CASE STUDY OF IMPLEMENTATION OF ERP IN MANUFACTURING INDUSTRIES

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Abstract—Nowadays, Indian Industries have invested enormous resources for the implementation of Enterprise Resource Planning (ERP) systems. An Enterprise resource planning system is a fully integrated business management system covering functional areas of an enterprise like Logistics, Production, Finance, Accounting and Human Resources. ERP is the process of integrating entire business functions and processes in an organization to attain various benefits. Implementation of ERP systems in the industries does not get the success always but this brings partial success or complete failure. In this paper, an attempt is made to introduce ERP systems on the basis of a case study that can help in bringing the complicated ERP systems under control.

ERP provides platform for various facilities. It supports strategic, business planning activities, operational planning and execution activities. ERP covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory, accounts, human resources, purchases etc. ERP provides complete integration of systems not only across departments but also across companies under the same management.

A survey of individuals and industries has been conducted for the implementation of ERP systems and some critical success and failure factors have been identified. From the case study the software used some 10 more other benefits and difficulties faced by the industries in implementing ERP. These findings will help managers, practitioners and consultants to develop better strategies for supervising and controlling ERP implementation projects. The identified critical success factor will be considered in developing model of ERP system development for manufacturing Indian steel industry.

ERP is the solution for better project management. ERP allows automatic introduction of the latest technologies like Electronic Fund Transfer (EFT), Electronic Data Interchange (EDI), Internet, Video conferencing, E-Commerce etc.

Keywords—Critical Factors, ERP, ERP Implementation, ERP Perspectives

I. INTRODUCTION

An Enterprise resource planning system is a fully integrated business management system covering functional areas of an enterprise like Logistics, Production, Finance, Accounting and Human Resources. It organizes and integrates operation processes and information flows to make optimum use of resources such as men, material, money and machine. Enterprise resources planning (ERP) systems allow seamless integration of information flows and business processes across functional areas within industry. They support information sharing across the company value chain and help to achieve operating efficiency. ERP packages offer a workflow engine to generate automated workflows according to business rules and approval matrix. Information and documents can be routed to operational users for transaction handling and to managers and directors for review and approval. Many new concepts and associated software have been suggested for complementing some
of the functionalities of ERP systems such as SCM, CRM, SRM, B2B, B2C and others. The arrival of these concepts and software on the platform of industrial management has motivated a new problem concerning their consistency and possible relation with the ERP concept. The availability of these systems on the market together with the fact that most of the large industries have already implemented their ERP solution has led ERP doors to open a little bit their products. One thing that compares ERP systems from “traditionally” developed systems is that they come with a frame of how the processes in a company should be shaped. Instead of making a system completely adapted to the company’s processes, an ERP system offers a set of processes for the organization to follow. The main function of the system is to improve the flow of information in an organization. It is unavoidable that the business processes are affected as well. The purpose of this study is to describe and analyse the factors that contribute to the successful ERP system implementation. The question arises how the stakeholders are related to CSFs (critical success factors) of ERP system implementation. ERP process fits for the industries who have implemented the ERP systems. Limited study has been conducted in the ERP implementation risks area with most research consisting of implementation of case studies in individual organization. To sustain in the present competitive age, operational effectiveness is the basic success factor for manufacturing organizations.

This paper presents the plan of how to implement ERP efficiently to have the ability to raise the productivity & profits of the industries.

In this study the plan for ERP’s implementation has been prepared. Therefore an attempt has been made to implement and observe the impact of ERP in manufacturing Industries. Industries have invested remarkable resources in the implementation of ERP systems. The results initially expected have rarely been reached. It becomes clear that nowadays, results do not live up to the managers’ expectations. 85% of companies consider the ERP as an investment for more than 5 years, 70% expect no more than 25% of return on investment and 50% did not even try to estimate the ROI. By combining the factors of implementation with a process perspective, examined the exhaustive framework of investigating the issues that will dominate each implementation stage of ERP. The study brings out some relevant elements for the problem of optimization of ERP use. The purpose is also to describe and analyse the factors that contribute to the successful/unsuccessful ERP system implementations, the stakeholders of ERP system and how these stakeholders are related to CSFs/ CFFs (Critical Success Factors/ Critical Failure Factors) of ERP system’s implementation. The identified factors are: top management support, project management, business process reengineering, user’s training, appropriate use of consultants with technical and business ability, ERP system integration with old legacy system, careful selection of software and vendor, Project team composition, Strong communication inside and outside, Preventive troubleshooting.

