TO STUDY FACTORS INFLUENCING ADOPTION OF ERP SYSTEM IN THE AUTOMOBILE SECTOR

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ABSTRACT
The automobile industry's adoption of ERP from automotive hubs like Pune is examined in this study. This article addresses not just the amount of ERP adoption in the automotive industry in the Pune region, as well as the variables that drive ERP adoption, but also the benefits of ERP after implementation. Four key characteristics were identified as driving factors for ERP adoption, as well as ten perceived post-adoption benefits. Questionnaires and semi-structured interviews were used to gather information. Quantitative data was collected from 434 questionnaires, which was analyzed using regression and ANOVA analysis. ERP adoption opens up new business opportunities for an organization, allows it to complete specific tasks more quickly, increases productivity, allows for the purchase of products and services, provides integrated, timely, accurate, and reliable information for decision making, increases profitability, and aids in the control and monitoring of multiple projects. The findings of this study could aid automotive industry owners, managers, and others in increasing profitability, achieving better targets, and making successful management decisions. They can focus on the key drivers of ERP implementation in order to improve their performance. Many automotive company owners are working to increase their adoption levels in order to compete. This research study contributes to theory and practice by offering a solution in terms of influencing factors for automotive companies.
Keywords:ERP, Factors, Influencing, Adoption, Implementation

Introduction

Enterprise Resource Planning (ERP) is seen as a valuable tool for improving organizational efficiency since it integrates and distributes organizational systems and allows for seamless transactions and development. ERP systems have grown increasingly important to organizations of all types. Understanding the elements that influence ERP acceptance in organizations is critical to improve the quality and efficacy of ERP implementation. Others looked at success characteristics from an organizational or personal standpoint. This research develops an integrated framework that takes into account organizational, technological, personal, and environmental elements. The contributing elements have been known for a long time thanks to studies, but how those aspects effect the deployment of an ERP system in the automobile industry is still unknown. The impact of these influencing elements on the ERP user's perceived advantages was investigated in this study. According to the data, all four variables gain perceived advantages that will lead to ERP success in an automobile company.

The goal of this study was to identify factors that influence ERP adoption in the automotive industry, with a focus on the Pune region. ERPs (enterprise resource planning systems) are the foundational software for modern business information systems, as well as the usual organizational computing model (Bradford 2010). Organizations employ Enterprise Resource Planning (ERP) systems in order to reap the benefits of such technologies. ERP stands for enterprise resource planning, and it is a software package that allows businesses to manage information flow into business operations and integrate all departmental tasks into a single system (Markus, Tanis 2000). Organizations anticipate to get business benefits from ERP systems as a result of the system's output, such as more effective business processes, lower inventory, enhanced decision making, increased customer service, and business growth (Panorama 2015; Shang , Seddon 2002). Companies seek to gain a competitive edge as a result of these advantages.

In recent years, most businesses have installed Enterprise Resource Planning (ERP) programmes employing software packages such as SAP, Oracle, and BAAN, among others. Enterprise Resource Planning software is one of the fastest growing segments of the software industry (Sumner 2006). Companies are constantly seeking for methods to reduce expenses and operate more effectively and efficiently in order to remain competitive in the marketplace, and IT will assist them in accomplishing these objectives (Gurbaxani, Whang 1991).

Organizations must research the aspects that influence customer happiness in order to improve the quality of their ERP programmes, as well as their productivity and efficacy.

The goal of this research is to figure out what elements drive ERP system adoption and, as a result, how to improve an organization's success and, eventually, the ERP. This research intends to investigate driving factors by first identifying them in prior literature and then focusing on the Pune region's automobile sector through a well-designed questionnaire and interviews with ERP end-users within a business. The conclusions of this study are intended to raise awareness of the critical aspects that influence ERP system adoption and perceived benefits. This research focuses on ERP adoption and provides insights into the elements that drive ERP adoption.

Literature Review

The Enterprise Resource Planning (ERP) programme is a developing technology that falls under the umbrella of information management research. For the first time, in 1990, the Gartner Group purchased an American consulting firm, and the notion of ERP was born (Wylie 1990).

The author of this study wants to create a complete picture of ERP adoption and its possible benefits. By any means, I'd like to have a deeper understanding of the users' attitudes, habits, and perceived benefits.

The perceived benefits of ERP systems have a significant and positive impact on ERP adoption. ERP benefits organizations, according to both (Utecht 2004), by integrating operational processes to improve information flow, reduce costs, streamline business processes, increase product variety, establish links with business partners, and reduce response times to customer requirements. Companies that successfully implement integrative technology have been considered as extremely competitive on the global market.

