



Significance of SAP as ERP to Achieve the Overall Operational and Manufacturing Improvements (A Case Study of Auto Component Manufacturing Industry in Pune/ Aurangabad Area)

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ABSTRACT: After the introduction of the Internet many job functions changed from manual to automate. Using computers simplified storing and retrieving records. Enterprise Resource Planning (ERP) is the technology that provides the unified business function to the organization by integrating the core processes. SAP as ERP ranked as the number one largest independent ERP software provider in the world. This study is aimed at exploring the significance of using the SAP as ERP to achieve overall operational and manufacturing improvement with special reference of auto component manufacturing industry in Pune and Aurangabad area. As result of this paper it is observed that SAP is very useful ERP application, it offers competitive benefits hence very widely used.

Keywords: SAP, ERP, implementation, performance, Oracle, operational, managerial, information technology, organizational.

I. INTRODUCTION

Enterprise Resource Planning (ERP) is comprised with different modules to support business activities such as finance, sales distribution, production and human resources. All functional departments that are involved in operations or production are integrated in one system. An ERP system provides the common database and communicates needed actions that coordinate operations across different functional areas and with customers and vendors involved in the supply chain. ERP integrates all functions and departments across an organization into a single, integrated computer system based on a centralized common database, so that the requirements of various departments of a business organization can be achieved [3]. ERP system could help firms integrate inventory data with financial, accounting, production, sales, and human resources, and achieve seamless data and business process integration in their back offices in a wide range of tangible and intangible, qualitative and quantitative, benefits at the operational, managerial, strategic and organizational levels[4,6].

II. LITERATURE REVIEW

Enterprise Resources Planning (ERP) is a system that integrates the management of information through the management of the flow of data across the entire enterprise (Botta-Genoulaz *et al.*, 2005).

Sachin Borgave and Chaudhari J.S (2010) "Indian Auto Component Industry: Challenges Ahead" encompass the strength of Indian Auto Component Industry as well as the challenges faced by the industry. Because of globalization, global market is open for industry but there is a need of substantial improvements in quality and service standards. On the other hand, globalization also posed a global competition in the industry segment.

Atish Mukhopadhyaya (2011) "Overview of the Indian Automotive Component Industry" has written a paper for Tata Strategic management group. This paper talks about the revenue of Auto industry and the growth of Auto component industry, various segments of Auto components sectors and the long term sustainability of Auto component sector.

Akondi Srikant (2012) “Significance of BPR and ERP Implementation in Healthcare Industry” imbibed the significance of business process reengineering and ERP implementation in Indian healthcare industry. In the process reengineering the existing processes are challenged and the processes which are universally used in the particular industry are adopted. ERP implementation also strongly suggests removing the non-standard processes and recommends standardization. This helps the industry to compete & perform better in the segment. Although the study is about healthcare, it is also applicable to other segments in manufacturing.

S. Hanumanth Sastry, Prof .M.S. Prasada Babu (2013) – “ERP implementation for Manufacturing Enterprises” have emphasized that the issues like demand fluctuations, balancing of demand supply elements & controlling operational cost cause acute customization at ERP backbone. They have also emphasized that the successful implementation of any ERP project requires all stakeholders having a clear understanding of their role and responsibility in the process, as well as realistic expectations about the post implementation scenario.

Muralikrishnan R (2011) “SAP Architecture History and Evolution” has thrown a light on the evolution of SAP architecture in different time period from its start. The journey of SAP from SAP R/1 in 1972 as it started to SAP Netweaver 7.3 in 2011.

McKinsey and Company (2012) “Delivering large-scale IT projects on time, on budget, and on value” conducted this study in conjunction with the University of Oxford. They had studied 5400 large IT projects. There are some interesting key findings viz. 17% of large IT project go so badly that threaten the existence of the company. 45% project run over budget, 7% overtime and 56% produce less value than predicted.

S. Chandraju, B. Raviprasad and C. S. Chidan Kumar (2012) “Implementation of SAP Material Management (MM Module) for material requirement planning (MRP) for financial support in Sugar cane cultivation” conducted a research. In traditional mode of cane cultivation, harvesting and transportation of cane from the plot to the factory involves various steps and lot of paper work and requires more man power.

