

A Model Approach for the Analysis of Dominant Factors in ERP Software Implementation

Fahad N. Al-Aboud

King Saud University

Abstract

The recent advancement and development in Enterprise Resource Planning (ERP) Software Systems has been a major incident in the software industry in the last decades and their application is rising hastily in all industries. The recent research shows that the total revenue in the ERP software market is approaching to \$50 billions. The researcher demonstrated that there are some critical factors that must be consider for the successful ERP project implementation. These factors are highlighted by the researchers that some of these are assuming to play the core role in the ERP implementation and thus called as "Dominant".

In this paper some dominant factors of ERP project implementation has been addressed and the role and impact of these factors has analyzed, appraised, and validate with the high reputed organization in the globe.

Keywords

ERP, Revenue, Dominant Factors, Software, Implementation.

1. Introduction

The use of computer technology in the organizations is very common to improve the performance, productivity, portability, and information flow throughout the organization. Rapid improvement in the computer technology and to decrease the product lifecycle every organization need to have a stable and well organized information system that can help it improve the quality of service, decision making and achieve the target in the competitive market. To avail all these facilities many organizations started to move towards enterprise resource planning.

Several approaches and methodologies of ERP project implementation recognize a series of critical factors that must be carefully considered to ensure successful implementation of an ERP system project. In essence, there are dominant critical factors hypothesized to play a more overriding role in the implementation of ERP project and, they should be ongoing throughout all implementation levels. These factors are top management commitment, business case, change management, project management, training, and communication. Clearly, the Dominant Factors are the ones that will shape the overall project culture, and subsequently the organizational culture as ERP is far reaching in nature (Al-Mudimigh et-al, 2003).

2. Previous Work

As ERP is a new trend within the software industry, its implementation methodologies are still developing with experience. Some organizations underestimate the mass of an ERP system implementation (Gable et al., 1998). Davenport (1998a), Gibson et al. (1999) and Holland and Light (1999) all agree that most companies adopting an ERP system will be required to reengineer the company's core business processes to fit the requirements of the system. As mentioned earlier, implementation of an ERP software package involves a mix of business process change and software configuration to align the software with the business processes (Gibson et al., 1999; Holland and Light, 1999; Davenport, 2000). It has, therefore, become increasingly clear that implementing an ERP system requires extensive efforts to transform the organization's business processes (Davenport, 1998a). In addition, implementing ERP systems is not as much a technological exercise as it is an organizational revolution (West and Shields, 1998; Bingi et al. 1999; Davenport, 2000).

In fact ERP implementation has proven to be very risky and expensive. According to Rizzi and Zamboni (1999) and Rao (2000) that the ERP implementation need major capital investment either developed by the IT department in an organization or use ready made package from the market. While Holland and light (1999), Davenport (2000), Markus and Tanis (2000) suggested that ready made packages could be at lower cost than the packages developed by the IT department in the organization.

Although ERP implementation for many organizations is the large project they have ever assumed, require high potential advantages and possibly high potential risk. But ERP doesn't come without challenges. It has been estimated that at least 90% of ERP implementations end up late or over budget and various failure stories have been cited. Clearly, ERP systems are huge and complex, involve substantial investments of time and money, and bring about considerable organizational change, and, thus, warrant careful planning and execution for successful implementation (Al-Mudimigh et-al, 2003).

3. Dominant Factors

There are some critical factors that must be carefully considered for the successful ERP project implementation. Various studies pointed out these critical factors and all of them agreed that these factors deployed on all levels (strategic, tactical and operational) of ERP project implementation. This paper highlight that some of these factors are conjecture to play a very important role in the ERP implementation. The presented factors are: top management commitment, business case, change management, experienced project management, a world class training system, and communication process. These factors should be clear, visible and understandable throughout the ERP implementation process. Therefore these factors are termed as “Dominant” and shown in figure 1.

