

The Impact of Enterprise Resource Planning System (ERP) in a South African Company

Mushavhanamadi K., Mbohwa C.

Abstract—This paper presents the findings of the investigation of ERP implementation, challenges experiences by a South African Company in ERP implementation, success factors, failures, and propose recommendations to improve ERP implementation. The data collections methods used are questionnaires. The paper contributes to discussion on ERP implementation in developing economics.

Keywords—CSF, ERP, MRP, MRP II.

I. INTRODUCTION

ERP is the theory that incorporates the entire supply chain, including sales, orders, supply replenishment, scheduling, manufacturing and distribution. There are claims that an ERP system allows orders to be made more efficiently, aligns sales with production, and integrates customer orders and delivery data with plant-floor scheduling and production process [1]. Areas such as product design, information warehousing, materials planning, capacity planning, communication systems, human resources, finance and project management, could now be included in the plan. ERP can be used not only in manufacturing companies, but in any company that wants to enhance competitiveness by most effectively using all assets including information. Communication technologies and information have become major components of the competitive strategy of many businesses, and the strategic emphasis has made it possible for managers to integrate information and communication technologies throughout the organization and link all business units together [2]. An ERP system helps organizations to reduce costs, reduce rework, and better decision making. It handles the manufacturing, logistics and distribution, inventory, shipping, invoicing, and accounting for the organizations.

ERP began in the 1970s as a material requirements planning (MRP) system, and later developed into a more advanced system called Material Requirements Planning II (MRP II). The term MRP II evolved from MRP in the 1980s, it is an expanded approach to production resource planning, involving other areas of a firm in the planning process and enabling capacity requirements planning [3].

K. Mushavhanamadi is with the University of Johannesburg, Faculty of Engineering and the Built Environment, SA (Phone: 011 559 1055; Fax: 011 559 1347; e-mail: kmushavhanamadi@uj.ac.za).

C. Mbohwa is with the University of Johannesburg, Faculty of Engineering and the Built Environment, SA (Phone: 011 559 1202; Fax: 011 559 1347; e-mail: cmbohwa@uj.ac.za).

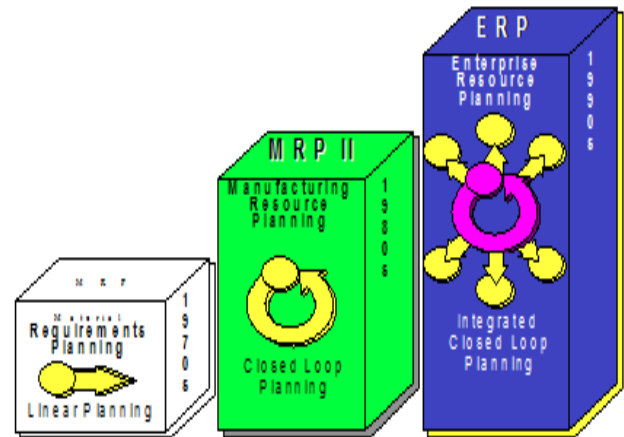


Fig. 1 The evolution towards enterprise resource planning [3]

Nowadays the latest generation of ERP systems is more advanced and effective in dealing with multiple business units, e.g. sales and finance [4]. By the early 1990's, continuing improvements in technology allowed MRP II to be expanded to incorporate all resource planning for the entire enterprise [5]. The difference between MRP II and ERP systems is that, ERP includes functionalities, such as human resources, planning, elements of supply chain management and maintenance that are beyond the traditional focus of MRP II, [6]. Rather than being just MRP II with a new name, ERP is the next logical sophistication level in an evolutionary service of computers tools for operations [7].

The roots of ERP systems can be traced back to MRP, systems developed and implemented across the world in 1970s and 1980s [8]. Organizational expenditure on Enterprise Resource Planning has also grown significantly during the 1990s and beyond. ERP systems have been adopted by the majority of large private sector firms and many public sector organizations in the UK, Europe and the industrialized world in general [9].

The ultimate goal of the ERP System is to satisfy customers' needs. An ERP provides a framework that enables companies around the world to provide the right products, in the right time, right quality, and right price; it also provides organizations with the integrated manufacturing operations, placing a new emphasis on a customer satisfaction involving quality [3].



Fig. 2 The goal of enterprise resource planning [3]

II. ERP SYSTEM

ERP can be used not only in manufacturing companies, but in any company that wants to enhance competitiveness by most effectively using all assets including information. It offers a distinct advantages to companies adopting them, improving the decision-making process via the provision of appropriate and timely information, [10]. The most important consideration is a clear implementation plan and strategy to implement that plan, the plan and strategy, should evolve through systematic consideration of the company's requirements, and its ability to manage changes that would be required under the new situation [11].