Jayachandran. S, Vijayakumar. K and Dinek. R (2014) conducted a research on “ERP Implemented in Fabtech Industry Using SAP” This research work focus on to improve the system using Enterprise Resource Planning (ERP) with the help of SAP software. This software will allow to take care of its supply chain and to manage customer relationships better. Some organizations do not have the awareness to implement

the Enterprise Resource Planning (ERP) in an effective way. The main objective of this work was to reduce the inventory level, system coordination in a supply chain through System, Application and Product (SAP) in data processing software.

Deepak Kumar Vishwakarma and K. J. Satao (2015) conducted a study on “Customization of Materials Management Module of SAP ERP for Chhattisgarh Steel Industries”. In this study they concentrating mainly on selected functionalities of Material Management module that are necessary for steel industries of Chhattisgarh state for customization of SAP ERP package. By customizing SAP (Materials Management-Module) for steel industry, the product can be ordered and received within safety period.

Mary Flor M. Sulit and Maribeth and G. Buenviaje conducted a research on “Status of Implementation of System Application and Product in Data Processing (SAP) Enterprise Resource Planning (ERP) System” This research generally assessed the status of system implementation of the System Application and Product in Data Processing (SAP) Enterprise Resource Planning (ERP) System in Universal Robina Corporation Calamba Plant. The result of this study could become a basis to propose strategies to enhance the effectiveness of SAP ERP system in Universal Robina Corporation Calamba Plant.

III. PROBLEM STATEMENT

There are lot of enterprise resource planning (ERP) applications is available in the market viz. Oracle applications, SAP, JD Edwards, PeopleSoft, Microsoft etc. However not all ERP implementations have been successful. There are various challenges faced by the industry which can be strategic or operational in nature. Since ERP implementation affects entire organizations such as process, people, and culture, there are a number of challenges that companies may encounter in implementing ERP systems. After studying various papers published in journals and other literature with related subject, few gaps were identified [5,9,7]. There is sufficient study found on SAP but the journey of SAP as ERP product and it’s maturity with time is not well compiled in any single research. There are sample studies available which talk about the challenges of the Auto component manufacturing. But, the studies lack the focus on the use of SAP to track relevant information in the study and produce the reports to help overcoming such challenges. The post SAP implementation scenario is not properly covered in the previous studies.

IV. SIGNIFICANCE OF THE RESEARCH

This research work deal with the significance of the SAP as ERP application for the overall operational improvements in auto comp industry. This research work therefore focus how SAP can help providing a flow of information to enable proper decision making for the overall improvements.

V. OBJECTIVE OF THE RESEARCH

- a) Process Integration before and after SAP Implementation
- b) Provide information to Auto comp manufacturers how their business processes can be integrated by using SAP and it can help overall operational improvement by measuring Key performance indicators (KPI).
- c) Provide collective view on SAP's development as ERP product over the time period and create comparison of SAP's business growth with competitors in same space.

VI. HYPOTHESIS

The proposed research considers following hypothesis.

Hypothesis – I. SAP can generate the information and reports which help Auto comp manufacturers to measure their Key Performance Indicators (KPI) which leads to operation improvements.

Hypothesis – II. Integration within business processes improved after SAP implementation.

VII. RESEARCH METHODOLOGY

The primary data is collected from following sources. The methods adopted to collect primary data are direct in depth interviews and mailed questionnaires:

- a) 420 SAP consultants worked on SAP implementation of Auto Comp Manufacturing (India)
- b) 60 Auto Component manufacturers which use SAP (Aurangabad and Pune region of Maharashtra).
- c) 60 Auto Component manufacturers which do not use SAP (Aurangabad and Pune region of Maharashtra).

The secondary data is collected from internet websites regarding SAP, research papers on SAP implementation, books, CDs and other audio visual material, SAP service portals and library. SPSS was used to analyze the data statistically. SPSS 17.0 is an advanced product from SPSS Company.

