Success Factors in Enterprise Resource Planning (ERP) Systems Implementation

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Abstract

There have been numerous industry stories about failures of Enterprise Resource Planning (ERP) initiatives. There have also been stories reporting on the significant benefits achieved from successful ERP initiatives. Review the industry and academic literature on ERP results and identify possible trends or factors which may help future ERP initiatives achieve greater success and less failure. The focus of this paper will be on reviewing academic and industry literature in an effort to identify potential trends or factors, which may help in providing better chances for a successful ERP implementation.

Introduction

According to Brown and Vessey (2000), an Enterprise Resource Planning (ERP) system is a software package that makes available an information structure that integrates all of the business's processes and functions. The widespread utilization of the ERP systems in organizations has been one of the most significant occurrences in the Information Technology (IT) starting in the early nineties (Vogt, 2002). However, such utilization has had a history of successful as well as failed attempts at implementing ERP systems (Davenport, 1998).

Organizations who choose to utilize ERP systems do so in an effort to computerize and amalgamate all company functions such as sales, marketing, and manufacturing (Vogt, 2002). The output of such functions are massive amounts of data which managers utilize to effectively accomplish such critical organizational tasks as human resource management, customer service, financing, and inventory management (Vogt, 2002). As a result, the concept of ERP has been a very tempting organizational initiative for many organizations. Some researchers went as far as referring to ERP as the complete solution to all of the organization's information system needs (Brown & Vessey, 2000).

While many organizations recognize the various benefits that ERP systems bring to their businesses, still, many of these organizations do not realize that the cost of a failed ERP initiative can be very high (Davenport, 1998). Many research studies have concluded that ERP system do not in fact assure the business the benefits that ERP advertises itself to be able of accomplishing (Brown & Vessey, 2000). Some research studies indicate the only 15 to 20% of all ERP implementations are successful (Brown &

Vessey, 2000). As a result, researchers and expert in the field of IT and ERP implementation have conducted studies that seek to identify ways and strategies for the successful implementation of ERP.

Benefits of ERP systems

A study by Deloitte Consulting (1998) which was based on interviews conducted with 62 Fortune 500 firms concluded that there are tangible and intangible benefits that an organization will most likely gain from implementing an ERP system. The tangible benefits of implementing an ERP system according to Deloitte Consulting (1998) are:

1. Personnel Reduction
2. Inventory Reduction
3. Productivity Improvement
4. Faster Financial Close Cycle
5. Order Management/Cycle Time Improvement
6. Procurement Cost Reductions
7. IT Cost Reduction
8. Cash Management Improvement
9. Revenue/Profit Enhancement
10. Maintenance Cost Reduction
11. On-Time Delivery Improvement
12. Transportation/Logistics Cost Reduction

The intangible benefits of implementing an ERP system according to Deloitte Consulting (1998) are:

1. Improved Information Visibility

2. New/Improved Processes
3. Improved Customer Responsiveness
4. Standardization
5. Integration
6. Improved Cost Structure
7. Greater Flexibility
8. Y2K
9. Globalization
10. Business Performance
11. Supply/Demand Chain Performance Improvement
12. New Business Model

Gattiker and Goodbue (2000) indicate that the benefits of ERP can be categorized as follows:

- Standardize and integrate organizational activities which improves the flow of information across the different functional units.
- Help in the centralization of administrative activities such as account payable and payroll.
- Decrease the cost of maintaining information systems while allowing to introduce new IS capabilities and functionalities.
- Transform ineffective business processes into effective and accepted best practices.

Potential problems with ERP systems

According to Brown & Vessey (2000), ERP systems have two major implementation issues: generality and complexity, which can bring about certain potential problems such as:

- Reliability: Since the ERP system encompasses all of the organization's functions and process, this could be a potential major problem if the ERP system becomes unavailable.
- Big Bang approach: Some organizations tend to introduce the ERP system all at once instead of phasing out its installation in their computing environments. Such practice has proven many times to be ineffective and led to the failure of implementing the ERP system. This is due to the fact that t ERP systems function as independent systems and do not integrate with existing systems.
- Customization: ERP systems are not developed for a certain industry or type of business; therefore, any customization efforts should be kept to a minimum since such customization will consume valuable resources and efforts with little tangible results.
- Cultural barriers: Even though top management know the foreseeable benefits of implementing an ERP system, this view is not necessarily shared with the rest of the employees who consider such implementation as a major organizational change. As a result, employees might have the feeling of uncertainty which could prompt them to resist such a change.

Success factors for the implementation of ERP systems

The Implementation of an ERP system is a complicated and tedious process, which requires extensive organizational resources. The literature contains many studies and research efforts by experts in the field of ERP implementation in an effort to outline certain practices that lend support to the successful completion of ERP projects. Still, many organizations have failed to successfully implement such projects. The remainder of this paper will attempt to synthesize the ERP implementation literature in an effort to put together a strategy for the successful completion of ERP projects.

Many researchers and experts in the field of IT and ERP have conducted studies to outline and recommend success actors for the implementation of ERP systems. In this section, a brief overview of selected IT literature that address the success factors needed for the successful implementation of ERP.