TABLE I
 BUSINESS FUNCTION OF ERP

MARKETING	OPERATIONS	FINANCE
Sales	Human Resources	Assets
Customer Service	Quality	Cash flow
Pricing	Logistics	Creditors
Promotion	Purchasing	Debtors
Product Development	Production	Statements

For a good business to survive, it is important for a company to have a good or a proper communication. Table I shows that there are three business function in an organization: Marketing: the department is responsible for all sales and advertising of products in a company, Finance: Responsible for Cash flows, all counts payable, and receivable; and Operations, who are responsible for manufacturing of products, Supply Chain management (SCM), and also responsible for quality of the products which are being delivered to customers [3]. It is not just communication in a company, but essentially the quality and speed of communication, which influences the response the whole enterprise, Production staff need to know about sales orders, and warehouse staff needs to know when to dispatch.

The ERP system has been developed to enable enterprises to approach business excellence. The systems are very complex such as the ERP systems of SAP R3, MK enterprise or BAAN, and the need for today's goal is for an integrated

business system, which enables all facets of business to work as a team to the common goal, hence their use [12]. In the last few years, the ERP market has undergone significant change with notable consolidation between role players, three of the five leading mid-market ERP vendors in 2000 (JD Edwards, People soft, and Baan) no longer existed as independent companies by 2007 [13]. ERP brings all information into central repository and given timeous access to interested persons [14]. Since the potential benefits are large, many organizations are willing to undertake the difficult process of converting from whatever they currently use to an ERP system [15].

Basic architecture of an ERP system builds upon one database, application and an unified interface across the enterprise, an entire enterprise organization is therefore be able to operate under one application standard, where all applications serving human resources, accounting, sales, manufacturing, distribution, and supply chain management aspects are firmly integrated [16].

Implementing ERP systems successfully calls for strong leadership, a clear implementation plan and a constant watch on the budget [17]. ERP implementations are complicated and risky projects. They require large scale business process reengineering, complex arrangements to adapt with any existing or future software to the core ERP technology, and good management for the different contributions from the functional departments, consultants business partners, and vendors involved in the project [18].

Before implementation begins, it is critical for the organization to figure out if their way of doing business will fit in within the ERP system. The most common reason why companies walk away from multimillion rand ERP projects is that, they discover that the software does not support one of their important business processes, implementation are costly and time consuming, often lasting many years, and they require extensive employee and training throughout the organization [19].

III. CHALLENGES AND PROBLEMS

ERP implementations are complicated projects. They require good management for the different contributions from the functional departments, consultants' business partners, and vendors involved in the project [18]. Literature review shows that some organizations perform inadequate research, both in terms of time and spending, before choosing an ERP system [20]. The main problem areas identified were: Inadequate financial research; Time constraints and; Skill constraints.

IV. CRITICAL SUCCESS FACTORS OF AN ERP SYSTEM

An ERP system can help organizations to reduce costs, reduce rework, and better decision making. It can handle manufacturing, logistics and distribution, inventory, shipping, invoicing, and accounting for the organizations. Numerous authors have identified an additional variety of factors that can be considered to be critical to the success of an ERP

implementation [5]. One of the most prominent of these success factors is, Clear Understanding of Strategic goal: Key people in the organization should create a clear vision on how the company should operate in order to satisfy customers, empower employees and facilitate suppliers for the next three to five years, but [21] argue that BPR is one of the CSF for successful ERP implementation and operation at a given enterprise.

V. METHODOLOGY

Number of research methods and techniques were used in the study, this include the use of questionnaires, interviews, observation, and the review of the company documents. The researcher used both Quantitative and Qualitative research. In Quantitative, closed ended questionnaires were used, because it is appropriate when the variable is known, and all respondents were exposed to the same categories of responses, example: grouping employees with occupational level. Closed ended questions are easy to analyze, can be more specific, and it does not take too much time of the respondent. The researcher asked all the respondents similar questions and divided them into two sections. The researcher designed closed ended questions; guidance was sought from the University of Johannesburg STATKON so that the questionnaire would provide data that is easier to analyze. The final version of the questionnaire was sent to the company after reproductions of 150 questionnaires were distributed, 101 questionnaires came back from the company, and they were analyzed with the help of STATKON.

VI. FINDINGS

The paper has presented results of the investigation conducted on the implementation of ERP and its impacts in a South African Company. The findings of the study revealed that the majority of the respondents are aware of what ERP is all about, and they are also aware about critical issues in the implementation of ERP. The findings pertaining to ERP implementation lessons were that:

- Inadequate financial budget and resources can lead to failure of ERP implementation.
- Failure to select committees needed for the successful implementation of ERP can be a problem to successful implementation of ERP.
- Failure to use knowledgeable consultants can hamper successful implementation of ERP.

