gash, 1994). Proponents of this theory argue that technologies, once developed and implemented, not only interact with their environment to generate new forms of technology but also create new environments (Davidson, 2006; Orlikowski and Gash, 1994).

Substantial changes to organizational structure and work methods occur during the implementation of ERP systems (Kallunki *et al.*, 2011). Further, implementation of ERP systems differs among organizations as well as from one country to another. This indicates that IT and managerial practices require modification to respond to different cultural and organizational contexts (Anandarajan *et al.*, 2002). The perceptions of key groups in firms such as managers, technologists and users differ considerably, and these differences may produce problems and conflicts regarding technology development, use, change and implementation (Orlikowski and Yates, 1994).

3. Research method

As previously mentioned, this study focuses primarily on the post-implementation phase of ERP projects. This research employs a qualitative case study approach and thus is suited to address "how" and "what" question types. A focus group was conducted, including formal and informal interviews with employees in a firm that was in the ERP post-implementation

phase. For the purposes of illustration, we present a brief background on this firm; to maintain data confidentiality and anonymity of focus group participants, the firm's name is not included. The company involved in this case study has achieved remarkable development during the past two decades. Its operations include customer service support activities as well as operation. Therefore, the customer service business was considered a fruitful empirical setting for the study. The case study focuses specifically on the effects of ERP implementation on the company's customer service division, which accounts for a significant part of the corporation's sales and profits.

The firm selected was an experienced large service industry firm centred in the Gulf Region with global operations. A main reason for the selection of this firm was the ease of accessing and gathering data and meets the selection criteria of this study.

3.1 Data collection techniques

To enhance the credibility of the findings, a triangulation approach was used to strengthen the study by minimizing bias (Case Study Research, 2004). Multiple data collection methods were used, namely, focus group, and both face-to-face and over the phone semi-structured interviews. FGDs were carried out with business users who use the ERP system with the support of IT staff. Before conducting the FGDs, service desk calls from the same company were intensively reviewed to identify a range of possible focus group questions that were relevant to the company, and these questions were prepared by phrasing them in ways that could be easily understood by the participants. The most active user and least active user in each business unit, as identified by reviewing the service desk database system, were invited to the FGDs.

We have invited IT professionals, Businesses ERP users and executive management to discuss issues related to post ERP success factors and identify reasons for user resistance. There were different professions with a variety of background and job positions who participated in three FGDs, lasting within the range of 120 to 180 min. The FGDs were guided by a predefined open-ended questions with a specific emphasis on avoiding "why" questions, because such questions imply the existence of a rational answer, but the issues involved may be complex and involve numerous different factors in the organization (Morgan, 1988; Powell and Single, 1996). An assistant facilitator was employed to capture comprehensive notes from the discussions. Table II presents the profiles of the firm participants. Most of the participants had at least five years of experience dealing with ERP systems and Table III provides details on the focus group participants' job roles.

To further to support and build creditability to our findings, two semi-structured interviews were conducted with the CIO of the information technology group and the executive vice president as key decision makers to discuss the outcome of the focus group

Table II.
Demographic
characteristics of
focus group
interview
participants

Demographics	Category	Count	(%)
Gender	Male	10	75
	Female	5	25
Educational	Graduated degree	6	40
	Post Graduated Degree	9	60
Work experience with ERP systems	5 – 10 Years	10	75
	Above 11 Years	5	25
IT Experience	Yes	5	25
	No	10	75
ERP Experience	Yes	15	100

Table III.
Demographic of
focus group
interview
participant's
business units and
category

Invitees/position	Business unit	Category
Marketing Research Manager	Marketing	System users
Marketing Officer	Marketing	System users
Admin Assistant	Business support	System users
Vice President	Business support	System users
Business Development executive	Commercial	System users
Business Development Manager	Commercial	System users
Sr. Engineering Manager	Projects	System users
Sr. Civil Engineer	Projects	System users
Project Coordinator	Projects	System users
Visitor Centre Representative	Customer service	System users
Acting VP – Investor Relations	Customer service	IT
IT Team Lead	IT	IT
IT Developer	IT	IT
Chief information officer	IT	IT
IT Project Manager	IT	IT

and to also discuss their experience with the system implementation. We also carried out informal interviews with several employees involved in the ERP system post-implementation process. In-addition, the available ERP system documentation and the portion of the information technology service desk database concerning the ERP post-implementation process were also reviewed.

