Effectiveness of Cloud Computing Technology on SMEs in India an Opportunity

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Abstract— The Cloud computing is a set of services that provide infrastructure resources using internet medium and data storage on a third party server. SMEs are said to be the support of any exciting economy. Small and Medium Enterprises seek opportunities to reduce the way they manage their resources. Information technology (IT) had a great impact in all aspects of life and the global economy is currently undergoing fundamental transformation. IT has very real impact in most of industries and in all aspects of economy, while businesses and enterprises continue to undergo significant changes. They are recognized to be the silent drivers of a nation's economy. SMEs of India are one of the most violent adopters of ERP Packages. Most of the Indian SMEs have understanding the traditional ERP Systems and have incurred a heavy cost while implementing these systems. This paper presents the cost savings and reduction in the level of difficulty in using a cloud computing Service (CCS) enabled ERP system. For the study, IT people from 30 North Indian SMEs were interviewed. In the cloud computing environment the SMEs will not have to own the infrastructure so they can give up from any capital expenditure and instead they can utilize the resources as a service and pay as per their usage. We think the results of the paper to be encouraging to our anticipated research conception.

Keywords- Cloud Computing, ERP, Cost scenario, SMEs, IaaS, PaaS, SaaS, IT Revenue India

I.   INTRODUCTION TO CLOUD COMPUTING IN INDIA

Now-a-days cloud computing has taken the worldwide information technology sector by storm and India is no different. Subscription based service model and effectiveness of cost are two of the major factors that are directing more and more Indian companies/SMEs to utilize cloud based applications. With the introduction of the cloud, the IT landscape in India is changing, with more companies reserving a sizeable portion of their investments for cloud upgrades and innovations.

According to a study done by NASSCOM, in association with Deloitte, cloud computing is expected to have a major impact on the service industry, with respect to services offered, business models and delivery processes. It states that the Indian market for cloud computing is expected to grow by $16 billion in 2020, out of which two-third of the growth will be from new businesses and the rest from already existing services. As per IDC, a tech research company, the cloud segment in India will reach $3.5 billion by 2016, five times more than the $688 million it clocked in 2012. In India, investments of cloud services providers are growing at a rapid pace and 20-25% of large outsourcing deals already involve the cloud. Another report by Gartner suggests that in 2014, India will see a 30% growth in the cloud segment, totaling to $550 million. Cloud based Business Intelligence (BI) is something that few enterprises can resist. As indicated in a Redwood Capital report, cloud based BI will increase, from less than a billion dollars in 2013, to almost $3 billion in 2018 globally.

BI is doing great on the cloud platform in India too. According to Srikanth Karnakota, country head of Microsoft India's Server and Cloud Business, people are realizing that the cloud is a platform that offers the best BI solutions, no matter the business size. It has something to offer for enterprises of all sizes – from linking amorphous data in hand to data that you already have, enhanced functionality from existing hardware or liberty to move licenses and run operations across hybrid environments and much more. India has always been on its toes when it comes to adopting new things in information technology and the same can be said when it comes to cloud platform. Cloud is a pool of computing service on large scale. The increasing network bandwidth and reliable yet flexible network connections make it even possible that users can now subscribe high quality services from data and software that reside solely on remote data centers.

