Successful ERP implementation: an integrative model

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Received 30 December 2011
Revised 17 June 2012
7 August 2012
Accepted 21 September 2012

Abstract

Purpose – The paper aims to present a conceptual model that better defines critical success factors to ERP implementation organized with the technology, organization and environment (TOE) framework. The paper also adds to current literature the critical success factor of trust with the vendor, system and consultant which has largely been ignored in the past.

Design/methodology/approach – The paper uses past literature and theoretical and conceptual framework development to illustrate a new conceptual model that incorporates critical success factors that have both been empirically tied to ERP implementation success in the past and new insights into how trust impacts ERP implementation success.

Findings – The paper finds a lack of research depicted in how trust impacts ERP implementation success and likewise a lack of a greater conceptual model organized to provide insight into ERP implementation success.

Originality/value – The paper proposes a holistic conceptual framework for ERP implementation success and discusses the impact that trust with the vendor, system and consultant has on ERP implementation success.

Keywords Enterprise resource planning, Trust, Technology, Organization, Environment, Business planning

Paper type Conceptual paper

Introduction

ERP systems are software packages that integrate a number of business processes, such as manufacturing, supply chain, sales, finance, human resources, budgeting and customer service activities (Amalnick *et al.*, 2011; Weinrich and Ahmad, 2009). The question, "what makes implementation of an enterprise resource planning (ERP) system a success?" has been studied extensively in the past few years. Yet little research has been done on the impact of trust with vendors, systems and consultants and how it affects ERP implementation success. We, like other previous researchers, believe that ERP evaluation should extend beyond operational improvements to the more strategic impact of ERP looking at the intangible nature of costs and benefits in organizational, technological and behavioral aspects (Stefanou, 2001).

Previous ERP system research focused on case studies of organizations new to implementing ERP or that highlighted only one phase of the ERP lifecycle (Weinrich and Ahmad, 2009; Zarotsky *et al.*, 2006; Nah and Delgado, 2006; Beatty and Williams, 2006; Kim *et al.*, 2005; Brown, 2004; Umble *et al.*, 2003; Ng *et al.*, 2003; Rollands and Prakash, 2001; Mabert *et al.*, 2001; Brehm *et al.*, 2001; Markus *et al.*, 2000; Jarrar *et al.*, 2000). ERP implementation has also been tied to firm performance (Yang and Su, 2009; Hendricks *et al.*, 2007; Gupta and Kohli, 2006; Laframboise and Reyes, 2005; McAfee, 2002). While past research has criticized literature on critical success factors (CSFs) in ERP implementation, specifically referring to them as laundry lists of information

Business Process Management Journal
Vol. 19 No. 2, 2013
pp. 364-398

1463-7154
DOI 10.1108/14637151311308358

(Richmond, 1993), new research suggests that an understanding of the relationships between factors for ERP implementation success is necessary (Tsai *et al.*, 2011).

The authors of this paper believe that ERP implementation success can be negatively impacted by a culture resistant to change and a lack of trust. There are certain behavioral components within organizations that impact the overall success of ERP implementation before it occurs. These include the trust within the ERP community, including the vendor, consultant and ERP implementing organization, as well as trust with the system itself. Using various theoretical foundations, we develop a comprehensive model depicting facets that impact ERP implementation success. Although some insights on trust have been made in previous literature, we develop a preliminary model that incorporates competence and contractual trust between the vendor, consultant, ERP implementation company and the system itself.

Overall, this paper offers future research implications by providing theoretical support for trust with the ERP community and how it impacts ERP implementation success. Additionally, we identify the importance of a community culture that is accepting of change within the realm of change management. We also suggest that future research should focus on behavioral aspects of ERP implementation and how individual or collective behavior might impact ERP implementation success prior to actual implementation.

This paper also provides various managerial implications. First, we explain that trust not only within the confines of the organization is important, but also it is vital for ERP implementation success with external consultants and vendors. Second, we provide practitioners a comprehensive model that depicts not only past empirically examined CSFs, but also theoretically validates the importance of organizational factors such as a company culture of acceptance of change and environmental aspects like regulatory pressure and trust. Managers can use this conceptual model as a tool for optimizing ERP implementation both before and during the implementation process.

Theoretical foundations

To help examine the variety of relationships depicted between CSFs and ERP implementation success, we use several underlying theoretical foundations including: capability maturity model (CMM), strategic choice theory, contingency theory, resource based view, knowledge based view and social capital theory. In this section we will briefly explain these definitions as well as which relationships these theories underlie that will be further discussed in the propositions.

Capability maturity model

The CMM suggests that a target maturity level in IT can be achieved only after going through a series of previous phased levels (Randeree *et al.*, 2012). Paulk (1994) describes the six levels of the CMM as follows: Level 0 means there is no IT architecture or maturity. Level 1 (the initial level) is the level where the software process is *ad hoc* and occasionally chaotic, where few processes are defined and success depends on individual effort. Level 2 (the repeatable level) is where basic project management processes are established to find cost, schedule and functionality. Level 3 (the defined level) is the level in which the software process for both management and engineering activities is documented, standardized and integrated into a standard software process. Level 4 (the managed level) has detailed measures of product quality and software processes,

which are understood and controlled. Finally, Level 5 (the optimizing level) is the level where there is continuous process improvement enabled by quantitative feedback using innovative ideas and technologies. In this paper we suggest that greater capability maturity can enhance ERP implementation success, given greater knowledge and innovation. That is, a firm at Level 5 implementing a new ERP system is likely to have greater success than a firm at Levels 4, 3 and so on. Previous research supports this by suggesting higher capability maturity encourages creation, evaluation and continuous improvement of IT services designed to achieve business objectives (Bowen *et al.*, 2007). We will further analyze this relationship in the next section.

Strategic choice theory

Strategic choice theory assumes that users can actively shape their environments and can play a role in organizational success and failure (Ketchen Jr and Hult, 2007). IT departments, with the right capabilities and understanding have the capability to impact the success or failure of systems in use. However, in order for this to occur the organization must make strategic choices with concern for the firm as the primary driver (Ketchen Jr and Hult, 2007). Moreover, organizational leadership must have adequate knowledge of the ERP users' needs when it comes to implementing the ERP system. This is especially true when an organization is restructured during business process reengineering (BPR), which requires management to focus on strategic decisions that fit the central tenets of an organization as a whole. If management takes into account user needs and makes adequate strategic decisions during BPR, it is more likely ERP implementation will be successful. This relationship will be further analyzed in the next section.