Proposed Factors for ERP Adoption and Implementation in Automobile Sector

Multiple factors have been discussed and used in the literature on numerous occasions. These elements play an important role in ERP acceptance and implementation, providing a better knowledge of ERP adoption. The analysis of the aforementioned factors reveals that they cover the organization's broad range of activities across several industries. Such concerns give the author plenty of motivation to find some of the most important ones for creating an ERP acceptability and implementation model for the automobile industry. The author has identified a number of elements that could aid in the development of a conceptual model for ERP adoption in the automotive industry in the future. Figure 1 shows proposed influencing factors,

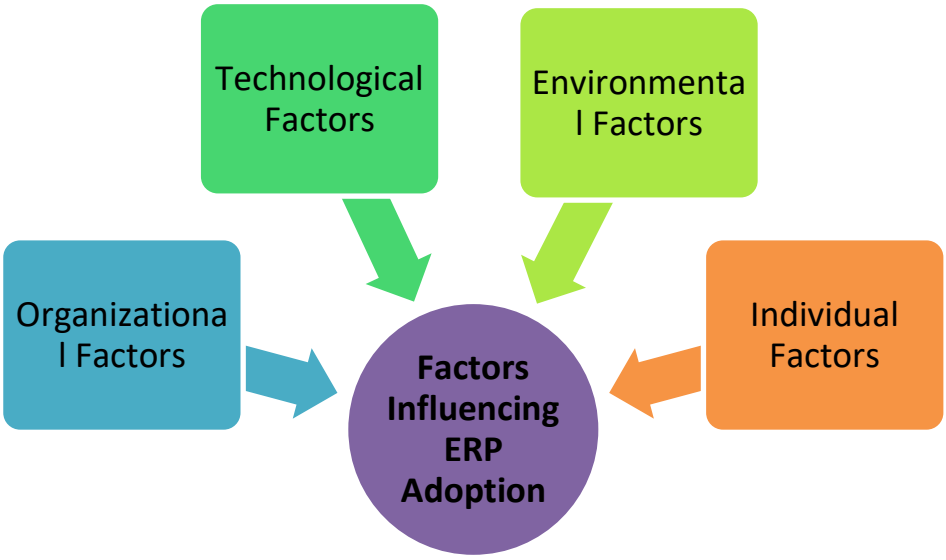


Figure 1 Proposed influencing factors

Factors Explanation

Technological Factors

(Rajemi , Egdair 2015) Understanding the impact of technology variables on the relationship between ERP and efficiency is critical to the device adoption process' success. It appears that new directions need to be investigated further, which necessitates expertise. There have been few studies that have looked at organizational success and some of the aspects that influence it, such as ERP adoption and technological factors.

The importance of understanding technology variables about the relationship between ERP and efficiency is the most important issue for the device adoption process's success. It appears that a new path needs to be investigated further, which includes recognition of this phenomenon and further analysis of the expansion of information in the practice of multiple factors in addition to the established factors.

Organizational Factors

(Dezdar , Ainin 2012) look at how organizational elements including training and education, senior management support, and enterprise-wide communication affect corporate resource planning. According to the findings, there is a link between top management support, enterprise-wide communication, and ERP training and education and successful ERP deployment.

Environmental Factors

Consumer demand, economic pressure, external pressure, internal pressure, trading partner pressure, commercial dependence, environmental uncertainty, information intensity, and network strength are all significant environmental variables, while policy regulation is not (Jang , Li 2012).

Individual Factors

It has been empirically demonstrated that various individual qualities of information system users are associated with specific rates of system use (Szajna 1996).

Research Objectives

The goals of this study, as stated in earlier, are as follows:

- To understand the factors influencing adoption of ERP.
- To study the perceived benefits of ERP adoption.
- To study relationship of position of respondents in the organization with the Perceived Benefits of ERP.

Research Hypothesis

- **H1:** There is significant impact of adoption of ERP on Perceived Benefits.
- **H2:** There is significant relationship of position of respondents in the organization with the Perceived Benefits of ERP.