VIII. DATA ANALYSIS

A. SAP consultants worked on SAP implementation

1. Process Integration before SAP Implementation.

The process integration is the key aspect of business processes. The lack of integration between the business processes give rise to manual interventions and result into errors [9,4]. The Table 1 and Fig. 1 showed the scale through frequencies, percentage and mean of the statement "What was the level of process integration before SAP implementation?". The Table 1 and Fig. 1 reflect that 84.52 % consultants mentioned that the process integration was low and 13.33% consultants mentioned that it was medium before SAP implementation. It is important to note that only 2.14 % consultant mentioned that Process integration was high before SAP implementation. The mean score is 3.93.

Table 1: Process Integration before SAP Implementation.

S. No.	Statement	Level	Frequency	Percentage
1	What was the level of process integration before SAP implementation?	High	9	2.14
		Medium	56	13.33
		Low	355	84.52

N =420

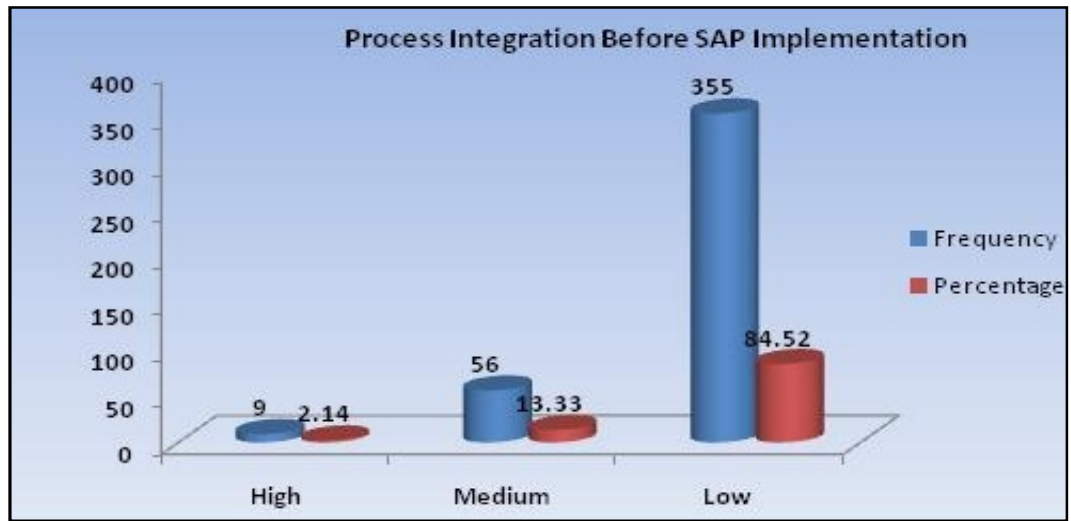


Fig. 1. Process Integration before SAP Implementation.

2. Process Integration after SAP Implementation.
 The Table 2 showed the scale through frequencies, percentage and mean of the statement “What was the level of process integration after SAP implementation?”. The Fig. 2 reflects that 85.95 %

consultants mentioned that the process integration was high, 11.67 consultants medium and 2.38 mentioned that it was low after SAP implementation. The mean score is 3.93. Process integration is therefore the key aspect of SAP implementation.

Table 2: Process Itegration after SAP Implementation.

S. No.	Statement	Level	Frequency	Percentage
2	What was the level of process integration after SAP implementation?	High	361	85.95
		Medium	49	11.67
		Low	10	2.38