II. RESEARCH METHODOLOGY

The method of the research chosen for this study is secondary data. Where in data collection consists of thorough literature review, secondary data review of documentation regarding the ERP implementation risks, observations and interviews. In order to carryout the above mentioned tasks, a multi-channel survey consists of various factors and the questionnaire is adapted from prior literature.

III. CASE STUDY

3.1 Case Study Highlights

ERP implementation remains mostly successful but in some cases it also brings partial success or failure. The success or failure of ERP depends upon a large number of organizational and technological perspectives which may have different values depending upon the work culture
existing in the industry using ERP. The prioritizing of the contributing success/failure factors will help industries to develop better strategies for controlling ERP implementation projects.

3.2 Detailed Observations of Case Study

Key Findings

The research describes the following primary results of what Industries reflect about ERP:

- Due to the investment level and time length needed to implement ERP system, many industries started to implement ERP without making any return calculations.
- Most ERP implementations do not deliver business value.
- Industries do not effectively manage the organizational change of ERP.

Case Study: The Statistical Data of the Manufacturing Industries during ERP implementation:

The main objective of implementing ERP in Industries:

60% of the industries have the main objective to be competitive in the market, 20% of the industries have the objective to meet customer needs and 20% of the industries want to gain more profits through ERP. 11.8% of the industries have their other objectives for implementing ERP in their organization like better control over stocks and to optimize business processes.

Support from primary users (End Users) during ERP:

The result shows in almost every industry. Primary users were remained supportive during the whole process of ERP implementation. 80% of the industries have full support from primary users till the last phase of ERP implementation and 20% of the industries have little support from primary users, so they have to face problems during the process of ERP implementation.

ERP implementation remained successful / unsuccessful / Partly successful:

According to the responses received from the industries; ERP implementation remained successful in 80% of the industries. In 20% of the industries, ERP results in partial successful (failure) after its implementation. No industry has responded of complete failure.

Support from Top/middle management during ERP:

92% of the industries have full support from top management till the last phase of ERP implementation. Only 8% of the industries have lost the support from top management in middle way of ERP project.

Hiring of consultant for ERP implementation:

90% of the industries have hired consultant for ERP’s implementation and 10% industries responded that they have not hired consultant to implement ERP and responded that they have designed their own ERP system which suits the best to their business processes.

Expected targets achieved after ERP implementation:

Maximum industries viz.

50% achieved their expected targets in the range of 80-100%.

20% of the companies achieved 60-80% and
20% of the industries achieved 40-60% of the expected targets respectively.

10% of the industries achieved about 20-40% of their predefined targets with ERP.

**Percentage of financial benefits achieved after ERP implementation:**

Minimum 40.0% of the industries have achieved about 80-100% of financial benefits as expected before ERP implementation. 25.0% of the firms have achieved about 60-80% of the financial benefits after ERP implementation. 10.0% of the firms have achieved 40-60% and 25% of the industries achieved 20-40% of the expected financial benefits respectively after ERP.

**ERP software used in manufacturing industry:**

SAP as software/package for ERP implementation has been used by most (60%) of the industries. ORACLE is being used by 15% of the industries as their software package. 20% and 25% of the industries are using BAAN and others as ERP software respectively i.e. most of the market has been captured by SAP.

**The most difficult phase of ERP implementation:**

60% of the industries found difficulties in the implementation phase. So, implementation is the most important phase of ERP implementation and it has to be implemented with utmost care.