Contingency theory

Contingency theory suggests an appropriate organizational structure depends on the overall environment (Hung *et al.*, 2011). This proposes that managers should identify contingency factors such as the environment that will influence the organization (Hung *et al.*, 2011). Further research suggests that if contingency factors fit the business environment adequately, the overall organizational performance will flourish (Weill and Olson, 1989). If contingency factors also fit the environment in which the ERP system is being implemented, it can enhance the likelihood that both external and internal benefits will accrue during and post implementation (Elmeziane and Elmeziane, 2012). Change management requires that firms look at a variety of factors that may impede successful change. For example, users of ERP systems must have adequate education as well as the capability to implement ERP with ease. Further, the overall culture must be accepting of the change itself. Some of the many questions that should be addressed to facilitate successful ERP implementation include: how does our organization react to change? What are some of the main impediments to change in IT in this organization? With management taking into consideration the culture of the organization and the acceptance of change specifically in IT as a whole, it is likely that users will be better able to facilitate ERP implementation successfully.

Resource based view

Resource based view posits that firms develop internal capabilities to strengthen competitive advantage (Barney, 1996). Firm specific capabilities including human and

organizational resources differentiate successful firms from failing ones (Peng *et al.*, 2009). In order to gain a competitive advantage firms will utilize whatever resources are available over competition, but often this is accelerated by competitive and regulatory pressure. When there is sufficient competitive and regulatory pressure to adopt ERP systems, firms are more likely to use internal capabilities to drive successful ERP implementation.

Knowledge based view

Knowledge based view of the firm builds from resource based view initially proposed by Penrose (1959) and developed further by Wernerfelt (1984), Barney (1991) and Conner and Prahalad (1991). While resource based view focuses on specific valuable resources that a firm has, knowledge based view proposes that knowledge can be used as a distinctive, unique resource to achieve competitive advantage (Kearns and Sabherwal, 2007). It also views the firm as a "dynamic, evolving, quasi-autonomous system of knowledge production" (Kearns and Sabherwal, 2007, p. 132). User training in developing the ERP implementation plan is vital for both enhancing system configuration and therefore, achieving successful implementation. Further, adequate organizational knowledge, perceived cost/benefits analysis, as well as a more strategic package selection can enhance performance during implementation.

In the realm of project management, knowledge is also vital and elicited through IT and team training, as well as overall team expertise in working toward a common plan based on a company's strategy. A project manager and/or champion must be knowledgeable of not only firm objectives, but also must be aware of the scope and project plan. For example, consideration must be given to whether the plan is on task, whether it is following the overall objective and also any potential impediments that may arise. Moreover, progress should be communicated to everyone throughout the organization. With competent knowledge and knowledge sharing throughout the organization the implementation plan, as well as capable project management, will help improve the likelihood of successful ERP implementation.

Social capital theory

Social capital theory indicates that there are different types of social capital in organizations, including trust, obligation, identification of relationships, shared goals and values between individuals, network characteristics and knowledge sharing (Carey and Lawson, 2011; Nahapiet and Ghoshal, 1998). Further, firms are embedded in social networks where these factors impact economic actions (Osarenkhoe, 2009). Social capital, including shared goals and values and knowledge sharing, is often perpetuated by responsible leadership (Maak, 2007). This can include both the amount of leadership involvement and overall commitment. Further, in order for leadership to perpetuate this social capital, a company must be supportive of both the task at hand, as well as supportive of the leaders themselves. When top management is not involved nor committed to the changeover process required for ERP implementation, it is unlikely that the ERP implementation itself will be successful. Further, the company must be supportive of the change as well as the leaders' vision in adopting the ERP system.

Another dimension of social capital that has important implications for ERP implementation success is trust. This is similar to the impact of a company culture that is supportive of the project at hand. When users have trust with vendors, consultants

and the system, it is more likely that success will occur as opposed to users who are weary of any element in the ERP implementation community. When trust and top management support built by social capital are present, it improves the likelihood of ERP implementation success.

While we have briefly described the relationships shown in Figure 1, as well as their underlying theories, the next section will further elaborate on each CSF and how it impacts ERP implementation success.

Propositions

ERP implementation success

Implementation of any innovation has been referred to as a "re-invention of the technology and simultaneous adaptation of the organization" (Hong and Kim, 2002; Leonard-Barton, 1988). During implementation, an IT application is developed and maintained, organizational procedures are revised and organization members are trained and educated (Hong and Kim, 2002; Cooper and Zmud, 1990). Given this, we define ERP implementation as any process during the beginning stages of ERP implementation. Previous research focuses on CSFs or what an organization must do to accomplish what it was designed to do (Elmeziane and Elmeziane, 2012). Since failure of ERP implementation can be fatal to a firm through waste of enormous amounts of money or destruction of the competitive advantage of a firm (Hong and Kim, 2002; Davenport, 2000, 1998), we chose to focus on CSFs and how they ultimately lead to success in ERP implementation.

ERP implementation success can be measured in a broad sense from the perceived deviation from projected objectives (Annamalai and Ramayah, 2012; Singla, 2009). However, in order to further define ERP implementation success, one must understand what some of those objectives are. An ERP system comprises of a central database that stores data across various business functions and activities in an organization (Supramaniam and Kuppusamy, 2011). An organization typically expects the system to not only address problems associated with business process integration, but also enable information to flow seamlessly across functions and streamline functional processes (Bharathi and Parikh, 2012). When a project is completed on time and within the budget (Chen and Li, 2005; Hong and Kim, 2002), various operational benefits occur. For example, economies of scale are obtained through integration of business functions and in turn, significant operating cost reduction, improved capabilities and information transparency results (Supramaniam and Kuppusamy, 2011). Previous research also alludes to significant internal and external benefits like faster information transferals, greater financial management, reduced transportation and logistics costs, greater supply chain relations, increased responsiveness to customers, as well as flexibility, productivity, and reduced inventory, thereby increasing service levels (Patil *et al.*, 2012; Dezdar and Ainin, 2011c; Grabski *et al.*, 2011; Davenport *et al.*, 2004). The results of a successful ERP implementation are different from the results of an ERP implementation failure, which manifests in an implementation being delayed, going over budget and needing additional funding (Dezdar and Ainin, 2011c; Zhang *et al.*, 2005), potential loss of authorization security, data confidentiality, authentication safety, server downtime, or ultimately system failure (Goel *et al.*, 2011). Overall, a failure entails wasting large amounts of money for a firm or destroying its competitive advantage (Hong and Kim, 2002); ultimately leading to the system's or even an organization's demise.