Data Collection

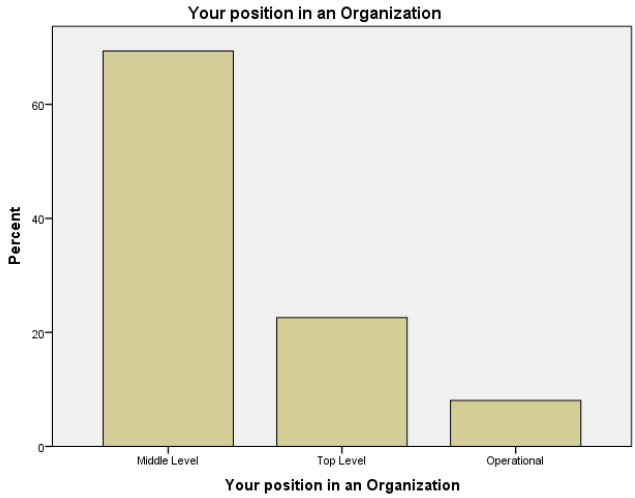
In this study, the identical questionnaire was sent in hard copy form. The respondents to the stated questionnaire were, once again, ERP users, managers, and decision makers from the individual firms who were familiar with their vision, plans, and policies. The same questionnaire was sent to the intended participants via email, together with a link to the online questionnaires and a brief description of the study objectives. Participants who had not responded in a timely manner received follow-up emails as a reminder. Finally, 434 respondents from various automobile businesses answered to the survey, the majority of them were ERP practitioners and people who had been involved in ERP deployment methods.

During personal meetings with the participants, who are ERP users, managers, and decision makers, pertinent questions were answered, and primary data was collected.

The study is based on primary data obtained through a survey questionnaire and interviews with selected vehicle companies in the Pune region. These companies have branches in Chakan, Pimpri, Chinchwad, Pune City, Pirangut, and Ranjangoan, among other places.

Analysis and interpretation

- Position of ERP user in organization



Graph 1 Position of ERP users in organization

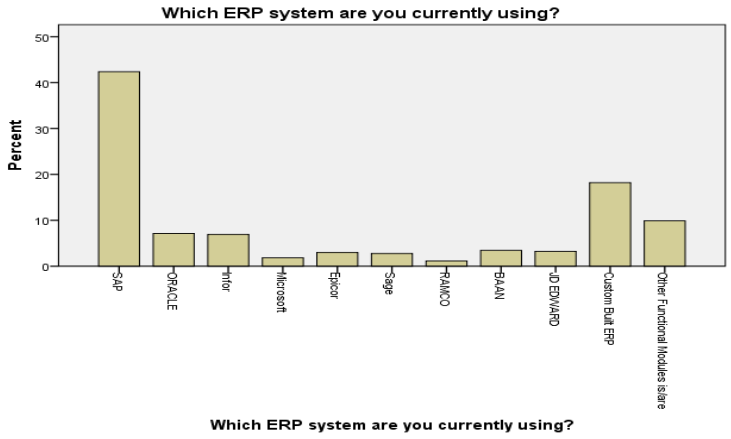
Interpretation:
69.4 percent of the 434 respondents are in a middle level position, 22.6 percent are in a top level position, and 8.1 percent are operational level ERP users. As can be seen from the table above, intermediate level ERP users were more likely to engage in the study than top level ERP users. In addition, only a small number of personnel at the operational level took part in the research.

- **Which ERP package is organizations are using**

Table 1 below presents data which ERP system organization is currently using. And graph 2 shows graphical representation of which ERP system organization is currently using.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SAP	184	42.4	42.4	42.4
	ORACLE	31	7.1	7.1	49.5
	Infor	30	6.9	6.9	56.5
	Microsoft	8	1.8	1.8	58.3
	Epicor	13	3.0	3.0	61.3
	Sage	12	2.8	2.8	64.1
	RAMCO	5	1.2	1.2	65.2
	BAAN	15	3.5	3.5	68.7
	JD EDWARD	14	3.2	3.2	71.9
	Custom Built ERP	79	18.2	18.2	90.1
	Other Functional Modules is/are	43	9.9	9.9	100.0
	Total	434	100.0	100.0	

Table 1 Which ERP system is you currently using



Graph 2 Which ERP system is you currently using

Interpretation

The SAP-ERP programme is used by 42.4 percent of the 434 respondents. It signifies that the SAP –ERP package is used by the majority of businesses.

The study's most noteworthy finding was that most organizations prefer SAP to other ERP solutions. Finally, just half of the organizations have implemented all ERP modules. It means that in the remaining 50% of businesses, all modules must be implemented.