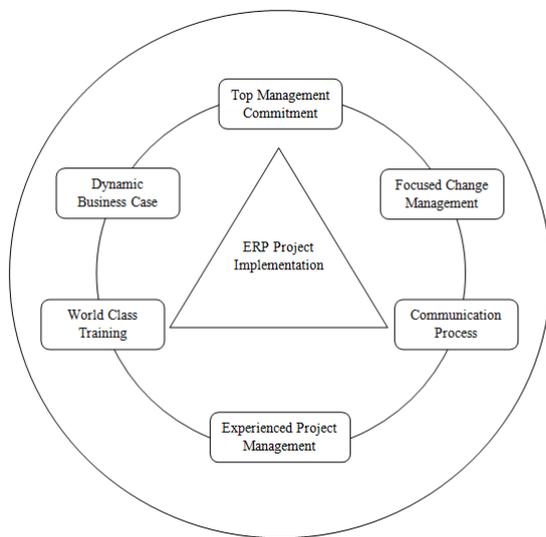


Figure 1: A model for the Dominant Factors of ERP Project Implementation

The factors shown in figure 1 are about the people and processes and they are interdependent. Failure in one factor can affect the whole ERP project and can lead to failure if not consider these factors seriously.

3.1 Top Management Commitment

Top management support was consistently identified as the most important and crucial success factor in ERP system implementation projects (Al-Mudimigh, et-al; Somers and Nelson, 2001,).

The top management must be involved at every step of the ERP implementation. They must be willing to allow for a mindset change by accepting that a lot of learning has to be done at all levels, including themselves (Rao, 2000). The

top management support and commitment does not end with initiation and facilitation, but must extend to the full implementation of an ERP system. They should continually monitor the progress of the project and provide direction to the implementation teams (Bingi et al., 1999).

3.2 Focused Change Management

Change management is a primary concern of many organization involved in ERP project implementation (Somers and Nelson, 2001). Cooke and Peterson (1998) identify change management, in terms of adopting an ERP system, as activities, processes, and methodologies that support employee understanding and organizational shifts during the implementation of ERP systems and reengineering initiatives.

Martin and Ching (1999) argue that the IT staffs are effective when they make physical IT changes, but usually disregard non-physical changes. However, embarking on a new IT system requires users to embrace procedural changes with focusing on physical changes. In this respect, Welti (1999) suggests that the users in an enterprise could perceive changes either positively or negatively.

Guptara (2000) suggests that the management of change has become an increasingly urgent issue in all organizations due to the impact of new technology. Peak (2000) argues that change management gives the project manager a tool for coping with internally and externally motivated changes.

In essence, Norris et al. (2000) point out that the tools of management of change are leadership, communication, training, planning, and incentive systems. They argue that these tools can all be used as levers and can move great obstacles with a minimum of efforts when applied correctly.

Many ERP implementation failures have been caused by the lack of focus on ‘the soft issues’, i.e. the business process and change management (Kelly et al., 1999; Sumner, 1999). Pawlowski and Boudreau (1999) point out that almost half of ERP projects fail to achieve expected benefits because managers underestimate the efforts involved in change management.

An ERP system package has a major impact on organizations, especially on their staff (Welti, 1999). Thus, change management is essential for preparing a company to the introduction of an ERP system, and its successful implementation. To implement an ERP system successfully, the way organizations do business will need to change and the ways people do their jobs will need to change too (Koch et al., 1999; Davenport, 2000).

Generally, one of the main obstacles facing ERP implementation is resistance to change. Bancroft et al., (1998) and Gupta (2000) point out that the resistance to change is one of the main hurdles faced by most companies. Martin and Ching (1999) suggest that to

decrease resistance to change, people must be engaged in the change process and helped to see how the change profits them.

3.3 Project Management

ERP implementation is challenging, costly, and risky. Consequently, to achieve the desired benefits, the ERP system implementation must be carefully managed and monitored. It is in this respect that project management becomes important, if not crucial for success.

Project management deals with various aspects of the project, such as planning, organization, information system acquisition, personnel selection, and management and monitoring of software implementation (Appelrath and Ritter, 2000; Peak, 2000). Peak (2000) suggests that the project management is a practiced system necessary to govern a project and to deliver quality products.

Initially, the project manager, the external face of the project (Norris et al., 2000), in conjunction with the steering committee, will select the project team. Owing to the wide-ranging impact of ERP software, the members of the project team should ideally be from management or supervisory positions (Bancroft et al., 1998), and have the authority to make a decision regarding how a process will be completed (Computer Technology Research Corporation, 1999).

