

Impact of cloud computing on sme's in automobile sector



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Research Methodology Impact of Cloud Computing on SMEs in the

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 17 2 EXECUTIVE SUMMARY

It can be noted that in order for an automobile company to be successful in the highly competitive market, their business process must be both effective and efficient.

The IT spending has increased to ensure that there is a reduction in time to market and product life cycles and also to ensure that rapid customization of products as per the changing needs of the market. There has been a 25%

year on year growth in the small businesses in India. These businesses give higher priority to ease of use and right business architecture than on the technology or applications. But their low IT budgets restrict them from using the service being provided through Internet to their maximum advantage.

Hence, we firmly feel that cloud computing will have a huge impact and be beneficial for the companies in both the aspects -Operational as well as Financial. As cloud computing becomes more accepted among automotive companies, more of their business processes will be shifted to the cloud. The integration that will be enabled by different cloud-based applications and processes will result in faster and much more effective cross-enterprise and extended supply chain analysis and reporting. All this will lead to timely, accurate and comprehensive management of the information, hence supporting better decisions.

Hence it is important for a company to understand the different areas of automotive supply chain where the concept of cloud computing can be applied. The research would help in emergence of more efficient and innovative ideas, which would ultimately result in a totally new working of the automobile sector and hence would yield higher returns on investments. In this research we have found the different types of dependent, independent and other intervening and moderating variables and have tried to relate them to the best of our knowledge.

Also we have studied the literature of various cloud computing concepts and present scenario of the automobile sector in India, which has also helped us greatly in our analysis on the impact of cloud computing on the Indian

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automotive sector. This will enable us to be ready with the appropriate products/services/solutions that will be useful in addressing to the issues faced by the automobile industry in the near future. 3 INTRODUCTION Today is the age of information technology.

The facets of work and personal life are moving towards the concept of availability of everything online. Understanding this trend, many web based companies like Google, Amazon, Salesforce. com came with a model named “ Cloud Computing” that is the sharing of web infrastructure to deal with the internet data storage, scalability and computation. According to NIST - “ Cloud computing is a model for on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction”.

The automotive SME's of India are amongst the country's largest and fastest growing industry with high growth rates in the automobile sector observed in the previous years also, the Indian automobile sector is expected to grow at CAGR 15% over next 5 years. All these facts and many more clearly point to the fact that the automobile industry will definitely grow significantly in the next 5 years and as it is known whenever any industry or a vertical/sector advances, along come with it are numerous challenges.

In order for automobile companies to survive the ever-increasing global competition, it has become very important for them to constantly innovate, upgrade and evolve according to the changing market dynamics. It is believed that they key to innovation lies in - collaboration. The collaboration can take place over the Internet either between suppliers and original

equipment manufacturers or between supplier-suppliers or between OEM-OEM in the automobile sector. It is known that cloud computing, in the coming years will make a huge impact across all verticals all over the world which would include the automotive supply chain as well.

Hence, it is crucial to understand the effects of cloud computing in the automobile industry and where it can be beneficial for the automobile makers. 4 OBJECTIVE OF THE STUDY To understand the evolution and different challenges faced by the automobile industry in a period of 5 years from now and analyze in which different areas of the automobile sector, the concept of cloud computing can be applied and henceforth help the industry to be ready with the appropriate solutions for the future. LITERATURE REVIEW

The literature on Cloud Computing agonizes from publicity and conflicting descriptions and lookouts. One report by McKinsey & Co. exposed 22 discrete characterizations of Cloud Computing. For this exercise, we will use the Gartner definition of cloud computing as “ a style of computing where massively scalable IT-enabled capabilities are delivered ‘ as a service’ to external customers using Internet technologies. ” McKinsey presents a typology of software-as-a-service that elaborates the Gartner definition and is characterized by: ?

Delivery Platforms o Managed Hosting contracting with hosting provider to host or manage an infrastructure (IBM, OpSource) o Cloud Computing using an on-demand cloud based infrastructure to deploy an infrastructure or applications (Amazon Elastic Compute Cloud) Development Platforms o

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Cloud Computing- using an on-demand cloud based development environment to provide a general purpose programming language (Bungee labs, Coghead) Application-led Platforms o SaaS Platforms- using platforms of popular SaaS applications to develop and deploy application ? ?

In the current scenario, companies all over the world are aiming to operate a supply chain that is dynamic in nature and can change according to the volatile market conditions and customer demands. It is estimated that the market for the cloudbased services will reach around \$150 billion by 2014. Cloud computing can be beneficial for supply chain by enabling flexible and new transaction-based models which is the need of the hour. Cloud computing will help companies to reach new markets and create new services and respond better to the changing needs of the market, hence help companies to achieve better performance. 5

It is known that different business will choose different routes to cloud for running their different business processes. The automobile industry will definitely grow significantly in the next 5 years and to compete in the international markets; the SMEs have to create strong local supply chains. Also, technology is considered as one major enabler that has made possible to eliminate time and space as barriers between different companies as well as countries. They can be listed as follow: ? Hardware - High cost of infrastructure, Inverted duty structure ? Software - Lack of last mile connectivity, high cost structures ?