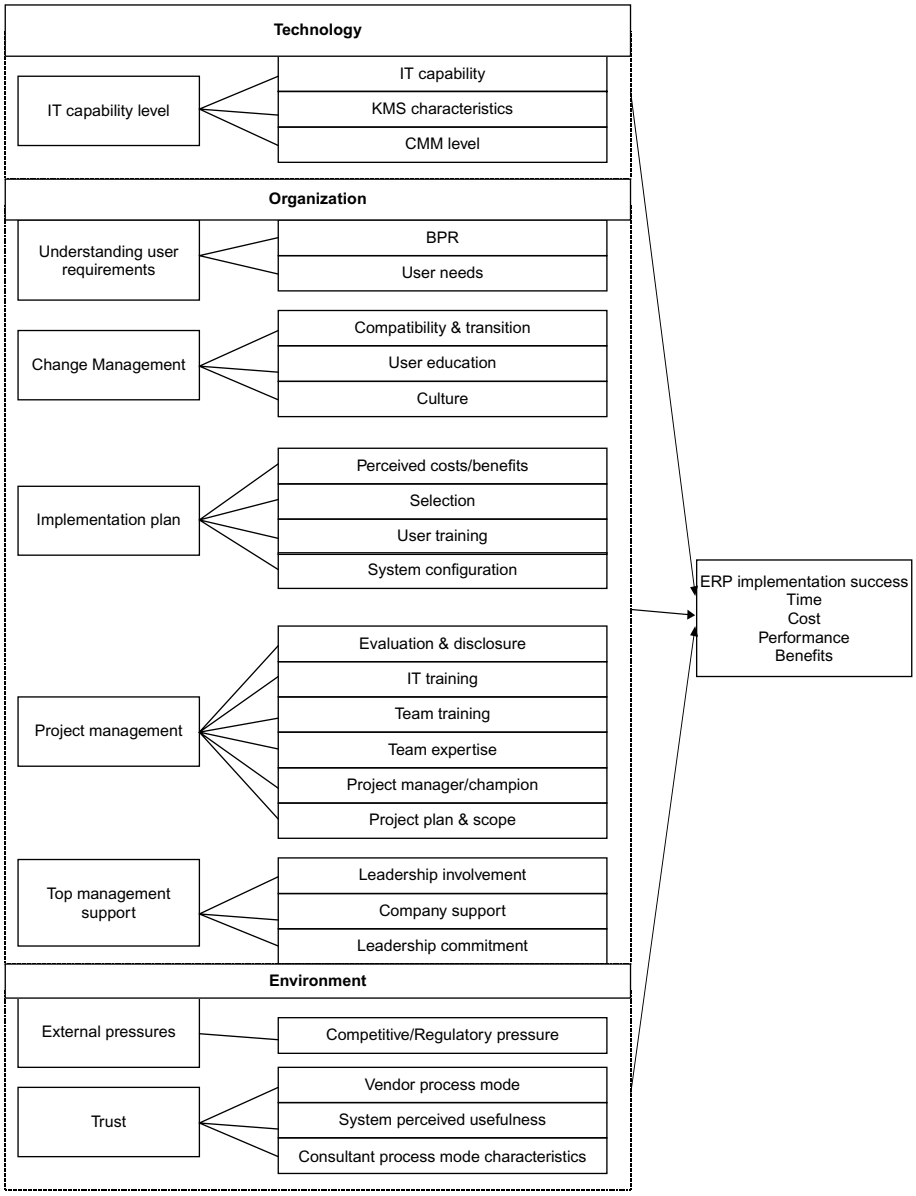

Figure 1.
Integrative model

However, what must be kept in mind are the different stages of the project. Markus *et al.* (2000) suggest that success in projects can be divided into three phases: the project phase, shakedown phase and onward and upward phase (Candra, 2011). In this paper, we focus on ERP implementation success, which is primarily structured around the project and shakedown phases, including metrics such as project cost relative to budget, project completion time relative to schedule, system functionality and short term changes

occurring after the system is implemented, including cost reductions and information flow (Candra, 2011; Markus *et al.*, 2000). Given the complexity of ERP implementation success as a construct, we view it as a multifaceted variable. More specifically we adopt Hong and Kim's (2002) definition of ERP implementation which uses four metrics: reduced costs, time allotted to project, performance of the system during implementation phase, and benefits accrued to the organization due to implementation. If the implementation of the system results in reduced costs, increased service levels, various benefits to an organization's internal and external environment and all the while maintains adequate project management, user involvement and adequate performance, the ERP implementation is deemed successful. Further, this definition takes into account not only performance of the system in terms of costs and benefits accrued, but also project management and the organizational environment. This is vital because implementation involves simultaneous adaptation of an organization along with adoption of the system itself (Hong and Kim, 2002). To further enhance this definition, we also borrow from Goel *et al.* (2011). They suggest success is defined by a system's functionality, security and quality. While these aspects can be labeled under performance of the system during the implementation phase and benefits accrued, security of the ERP system is not specifically mentioned in Hong and Kim (2002) paper. By security we refer to both user and system security, including data confidentiality, server downtime and system failure probabilities (Goel *et al.*, 2011). Trust in the system, vendor, and consultant is vital for the user in order to ensure security breaches and problems with system downtime do not occur during the implementation. This will be further analyzed later in this paper.

Overall, we believe this definition provides a broad variety of measures for ERP implementation success, and thus, we have adopted it. However, ERP implementation success would not be possible without select CSFs, which is described using the TOE framework below.

Technology

Tornatzky and Fleischer (1990) developed the TOE framework to study the adoption of technology innovations (Pan and Jang, 2008). The technology aspect refers to the internal and external technologies relevant to the firm (Pan and Jang, 2008). We consider IT capability level as a construct that contains various CSFs.

IT capability level. The IT capability level encompasses the type of IT capability, knowledge management system capability, and stage where an organization is at on the CMM. Venkatraman (1997) showed four interdependent sources of value from IT resources, which include:

(1) cost center;

(2) service center;

(3) investment center; and

(4) profit center.

Davis *et al.* (2009) suggest that joint IT competence is a key driver of user satisfaction of an ERP system. Some IT capabilities associated with ERP implementation success include human capital, which was shown to also be effective in IT adoption (Oliveira and Martins, 2011). Human capital can be in-house IT expertise (Ifinedo, 2011a, b; Nour and Mouakket, 2011) and user knowledge (Upadhyay *et al.*, 2011). IT infrastructure is also

a CSF (Nour and Mouakket, 2011), as well as IT maturity through resources and assets (Supramaniam and Kuppusamy, 2011). Other previously explored IT capabilities are data conversion and integrity (Basu *et al.*, 2011), information flow management (Upadhyay *et al.*, 2011), as well as testing after implementation (Bharathi and Parikh, 2012; Wickramasinghe and Gunawardena, 2010).

Oliveira and Martins (2011) suggest that factors like formalization of system, technology competence, and support from technology are important in the adoption of IT. We believe these are also important assets to ERP implementation success, because many are facets of IT maturity including formalization of system technology competence. Likewise, support from technology is also important in establishing an ERP system and having it become successful.

Along with IT capabilities, past literature have looked at knowledge management system characteristics. These include compatibility with legacy systems (Bharathi and Parikh, 2012; Dezdar and Ainin, 2011a, b; Dezdar and Sulaiman, 2009) and relative advantage and complexity of knowledge management systems (Oliveira and Martins, 2011).

One factor that we believe is important in ERP implementation research is the actual level or stage of capability maturity of the IT system of the firm. The CMM is mainly used by the operating units and each CIO to assess IT architecture capability and progress.