Slevin and Pinto (1987) argue that in order to manage a project successfully, project managers must be capable both in strategic and tactical project management activities. With the ERP system implementation context, Bancroft et al. (1998) suggest that implementation is complex, requiring a combination of business, technical, and change management skills.

Hoffer et al. (1998) argue that the project management activities span the life of the project from initiating the project to closing it.

The project manager has a key role in the whole project, and has to manage the project within budget and time constraints (Bancroft et al., 1998). Thus, the project manager should have full authority over all elements of the project.

3.4 Business Case

A strong business case can control a project's scope (Industry Week, 1998). It considers project objective, needs, and benefits. In this respect, Wee (2000) argues that the business case is an effective tool to the ERP project implementation through its life cycle.

Cooke and Peterson (1998) point out that to ensure a business-specific result, the business case needs to be translated down to those who are deploying the actual systems. Moreover, they mention that, based on a global survey, the development of a strong business case was one of the key success factors.

Davenport (2000) points out that the business case should be modified continually and interactive through all project stages to realise the benefits. It may be recommended to change the project scope based on an ongoing business case. For example, Owens Corning's Company decision to back off from some aspects of ERP project implementation after it encountered some financial performance issues.

Moreover, a business case can help to convince people of the need for change, and therefore, their commitment to it (Wee, 2000; Industry Week, 1998). On the other hand, (Davenport, 2000; Wee, 2000) argue that the business case will focus on the expected business value to be achieved from the ERP project and associated business changes. The organization should go in the business case if it intends to make a better and faster decision with ERP implementation.

3.5 Training

ERP systems are extremely complex systems and demand rigorous training. Installing an ERP software package without adequate end-user preparation could lead to drastic consequences. Inadequate or lack of training has been one of the most significant reasons of many ERP systems' failure (Kelley et al., 1999; Gupta, 2000; Somers and Nelson, 2001).

ERP training should address all aspects of the system, be continuous, and be based on knowledge transfer principles wherever consultants are involved (Davenport, 1998b). However, it is difficult for trainers or consultants to pass on the knowledge to the employees in a short period of time (Bingi et al., 1999). A particular challenge in ERP implementation is to select an appropriate plan for end-user training and education. It is, however, important to stress that the main goal of ERP training should be the effective understanding of the various business processes behind the ERP applications (Gupta, 2000). In this regard, the costs of training are often under-estimated, and these costs could be many times greater than initially anticipated (Sumner, 1999). Epson noted that the costs of training and support are often under-estimated, and these costs may be many times greater than originally anticipated (Deloitte Consulting, 2000).

Overall, enterprises should provide opportunities to improve the skills of the employees by training opportunities on a continuous basis to meet the changing needs of the business and employees. Several authors and practitioners (e.g. Kelley et al., 1999; Sumner, 1999; Welti, 1999; Soh, 2000) agree that proper training is one of the main critical success factors.

3.6 Communication

Communication is one of most challenging and difficult tasks in any ERP implementation project (Welti, 1999). Slevin and Pinto (1987) define communication as the

provision of an appropriate network and necessary data to all key factors in the project implementation. Communication has to cover the scope, objectives, and tasks of an ERP implementation project (Sumner, 1999). The way to avoid the various communication failures is for an open information policy to be maintained throughout the project. For example, a good e-mail system can help promote this policy, but serious problems need to be discussed by telephone or, preferably, face-to-face (Welti, 1999).

4. Conclusion

This paper has discussed the role and impact of Dominant Factors of ERP software system implementation through a comprehensive scrutiny of the relevant literature, and analytical study of over 100 case studies. They include (Figure 1): top management commitment, a dynamic business case, focused change management, experienced project management, a world class training system, and a well governed communication process. These factors should be clearly visible and monitored at all stages the ERP project implementation. In other words, they are deployed on all levels of ERP project implementation (strategic, tactical, and operational) and hypothesized to play a more overriding role in ERP implementation. In essences, these factors are about people and business processes and they highly interdependent. In other words, failure in one factor can affect the overall ERP project implementation.