**Communication between management & employees during ERP:**

It has been found that 60% of the industries have reported that there remained excellent communication between management and employees during the implementation process, while 50% industries quoted that there was Good communication between management and employees. No industry has reported of fair and poor communication.

**Delay in ERP implementation:**

Only some of the industries 20% have faced 10%-20% delay in ERP implementation. This delay may result in many losses like over budgeting of the project. Whereas the rest of the industries didn’t face any delay.

**A. Organizational Perspectives**

**Response:**

a) Good project scope management: In manufacturing industries ERP has a wide scope for project management

b) Effective organizational change management and business process reengineering:

c) Top management support: The Top Management support plays an important role. With the help of the data Top Management were always supportive and enthusiastic. Without any hesitation they welcomed and introduced this ERP process.

In this phase the business blueprint is defined and the business processes are documented. There is the need to understand how the organization intends to run its business within the ERP system and the changes in the organization.

d) **User involvement and satisfaction:**

It is relevant in the phases where their know-how is important to achieve a good customization of the system to meet the organizational needs i.e. in the planning phase. They
participate in the definition of business requirements. It helps in the analysis of the ERP configuration and in conversion of data and the testing of the system.

e) **Project team composition:**

It is more relevant in the first phase (Planning) because it is when the project team is established although it can be re-structured along the implementation phases according to the implementation needs.

f) **Trust between partners:**

Trust is required in every field. The success of every organisation is based on Trust and efforts. ERP builds a good rapport between among the partners.

g) **Strong communication inside and outside:**

It is more relevant at the first phase i.e. planning where there is strong need of communication between senior management and the project team in the definition of project plan and scope, and in the final phase.

B. **Technological Perspectives**

Response:-

It is helpful to avoid customization, adequate software configuration and adequate software configuration

**Adequate legacy system:**

It is less relevant at the first phase (Planning) because this phase is related with the preparation of project implementation. In the next phases the need of knowledge of legacy systems is more relevant in order to minimize the effort of configuration and help in conversion of data and the creation of interfaces.

**Adequate ERP Implementation Strategy:**

This critical factor is more relevant in the two phases i.e. planning and implementation because if the implementation strategy is not chosen properly then it may result in a failed implementation.

**Responses received from the Manufacturing Industries :-**

Responses always creates a great impact to check and evaluate the ERP System. According to the responses received from the industries, Poor Top Management Support, High Turnover Rate of Project Team members and too tight Project Plan/ Schedule are the factors of least relevance in the implementation of ERP systems.

According to the responses received from the industries Poor consultant effectiveness, Poor IT infrastructures, Poor knowledge transfer, User’s resistance to change are the most critical factors that may result in failure of the ERP systems and must be handled with utmost care.

**Case Study of ERP Implementation at Bhilai Steel Plant (BSP), Bhilai:**

**PROFILE OF CASE ORGANIZATION-BHILAI STEEL PLANT:**

Bhilai Steel Plant (BSP) is the largest manufacturer of steel in India and one of the leading players worldwide. According to World Steel Dynamics, SAIL with a turnover exceeding $10 billion—ranks
second in the league of ‘world class’ steel makers evaluated in terms of a slew of performance measurement yardsticks.

It is the largest integrated steel plants of steel authority of India Ltd. With capacity of 4 MT per annum of saleable steel. The Board of the Directors of the company decided in Dec. 2006 to implement Enterprise Resource Planning at Bhilai Steel

Currently producing five MT of steel, BSP—the largest in the SAIL family after a capacity expansion program that's currently underway—is set to produce seven MT of crude steel per annum by 2012. (Source: Express computer, business weekly Aug 02,2010). Ten - times winner of Prime Minister's Trophy for best Integrated Steel Plant in the country, Bhilai Steel Plant (BSP) Chhattisgarh is India's sole producer of rails and heavy steel plates and major producer of structural. Since BSP is accredited with ISO 9001:2000 Quality Management System Standard. At Bhilai ISO:14001 have been awarded for Environment Management System in the Plant. BSP has bagged the CII-ITC Sustainability award for three consecutive years. (Source: SAIL-Newsflash)

IV. IMPLEMENTATION OF ERP SAP IN BSP

The ERP project is being followed by Manufacturing Execution system (MES) project. Bhilai Steel Plant, the first PSU integrated Steel Plant to have successfully implemented Enterprise Resource Planning (ERP) SAP, has now taken up the implementation of MES for improving production scheduling and optimization of manufacturing operations (Source: Annual report 2010 BSP).