4. Data analysis

An inductive analysis approach was used to generate codes and a list of themes, including the use of thematic analysis to encode the qualitative information gathered (Walton, 2000). First-order concepts were introduced and labelled. The first-order concepts were then used as the foundation for identifying second-order concepts. Then, more aggregate concepts were formed by reviewing and analysing the second-order concepts. Table IV summarizes the different levels of concepts identified. The emerged codes and themes were finalized after discussion and agreement between the researchers.

In responses to FGDs Interview discussion questions, participants talked about several key points and often identified by several different participants. At the end of the FGDs, the themes are reported to the participants for verification and confirmation. the words used by the participants and the meanings of those words have been analysed to determine the degree of similarity between these responses and the frequency of each theme. The result of this coding process was a classification scheme consisting of the emerged inferential codes, also referred to as themes (Kuettner et al., 2013). The next section explains the top categories and their themes that emerged based on the high-frequency count across the three project participant groups (Information Technology, ERP users and Business management) are listed.

4.1 Ongoing support: challenges and opportunities

Due to the diverse perspectives held by the focus group participants, the participants were categorized into three categories: information technology staff, ERP users and business management. Table V lists potential themes related to ongoing support, including the number of times each theme was mentioned by participants from each group in significant connection to their responses to a research question.

			Promoting successful ERP
Aggregate concepts	Second-order concepts	First-order concepts	
On-going support	Phasing approach	Priority, Business units involvement, Business processes evaluation, Data cleansing, Joint Efforts, Business users	333
	Documented business processes	Business Processes, Current business processes (AS Is), New Business Processes (To Be), Customer Needs, Service efficiency	
	Tested business processes	Process re-engineering implementation, Process re-engineering Awareness, Benchmark and Process evaluation, Industry standard, Efficiency of Service Delivery	
	Training program	Training environment, Number of employees, Training budget, Maximizing return on investment, Full time user, Engage the Audience, ERP and none ERP user awareness, Training methodology awareness, Business process driven training	
	Forming a steering committee	Business changes, Business clarity, Business Priority	
Evaluating user Interactions	Business process management	Organization Commitment, Clear Business Processes, Clear Business Processes, System standardization Impact, Analyze the customer needs, Industry standard impact, Business user needs, All stakeholders' involvement	Table IV. Emerged concepts
	Business users commitments	Success is combined efforts, User acceptance commitment, ERP user experience, ERP Users, Non-ERP users	
	Post ERP Training program	Training environment, ERP Users Involvement, Non-ERP Users Involvement, Business User commitment, New Employee orientation, Number of employees in training, Strategic focus	
	System usage	Balance of technology usage, System Upgrade, Control and monitor system usage, System utilization	
Stakeholder views	User participation	After sales services, ERP Users, Non-ERP users, Ongoing enhancement, Business Process Priority, es, Business process driven training, Business process driven training	
	Measuring system success	System Usage, System Customization, System Upgrade, Value of ERP, System Utilization, Customer efficiency	
	Maximum success	Success is combined efforts, Customer experience, Customer excellence, Industry Benchmarking	

On-going support themes	Information technology	ERP users	Business management	
Phasing approach	2	3	0	Table V. ERP on-going support – themes and sub themes
Documented business process	3	2	1	
Tested business processes	0	4	1	
Training program	0	3	2	
Steering committee	2	0	2	

In discussing the implementation phase of the project, business users mentioned that automating the system for the entire company and for all business process is a major risk, and they recommended conducting the implementation in phases. Specifically, the vice president of business support said:

[...] the new ERP system should be phased out through different phases. Business always changes rapidly, so the company should not hurry in automating all business process. We have to keep in our mind the Titanic disaster, and Noah's Ark, and think about how Noah's ship was saved.

The best approach for the large organization is considering the priority and phased approach. The vice president of business support said that "a phased approach is always recommended, from my personal experience; can the sales start after service?"