N =420

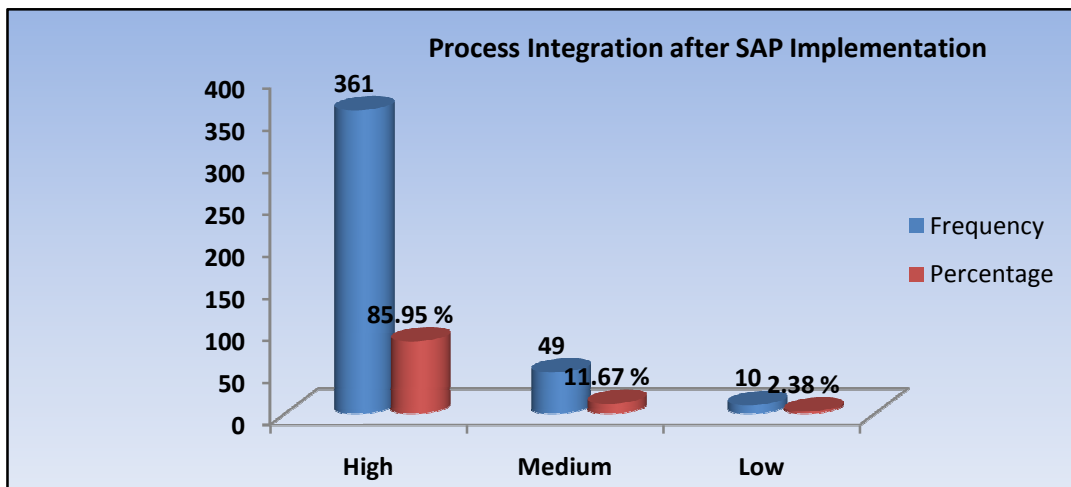


Fig. 2. Process Integration after SAP Implementation.

3. Integration between the Processes Improved after SAP Implementation. The Table 3 and Fig. 3 showed the scale of the statement “Do you think that the integration between the processes improved after SAP implementation?”.

Hypotheses II – Proved.

Hypothesis II states that the integration within business processes improved after SAP implementation. This particular point emerged out of this survey proves the

hypotheses II. 355 out of 420 consultants mentioned that the process integration was low, 56 mentioned medium and 9 consultants mentioned that it was high before SAP implementation. Similarly 361 consultants mentioned that the process integration was high after SAP implementation 49 mentioned medium and 10 mentioned that it was low.

Table 3: Process Integration Before and After SAP Implementation.

S. No.	Process Integration	High	Medium	Low
3	Before SAP Implementation	9	56	355
	After SAP Implementation	361	49	10

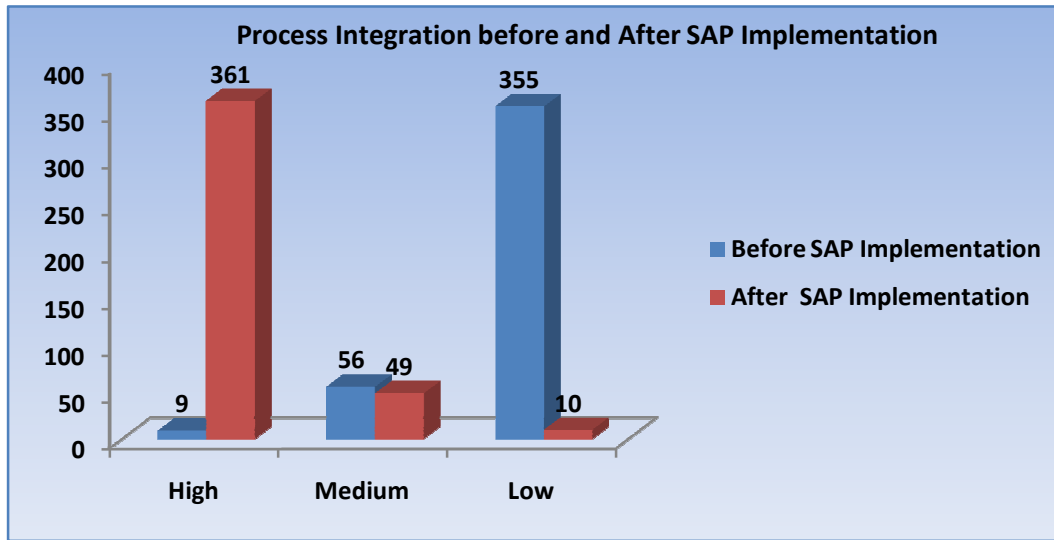


Fig. 3. Process Integration Before and After SAP Implementation.