V. DATA COLLECTION AND ANALYSIS

Past studies have identified a variety of CSFs for ERP implementation, among which context related factors do not consistently appear. The case study approach attempts to capture and communicate the reality of particular surroundings at a point in time (Jenkins, 1985). According to Walsham (1995) in the case of an outside observer in interpretive case studies, interviews are the primary data sources, since this is the best way to access the interpretations and views of the respondents. In interpretive study, the data collected are mostly qualitative.

On the other hand, over submissive, i.e. by not offering the researcher’s own ideas or by not prompting with questions following a new direction taken by the interviewee, may lead to the conclusion by the interviewees that the researcher is not interested in interview. The researcher has no vision of his/her own regarding the subject in question. Regarding recording of interviews, Walsham (1995) stated that, “tape-recording interviews can provide a full transcript of what was said, interview subjects may be reserved on the sight of a tape-recorder regarding sensitive or confidential material”.

The top ten vital Critical Success Factor namely Top Management, Change management, Vendor support, User training and Education, Customization, Careful package selection, Project team competence, Business Process Reengineering, Use of consultants and Interdepartmental communication and cooperation.

Case Study Results of BSP Bhilai:

Objective of this research

1. To identify the most Critical Success Factors for the effective implementation of ERP package in Indian steel sector

2. To identify the impact of that most Critical Success Factors within the organisation for the effective implementation of ERP package to enhance the production, productivity and effectiveness of the organisation.
Findings from this BSP Case Study:

1. Enterprise Resource planning (ERP) package gives a common platform for sharing information and helping top management to fulfill the target and take quick decisions.
2. The study has proved that efficient change management is one of the critical success factors to successful implementation of ERP package in BSP.
3. Identification of critical success factors was the challenging task for the implementation of ERP in Bhilai Steel Plant (BSP).

In this research, five most critical success factors are identified as per their rankings. In order to facilitate a smooth ERP implementation. The study indicates that managing these CSFs effectively by acknowledging importance to employees concern, having regular and open communication, get everyone's participation and promote skills and development are some of the ways to manage these issues.

Many training and education system were developed to involve the end users and to manage resistance to change. According to this study, top management support and vendor selection stands in second and third position respectively.

VI. CONCLUSIONS

In the present research work, the results of the study show that ERP implementation is a modern information system to achieve competitive advantage in the market. It has a lot of potential for the small industries which are being continuously threatened by modern economic wave. In manufacturing industry, successful implementation of ERP has been mostly limited to large organizations. Literature review has also indicated little evidence of any such implementation in small or medium scale industry.

The highlights of the case study suggest that the implementers of ERP must devote more attention in Transition, Implementation phases of ERP systems out of all phases. Top Management support is the most important factor in an ERP implementation followed by strong communication inside and outside and adequate training program. Training is perhaps the most neglected activity of the ERP implementation lifecycle. Lack of proper training can prevent people and industry from getting the full benefit from the ERP systems which result in failed implementation. It is imperative that the top management assume responsibility and drive change management throughout the implementation cycle. There is a need of changing mindset of internal people.

Consultants should have in depth knowledge of software and industry should be able to manage well these consultants. Industries should avoid customization to implement ERP within their budget. Identifying the CSFs is essential to increase the chances for the successful implementations of ERP across manufacturing industries. However, it is also found that the industries engaged in ERP implementation differed significantly in performance concerning CSFs. The result from analysis also showed a correlation between IT professionals and several CFFs such as selection of ERP system, user training and involvement, top management support, effectiveness of consultants, ERP project team, effective communication plan and IT infrastructure.

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