Participants' views varied about whether to apply the best practices ERP modules without any customization. We noticed that the executive management supported standardization to follow the best practices whereas the system users supported customization if required to support business needs. Clarity should be gained early on which business unit should be automated first. According to the acting vice president of investor relations:

[...] each business unit should be very clear and prepared to have their own business processes documented and tested before even talking about the system. In this case, the best practice will be driven by having these business processes; this will avoid a lot of time spent on data cleansing and integration with other systems, and require less concentration on re-engineering processes in the future.

Participants emphasized the importance of re-engineering existing business processes to avoid spending time collecting business requirements. So, participation is also required at a stage before starting the ERP system itself. The CIO and the vice president of business support mentioned that: "having business processes re-engineered and documented will save a lot of time in collecting the relevant information about business processes from the business units." ERP system training programs represent a milestone in achieving project success. In addition, ongoing training will shorten the learning cycle of new employees and avoid data integrity issues and system misuse. "Having training programs, workshops, and ongoing training sessions in place will indicate the degree of system understanding and increase employee productivity", said a business development manager. There was a common agreement among all participants that forming a guidance committee is always a key milestone in the ERP post-implementation phase:

Forming a guidance committee from all business units including executive and middle management will expedite project development and reduce interdepartmental conflicts, noted the chief information officer, vice president, IT team lead, and visitor centre representative.

4.2 Evaluating system-user interactions

Potential themes related to system-user interactions, including the number of times each theme was mentioned by participants from each group in significant connection to their responses to a research question have been grouped and listed in [Table VI](#).

Also, participants commented that business process management, through documenting and testing the processes, will minimize the conflicts of having to re-engineer processes at a later stage, but that despite this, it is not easy for a business to identify which process to automate first. A senior engineering manager and a senior civil engineer said "selecting which business process to automate first is one of the most challenging tasks in the ERP

implementation. This is something should be evaluated carefully before and after implementation.” Another common agreement among all participants was that, to maintain the success of the ERP during the post-implementation phase, it is very important to involve the end users and operating system users in system evaluations, and to acquire their feedback. According to the IT team lead, an IT developer, and the CIO:

It is necessary to dedicate full-time business users during the project implementation in general, and in particular during the system’s user acceptance phase. It took us more than three months to test the new system, though the initial plan was three weeks.

Another point of view expressed was that training sessions should be process-driven and accommodated to small groups. If employees are not well trained to use the new system, this can trigger costly mistakes (Abdolvand *et al.*, 2008). The business management team (the vice president of business support, the acting vice president of investor relations, and the CIO) said:

It is always recommended to train employees in smaller groups. There is no need to hold a training session for dozens of employees all at once. The training room should not exceed more than 10 employees.

A further comment was put forward by the IT team (IT team lead, IT developer, and CIO) regarding system usage:

When you do not know how to use a new system, its potential remains underutilized. The new ERP systems cost a lot, and the big investment involved is reason enough to invest in training programs.

The business management team (the vice president of business support, the acting vice president of investor relations, and the CIO) offered a viewpoint on training that they perceived that most firms overlook. Employees are often asked to conduct training during office hours, but the management team additionally suggested that:

[...] employees should be trained outside the office premises to establish a sense of duty and seriousness and to have an enjoyable time, and to make them understand the new system outside the business environment. The training can’t be stopped, but should continue by hiring a dedicated employee to look after current and newly joining employees.

The management team (Vice President- Business support, Acting VP – Investor Relations and Chief information officer) suggested that:

[...] training should not only be limited to ERP users but all employees should really know what is going on; ERP non-users might have an influence on the system without our awareness.

The participants agreed that training is key to ERP implementation success. The acting VP of investor relations said “don’t expect system users to learn ERP without a formal methodology of training. When you know how to use the ERP, the tool becomes more beneficial to employee objectives.” The IT team lead and developer recommended

System user interactions	Information technology	ERP users	Business management
Business process management	2	2	4
Business users commitments	2	3	3
Post ERP training program	0	4	2
System usage	4	0	1

Table VI.
Evaluating system
user interactions
themes and Sub
themes

monitoring ERP progress continuously, including monitoring how employees use and benefit from the new system:

By ensuring that IT continuously monitors system usage, the ERP system is not merely a one-time effort. It is an ongoing process that involves employees, vendors, and all stakeholders. A recent report on system usage shows that most complaints come from employees who don't use the system heavily.