Overall, IT capabilities, KMS capabilities and the level of the organization on the CMM play vital roles in ERP implementation success. Past research supports this by suggesting that IT capability can aid in the development of innovation, especially through the implementation of ERP (Upadhyay *et al.*, 2011). In-house expertise and IT department value has been shown to help with the complex tasks of ERP implementation (Shah *et al.*, 2011; Upadhyay *et al.*, 2011). Likewise, knowledge management system capabilities and cooperation with legacy systems has also been shown to be effective in ERP implementation success (Dezdar and Sulaiman, 2009). We suggest that the level of a firm in terms of the CMM can also benefit an organization when implementing a new system such as ERP, given that the more capable a firm is in IT architecture, the more likely is successful implementation, considering previous findings connected to expertise and IT architecture to ERP implementation success. Based on the CMM model and previous literature we formulate *Proposition 1*:

P1. IT capability level, constructed of IT capability, knowledge management system characteristics and CMM level, is positively associated with ERP implementation success.

Organization

The organization aspect of the firm refers to descriptive measures of the organization, like size, scope, managerial structure and internal resources (Pan and Jang, 2008). We consider understanding user requirements, change management, implementation plan, project management, and top management support as constructs that contain various critical factors for ERP implementation success.

Understanding of user requirements. Understanding of user requirements focuses on BPR and knowledge of user needs in the ERP system in order to successfully implement ERP. Previous research identifies BPR as a key CSF in ERP implementation (Dezdar and Ainin, 2011b; Moohebat *et al.*, 2011).

Along with BPR is the ability to fulfill user needs in the ERP system. Most users will have particular needs based goals and capabilities when it comes to the implementation of the ERP system. For example, past research has identified ease of use and minimal customization of the ERP system as CSFs in ERP implementation (Khattak *et al.*, 2012; Supramaniam and Kuppusamy, 2011; Upadhyay *et al.*, 2011).

Overall, user needs are vital to the successful implementation of ERP systems, because theoretical foundations, including strategic choice theory, suggest users can control the success or failure of a system. While past literature has provided innovative insight into the importance of user functionality to the application of information technology (Baki and Cakar, 2005), very few have provided a theoretically driven conceptual model that depicts the various aspects of user requirements and how they impact, specifically, ERP implementation success. While the span of this article does not attempt to provide all aspects of user requirements, we do provide an insight into how user requirements can impact ERP implementation success by focusing its span in terms of BPR and knowledge of user needs. This concept is also theoretically supported by strategic choice theory. Many of the organizations that implement ERP do not have the fundamental processes and structure required for the types of information provided by the ERP system (Dezdar and Ainin, 2011c). Moreover, they are required to reengineer business processes to achieve successful ERP implementation (Dezdar and Ainin, 2011c; Yusuf *et al.*, 2004). We suggest that in the process of BPR organizational, entities such as users of ERP need to be at the forefront in reengineering the organization as a whole, since users can play a role in ERP implementation success. Further, for organizations to structure BPR according to user needs, there needs to be adequate knowledge pertaining to requirements for the user. Past research focuses on the ease of use and minimal customization. While these are vital and useful additions in the list of requirements for users, behavioral research also makes an important contribution to ERP implementation success. Strategic choice theory helps to support our *Proposition 2* stated below, but can also be applied to a variety of research in ERP implementation success. The fundamental knowledge of the user and their basic needs are important for impacting successful implementation of an ERP system. Based on previous research and strategic choice theory we formulate the following proposition:

P2. Greater understanding of user requirements, as defined by BPR and knowledge of user needs, is positively associated with ERP implementation success.

Change management. Change management refers to the ability to anticipate future changes, choose platforms that can accommodate change, and effectively manage change (Mata *et al.*, 1995; Bharadwaj *et al.*, 1998; Feeny and Willcocks, 1998; Wade and Hulland, 2004). In this paper we look at compatibility and transition in the organization, user education, and company culture.

Past research has shown change management to be a CSF in ERP implementation (Elmeziane and Elmeziane, 2012; Al-Turki, 2011; Nour and Mouakket, 2011). Some authors stress the need for change management and suggest that it is requisite for achieving sustainable competitive performance (Guha *et al.*, 1997). Thus, we have added it to our model. We have attempted to define change management through compatibility and transition (for example, organizational wide compatibility with the system), satisfaction with existing systems, like legacy systems, as well as user education in the

change process. While these factors have been identified in current and past ERP literature, we have also defined it using a company culture component. By company culture we mean a culture that is accepting of change, supports change, and works toward making improvements through change. Past literature suggests that an organization can provide tools such as user training for greater ease of transition (Bharathi and Parikh, 2012; Al-Turki, 2011; Upadhyay *et al.*, 2011).

It also shows a connection between change management, including organizational fit, company culture and user education with ERP implementation success (Al-Turki, 2011), by suggesting organizational fit impacts organizational readiness, which in turn impacts ERP system success (Zhu *et al.*, 2010). Further, Jones *et al.* (2006) suggest that organizational culture can impact knowledge sharing, which is vital during ERP implementation. While both of these are vital insights in the stages during and post implementation of ERP, we believe that organizational culture can significantly impact the pre-implementation stage, which will significantly impact overall change management. While it is true that firms can mitigate the impact of a misalignment using training, we believe before training occurs a misalignment can result in failure before implementation begins.

Current literature supports the notion that change management is critical in ERP implementation success in terms of empowered team management in project management (Dezdar and Ainin, 2011c) and adapting implementation strategies for identifying, managing and training for implementation of ERP projects (Upadhyay *et al.*, 2011). While some studies allude to the importance of organizational culture in ERP implementation (Bharathi and Parikh, 2012; Noudoostbeni *et al.*, 2010) often they view it as an afterthought. Previous research suggests that when implementing ERP, organizational structure needs to be managed effectively through formal education and training in order to be successful. What we believe is missing from current literature in change management is a broad focus of what change management entails. Change management not only entails a perspective on change in regard to altering current business processes and ensuring user training, but also the overall culture of the organization. For example, is the organization receptive to new technology and new support systems? Is the culture receptive of potential shortcomings that may appear in the changes of the processes required? While management may be able to impact and mitigate potential problems associated with a culture that is risk averse or not adaptive to change, a mismatch in culture and implementation can lead to possible failure even if training is available. Dezdar and Ainin (2011c) suggest the more employee oriented an organization is, the more likely ERP implementation will be successful. Hence, we believe change management in an organization should not only focus on ease of transition and training of individual users, but future research should also take into consideration the overall culture and whether it is accepting of change. This concept is also supported by theory, including contingency theory because effective change management entails managers to pre-analyze the culture of the organization before actual change begins. More specifically, an organization that is not accepting of changes required to implement an ERP system will either hinder or potentially lead to ultimate failure in the implementation process. Based on contingency theory and a review of previous literature we formulate the following proposition:

P3. Change management requires a focus on organizational culture to be positively associated with ERP implementation success.