Services - Lack of system integrators, lack of technical expertise The automobile-component suppliers can be divided into different levels which

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are OEMs (Original Equipment Manufacturers), tier-1 suppliers, tier-2 suppliers and so on. The orders of the industry rise from the bottom of the supply chain i. e. from the consumers and go through the automakers and climbs up until the third tier suppliers. In the Automobile Industry, the OEMs, both domestic and MNC, have cheered and collaborated with their Tier I suppliers to ensure high ICT adoption levels among the suppliers.

This has had a cataract effect with the Tier I suppliers providing a similar 'pull effect' to the Tier II suppliers and beyond. The role of Information Technology has become more crucial as now it not only it would be used in operational delivery but also would be used as a strategic, differentiating asset. Greater collaboration is required especially between trading partners, which can help in the following: ? Sharing of the leading practices being followed in the industry ? Better use of information, technology ?

Creating benchmark standards SME firms are often not aware of the good quality and appropriate solutions available in the market and also find it difficult to access to ICT vendors with high credibility and pedigree. Even within the same manufacturing vertical, solutions which may be successful in a particular cluster and have limited diffusion in other clusters of the same vertical. 6 This leaves SME firms reliant to what is available locally, both products and suppliers. Easy availability coupled with improved access to ICT solutions will help SME firms arrive at a ' best-fit solution for their business needs.

There is a need to build and develop the local IT vendor ecosystem so that the local technology providers can address the specific requirements of the

SMEs. Further, elimination of the market information asymmetries will enable the local IT vendors and other technology providers to market their products and services to a larger customer base. The key challenge for the automakers is to manage the global supply chains as this would have a direct impact on all the stakeholders within the value chains which include suppliers, dealers, OEMs and distributors and have an end-to-end integration encompassing the IT systems.

Terms and Definitions
Cloud Computing- Cloud computing is the delivery of computing as a service rather than a product, whereby shared resources, software and information are provided to computers and other devices as a utility (like the electricity grid) over a network (typically the Internet).
SME's- Small and Medium enterprise are companies whose headcount or turnover falls below certain limits. As per Ministry of Small scale, a small enterprise is an enterprise where the investment in plant and machinery is more than Rs. 25 lakh but does not exceed Rs. 5 crore and for a medium enterprise is more than Rs. 5 crore but does not exceed Rs. 10 crore.
OEM's- Original Equipment Manufacturer, manufactures products or components that are purchased by a company and retailed under that purchasing company's brand name. OEM designates a replacement part made by the manufacturer of the original part.
Suppliers- The automobile-component suppliers can be divided into different levels which are OEMs (Original Equipment Manufacturers), tier-1 suppliers, tier-2 suppliers and so on. The orders of the industry rise from the bottom of the supply chain i. e. from the consumers and go through the automakers and climbs up until the third tier suppliers.

ICT - Information and communications technology, a more general term that stresses the role of unified communications and the integration of telecommunications, intelligent building management systems and audiovisual systems in modern information technology. 7 Previous papers and discussions on SME's and role of cloud computing in Automobile/ Manufacturing Industry were referred which can be listed as follow: a. [http://www. acmainfo. com/](http://www.acmainfo.com/) ACMA - Automotive Component Manufacturers Association of India b. Report on " IT Adoption in the Indian Auto- Component Industry" published by NASSCOM (National Associations of

Software and Service Companies). c. Report on " Automotive Mission Plan - 2006-2016" by Ministry of Heavy Industries and Public Enterprises, Government of India. d. [http://www. siamindia. com/](http://www.siamindia.com/) SIAM- Society of Indian Manufacturers METHODOLOGY & DATA SOURCES For any research to be successful the most important part is the basic research plan and the data sources that will be used for analysis of the report. The purpose of the surveys and all the data is to collect the primary data, which is the data, collected and assembled specifically for the research project in hand.

The purpose of the research here is to access the effect of cloud computing on the automobile sector in India. The basic research question is: How cloud computing will have an effect on the Indian automobile sector?

METHODOLOGY FOLLOWED FOR SAMPLING AND DATA COLLECTION This research will help to study the scope of cloud computing for SMEs of Automobile sector present in India. The main purpose of this research is to examine and analyze the scope of cloud computing for the SMEs in India and understand the benefits that can be obtained by implementing it. <https://assignbuster.com/impact-of-cloud-computing-on-smes-in-automobile-sector/>

So, this research also aims to develop a research model, which would justify this paper's affinity towards the use of cloud computing for Indian SMEs in Automobile sector. One of the major challenges will be to get the financial data of some SMEs and another is to understand which data to choose for analyzing the scope.