4. KPI reporting after SAP Implementation. Earlier it is seen that SAP can generate reports which can help in measuring KPI[1]. Company performance is measured against a performance indicator. The Table 4 and Chart 1.4 showed the scale through frequencies, percentage and mean of the statement “Do you think

that SAP can help in providing the reports on measuring the KPI?”. The Table 4 and Fig. 4 reflect that 32.38% consultants respond ‘yes’, 16.43% consultants responded ‘No’ and 51.19% consultants responded ‘after customization’.

Table 4: KPI reporting after SAP Implementation.

S. No.	Statement	Level	Frequency	Percentage
4	What was the level of process integration after SAP implementation?	Yes	136	32.38
		No	69	16.43
		After Customization	215	51.19

N =420

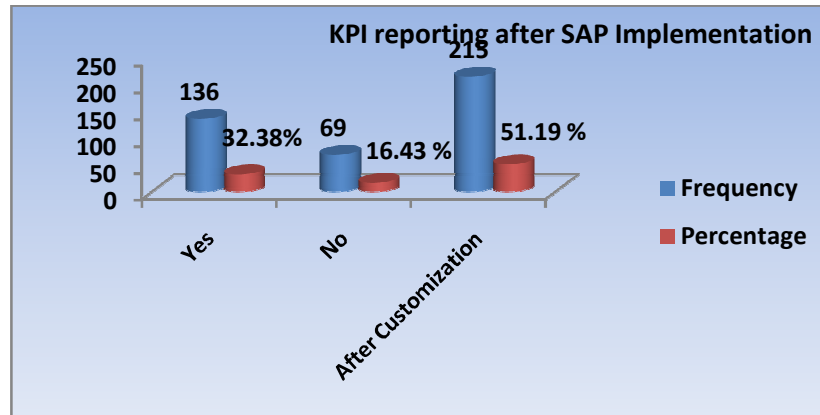


Fig. 4. KPI reporting after SAP Implementation.

Hypotheses I – Proved again. Earlier it is seen that SAP can generate reports which can help in measuring KPI. Following point in the survey again proves this point. Company performance is measured against a performance indicator. It was asked to the consultants, whether the KPI reporting is possible in SAP. 136 consultants respond 'yes', 69 consultants responded 'No' and 215 consultants responded 'after customization'. This response is quite obvious. Although the data is captured by SAP, some sort of custom coding is required to use the data and derive the value of respective performance indicator. Because of this, more than half consultants responded that KPI reporting is possible after customization. But most of

the consultants very commonly agree that SAP helps in informed decision making if the KPIs and other reports are tracked properly.

B. Auto Component manufacturers which use SAP

The operational benefits (OP), managerial benefits (MB), strategic benefits (SB), information technology (IT) benefits and organizational benefits (OR) of SAP packages are represents in the form of graph in this section [8,11]. The Fig. 5 represents the Level of Personal Reduction using, Fig. 6. SAP as ERP Achieve Productivity Improvement, Fig. 7 represents the Financial Close Cycle Reduction and Fig. 8 the Customer Responsiveness.

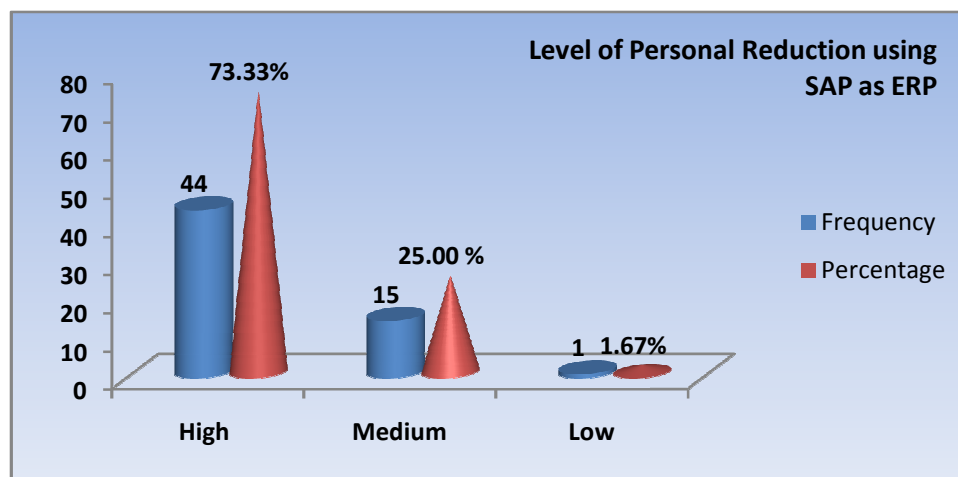


Fig. 5. Level of Personal Reduction using SAP as ERP.