Implementation plan. An implementation plan refers to a plan of action that entails the transformation of ideas into action (Alexander and Faludi, 1989). In particular, we consider this to be evaluated by an organization through perceived costs and benefits of an ERP system. This includes a cost/benefits assessment, perceived financial cost and perceived benefits of ERP. Budget size and cost have been looked at as a CSF of ERP implementation success (Annamalai and Ramayah, 2012; Upadhyay *et al.*, 2011). Previous literature also suggests that perceived financial costs and benefits are effective in evaluating the potential for success in ERP and IT implementation (Oliveira and Martins, 2011).

Along with the cost/benefit analysis of ERP is the actual package selection. Past research suggests careful package selection is a vital component to ERP implementation success (Bharathi and Parikh, 2012; Upadhyay *et al.*, 2011).

Another important aspect is user training for the implementation process. Past research indicates user training is a CSF in ERP implementation (Basu *et al.*, 2011). It is also vital that managers take this into account during implementation of the ERP system (Stefanou, 2001).

Planning with system configuration is also important in ERP systems. Sound system configuration is vital in the first few stages of ERP system implementation, as well as in the latter stages. Previous literature suggests that a large problem in ERP implementation is misalignment issues of input, control, data, process, output and schedule (Wei *et al.*, 2005). Likewise, cross-functional coordination between activities in organizations, in order to align interests, has been shown to be important in ERP implementations (Gosain *et al.*, 2005). In the first stages ERP architecture needs to be well configured and appropriated toward the organization's goals in order to prevent misalignment and ensure coordination. Without adequate system configuration it is likely that the ERP implementation process will be hindered (Dezdar and Sulaiman, 2009).

The importance of developing an effective implementation plan defined by cost/benefits analysis, careful package selection, user training and sound system configuration is supported by the knowledge based view. Adequate knowledge is required in terms of the specific costs and benefits involved with the ERP system, as well as research and comprehensive knowledge of the particular package and whether it is aligned with a company's goals and needs (Annamalai and Ramayah, 2012). Additionally, users need to be adequately trained on innovative methods of efficiently using the ERP system in order to gain a competitive advantage. This also promotes sound system configuration.

While we will not present a proposition, since these facets have been studied in past literature, it is important for organizations to take CSFs such as an adequate cost-benefits analysis, careful package selection, user training and sound system configuration into account before ERP implementation takes place. Thus, we have added these components to make a more complete conceptual model.

Project management. Effective project management ensures that an ERP system will follow a planned outline and will connect every aspect of an organization (Zhu *et al.*, 2010; Umble *et al.*, 2003; Markus and Tanis, 2000). This will in turn allow organizations to effectively communicate with one another and systematize the supply chain. Similarly, it will ensure that routine jobs can be automated by the system, which will accelerate processing speed and minimize human errors (Zhu *et al.*, 2010).

Various studies have shown that project management is a CSF. They have included variants of this construct, including progress being evaluated and disclosed at every

level (Upadhyay and Dan, 2009), information flow management (Upadhyay *et al.*, 2011), and ERP troubleshooting (Dezdar and Ainin, 2011b; Wickramasinghe and Gunawardena, 2010).

Other variants include training with IT, teamwork and composition (Elmeziane and Elmeziane, 2012; Hoch and Dulebohn, 2012; Amalnick *et al.*, 2011; Basu *et al.*, 2011), IT and team training (Elmeziane and Elmeziane, 2012; Dezdar and Ainin, 2011c), communication (Elmeziane and Elmeziane, 2012; Basu *et al.*, 2011), and interdepartmental cooperation (Nour and Mouakket, 2011). Similarly, a team must have expertise by using top personnel (Bradley, 2008). Along with the team, there must also be a project manager and a project champion that can help lead and effectively provide ERP implementation success (Moohebat *et al.*, 2011). Lastly, for project management to be a CSF in ERP implementation, there must be a detailed ERP plan and a scope that outlines clear goals and objectives for the ERP system (Annamalai and Ramayah, 2012; Bharathi and Parikh, 2012; Amalnick *et al.*, 2011; Dezdar and Ainin, 2011c).

Knowledge based view reinforces the significance of these factors in ERP implementation success. An ability for a firm to integrate knowledge streams ultimately leads to competitive advantage (Kearns and Sabherwal, 2007). Further, the integration of knowledge is the primary goals of a firm and refers to knowledge being shared, applied or combined to create new knowledge (Kearns and Sabherwal, 2007; Grover *et al.*, 1996; Okhuysen and Eisenhardt, 2002). Evaluation and disclosure of information reinforces knowledge of ERP implementation throughout the organization. Additionally, for this to occur there needs to be a project manager and champion that promotes a plan and an environment open to communication and education regarding the system itself.

Previous literature provides substantiated evidence of the importance of project management in any information technology adoption. For example, the *Project Management Body of Knowledge* (PMBOK) addresses both integration and scope management (Project Management Institute, 2004, p. 9). Research has made great strides in empirically examining the impact of project management on ERP implementation success as described in the preceding paragraphs. Hence, we have added these components to our comprehensive model depicting the various CSFs for ERP implementation success.

Top management support. Top management support refers to the support of priorities by top management or leadership (Martin, 1982). We define it through several facets, including leadership involvement with the project, leadership commitment, and company support.

Top management support is a CSF for enterprise application integration (EAI), which also has many of the same CSFs of ERP systems (Lam, 2005). It has also been identified as a CSF in ERP implementation success by various studies (Nour and Mouakket, 2011; Dezdar and Ainin, 2011a, b, c).

Past research has linked leadership commitment through managerial ability to overcoming obstacles to the adoption of IT (Oliveira and Martins, 2011). Likewise, recent literature suggests that ERP implementation success is positively associated with organizational culture, which is fostered through leadership (Khattak *et al.*, 2012; Al-Shamlan and Al-Mudimigh, 2011; Wei and Wei, 2011; Dezdar and Ainin, 2011b; Ke and Wei, 2008). Because there are inevitable problems associated with ERP implementation, we added this to the construct to top management support. Along with this, CSFs,

including competent project manager (Finney and Corbett, 2007) and project champion (Dezdar and Ainin, 2011b; Upadhyay *et al.*, 2011), have been associated with ERP implementation success. However, top management and the company as a whole need to provide overall company support, in order to make the ERP implementation successful (Moohebat *et al.*, 2011).

Past literature supports that top management leadership involvement, commitment and company support is vital to ERP implementation success. What is missing is the reciprocal relationship among users, vendors and top management. While top management needs to be supportive and committed to the project, company support of top management is also required. Social capital theory supports this by suggesting social capital can perpetuate greater performance when knowledge sharing and trust occurs between individuals. If the leadership is not supported by an organization, it is unlikely projects advocated by that leadership will be successful. While it is possible leaders can be replaced, it is probable projects such as ERP implementation will be delayed and hindered in the process. Our study produces a broad view of top management support and connects it to ERP implementation success. Based on social capital theory and previous literature we formulate the following proposition:

P4. Top management support, as defined by leadership involvement, company support and leadership commitment, is positively associated with ERP implementation success.