8 DATA COLLECTION METHODS:

1. Primary data

The Primary data for this paper will be collected using telephonic interview with IT personnel from about 30 Indian SMEs. It will be a structured interview, which will comprise of sequenced questions. An E-mail based questionnaire will be also used to collect the primary data.

This questionnaire will be sent to users of various traditional ERP software's in the above 30 Indian SMEs to get the general user opinion used to test the hypothesis.

2. Secondary data:

The Secondary data was collected using a)

Internet:

The Sites of all ERP providing software's using SaaS technology will be visited and the cost per user for each of them was collected via this method. Website of cloud vendors will also be referred for data gathering.

b) Journals:

White papers from IEEE, ACM and The Computing Journal will be used to collect the data related to the subject.

) News Papers:

Economics Times daily business newspaper was also used as a source for secondary data collection.

d) Magazines:

The CTO Forum magazine, Business Week, Digit, Chip.

9 RESEARCH FRAMEWORK OF THE STUDY

Supply Chain
Management
Centralization of Centralization Resources of resources
Cloud Computing
Saving in time & greater environmental sustainabili
Business
Process Optimization
Total Quality Management
Moderating Variable
Intervening Variable
Dependent Variable
Variables
Independent Variable
The

variables used for our study can be broadly classified as dependent and independent variables.

Since the topic of concern is the impact of cloud computing on Automotive SME's, our dependent variable here is Business Process Optimization.

Business Process Optimization: The main focus of the research is on the optimization of the business process. Better supply chain management, centralization of resources and total quality management lead to an optimized business process. Hence it is the dependent variable. It involves optimizing process flows of all sizes, crossing any application, company boundary and connects process design and process maintenance.

The variables on which Business Process Optimization is dependent are: 10

1. Supply Chain Management: SME's can streamline their worldwide supply chains for the long haul by signing up for pay-as-you-go logistics services available through the Internet " cloud. " These services reduce supply-chain costs by making it faster and easier to share information about shipments with suppliers, transportation providers and end users, and then processing that information with the latest, most powerful software tools.

By turning to services available " on demand" over the Internet — like other cloudbased business software, these companies gain access to a logistics platform they could never afford to build or maintain by themselves. They also acquire a strategic advantage over those old-fashioned competitors who still rely on inefficient tools like Microsoft Excel spreadsheets, e-mail and Electronic Data Interchange (EDI) formats to manage their trade compliance, transportation and logistics processes. 2.

Centralization of Resources: Resources can be centralized, allocated to various users on demand, thus if one user needs a bigger share of infrastructure for its peak load capacity, it can easily be allocated to him, without having to spend on installing extra infrastructure or effecting other users. Since resources are shared amongst various users in a cloud, it allows for utilization and efficiency improvements. 3. Total Quality Management: Total Quality Management (TQM) is an approach that organizations use to improve their internal processes and increase customer satisfaction.

When it is properly implemented, this style of management can lead to decreased costs related to corrective or preventative maintenance, better overall performance, and an increased number of happy and loyal customers. Hypothesis: Hypothesis for our study is that - better the supply chain management, application of total quality management and centralization of resources will lead to an optimized business process. 11 HYPOTHESIS DEVELOPMENT Cloud Computing is web based subscription model enabling the users to pay as per their needs and usage.

Cloud Computing Model provides IT based services and capabilities online with data shared on a third party server. As the users are paying on hourly basis and in some cases on monthly basis, cloud computing will result in a substantial cost saving and it will leverage the benefits of ERP solutions. Hence we hypothesize: H1: Cloud computing service provide lower per user annual cost than traditional ERP system. Cloud computing service provide higher per user annual cost than traditional ERP system.

Cloud computing services are more adaptable than traditional ERP systems.

Cloud computing services are less adaptable than traditional ERP systems.

H2: H3: H4: DATA ANALYSIS We can analyze the data for the research on the

impact of Cloud computing on the Indian automobile sector in India

especially SMEs For the analysis purpose there are a number of methods we

can use. Following figure shows how the process of research is carried out

and how the data analysis fits in. 12 1. 1 REGRESSION ANALYSIS

REGRESSION ANALYSIS - A body of statistical techniques in which the form of the relationship between a dependent variable and one or more independent variables is established so that knowledge of the values of the independent variables enables prediction of the value of the dependent variable or likelihood of the occurrence of an event if the dependent variable is categorical. Regression analysis is a method by which quantitative social science seeks to establish how things are caused. The objectives are both scientific description and prediction.