References

- [1] Al-Mudimigh, A, Zairi, M, Jarrar, Y, (2003), "Dominant Factors in ERP Software Systems Implementation: A Best Practice Perspective", European Center Best Practice Management, RP-ECBPM/0011, pages 17.
- [2] Davenport, T. (1998a), "putting the enterprise into the enterprise system", Harvard business review, volume 76(4), pp 121-131.
- [3] Gibson, N.; Holland, C. and Light, B. (1999) "A Case Study of a Fast Track SAP R/3 Implementation at Guilbert." Electronic Markets, June, pp.190-193
- [4] Holland, C. and Light, B. (1999) "A Critical Success Factors Model for ERP Implementation." IEEE Software, May/June, pp. 30-35.
- [5] Davenport, T. (2000) "Mission Critical: Realizing the Promise of Enterprise Systems." Harvard Business School Press, USA.
- [6] West, R. and Shields, M. (1998) "Strategic software selection." Management Accounting, August, pp. 3-7.
- [7] Bingi, P.; Sharma, M. and Godla, J. (1999) "Critical Issues Affecting an ERP Implementation." Information management, summer, pp.7-14.
- [8] Rao, S. (2000) "Enterprise resource Planning: Business needs and technologies", Industrial Management & Data System, volume 100(2), pp 81-88.
- [9] Markus, M. and Tanis, C. (2000) "The Enterprise System Experience - From Adoption to Success." In Framing the Domains of IT Management Research: Projecting the Future Through the Past, Pinnaflex Educational Resources, Inc., (Zmud, R., ed.).
- [10] Somers, TM, Nelson, K. (2001), The Impact of Critical Success Factors across the Strategies of Enterprise Resource Planning Implementations, IEEE/International conference on system sciences, pages 10.
- [11] Cooke, D. and Peterson, W. (1998) "SAP Implementation: Strategies and results." Research report 1217-98-RR, The Conference Board, New York.
- [12] Martin, M. and Ching, R. (1999) "Information Technology (IT) Change Management" Proceedings of the Americans Conference on Information Systems (AMICS).
- [13] Welti, N. (1999) "Successful SAP R/3 Implementation: Practical Management of ERP projects." Addison Wesley Longman Limited, USA.
- [14] Gupta, P. "Management of Change (2000) " In INTERNATIONAL ENCYCLOPEDIA OF BUSINESS & MANAGEMENT (IEBM), THE HANDBOOK OF INFORMATION TECHNOLOGY IN BUSINESS, (Zeleny, M., ed.), London.
- [15] Peak, D. (2000) "Project Management." In INTERNATIONAL ENCYCLOPEDIA OF BUSINESS & MANAGEMENT (IEBM), THE HANDBOOK OF INFORMATION TECHNOLOGY IN BUSINESS, (Zeleny, M., ed.), London
- [16] Sumner, M. (1999) "Critical Success Factors in Enterprise Wide Information Management Systems Projects." Proceedings of the Americans Conference on Information Systems (AMICS)
- [17] Bancroft, N.; Seip, H. and Sprengel, A. (1998) "Implementing SAP R/3: How to introduce a large system into a large organization." Manning Publication Co., USA.
- [18] Gupta, A. (2000) "Enterprise resource planning: the emerging organizational value systems." Industrial Management & Data Systems, 100(3), pp. 114-118.
- [19] Apperlath, H. and Ritter, J. (2000) "SAP R/3 Implementation: Method and Tools." Springer, Germany.
- [20] Computer technology Research Corporation (1999) "Enterprise Resource Planning: Integrating Applications and Business Process Across the Enterprise." Computer Technology Research Corporation, USA.
- [21] Slevin, D. and Pinto, J. (1987) "Balancing Strategy and Tactics in Project Implementation." Sloan Management Review, Fall, pp. 33-44.
- [22] Industry Week, (1998) "Just in case", Industry Week, 246(15), p. 28.
- [23] Davenport, T. (1998b) "Think Tank: Making the most of an information-rich environment." CIO Magazine, December 1.
- [24] Deloitte Consulting (2000) "Success File", Deloitte Consulting, <http://www.dc.com>
- [25] Soh, C.; Kien, S. and Tay-Yap, J. (2000) "Cultural Fits and Misfits: Is ERP a Universal Solution?" Communication of the ACM, 43(4), pp. 47-51.