According to Larsen and Myers (1997) indicate that what could be considered a successful ERP implementation could turn out to be a failure later due to abrupt end to the project and the lack of user training. To remedy such cause of failure, Larsen and Myers (1997) recommend phasing out the implementation efforts of the ERP project, and documenting every phase.

Bancroft et al. (1998) consider management issues such as management support, project championship, effective departmental communications, and effective project management as the key determining factors in the success or failure of a ERP initiative.

Bancroft et al. (1998) indicates that prior to any ERP implementation, IT must develop its own skills and capabilities to meet the complex and tedious nature of an ERP implementation effort. Bancroft et al. (1998) indicate that such IT skills and capabilities needed for the successful completion of an ERP effort are:

- IT leadership: develop strategies, structures, processes, and staff needed for ERP implementation
- Adopt systems view
- Cooperate with business user
- Create needed technical platform
- Technology fixing
- Compare vendor sources
- Contract facilitation and coordination of efforts
- Contract monitoring Hold suppliers accountable
- Explore long-term mutual benefits with suppliers.

Parr et al. (1999) indicate that ERP systems are far more complicated than the conventional software package due to the reengineering demanded by ERP of the entire organization. Parr et al. (1999) further indicate that ERP implementations require extensive interdepartmental coordination which adds to the complexity of ERP implementation. As a result, Parr et al. (1999) concludes that the support of management and the championship of the project become very critical to the success of ERP implementation.

Somers and Nelson (2001) indicate that the critical success factors that lend support to the successful implementation of an ERP project are many. In an effort to summarize these success factors, Somers and Nelson (2001) compiled a list of the top 22 factors that lead to the successful implementation of ERP projects. Their compilations of this list was based on a study of over 110 ERP implementation in organizations, as well

as on IT literature related to implementation of Business Process Reengineering (BPR) and ERP.

Somers and Nelson (2001) the ranked list of factors influencing the success of ERP projects is as follows:

1. Top management support
2. Project team competence
3. Interdepartmental co-operation
4. Clear goals and objectives
5. Project management
6. Interdepartmental communication
7. Management of expectations
8. Project champion
9. Vendor Support
10. Careful package selection
11. Data analysis and conversion
12. Dedicated resources
13. Steering committee
14. User training
15. Education on new business processes
16. BPR
17. Minimal customization
18. Architecture choices
19. Change management

20. Vendor partnership

21. Vendor's tools

22. Use of consultants

The following section will discuss in more detail these ERP success factors that seem to dominate the literature reviewed by this study.

Functional coordination

According to Kim et al. (2005), organizations that focused on coordination between the different business functional areas had much higher success rate when implementing an ERP project. Such coordination is manifested in the form of commitments to resources and the sharing of information. Kim et al. (2005) further indicate that it is often the case that a failed ERP implementation initiative is mainly due to problems that take place in the early phases of project initiation. Such problems which stem from lack of organizational support and technical knowledge. To avoid such chances for failure, Kim et al. (2005) indicates that management must establish organizational consensus and dedication to the success of the ERP project. Management must also focus on making sure that the technical staff who is responsible for the implementation of the ERP system have the know-how to understand the overall design mandates of such system (Kim et al. 2005).

Daneva and Wieringa (2006) share the same view held by Kim et al. (2005) with regards to the importance of functional coordination in the successful completion of an ERP effort. Daneva and Wieringa (2006) indicate that such coordination can be accomplished by using different mechanisms such as:

- Utility-oriented mechanisms, which refer to the agreement among the players and stakeholders involved in the implementation of the ERP system about the benefits of such coordination.
- Process-oriented mechanisms, which refer to the establishment of a continuous cross functional processes such as customer ordering or product provisioning processes.
- Semantics-oriented mechanisms, which refer to the agreement among the players and the stakeholders involved in the implementation of the ERP system with regards to interpreting common and critical pieces of information.
- Communication-oriented mechanisms, which refer to the diffusion of information across the organization's network.

The change management approach

Aladwani (2001) takes a different approach to outlining a strategy for the successful implementation of an ERP initiative. He indicates that an ERP system implementation presents a major organizational change. Therefore, a change management approach must be followed to insure the successful completion of such change effort (Aladwani, 2001). Towards such effort, Aladwani (2001) proposes a three-step process that outlines an approach for the implementation of ERP systems:

1. Knowledge formulation: Aladwani (2001) indicates that the focus in this stage is on planning for the prologue of the ERP system, assessing resources and defining goals as well potential issues that the company might face during the ERP implementation effort. Aladwani (2001) further indicate that it is important in this

stage that the organization identify those who resist the change and identify the reasons behind their opposition to the introduction of the ERP system.

2. Strategy implementation: The goal of this stage is to form certain strategies which Aladwani (2001) refer the awareness, feelings, and adaptation strategies. According to Aladwani (2001), these strategies aim to utilize communications with employees in an effort to change their negative attitude towards change. As a result, Aladwani (2001) asserts that employee will be able to set realistic expectations of what the ERP system will accomplish. Another goal of these strategies is to infuse employees' confidence by assuring them that the selected ERP will meet their expectations while achieving organizational goals (Aladwani, 2001).
3. Status evaluation: Aladwani (2001) emphasizes that it is crucial to provide timely and accurate feedback with regards to the implementation and utilization of the ERP system. According to Aladwani (2001), feedback in this case can be either positive where the status will continue with current plans, or negative where strategies and plans will have to be reevaluated and amended to uphold the ERP performance.