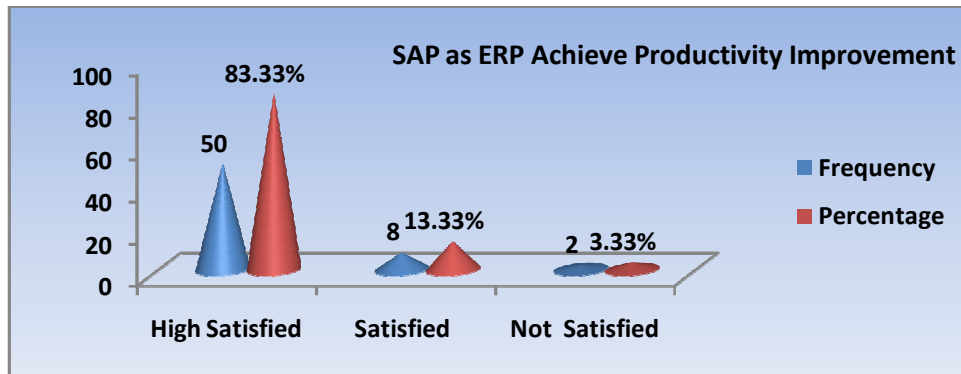


Fig. 6. SAP as ERP Achieve Productivity Improvement.

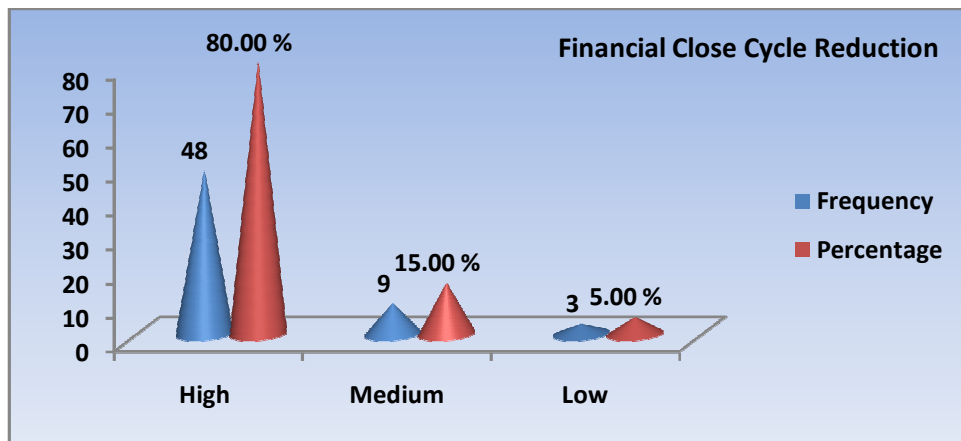


Fig. 7. Financial Close Cycle Reduction.

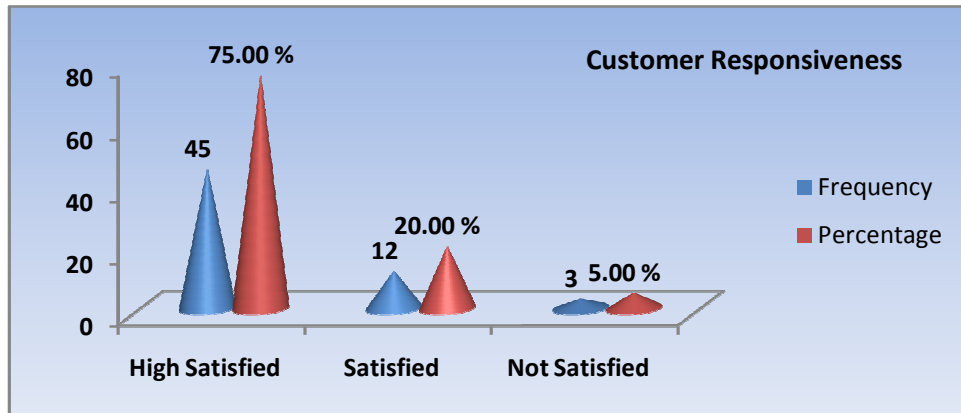


Fig. 8. Customer Responsiveness.