4.3 Stakeholder views

Themes related to stakeholder views (including the aspects of perception, attention, and cognition), and lists the number of times each theme was mentioned by participants from each group in significant connection to their responses to a research question have been grouped are depicted in Table VII. The FGDs methodology is introduced considering that the perceptions of the ERP audience are more important than anything else (Jovanovic, 1996).

The return on investment for such a project is difficult to measure; participants agreed that an ERP system is key in enhancing competitive advantage. The vice president of business support said that “it is very important to understand how companies benefit from the new ERP investments.” Early and efficient participation promotes system user satisfaction and helps to recognize all issues associated with the new ERP system. The CIO and his team noted: “if my needs are not met, I will resist and reject using the ERP system.”

The contributions of system users make the end user more confident that the system will meet their requirements (Soja et al., 2015). User participation has always been highly critical and is associated with the success of the ERP implementation. The ERP implementation has to ensure that all units of the organization are fully integrated; this is crucial and represents the main objective of the ERP system (Gunasekaran et al., 2000). Participation is a definite requirement before and after the ERP implementation. Involving all employees who are part of the process in the ERP implementation is a must. The acting VP of investor relations said:

Our success was supported by our management, who made sure to have all employees who are part of the process to document the processes before the ERP implementation. We had a workshop inviting general managers, senior managers, administration, and all people involved in the business processes to come up with the 'to be' process.

There was a great deal of disagreement between the participants regarding system customization. IT staff supported the idea of zero customization, whereas business users were strongly against this suggestion. A project coordinator said: “no matter whether the system is customized or standard, we would like to have a system that supports our business needs.” A very interesting point was shared with the IT team about monitoring the

Table VII.
Perception, attention
and cognition
(themes and Sub
themes)

Perception, attention and cognition	IT	ERP users	Business management
Value of ERP	3	3	4
User participation	3	3	3
System customization	3	3	3
System usage	3	1	0
Success is combined efforts	3	0	0
System upgrade	3	0	4
Customer experience	0	3	4
Industry benchmarking	0	0	2

system post-go-live: it is very important to know if the system is being fully used. People (customers) often complain that the new ERP system is not meeting business expectations and is not as good as the legacy system. Also, they might complain that the new system takes a long time to process transactions. Many concerns might be raised by system users regarding the system. The IT team lead stated the following and was supported by the management team:

Having been involved in a number of new ERP implementations as part of the implementation team, I have discovered that in most companies the ERP implementation is seen as an IT project, but this misses the point of why companies and business implement new ERP systems.

A part of the IT staff commented that there is a common misunderstanding between group members when it comes to a system upgrade. A visitor centre representative said:

We were all under the impression that the system upgrade would introduce new functions to resolve current system bugs and limitations, but unfortunately the system upgrade always introduces new standard functionalities that are not used in our region or do not resolve system bugs, and in the end such upgrades do not have an instant impact on day-to-day business.

Most participants felt that using an ERP system is key to improving customer service by having access to product or service availability, product location and queuing of services to understand lead and delivery time. The acting VP of investor relations said:

To get a great system and do the right thing requires you to put yourself in the shoes of the customer. This will force you to re-evaluate and re-engineer your business processes and customer service with more efficiency.

Lead time impacts the customer experience and is vital to measure customer satisfaction (Jewer and Evermann, 2015). This concern was raised by one of the system users, who identified lead time as the time taken from the moment a service is requested until the moment it is delivered to the customer. A business development manager, supported by the CIO, said:

[...] the ability to increase customer satisfaction depends upon the ability to deliver accurate and accurate service; any delay in the delivery of the requested service to the customer will cause high customer dissatisfaction.