Qualitative Analysis

The qualitative analysis involved responses to eight sections soliciting for open-ended responses. This was followed by interviews of some of the respondents to confirm the information obtained through triangulation. The aim was to get the views of the respondents in order to measure the impact of ERP system in a South African Company.

Company background: The results showed that the majority of the respondents indicated that ERP (SYSPRO) is a system used by companies based in South Africa only.

What is your understanding of ERP (SYSPRO)? – Most of the respondents understood ERP to be an integrated system that allows financial, logistics and manufacturing transactions. Some indicated that ERP as a tool helped in improving the performance of the organization. The majority of the respondents indicated that ERP assists in organizing, codifying and standardizing the business processes. The respondents displayed a good understanding of ERP.

How does it feel to use ERP system in your company today, any benefits? - The respondents were happy to use the ERP system. Some of them indicated that they realized many of the benefits claimed for ERP systems. The majority of the respondents indicated that it was easy to amalgamate different operations and functions in the company using ERP system. It made access to information easier. Some respondents claimed that the ERP system speeds transactions and responses to inquiries, and they indicated that since the introduction of ERP, customer service had improved tremendously. It was easier to install systems that allow customers to access company information through the Internet and to place orders. The orders can now be done in a minute and not in a week as was the case before ERP implementation. Communication with customers, shareholders and suppliers has become faster and easier.

What were the reasons for introducing an ERP system? The respondents indicated that there are many reasons for introducing ERP system for example some of the responses were as follows:

- It was introduced due to necessary technological changes as demanded by customers and suppliers
- The introduction of new and faster computer systems compelled the company to change dramatically in the world of technology
- The company was forced to introduce ERP to improve and develop its operations to cope future needs

Looking at the implementation of ERP system, do you have any regrets, or do you think it was the right decision, and why? (Things that make them happy and the things that make them worry about the implementation of the ERP system and why?) - The majority of the respondents did not regret the implementing ERP. Some of the reasons were as follows:

- Short time to implement. It took them only months to implement the local version of ERP (SYSPRO).
- There was minimal business interruption.
- The benefits of the system were apparent immediately, It enhanced and speeded responses to inquiries.
- Business processes were re-aligned in a way that improved performance and work procedures.

What would you say are the progress and success factors in the implementation of the ERP system? – It was noted that top management found it easier to understand the business due to enhanced visibility. They also in the process understood their role in the implementation of ERP and other related business procedures in a way that improved total

company operations and systems. Furthermore, ERP improved the smooth running of the business.

What are some of the challenges or problems faced in the implementation of an ERP system? How are these problems or challenges affecting your company? - There are many challenges which were identified by the respondents in the implementation of ERP. Some of the main challenges identified were as follows:

Adaptability: The majority of the respondents indicated that some employees are failing to adapt to the new system. Initially most of the employees were afraid to use the system thinking that it might crush and stop working. Initially many employees were afraid of this new and unknown system and of the changes that would result. At some point the system was seen as an enemy of the organization. This changed as the people got used to operating it realizing the benefits that resulted.

Some of the employees were not eager to embrace the necessary change. Initially employees were not ready for change and this was one the greatest challenge for the implementation of ERP. The young generation in the organization was eager for change whereas the older generation was not eager for change. This conflict was a setback during the implementation of ERP in the organization and slowed down progress. Furthermore, the change in the warehouse was a nightmare because the people in that section were most resistant, not ready to face the necessary changes.

Insufficient time was allocated for the implementation of ERP and this posed many serious challenges. Employees were not given enough time to fully understand and to implement the ERP system. Initially top management did not offer enough support. However when these issues were addressed it took the company less than a year only to move to the new system.

What do you think could be done to address these challenges? Who should play a role on addressing these challenges/problems? - The majority of the respondents indicated that both employees and all levels of management should adhere to the change. Furthermore, respondents indicated that there should be workshops on change management. "If employees and top management had attended change management workshops, it could have assisted the company to have a better understanding of ERP implementation".

Another area that needed to be attended to according to the respondents is the allocation of adequate time for the implementation of ERP. To strengthen the implementation of ERP, respondents suggested that the top management should provide sufficient resources for the project. All the respondents indicated that it is the responsibility of the Project Implementation Team, with full support from the top management, to address these challenges and problems.

VII. RECOMMENDATION

The following were identified as the recommendations for addressing challenges and problems in the implementation of ERP:

- Project Management Team should be provided with enough time for the implementation.
- Allocate sufficient resources for the proper implementation of ERP.
- The Project Management Team should lead in change management.