Environment

Along with the technological and organizational aspects of a firm, environmental aspects are also important. The environmental aspect refers to the arena in which a firm conducts its business, including its industry, competitors and dealings with the government (Pan and Jang, 2008). We consider external pressures and trust as two dimensions that contain various CSFs for ERP implementation success.

External pressures. External pressures are competitive, regulatory pressures to adopt a specific information technology. Recent research suggests that competitive pressure and regulatory policy have influenced ERP adoption (Oliveira and Martins, 2011).

Previous literature suggests the importance of competitive pressure for adopting innovations, as well as regulatory environment (Zhu and Kraemer, 2005; Zhu *et al.*, 2003, 2004; Premkumar and Ramamurthy, 1995; Iacovou *et al.*, 1995). Likewise, competitive pressure and regulatory environment, through strategic aspects of ERP systems, have been shown to have a greater impact on a firm's competitiveness than any technical aspect (Yen and Sheu, 2004). Often the decision to invest in ERP technology is based on researching the IT capabilities of other firms and whether or not they have invested in ERP technology.

While past studies have identified the positive association between external pressures, including competition (Bradford and Florin, 2003), on ERP implementation success, very little if any previous literature examines the relationship between regulatory pressure and implementation. Most previous research in information technology and ERP is centered on adoption of the system (Pan and Jang, 2008; Yen and Sheu, 2004; Zhu *et al.*, 2004). However, these pressures might also have a positive association with ERP implementation success. The main goal of an organization is not simply to just adopt an information technology, but to do so effectively and efficiently so as to reduce pressure from competition, as well as problems stemming from

regulatory pressure. The impact of external pressure is also supported by resource based view in that to mitigate pressures from the outside, firms will attempt successful internal capabilities and likewise a successful ERP implementation. Additionally, the incentive for first mover advantage and to reduce regulatory problems will ultimately provide focus toward successfully overcoming obstacles with ERP implementation (Bradford and Florin, 2003). Based on resource based view and previous literature we formulate the following proposition:

P5. External pressure, as defined by competitive and regulatory pressures, is positively associated with ERP implementation success.

Trust. One of the factors that past ERP implementation success research has failed to consider is the importance of trust. As mentioned previously, user security and system security are both vital facets in ERP implementation success (Goel *et al.*, 2011). Trust between a user, the vendor, consultant and system is vital for adequate user and system security. Based on this, we suggest that trust is one of the most important CSFs. Although previous literature alludes to the importance of relationships between individuals in an organization during ERP implementation (Amoako-Gyampah and Salam, 2004), and theoretical underpinnings such as social capital theory alludes to the importance of trust in both an individual and organizational level to gain competitive advantage, very little research examines trust within the ERP community, as well as trust of an organization with the system itself.

Trust has been defined in several ways. It has been defined in both organizational and individual contexts. While personality psychologists view trust as an individual characteristic (Rotter, 1971), economists and sociologists show how institutions are created to reduce uncertainty and increase trust in specific business transactions (Bhattacharya *et al.*, 1998; Zucker, 1986; Goffman, 1971).

Recent trust research focuses on various types of trust, including:

- Contractual trust, which is the trustor's perception that the trustee will or will not comply with agreements.
- Competence based trust, which is the trustor's perception that the trustee is able and willing to do what they say they will do.
- Goodwill based trust, which focuses on the trustor's perception of whether or not the trustee will take him/her into account when making decisions (Chun Ha *et al.*, 2011; Ireland and Webb, 2007).

Our paper focuses on the trust within the ERP community, which has been defined in previous research as a triadic group composed of an implementing organization, the vendor who supplies the ERP system, or in other words vendor process mode, and the ERP system consultant or consultant process mode characteristics (Adam and Sammon, 2004). Further, we look at the trust of the organization for the system.

The main task of an ERP software vendor is to provide a working ERP system to a company. The type of trust that occurs between a vendor and a client is similar to competence and contractual trust. The ERP implementing organization expects that the vendor will provide an adequate system and give the client all information, including disclosure of limitations of the system. In this sense they expect honesty as well as competence in providing a capable system. Often vendors will exclude information when trying to sell a product. Similarly, they may try to go above the heads of the

implementation team, straight to senior management in order to close a deal. These issues can limit trust and reduce the morale of the implementation team, thereby proving detrimental to the implementation of the system itself. Gefen (2004) found that client trust in the vendor and perceived usefulness of the ERP contribute to the client's assessment that the relationship with the vendor is worthwhile. Various studies have also alluded to the importance of the relationship, knowledge, quality and support a vendor provides to the client for ERP implementation success (Hung *et al.*, 2012). Without trust between the client and the vendor the relationship would be hindered, thereby leading to difficulties in ERP system implementation.

The trust that an organization has with an ERP system is fundamental not only during implementation, but also for the future. If an organization does not understand the system, trust can also be hindered. Rotter (1954) defines this as external *locus* of control. It also relates to Heider (1958) attribution theory. If something appears to be going wrong with the system, people might attribute it to the system itself, rather than to their own manipulation, thus, inhibiting trust. If trust in the system is low, it is less likely that the organization will continue using it, thus, limiting chances for system success. Past studies have failed to look at the impact of system trust with regard to ERP implementation success.

The ERP system consultant's duty is to aid in the implementation process of the ERP system and support a continuous effort toward helping the organization streamline operations. The type of trust that occurs between an ERP implementing organization and the consultant is likely characterized by competence and is contractual. An ERP implementing organization expects a consultant to not only be capable of fulfilling his/her duties, but to also follow guidelines set out before the relationship began. Previous literature suggests that ERP implementation provokes considerable impact on the organization, management model, and interaction among individuals and the group (Wood and Caldas, 2001). Consultants take on the role of supporting an organization and helping it view the undertaking as a major organizational change process as opposed to merely an IT project (Wood and Caldas, 2001), which could ultimately lead to ERP implementation failure. When organizations take advice from consultants, specifically regarding IT implementation, they require a basic form of competency trust in the vendor. This form of trust is separate from the trust of the system itself in that it is between the organization and a separate entity. Yet the trust between the consultant and the organization is vital to the success of the system, because the consultant is in charge of the start-up. That is, the consultant is inextricably linked to the system. Without the help of the consultant, operating the system could be troublesome and might be a success inhibitor. Various studies have looked at the importance of consultant selection, relationship, services, and qualifications in ERP implementation success (Supramaniam and Kuppusamy, 2011). The careful selection of a consultant can also reduce moral hazard (i.e. consultant shirking) (Basu and Lederer, 2011), which can impede a variety of success factors, including user security and potentially functionality and quality of the system. Overall, trust can help facilitate the relationship between the consultant and the organization thus being vital to the success of the system.

If one trust link is slow to provide information, it could be detrimental in the implementation of any project or system, especially in ERP systems, where the main focus is collecting and maintaining communications within and outside an organization. Hence, we formulate the following proposition:

P6. Trust, as defined by vendor process mode characteristics, consultant process mode characteristics and system perceived usefulness, is positively associated with ERP implementation success.