If we know the form of the relationship between things we have measured and know to be causal to something else, then we can predict the value of the caused. 1. 2 CHI-SQUARE GOODNESS OF FIT TEST The chi-square test is used to test if a sample of data came from a population with a specific distribution. An attractive feature of the chi-square goodness-of-fit test is that it can be applied to any univariate distribution for which you can calculate the cumulative distribution function. The chi-square goodness-of-fit test is applied to binned data (i. e. , data put into classes).

This is actually not a restriction since for non-binned data you can simply calculate a histogram or frequency table before generating the chi-square test. However, the value of the chi-square test statistic is dependent on how the data is binned. Another disadvantage of the chi-square test is that it requires a sufficient sample size in order for the chi-square approximation to be valid. The problem with this test would be: there won't be sufficient data available for the test to carry out and analysis to be done. As this research are done using surveys and data already available on the automobile and cloud-computing.

The survey has to be done on the B2B platform. 1. 3 T-TEST The t-test (or student's t-test) gives an indication of the separateness of two sets of measurements, and is thus used to check whether two sets of measures are essentially different (and usually that an experimental effect has been demonstrated). The typical way of doing this is with the null hypothesis that means of the two sets of measures are equal. 13 The t-test assumes: A normal distribution (parametric data) Underlying variances are equal (if not, use Welch's test) It is used when there is random assignment and only two sets of measurement to compare.

There are two main types of t-test: 1. Independent-measures t-test: When samples are not matched. 2. Matched-pair t-test: When samples appear in pairs (eg. before-and-after). A single-sample t-test compares a sample against a known figure, for example where measures of a manufactured item are compared against the required standard. Calculation: The value of t may be calculated using packages such as SPSS. The actual calculation for two groups is: $t = \frac{\text{experimental effect}}{\text{variability}} = \frac{\text{Difference between group}}{\text{standard error}}$
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means / standard error of difference between group means 1. ANOVA One-way analysis of variance (abbreviated one-way ANOVA) is a technique used to compare means of two or more samples (using the F distribution). This technique can be used only for numerical data. The ANOVA tests the null hypothesis that samples in two or more groups are drawn from the same population. To do this, two estimates are made of the population variance. These estimates rely on various assumptions. The ANOVA produces an F statistic, the ratio of the variance calculated among the means to the variance within the samples.

If the group means are drawn from the same population, the variance between the group means should be lower than the variance of the samples, following central limit theorem. A higher ratio therefore implies that the samples were drawn from different populations. The degrees of freedom for the numerator are $I-1$, where I is the number of groups (means), e. g. I levels of urea fertilizer application in a crop. The degrees of freedom for the denominator is $N - I$, where N is the total of all the sample sizes. 14

FINDINGS AND CONCLUSIONS ?

The Indian Automotive Industry has to remain globally competitive so that it can sustain the same levels of growth as it has enjoyed in the previous years. It can be noted that in order for an automobile company to be successful in the highly competitive market, their supply chain must be both effective and efficient. ? The key challenge for the automakers is to manage the global supply chains as this would have a direct impact on all the stakeholders within the value chains which include suppliers, dealers, OEMs

and distributors and have an end-to-end integration encompassing the IT systems. ?

The trends that were drawn from both in the automobile industry and the supply chain indicate that there is an urgent need to fine tune the supply chain strategies and operations further. This includes making the supply chain more flexible and enabling it to share real time data. ? The velocity of business innovation has accelerated, and business is hungry to meet new opportunities and challenges as quickly as possible. The role of Information Technology has become more crucial as now it not only it would be used in operational delivery but also would be used as a strategic, differentiating asset. Greater collaboration is required especially between trading partners who can help in the following: sharing of the leading practices being followed in the industry, better use of information, technology and creating benchmark standards. ? The IT spending on Supply Chain Management has increased to ensure that there is a reduction in - time to market and product life cycles and also to ensure that rapid customization of products as per the changing needs of the market. 15 ?

Another important point is to understand that what data should be transferred with its significance and what infrastructure should be required between partners internally. Also proper training is required to make sure the employees can use their SCMs to their maximum advantage. ? It is also known that Cloud Computing would play a huge role in the IT sector and many business processes would be shifted to it because of its unique offering and advantages. But one has to understand that not all processes in the supply chain can be moved to the cloud straight away.

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There has to exist some type of filter or specific criteria that has to be defined in order for a business process to move to a cloud. ? As cloud computing becomes more accepted among automotive companies, more of their business processes will be shifted to the cloud. The integration that will be enabled by different cloud-based applications and processes will result in faster and much more effective cross-enterprise and extended supply chain analysis and reporting. All this will lead to timely, accurate and comprehensive management of the information, hence supporting better decisions. 16