

**A study on impact of ERP implementation on supply chain management**Devina Upadhyay¹, Richa Pandit²¹Faculty of Statistics, Shri Chimanbhai Patel Institute of Management,²Faculty of Marketing, Shri Chimanbhai Patel Institute of Management,

Abstract —An ERP system is a packaged business software system that allows a company to automate & integrate the majority of its business processes, and share common data and practices across the entire enterprise. Antecedents of ERP such as IT department technical quality, IT plan utilization, and top management of IT positively affected the supply chain. In this study, total 70 companies were contacted and based on their response, this study concludes that ERP implementation has an impact on support cost and it leads to productivity and improvement in operational process. Ultimately ERP implementation contributes significantly in organizational benefits.

Keywords- ERP, Supply Chain Management

I. INTRODUCTION

An ERP system is a packaged business software system that allows a company to automate & integrate the majority of its business processes, and share common data and practices across the entire enterprise. ERP also produces and accesses information in a real-time environment. Many companies use ERP software to integrate the enterprise-wide information and process for example their financial, human resources, manufacturing, logistics, sales and marketing functions. ERP was designed mainly to provide a total, integrated company's resource to manage the business process efficiently and effectively.

According to Elliot Bendoly et al (2005) although a considerable amount of documentation has been published on the alleged benefits of Enterprise Resource Planning (ERP) systems, rigorous theoretically supported research into this topic has been limited. Furthermore, with the recent popularity of new technologies such as those supporting Business-to-Business (B2B) e-procurement, many have begun to lose focus of the underlying infrastructure upon which these new technologies depend, and which ERP systems provide.

According to Yi-fen Su & Chyan Yang (2009) in the past decade, nearly all literature on ERP has focused on reasons for implementation and on the challenges of the implementation project itself. Several distinct research streams on ERP are observed in the recent literature. Although the initial focus of ERP was "within the organization," many organizations have addressed supply chain challenges with their ERP systems (Davenport and Brooks, 2004). Several studies have demonstrated a relationship between ERP benefits and SCM. Although there is no analytical framework for measuring the impacts of ERP systems on SCM competencies, Byrd and Davidson (2003) have examined how the antecedents, IT department technical quality, IT plan utilization, and top management of IT positively affected IT impact on the supply chain.

Wade and Hulland (2004) provide an overview of the literature on IT-related resources and their impact on firm strategy and performance, where IT covers all of the information systems, including ERP systems. Akkermans et al. (2003) studied the future impact of ERP systems on SCM. Their panel experts saw only a modest role for ERP in improving future supply chain effectiveness, and a clear risk of ERP actually limiting progress in SCM. Moreover, they identified key limitations of current ERP systems in providing effective SCM support.

II. RESEARCH METHODOLOGY

Following 70 companies were surveyed with the use of structured questionnaire and Non-Probability Convenience Sampling. Research Design adopted is Descriptive Research Design. List of the Companies are as follows:

Table 1. Companies Surveyed

SIEMENS ENERGY INC.	TOTAL LUBRICANTS	RELIANCE POWER
VINMAR INTERNATIONAL INC.	EXARRO MINERALS	ECO LABS
AGC NETWORKS INC.	TRANSCEND UNITED INC.	FUTURE GROUP
STAR TV PVT. LTD.	GENENTECH INC.	ZYDUS CADILA

HDFC STANDARD LIFE INSURANCE	TORRENT PHARMA	ARVIND MILLS
TRONOX INC.	INTAS	TATA GLOBAL BEVERAGES LTD.
VOLTAS LTD.	ANIL STARCH	ESSAR PROJECTS
TATA SKY LTD.	TORRENT POWER	SUZLON ENERGY
AGC NETWORKS. LTD.	AMUL DAIRY	AMI ALLOYS LTD.
TATA INTERNATIONAL	NEOTEL	AIA ENGINEERING
ESSAR STEEL	BACARDI	LAXCON STEEL LTD.
RUKKI STEEL	GINGER HOTELS	ROYAL ENFIELD
SIMINN INC.	RATNAMANI STEELS	GENERAL MOTORS
BIRLA CEMENT LTD.	AOL	FORD MOTORS
BINANI CEMENT LTD.	RATNAMANI TYRES AND TUBES	BOWEL CONSTRUCTIONS
JKLC CEMENT	GSFC	OXFORD
PERFORMANCE FIBER INC.	INDIKA ENERGY	GOKUL
NELCO LTD.	GSPC	WARNER BROTHER
COTMAC LTD.	ABB	BOMBARDIER
CHEDDA LTD.	KIRLOSKAR	WELSPUN LTD.
QIAZEN INC.	SCHNIEDER	TATA CHEMICALS
TRITON INC.	SHAH ALLOYS LTD.	TATA MOTORS
RELIANCE INDUSTRIES LTD.	3AC	CMS LILY
		DIESEL

III. DATA ANALYSIS AND INTERPRETATION

Objective1: To study the impact of ERP implementation on support cost pre-ERP & post-ERP.

Hypothesis 1:

H0: There is no significance impact of ERP implementation on Support cost.

H1: There is significance impact of ERP implementation on Support cost.