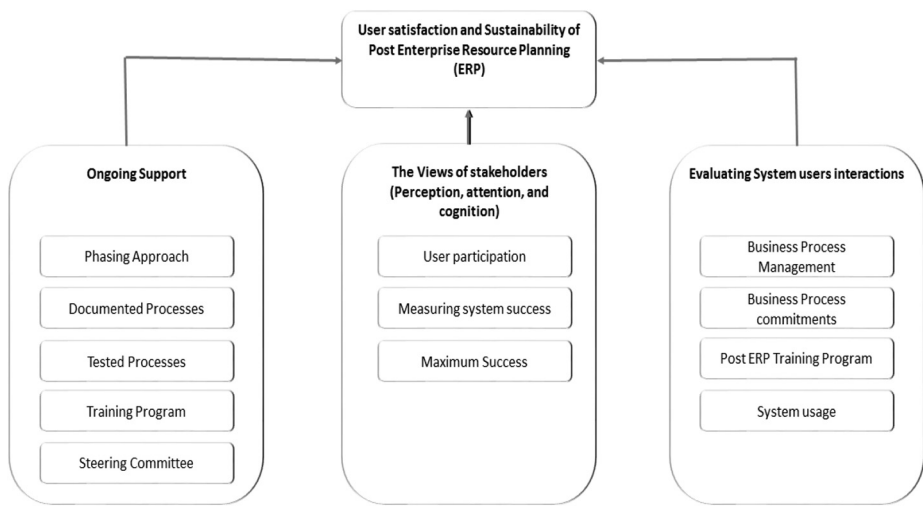
Finally, another point was raised regarding the effect upon competitive advantage of how the firm uses the new ERP system. It is wise to conduct benchmarking of business processes with other industry standards and to compare it with best practices. The CIO said:

[...] each business unit should be in line with other industry standards. Automating existing business process will not add any value to the business if the best practices are not considered.

5. Discussion

We have constructed a proposed theoretical model based on the findings and data analysis as shown in Figure 1. Analysis of the data showed that the success of the ERP system during the post-implementation phase is affected by ongoing support, including the themes of utilizing a phased approach, using documented and tested business processes, inclusion of a training program, and the operation of a steering committee. There were recurring themes in interviews indicating that these themes are drivers of post-implementation success, with agreement from all participants. These factors were a strong motivator. The developed model represents the Post-ERP sustainability and ERP users' satisfaction captured from multiple dimensions. The model suggests that greater gains in overall Post-

Figure 1.
Proposed theoretical
model



ERP success can be achieved by Ongoing Support, System–User Interactions and Stakeholders Views.

This study illustrates the role of organization’s internal forces during the post-implementation on users’ satisfaction. In particular, we are interested in determining the view of users on organization’s internal forces impact on post ERP sustainability and user satisfaction during the post-ERP. We also, wanted to examine if users hold different views on the internal forces related to the technology, and ultimately if those different views influence their satisfaction on post ERP sustainability. The findings suggests that users’ expectations of the ERP differed from those of users, who experienced the same ERP system in diverse ways. Based on the assumptions that knowledge, and expectations are used to understand technology in organizations (Bartis, 2007). Accordingly, technological views strongly influence the collective views held about the ERP Function, value and benefits of technology.

The findings of this study show that the Organizational Ongoing Support prompts Post-ERP success, this is in agreement with the findings of Zhu *et al.* (2010) and Federici (2009). This study also identified factors such as phasing approach, documented processes, tested processes, training program and steering committee, are considered as organizational readiness indicators that may be used to measure the success and failure of post ERP implementation. It is critical to establish business performance indicators that can support the feasibility of business readiness as reported by Garg and Garg (2014) and Zabjek *et al.* (2009).

System–user interactions also emerged as an important factor in supporting ERP sustainability and success during the post-implementation phase; analysis of these interactions uncovered the themes of business process management, business users’ commitment, post-implementation training, and system usage. Achieving post-ERP success relies heavily on Interactive communication. This result is line with the results of Arthur (2016) and Fryling (2010). Increasing communication effectiveness between the entire ERP team and the firm can facilitate smooth post ERP projects. This is also in line with the results of (Barki *et al.*, 2008; Pei-Hung, *et al.*, 2016; Liu *et al.*, 2011) that indicates the importance of user participation in ERP implementation as one of the most effective ways of

delivering a successful ERP implementation. Furthermore, the study indicates there is a relationship between information technology staff interaction and system users that may affect the outcome of the ERP systems. Therefore, ERP implementation should have an interactive communication to control and support the post ERP process. Organizations should clearly establish an interactive communication plan with clear objectives, and deliverables with measurable results.