C. Manufacturers Who are Using ORACLE AS ERP
 The operational benefits (OP), managerial benefits (MB), strategic benefits (SB), information technology (IT) benefits and organizational benefits (OR) of Oracle packages are statistically analysis in this section. The Fig. 9 represents Satisfaction using

ORACLE as ERP in IT Cost Reduction, Fig. 10 Level of Personal Reduction using Oracle as ERP, Fig. 11. Oracle as ERP Achieve Productivity Improvement, Fig. 12. Financial Close Cycle Reduction, Fig. 13 represents the Procurement Cost Reduction using ORACLE as ERP.

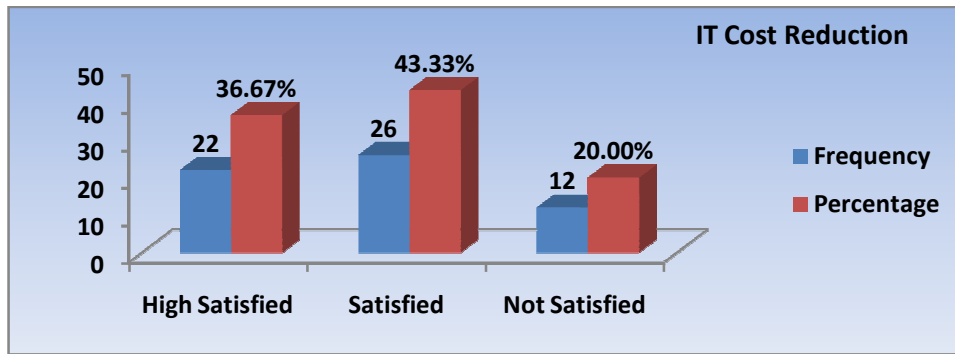


Fig. 9. Satisfaction using ORACLE as ERP in IT Cost Reduction.

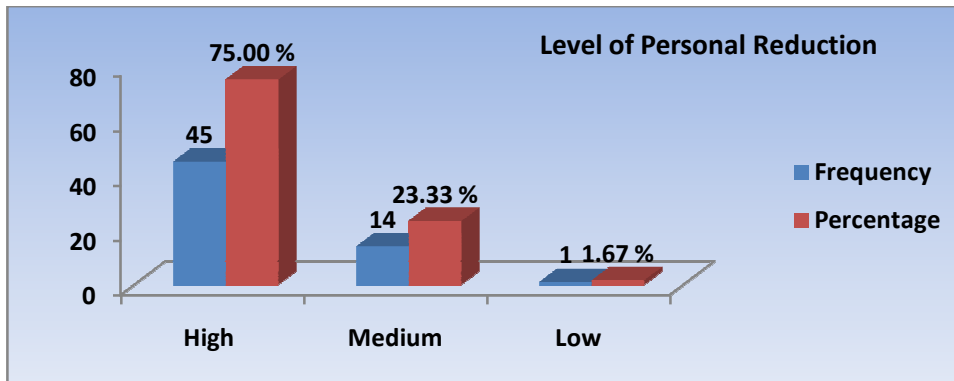


Fig. 10. Level of Personal Reduction using Oracle as ERP.