ERP variables are explained by following abbreviations,

- Organizational Factors -ERP1
- Technological Factors- ERP2
- Environmental Factors -ERP3
- Individual Factors- ERP4

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ERP1	434	1.3000	5.0000	4.221889	.4172993
ERP2	434	1.0000	5.0000	4.040092	.4383530
ERP3	434	1.0000	5.0000	3.980645	.5170475
ERP4	434	1.0000	5.0000	4.049539	.5358975
Valid N (list wise)	434				

Table-2: Descriptive Statistics for Adoption of ERP (All components)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ERP Avg	434	1.0750	5.0000	4.073041	.3914281
Valid N (list wise)	434				

Table –3 : Descriptive Statistics for Adoption of ERP (Avg of all components)

- The descriptive statistics of the variable – Adoption of ERP with four components (Organizational factors, Technological factors, Environmental factors and Individual Factors) denoted as ERP1, ERP2, ERP3 and ERP4 says that the overall means value of all the four components is 4.07 which signifies that the respondents generally agree to the fact that adoption of ERP is essential considering all the factors in account.

The overall SD is .391, a low SD implies less deviation from the mean value. Means the respondents are consistent in their opinion.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PB1	434	1	5	3.72	.970
PB2	434	1	5	4.03	.782
PB3	434	1	5	3.94	.725
PB4	434	1	5	3.74	.900
PB5	434	1	5	4.23	.815
PB6	434	1	5	3.39	.980
PB7	434	1	5	3.76	.878
PB8	434	1	5	4.12	.882
PB9	433	1	5	4.39	.784
PB10	434	1	5	4.38	.813
Valid N (listwise)	433				

Table -4: Descriptive Statistics for Perceived Benefits (All components)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Avg Perceived Benefits	434	1.0	5.0	3.970	.4516
Valid N (list wise)	434				

Table –5: Descriptive Statistics for Perceived Benefits (Avg of all components)

According to the descriptive statistics of the variable – Perceived Benefits, which has ten components denoted as PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8, PB9, PB10, the overall mean value of all the components is 3.9, indicating that the respondents recognize that the benefits derived from the implementation of ERP system in the organization are beneficial when all the factors influencing the adoption are taken into account. The overall SD is 0.451; a low SD indicates that there is less variability from the mean. This indicates that the respondents' opinions are consistent.

Reliability and Validity Statistics for Adoption of ERP

Reliability Statistics

Cronbach's Alpha	N of Items
.833	4

Table- 6: Reliability Statistics for Adoption of ERP

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ERP1	12.070276	1.575	.671	.789
ERP2	12.252074	1.521	.683	.782
ERP3	12.311521	1.362	.681	.780
ERP4	12.242627	1.365	.638	.804

Table-7: Validity Statistics for Adoption of ERP

- **Reliability And Validity Statistics For Perceived Benefits**

Reliability Statistics

Cronbach's Alpha	N of Items
.712	10

Table- 8: Reliability Statistics For perceived Benefits

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PB1	35.98	16.504	.377	.689
PB2	35.67	17.111	.417	.683
PB3	35.75	17.073	.471	.676
PB4	35.96	17.068	.341	.695
PB5	35.46	17.337	.356	.692
PB6	36.30	16.904	.316	.701
PB7	35.94	17.020	.363	.691
PB8	35.57	16.634	.417	.681
PB9	35.30	17.692	.320	.697
PB10	35.31	17.331	.358	.692

Table-9: Validity Statistics for Perceived Benefits

Sr. No.	**Indicators**	**Cronbach Alpha for Reliability**	**According to Pearson's critical value or r product moment value**	**Validity**
1	Adoption of ERP	.833	For infinite samples in 0.05 significance level, r value is 0.073	Valid
2	Perceived Benefits	.712		Valid

Table No-10: Summary Table

- **Interpretation of Reliability and Validity**

Because all of the variables have reliability score of greater than 0.7, it is assumed that they are all dependable. The r value for infinite samples in the 0.05 significance level, according to Pearson's critical value or r product moment value, is 0.073.

The calculated correlation values for ERP1, ERP2, ERP3, and ERP4 are 0.671, 0.683, 0.681, and 0.638, respectively. All of these numbers are higher than 0.073. (r product moment value). As a result, the ERP data is assumed to be correct.

The calculated correlation values for PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8, PB9, and PB10 are 0.377, 0.417, 0.471, 0.341, 0.356, 0.316, 0.363, 0.417, 0.320, and 0.358, respectively. All of these numbers are higher than 0.073. (r product moment value). As a result, the data on Perceived Benefits is presumed to be accurate.
The position of the respondents in the organization and perceived ERP benefits are tested using a one-way ANOVA test.