Integrative model

This research proposes that IT capability level, understanding of user requirements, change management, implementation plan, project management, top management support, external pressures and trust are positively associated with ERP implementation success. The model in Figure 1 shows the connections between these constructs.

In this model we have added the element of trust because very little research has applied it to ERP implementation success. The closest study linking trust and ERP found that client trust in the vendor and perceived usefulness of the ERP contribute to the client's assessment that the relationship with the vendor is worthwhile (Gefen, 2004). Likewise, four governance structures, including explicit and implicit contracts, reputation and trust play a role in ERP project success (Wang and Chen, 2006). Yet this study still fails to specifically link it with ERP implementation and likewise, fails to identify each relationship, including the relationship with the vendor, system and consultant.

Validation of the conceptual model

In this section the proposed model will be logically validated by comparing features of the model with those of other proposed ERP implementation success models. Tables I-V present a list of publications that contain elements of ERP implementation success. Table VI presents further analysis of how we theoretically developed our model and supporting literature. We focus on articles within the past ten years whose domain is in ERP implementation success. Using the key words "ERP implementation success" and "CSFs", we discovered several articles from 2001 to 2012 depicted in Tables I-V.

During our review of literature, we found many terms used to identify similar constructs. For example, various studies supported the notion that clear goals and objectives are critical for ERP implementation success. Clear goals are labeled in project management under plan and scope of the project.

Limitations and future research directions

In this paper we have provided both researchers and professionals a conceptual model that depicts the various CSFs organized using the TOE framework of ERP implementation success. Our research contributions include developing a theoretically supported conceptual framework that includes a variety of CSFs that have been empirically validated as well as others that have not. More specifically, we have also provided researchers insight into CSFs that have not been examined in previous literature, including trust between user, vendor, consultant and system, as well as a community culture that is accepting of change. The paper also provided a few managerial implications, including theoretically based knowledge that trust not only within the confines of the organization is important, but also that trust with consultants and vendors themselves is vital for ERP implementation success. Further, we provided practitioners a model that depicts established CSFs and theoretically validated organizational factors and environmental aspects that practitioners can use as a tool for optimizing ERP implementation success. However, this paper only provides a first step in establishing a model for optimization.

Table I.
Critical success factors

	PM	TP	PS	CPM	PED	T	CM	CPS	IFM	PC	RA	ITI	IEI	LS	UK	SCR	IAI	AD	EU	MC	TMS	CS	T	VT	ST	CT	OF	BPR	IC	TW	C	TR
Hong and Kim (2002)																											X					
Akkermans and Van Helden (2002)	X	X	X					X		X	X							X		X	X	X		X		X		X	X			X
Nah *et al.* (2001)	X		X		X	X	X			X	X			X						X	X						X	X		X	X	
Finney and Corbett (2007)	X	X	X	X		X	X			X	X		X			X	X	X		X	X					X		X		X		X
Zhang *et al.* (2005)	X										X		X			X	X		X		X	X		X			X	X				X
Gargeya and Brady (2005)	X		X		X	X						X									X	X										X
Soja (2006)			X								X					X					X									X		
Ehie and Madsen (2005)	X				X							X									X					X		X				
Sarker and Lee (2003)																					X									X	X	
Amoako-Gyampah (2004)																			X												X	X
Jafari *et al.* (2006)	X		X								X							X			X	X		X				X			X	X
Bradley (2008)	X	X								X																						X

	PM	TP	PS	CPM	PED	T	CM	CPS	IFM	PC	RA	ITI	IEI	LS	UK	SCR	IAI	AD	EU	MC	TMS	CS	T	VT	ST	CT	OT	BPR	IC	TW	C	TR
Ramayah *et al.* (2007)																					X									X	X	
El Sawah *et al.* (2008)	X																				X	X					X					
Wang *et al.* (2006)																														X		
Dezdar and Sulaiman (2009)	X		X			X	X	X		X				X		X					X	X		X		X	X	X		X	X	X
Snider *et al.* (2009)	X										X										X					X				X		X
Kamhawi and Gunasekaran (2009)																											X					
Motwani *et al.* (2005)							X	X														X					X					
Zabjek *et al.* (2009)							X														X							X				
Upadhyay and Dan (2009)	X		X		X			X			X		X								X			X		X				X	X	X
Doom *et al.* (2010)	X		X										X									X					X					
Sternad and Bobek (2006)	X		X				X	X		X								X		X	X	X				X		X		X	X	X
Jafari *et al.* (2006)	X		X													X		X			X	X		X				X			X	X

Table II.
Critical success factors

	PM	TP	PS	CPM	PED	T	CM	CPS	IFM	PC	RA	ITI	IEI	LS	UK	SCR	IAI	AD	EU	MC	TMS	CS	T	VT	ST	CT	OF	BPR	IC	TW	C	TR
Singla (2009)	X		X			X		X			X	X				X					X	X						X		X	X	X
Singla and Goyal (2006)	X		X													X						X										X
Aboelmaged (2009)			X		X			X		X	X						X				X	X		X		X	X	X	X	X	X	X
Becerra-Fernandez *et al.* (2005)	X						X						X								X	X									X	
Moohebat *et al.* (2011)	X																					X						X		X		
Nour and Mouakket (2011)	X			X			X				X	X	X		X	X		X			X			X			X		X	X	X	
Dezdar and Ainin (2011a, b, c)			X																		X											X
Dezdar and Ainin (2011b)	X		X				X	X		X				X		X	X				X	X		X		X		X		X	X	X
Basu *et al.* (2011)	X		X				X											X			X					X				X	X	X
Upadhyay *et al.* (2011)	X		X				X	X	X	X		X	X		X					X	X			X		X				X		X
Shah *et al.* (2011)			X				X						X								X							X				
Wickramasinghe and Gunawardena (2010)	X					X	X			X						X	X					X					X	X	X	X	X	X
Supramaniam and Kuppusamy (2011)	X		X				X			X	X							X		X	X			X		X		X			X	X
Amalnick *et al.* (2011)	X		X																			X		X						X		
Al-Shamlan and Al-Mudimigh (2011)	X						X														X									X	X	X
Wei and Wei (2011)				X											X						X										X	

Table III.
Critical success factors

	PM	TP	PS	CPM	PED	T	CM	CPS	IFM	PC	RA	ITI	IEI	LS	UK	SCR	IAI	AD	EU	MC	TMS	CS	T	VT	ST	CT	OF	BPR	IC	TW	C	TR
Annamalai and Ramayah (2012)	X		X		X																X							X		X	X	
Bharathi and Parikh (2012)	X		X					X				X					X				X	X		X		X				X	X	X
Hoch and Dulebohn (2012)																														X		
Elmeziane and Elmeziane (2012)							X																							X	X	X
Khattak *et al.* (2012)			X	X			X												X		X							X		X	X	X

Table IV.
Critical success factors

PM	Project management
TP	Top personnel
PS	Plan and scope
CPM	Competent project manager
PED	Progress evaluated and disclosed
T	Troubleshooting
CM	Change management
CPS	Careful package selection
IFM	Information flow management
PC	Project champion
RA	Resources/assets
ITI	IT infrastructure
IIE	In-house IT expertise
LS	Legacy systems
UK	User knowledge
SCR	System configuration/reliability
TAI	Testing after Implementation
AD	Accurate data
EU	Ease of use
MC	Minimal customization
TMS	Top management support
CS	Company support
T	Trust
VT	Vendor trust
ST	System trust
CT	Consultant trust
TW	Teamwork
C	Communication
TR	Training

Table V.
Tables I-III key

One limitation of this paper is that the model has not yet been empirically examined. While we provide a comprehensive CSF model for ERP implementation success that introduces trust, a major component of project success that has not been established in previous research, future research should examine this relationship empirically. This will help further validate the model and its separate components. Another limitation to the study is that we do not assess all behavioral aspects involved in ERP implementation and how they promote success. Future research should focus on establishing how individual or collective behavior, specifically in the ERP community, may impact success at different levels.