The paper has presented results of the investigation conducted on the implementation of ERP and its impacts in a South African Company. The findings of the study revealed that the majority of the respondents are aware of what ERP is all about, and they are also aware about critical issues in the implementation of ERP. The findings pertaining to ERP implementation lessons were that:

- ERP permits for information sharing assisting in organizing, codifying and standardizing the business process. Furthermore, ERP handles the different functions of a company like manufacturing, logistics, distribution, inventory, shipping invoicing and accounting.
- Inadequate financial budget and resources can lead to failure of ERP implementation.
- Failure to select committees needed for the successful implementation of ERP can be a hindrance to successful implementation of ERP.
- Failure to use knowledgeable consultants can hamper successful implementation of ERP.

In order to improve the implementation of ERP the following are recommended:

- Clear understanding of strategic goals that necessitate use of ERP
- Excellent project management
- Organizational change management is needed
- Top management should support the implementation of ERP
- Adequate budget and competent human resources
- Use knowledgeable consultants in training
- Put strong leadership to lead in the implementation process
- The company should put in place a strong implementation team
- Sufficient support from the top management
- Implementers should be trained
- Training should be tailor made so that it should address the needs of the company and the implementers
- There should be enough budgets for monitoring and evaluation of the system.
- The implementers should articulate the common goals which should help both parties to rise above their differences.

REFERENCES

- [1] Kruger, D. and R. Ramphal, 2009, *Operations management*, Oxford Southern Africa, 2nd edition, PP 257.
- [2] Yang C, and Su Y, why are enterprise resource planning systems indispensable to supply chain management, *European journal of operational research*, production, manufacturing, and logistics, 2009, Elsevier.
- [3] Basic concept and principles. 2006, *Programme in Enterprise Resource Planning*, Department of Quality and operations management, University of Johannesburg PP,4, 6,7,and 8.
- [4] Ngai E.W.T, Law C.C.H, and Wat F.K.T, Examining the critical success factors in the adoption of enterprise resource planning, department of management and marketing, the Hong Kong polytechnic university, Hung Hom, Kowloon, Hong Kong, China, 2006.
- [5] Umble, J.E., R.R., Haft and Umble M.M, 2003. Enterprise resource planning: Implementation procedures and critical success factors, *European Journal of Operational Research* 146.
- [6] Yusuf, Y., and D. Little, 1998, an empirical investigation of Enterprise-wide integration of MRP II. *International Journal of Operations and Production Management*.
- [7] Ptak, C.A., and E. Schragenheim, 2000. ERP: Tools, Techniques and Applications for integrating the supply chain. St. Lucie Press, New York.
- [8] Wilson, F., Desmond, J., Roberts,H., 1994. Success and failure of MRP II implementation. *British Journal of Management* 5.
- [9] Trott P, and Hoecht A, Enterprise resource planning and its impact on the innovative capability of the firm, *International Journal of innovative management*, Vol.8, no.4 (September 2004) pp.381-398, Imperial college press.
- [10] Constantinesides S. and C. Spathis, Enterprise resource planning systems, Impact on accounting processes, *Business Process Management Journal*, Vol.10.2, 2004, pp. 234-247.
- [11] Mandal, P. and A. Gunasegaram, 2003, Issues in implementing ERPw2, A Case Study, *European Journal of Operational Research* 146.
- [12] Smit B.R, 2000. Training scope and budgeting for effective ERP implementation.
- [13] Malie, M., N. Duffy and A.C. J. Van Rensburg., 2008, Enterprise Resource Planning solution selection criteria in medium sized South African Companies.
- [14] Botes, V.L and B.R. Smit, 2000, Interdependent Training for ERP: A focus on Operations and Finance, SAPICS International conference proceedings, Sun city, South Africa.
- [15] Abdinnour-Helma, S., and Lengnick-Hall, M. (2003). Pre-implementation attitudes and organisational readiness for implementing an Enterprise Resource Planning System. *European Journal of Operational Research* 146.
- [16] Al-Mashari, M., A. Al-Mudimigh and M. Zairi., 2002, Enterprise Resource Planning: taxonomy of critical factors.
- [17] Wagle, D., 1998. The case for ERP systems. *The McKinsey quarterly* (2).
- [18] Sandoe, K., G., Corbit and T. Boykin, 2001, *Enterprise Integration*. New York Wiley.
- [19] Stevenson W.J, 2009. *Operations Management*, Tenth Edition, McGraw-Hill Irwin, PP 669.
- [20] Das Neves, D., D. Fenn and P. Sulcas. , 2003, Graduate School of Business, University of Cape Town, Selection of ERP systems.
- [21] Summer, M (1999), Critical Success Factors in Enterprise wide information management system projects. *Proceeding of the Americans conference of information systems*.