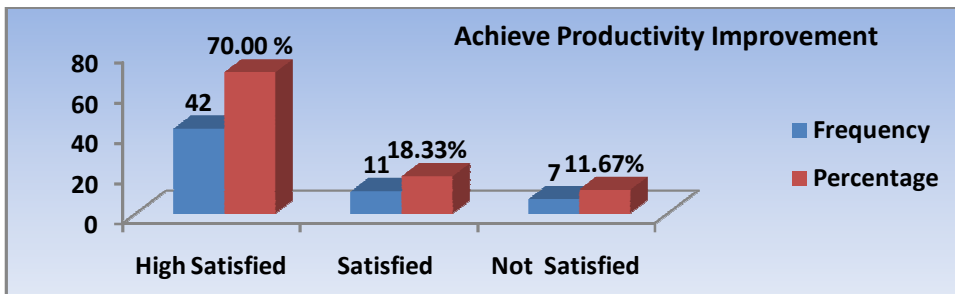


Fig. 11. Oracle as ERP Achieve Productivity Improvement.

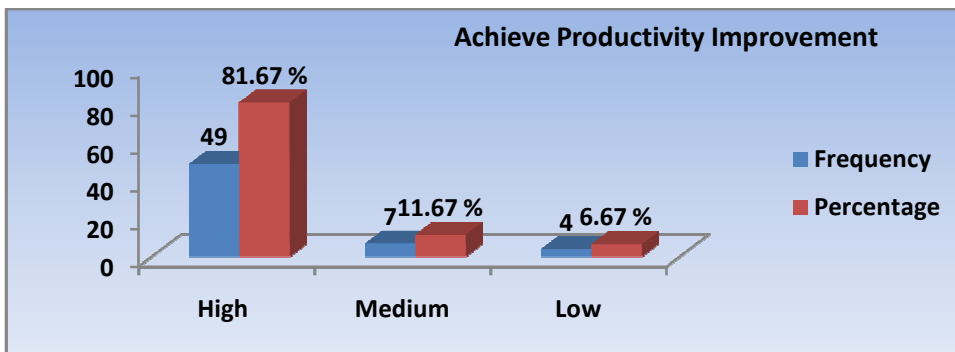


Fig. 12. Financial Close Cycle Reduction.

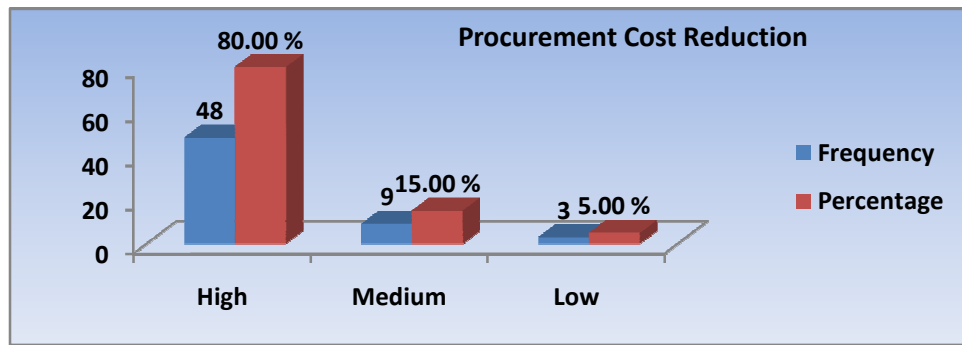


Fig. 13. Procurement Cost Reduction.

IX. RECOMMENDATION

Some companies do not use SAP as their ERP product because of some demerits of SAP. The common demerits are Complex pricing, High TCO, Development risk, Recurring upgrades, Rigidity, Technology limitations, Complex master data management and weak workflow design. It is recommended that the company may clearly define what positive results can be expected from the use of the ERP system before or during ERP implementation and provide training opportunities on a continuous basis to meet the changing needs of the business and employees. To make the ERP system more useful, the company may focus more on enhancing the quality of output during its implementation, especially regarding to the management reports and measurement reports.

X. CONCLUSION

As a conclusion of this paper it is observed that SAP is very useful ERP application, it offers competitive benefits hence very widely used. Auto component manufacturers are also not behind in getting operational benefits using SAP. Finally we conclude that, SAP is most widely used ERP tool to get operational benefits, managerial benefits, information technology (IT) benefits and organizational benefits in auto component manufacturing industry in Pune/ Aurangabad Area.

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