Further, while there is a variety of research that examines the impact of CSF's on ERP implementation success, there is currently not many that examine the impact of CSF's on other CSF's. A recent study, Sternad *et al.* (2011), empirically investigates the influence of external factors on routine ERP usage. For example, Sternad *et al.* (2011) considers the impact of communication and training on overall ERP usefulness. Given the lack of research on trust and ERP implementation success, we suggest future studies should not only empirically examine the impact of trust on ERP implementation success, but also investigate what impacts trust between the user, vendor, consultant and system, and what are the antecedents? Moreover, are there any impacting mediating or moderating variables involved?

First order constructs	Second order constructs	Theory	Supporting literature
Technology			
IT capability level	IT capability, knowledge management system characteristics, CMM level	Capability maturity model	Oliveira and Martins (2011), Nour and Mouakket (2011), Upadhyay *et al.* (2011), Supramaniam and Kuppusamy (2011), Basu *et al.* (2011), Dezdar and Sulaiman (2009)
Organization			
Understanding of user requirements	BPR, knowledge of user needs	Strategic choice theory	Dezdar and Ainin (2011a, b, c), Yusuf *et al.* (2004)
Change management	Compatibility and ease of transition, user education, culture accepting of change	Contingency theory	Nour and Mouakket (2011), Shah *et al.* (2011), Supramaniam and Kuppusamy (2011), Upadhyay *et al.* (2011), Dezdar and Ainin (2011a, b), Hung *et al.* (2011), Zhu *et al.* (2010), Jones *et al.* (2006), Guha *et al.* (1997), Weill and Olson (1989)
Implementation plan	Perceived cost/benefits analysis, careful package selection, user training and sound system configuration	Knowledge based view	Upadhyay *et al.* (2011), Oliveira and Martins (2011), Basu *et al.* (2011), Dezdar and Ainin (2011a, b, c), Supramaniam and Kuppusamy (2011), Aboelmaged (2009), Dezdar and Sulaiman (2009), Singla (2009), Upadhyay and Dan (2009), Ehie and Madsen (2005), Gargeya and Brady (2005), Stefanou (2001)
Project management	Evaluation and disclosure, IT training, team training, team expertise, project manager, project champion, project plan and scope	Knowledge based view	Upadhyay *et al.* (2011), Basu *et al.* (2011), Moohebat *et al.* (2011), Nour and Mouakket (2011), Dezdar and Ainin (2011a, b, c), Supramaniam and Kuppusamy (2011), Upadhyay *et al.* (2011), Wickramasinghe and Gunawardena (2010), Zhu *et al.* (2010), Upadhyay and Dan (2009), Bradley (2008), Sternad and Bobek (2006), Umble *et al.* (2003), Markus and Tanis (2000)

(*continued*)

Table VI.
Constructs, supporting theory and literature

Table VI.

First order constructs	Second order constructs	Theory	Supporting literature
Top management support	Leadership involvement, company support, leadership commitment	Social capital theory	Nour and Mouakket (2011), Dezdar and Ainin (2011a, b, c), Basu *et al.* (2011), Supramaniam and Kuppusamy (2011), Shah *et al.* (2011), Upadhyay *et al.* (2011), Oliveira and Martins (2011), Finney and Corbett (2007), Moohebat *et al.* (2011)
Environment			
External pressures	Competitive pressure, regulatory pressure	Resource based view	Oliveira and Martins (2011), Pan and Jang (2008), Zhu and Kraemer (2005), Yen and Sheu (2004), Zhu *et al.* (2004), Zhu *et al.* (2003), Iacovou *et al.* (1995), Premkumar and Ramamurthy (1995)
Trust	Vendor process mode characteristics; consultant process mode characteristics; system perceived usefulness	Social capital theory, attribution theory	Hung *et al.* (2012), Wood and Caldas (2001), Nour and Mouakket (2011), Supramaniam and Kuppusamy (2011), Upadhyay *et al.* (2011), Basu *et al.* (2011), Amoako-Gyampah and Salam (2004), Gefen (2004), Nah *et al.* (2001)

While this research is a first step toward assessing behavioral CSF's on ERP implementation success, there is still a myriad of questions left unanswered. We hope that researchers will incorporate these ideas to help improve knowledge of ERP implementation.

Conclusion

Past literature has criticized the development and long list of CSFs in ERP implementation research, referring to them as "laundry lists" without insight into how one affects another and vice versa (Akkermans and Van Helden, 2002; Richmond, 1993). We believe that future research should entail a greater understanding of ERP implementations using a holistic approach that analyzes ERP implementation success and refrains from a reductionistic perspective that reduces ERP implementation into a subset of factors that is incomplete. The problems of reductionism in ERP implementation CSFs have also been examined by Wood and Caldas (2001), who recommend ERP implementation should be thought of as a major organizational change process and should not be planned and conducted with a reductionist point of view.

Following these criticisms and important insights, we wish to provide a complete conceptual model of ERP implementation organized using the TOE framework. We believe that although previous literature in the past 20 years has provided important insights into the various factors that should be of major concern for organizations implementing ERP, and should not be ignored in this model, we also advocate future research concentrate on insights that have limited or no research to date. In this paper we have provided insight and theoretical foundations for the importance of company culture and its vitality in change management and regulatory pressure in ERP implementation. However, one of the most important insights in this article is the importance of trust in the ERP community. Specifically, new research should broaden the perspective of different types of trust existing before and during ERP implementation, including trust that exists between organizations implementing ERP, vendors, consultants and trust that exists regarding the system itself. While previous research alludes to this importance, very little work has been done on each of these relationships of trust, as well as the different types, including contractual and competence trust.

We hope that the model presented here can be used as a tool for optimizing ERP implementation, both before and during the implementation process. Moreover, we hope that future research empirically examines behavioral aspects of the individuals and the collective impact on ERP implementation success.

Overall, researchers can utilize this model to help integrate parts into their own models of ERP implementation success. The authors of this article encourage further development through empirical work using the model in future research publications.

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