The Business Process Reengineering Approach

The nature of the implementation of an ERP project demands the examination of the entire business processes and functions (Taylor, 1998). As a result, the successful ERP implementation will pave the way for the successful implementation of a BPR process (Taylor 1998).

According to Hammer and Champy (1993), Business Process Reengineering (BPR) is the "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service ands peed" (p. 32). A key perception provided in that description is that BPR requires that the organization revisit its fundamental processes in an effort to make dramatic and major changes to the way it runs its business.

Many researchers consider BPR as a significant factor in the successful implementation of an ERP system. According to Bhatti (2005) organizations who are looking to implement an ERP system should be willing to make the necessary adjustments to the way they run their business in an effort to reduce the amount of customization the ERP system often demands. Bhatti (2005) further indicates that the implementation of an ERP system demands the reevaluation of many business processes, which is in itself is a benefit that the organization will gain as a result of an ERP system implementation.

Clear goals and objectives.

Traditionally, IT projects start off with a definition of requirements as well as the goals and objectives that the project will meet and will accomplish. This is what Bhatti (2005) refer to as the conceptualization of goals and objectives. Even though clear goals and objectives are a critical success factor in ERP implementation, they can also present potential issues due to the fact that it is difficult to determine the beginning of an ERP project since such a project is business endeavor rather than a project (Bhatti, 2005). As a result, it is highly recommend that the approach to ERP implementation should be a phased one with each phase having its own clear goals and objectives.

Management support

All of the literature reviewed for this research effort seem to consider management support as one of the most critical factors in the successful implementation of an ERP project. According to Parr et al. (1999), management support during the implementation of an ERP project is a critical factor in the successful conclusion of such project. This view is shared by Bancroft et al. (1998) who indicate that it is imperative that top management be committed and supportive of the implementation efforts of an ERP project. Bingi et al. (1999) goes as far as considering the success of an ERP project is mainly dependant on the continued commitment and support of management through the implementation phases of the ERP project.

According to Bhatti (2005), management support during the implementation efforts of an ERP project is manifested through providing the leadership and the resources needed. Bhatti (2005) further indicates that it is crucial that management overlook and supervise the progress of implementation efforts as well as provide input on how these efforts should proceed. Bhatti (2005) by asserting that management must pave the way for a change process that will involve considerable amount of learning.

Measuring for success

Measuring the success of the implementation of ERP systems has been the subject of considerable research. According to Wang and Chen (2004), assessing the success of an ERP project can be examined from three different standpoints depending on which phase of the development life cycle the project is undergoing. These standpoints according to Wang and Chen (2004) are:

- Operational, which refers to the requirement that the ERP system once implemented, should have the anticipated functionality.
- Financial, which indicates that focus should be on ascertaining that the ERP system take into account key organizational performance indicators.
- Project implementation, which indicates that the success of an ERP project would accomplished if the system meets budget as well as time constraints.

Conclusion

Enterprise Resource Planning (ERP) systems incorporate major business functions and management practices within an organization. The potential benefits that an organization can realize from the implementation of an ERP system are many. In the meantime, the price of failure of such implementation can be very costly if the organization did not put together strategies to assure a successful conclusion to such implementation.

This study was aimed at reviewing IT and management literature in an effort to identify trends and factors for the successful implementation of ERP projects. This review has revealed that different experts and researchers in the field of ERP implementation have come up with different factors that can lead to the successful conclusion of an ERP project.

While these factors are many, this study has identified what is thought to be the common success factors that were shared in the different studies reviewed. Coordination and communication between the different organizational functions seemed to be shared by many experts and researchers. This factor is important for the success of the ERP project since ERP integrates these different functions.

The change management approach was also identified by researchers as a key factor in the successful implementation of an ERP system. This is because the nature of the ERP systems is viewed as a major organization change and, therefore, should be dealt with as a major change using a change management approach. This leads to the need by the organization to re-examine its entire processes in order to tailor these processes to fit the new ERP. This is what experts and researchers refer to as the Business Process Reengineering (BPR). Going through such process is important for the success of the ERP system since it reduces the amount of customization that has to be done to the system. All of these factors would not be effective unless there is a strong commitment and effective support by upper management. Therefore, many experts and researchers have emphasized the importance of management support and commitment to the implementation of ERP systems. Management support and commitment is the glue that ties all these factors together for the success of ERP implementation.

Future research needs to consider the success factors for the implementation of ERP systems based on different organizational settings and different ERP systems. Such research should conclude with a categorization of these factors in an effort to provide a taxonomy that can be applied to the different implementations of ERP systems.

Management support was found to be also critical for the success of ERP projects, which typical of any IT project. However, management support becomes such a crucial factor for ERP success since the nature of ERP projects is complexity which requires commitments, coordination, and resources which management can effectively supply

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