Table 2. Regression Table

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	SIGNIFICANCE VALUE
ERP IMPLEMENTATION	SUPPORT COST	0.00

On the basis of the data collected we can say that impact of ERP implementation on support cost was that the support cost of staff/personnel increased between 0 to 100%. It was also noticed that the cost of packed software lead to increase in cost near to 100% then what it was before. The cost of hardware and Infrastructure had less impact and remained nearly same. It was noticed that the cost of training the employee for the ERP implementation lead to rise in support cost over 100%. The cost of improving the database due to ERP implementation increased to about 100%. Thus we can interpret from above that the cost of training the employee was the highest cost that was involved due to ERP implementation. Also the cost related to the hardware and infrastructure was the lowest cost that was involved pre-ERP and post- ERP.

As found out from the analysis we came to know that the significance value of the dependent variable which are cost to the independent variable of implementation are near to zero. This leads us to conclude that the value of $P = 0$. Thus as $P < 0.05$. We can say that the null hypothesis is rejected.

Thus hypothesis H1 is accepted which shows that ERP implementation has significant impact on the support cost.

Objective 2: to study impact of ERP implementation on productivity of organization.

Hypothesis 2:

H0: There is no significance impact of ERP implementation on productivity.

H1: There is significance impact of ERP implementation on productivity.

Table 3. Regression Table

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	SIGNIFICANCE VALUE
ERP IMPLEMENTATION	PRODUCTIVITY	0.00

On the basis of data collected we can say that most of the respondents believe that there was an immediate impact on the productivity due to ERP implementation. It was also noticed that most of the respondents agreed that today the productivity has increased due to ERP implementation. most of the respondents believe that the workload of department has remained nearly same irrespective of ERP implementation. The most of the respondents agree that the nature of the work of department has changed significantly.

Thus we can interpret that the most important impact of the ERP implementation was the increase in productivity and the nature of work of department. As found out from the analysis we came to know that the significance value of the dependent variable which are productivity to the independent variable of implementation are near to zero. This leads us to conclude that the value of $P = 0$. Thus as $P < 0.05$, we can say that the null hypothesis is rejected. Thus the hypothesis H1 is accepted which shows that ERP implementation has significant impact on the productivity.

Objective 3: to study impact of implementation on the organizational benefits.

Hypothesis 3:

H0: There is no significance impact of ERP implementation on organizational benefits.

H1: There is significance impact of ERP implementation on organizational benefits.

Table 4. Regression Table

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	SIGNIFICANCE VALUE
ERP IMPLEMENTATION	ORGANIZATIONAL BENEFITS	0.00

On the basis of the data collected we can say that the most of the respondents agree that the ERP implementation has reduced the organizations business risk. Also we came to know that the most of the respondents agree that the new system has made the management information more accurate and accessible..most of the respondents agree that the implementation of ERP has increased the organizational accountability. It was also noticed that the most of the respondents agree that the ERP system are less costly to maintain and operate than the system that were replaced. We also came to know that all the responder strongly agree that the ERP implementation has enhanced the organizations performance.

Thus we can say that the most important impact of ERP implementation was that the organizations performance was enhanced. As found out from the analysis we came to know that the significance value of the dependent variable which are benefits to the independent variable of implementation are near to zero. This leads us to conclude that the value of $P = 0.01$.

Thus as $P < 0.05$, we can say that the null hypothesis is rejected. Thus the hypothesis H1 is accepted which shows that ERP implementation has significant impact on the organizational benefits.

Objective 4: to study impact of implementation on improvement in operational process in SCM.

Hypothesis 4:

H0: There is no significance impact of ERP implementation on improvement in operational processes.

H1: There is significance impact of ERP implementation on improvement in operational processes.

Table 5. Regression Table

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	SIGNIFICANCE VALUE
ERP IMPLEMENTATION	OPERATIONAL PROCESS	0.00

On the basis of the data collected we can say that the most of the respondents strongly agree that the ERP system implementation has caused the processes to be integrated with high level of data integrity. It was also observed that most of the respondents agree that the ERP has become excellent decision support tool that will be extensively used by management. It was also observed that the most of the respondents agree that they are finding new and innovative method used for ERP system for different processes. The most of the respondents neither agreed nor disagreed to the fact that the ERP had made the process faster and easier. The most of the respondents agreed that the ERP has made management information accurate and accessible.

Thus we can interpret that the most important impact of ERP implementation to which all the responder strongly agreed is that it has caused many more processes to be integrated with high level of data integrity. As found out from the analysis we came to know that the significance value of the dependent variable which are improvement in process to the independent variable of implementation are near to zero. This leads us to conclude that the value of $P = 0$. Thus as $P < 0.05$, we can say that the null hypothesis is rejected. Thus the hypothesis H1 is accepted which shows that ERP implementation has significant impact on the improvement in processes.

IV. CONCLUSION

The ERP implementation has become the very important aspect for any organizations that want to compete in the growing global competition. The ERP implementation impact and increase the support cost which means that there has to be made significant investment as cost is increasing. This cost increase is involved in various factors like staffing of personnel, their training, purchasing of the ERP software, the database management and infrastructure that has to be created. The ERP implementation does not immediately increase the productivity of organization but it increases the productivity significantly and make the processes faster once the operational stage is completed and stabilizes. Also the nature of work changes and the work load on department decreases due to automation and computerization.

The ERP implementation decreases the business risk and helps to compete with other global competitions by making management information more faster, easier to understand and accurate. It also increases the accountability and enhances the performance of organization. The ERP has also lead to high level of data and process integrity and thus helped the management as tool to make decision regarding any variations or changes by developing an excellent management information system. Thus the future for the ERP implementation is bright and secure as new methods for implementing ERP in existing business processes are still under research to increase the productivity and efficiency.

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