Finally, stakeholder views can play an important supportive role in post-implementation success. These include the aspects of ERP value, user participation, system customization, combined efforts, system upgrade, customer experience and industry benchmarking. This finding is in agreement with the study of [Maheshwari \(2008\)](#), which highlighted the importance of user cognition and the potential impact on the selection of procedures and outcomes and the necessity to examine various ways people perceive ERP project matters and to investigate factors that might affect users' perceptions. This is also in line with the results of [Olfers and Band \(2018\)](#), which indicated for the need for enhancing cognitive flexibility, as it can be a limiting factor for daily performance. Overall, understanding these issues and themes will assist firms and decision makers to explore the possible risks that may influence the implementation and sustainability of ERP systems.

The methodological contributions of this study brought diverse insights to review the Post-ERP processes. First, the findings would be useful to CIOs and ERP professionals by providing better understanding of Post-ERP processes from both the ERP user and organizational perspectives. This will provide better guidance in Post-ERP live cycle. Second, practitioners can consider the finding at Pre and post ERP implementation to gather organization needs, which can facilitate and discover the key capabilities for Better Information Technology management and planning.

6. Implications

The present study revealed a list of factors related to ERP post-implementation issues, and our findings in this research indicate some future directions for new research. We have grouped the emerged factors into a model illustrating the impact of ERP post-implementation success into three major groups (ongoing support, system-user interaction and stakeholder views). Due to the highly integrative nature of ERP and its processes across functional areas, the post-implementation phase requires interactions between employees in all areas ([Bintoro et al., 2015](#)). A common agreement among all participants was that ongoing training will reduce the conflicts of understanding the new ERP system and will promote maximum use of the system functionality. Future research might answer what is the appropriate structure of the training program to support the post-implementation phase, especially highlighting the difference from the training required at the go-live or the implementation phases.

A major issue was identified related to the documenting and testing new ERP systems. Participants advised that operational employees and ERP non-users should be deeply involved in the system, including external system users from the customer side who can add value to the implementation and increase customer satisfaction in the post-implementation phase. Thus, it is critical that the user acceptance must consider all stakeholders. Future research might introduce a new model for the user interactions. Again, we stress the need to capture the internal perspectives from all employees to gain valuable insights into the various phases of implementation ([Babu and Dalal, 2006](#)).

It is noteworthy, that in our study, there was some debate between the business units and IT staff about a few issues related to the factors affecting the stakeholders' views. These differences sometimes led to disagreements. This highlights the importance of managing expectations, and providing a clear deliverable for the business. Some research has revealed a significant decline in users' perceptions regarding the ERP during post-implementation (Abdinnour and Saeed, 2015). The study has also identified factors to be further investigated such as the perceptions of ERP value, user participation, system customization, system usage, success as a combined effort, system upgrade, customer experience and industry benchmarking.

7. Conclusions

This research inductively developed a theoretical model of human behavioural patterns and their support of the success of ERP systems in the post-implementation phase. It exposes a list of factors that affect success in this phase. The benefits of these factors might be generalized to other settings of project implementation and information systems development. Each of these factors can be extended in further studies for developing measurement techniques and for collecting information from other companies that have adopted ERP systems. Further research could also analyse and introduce new processes for the ERP post-implementation phase. Processes could also be introduced to monitor the levels of various business users' involvement in the implementation and post-implementation phases.

By having different employees with different backgrounds discussing the ERP system together in a focus group allows for exploration of peoples' real-life interactions with ERP systems and to provide a clear picture of participants' attitudes and perceptions. This study revealed essential drivers that can be used to review post-implementation activities and measure success. The findings from this research will be useful to system users, information technology staff, and executive management in increasing their understanding of ERP systems.

In conclusion, this paper has attempted to qualitatively study ERP post-implementation factors, to outline these factors, and to propose a new conceptual model that may be beneficial in the post-implementation phase. Generally, we noted in the FGDs that post-implementation satisfaction is associated with a high level of company readiness and consideration of the proposed constructs. Organizations have always focused on implementing new ERP systems, but without giving enough attention to the important stage of post-implementation.

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