Here because there are more than two samples, a one-way ANOVA is used. The dependent variable is on a scale of one to ten, while the independent variables are on a scale of one to ten.

One-Way ANOVA Test between Position and Perceived Benefits	ANOVA test significance value	Value for homogeneity of variance
	.798	.895

Table 11-Summary Table-one way ANOVA

The significance value in the One-way ANOVA is larger than 0.05, implying that the null hypothesis is accepted, i.e. that there is no significant difference between a respondent's viewpoint and the perceived advantages gained from ERP. This is a good sign that everyone in the organization, regardless of their status, recognizes the importance of ERP deployment. This emphasizes the significance of ERP installation in businesses. Regardless of position, the demand for system and process automation is of the utmost importance. The homogeneity of variance score is greater than 0.05, implying that equal variance exists.

Summary of Hypotheses- Table 12 shows the results of testing the hypotheses of the research.

	Hypotheses	**Results**
H1	There is significant impact of adoption of ERP on Perceived Benefits.	Accepted
H2	There is significant relationship of designation /position of respondents in the organization with the perceived benefits of ERP.	Rejected

Table-12: Summary of Results-Hypothesis

Findings

The most significant contributions of ERP systems are that they greatly cut the time necessary to perform company activities and simplify information sharing (Olhager , Selldin 2003; Lee 2010). Because they have more effective procedures, businesses provide a better working environment for their employees. ERP systems can be launched effectively from a technology standpoint during the regular phase of the ERP lifecycle, but complete performance is contingent on ERP users' willingness to use the provided system (Kwahk , Lee 2008). According to the findings, senior management support is always required when implementing any decision in an organization. Change management is always a part of ERP implementation. Most ERP implementations necessitate business process re-engineering. ERP adoption is usually influenced by organizational structure and culture. ERP adoption is largely influenced by the size of the company. It is critical to provide training and education to ERP users in order for the technology to be used successfully. It is critical to have great communication for not just successful ERP implementation but also for accomplishing any work in a more efficient manner. ERP adoption is impossible without clear organizational goals and objectives. It is nearly hard to implement ERP in an organization if the users of the technology are not active in its use. If a company wants to implement technology, it must be ready in every way. The operational cost of ERP adoption is a critical aspect in determining the success of its implementation. The ERP package that is implemented should not be overly complex because it will damage the user's ability to use it and may result in ERP failure. Regardless of the ERP software utilized, an organization's smooth operation should be ensured. Adoption of ERP system relies heavily on technological infrastructure. The key to a successful ERP implementation is choosing the right products. High-quality organizational data and information are required for successful adoption. It is nearly difficult to implement ERP without the help of the ERP vendor. The ERP system may test and maintain uniformity in business operations. The cost of ERP maintenance is crucial in determining how far the system will be used. The use of ERP allows businesses to aim to outperform their competitors on the market. Always For ERP to be adopted successfully, it must be able to embrace technical change. The ERP system enables business owners to devise effective management strategies. The ERP operating system assists users in reducing computer anxiety. Management support and a positive mindset are essential for ERP deployment to be effective. The efficiency with which a computer is used is not as significant while using an ERP system. A well-trained ERP user can make better use of the system. For all applications, the ERP system supports creative process control technologies. The ERP system makes work easier for all enterprises.

Conclusion

The majority of these research focus on a small number of parameters that influence ERP system acceptability and usage. The goal of this investigation was to increase the number of parameters that influence user acceptability. Researchers discovered a large number of external influences from literature. The adoption influencing elements and advantages have been the focus of ERP installation studies. This research contributes to ERP installation and adoption theory, with a focus on the automotive industry. This research examines the

factors that influence adoption in the areas of technology, organizations, people, and the environment. According to the findings of the study, more attention may be required to assist the automobile industry by giving context elements that may be relevant for ERP implementation.

The survey found that owners and managers in the automotive industry lacked the knowledge and resources needed to implement ERP. Have a thorough knowledge of the relevant components and information before beginning an ERP project. It will also provide an understanding of the actions that occur during the planning, execution, and comprehension of the elements that affect the technical, organizational, individual, and environmental domains of ERP implementation. The findings of the study will assist all types of automobile firms in mitigating the risks of ERP installation failures and change resistance by utilizing appropriate tools and approaches to ensure project success. Another intriguing topic would be to research firms who have already adopted and deployed ERP systems to see what missing components were the most important factors to consider in order achieving success. From the user's perspective, this will focus on the organizational, technological, individual, and environmental aspects of ERP adoption.

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