The Cloud computing has gained a lot of hype in the current world of I.T. Cloud computing is said to be the next big thing in the computer world after the internet. Cloud computing is the use of the Internet for the tasks performed on the computer and it is visualized as the next- generation architecture of IT Enterprise. The 'Cloud' represents the internet. Cloud computing is related to several technologies and the convergence of various technologies has emerged to be called cloud computing.
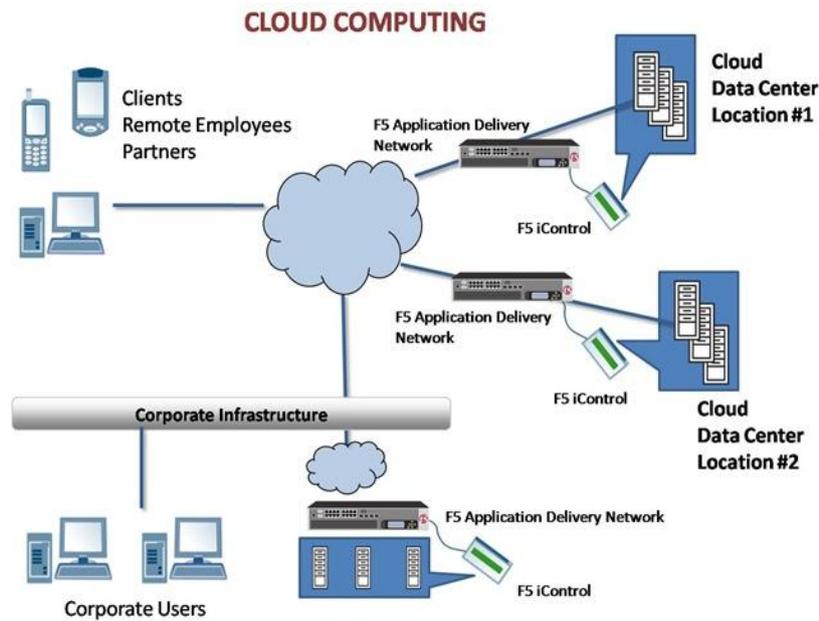
Figure 1. Showing cloud computing

The role and importance of IT is constantly evolving and has changed significantly from the days when the IT organization concern with data manipulation process. Today, the utilization of IT services can make the huge differences in company's growth. SMEs are now exposed to greater opportunities than ever for expansion and diversification across the sectors. Indian market is growing rapidly and Indian entrepreneurs are making remarkable progress in various Industries like Manufacturing, Precision Engineering Design, Food Processing, Pharmaceutical, Textile & Garments, Retail, IT and ITES, Agro and Service sector. However, cloud computing services could provide many of those companies like SMEs with the opportunity to continue to take advantage of new developments in IT technologies at affordable costs. The Cloud computing brought a lot of services i.e. database, storage, backup, data replication, data protection and maintain the security of the services.

Seeing SAAS success on September 2008 IBM launched cloud computing center in India at Bangalore. This center will cater to the increasing demand of web based infrastructure sharing services. IBM India collaborated with IIT Kanpur to come up with some new developments in computing that will help in academic advancement. Bharti Airtel has launched the cloud computing services with their NetPc model and other giant companies like Reliance Communications, TCS, HCL technologies, Wipro, Netmagic, Verizon, Novatium etc. have also launched cloud computing services in India.

SaaS will provide an opportunity for the SMBs to automate their business by reducing their investment in IT infrastructure (Rao).Cloud based services helps the industries to reduce their cost that are involved in on-premise ERP solutions such as hardware, software, upgradation, training and licensing costs. Moreover long implementation cycles with regular maintenance costs adds to the total cost of traditional ERP (Aggarwal and Barnes, 2010).

According to V Ramaswamy, SMB global head (TCS), SMBs are in need of easy to use technology (Business standard, Jan 2010). With the changing needs and increase of customer base there is requirement of CRM and ERP solutions. As technology changes companies requires up gradation in their software this poses obstacles for the SMEs to scale up. In order to operate in limited budget a less complicated and simplified offering is required. At present most of the Indian and Foreign IT companies are focusing on SMEs for their cloud computing offerings. According to Leslie D'Monte, Cloud computing is providing huge opportunities for the Indian IT company that is helping them to develop cost effective business models. Such models help the SMEs to uplift their business in an effective and cost efficient manner. The promoter of 'The India Cloud Initiative' Vijay Mukhi said that there is a huge saving of money by using cloud technology as the industries have to pay only for the operating cost. The biggest advantage of a

hosted model (cloud computing) is that it eradicates the need to purchase the software license

s and also eliminates the cost associated with developing and operating in-house applications. In a hosted model, the capital investment, security, backup and server maintenance costs are all the

provider's responsibilities."

II.   ORGANIZATIONS ASSOCIATED WITH SMES INDUSTRY

Associated Chamber of Commerce and Industry of India (ASSOCHAM), Federation of Indian Exporters Organization (FIEO), World Association for Small and Medium Enterprises (WASME), Federation of Associations of Small Industries of India (FASII), Consortium of Women Entrepreneurs of India (CWEI), Laghu Udyog Bharti (LUB), Indian Council of Small Industries (ICSI), Small Industries Development Organization (SIDO), Small Scale Industries Board (SSIB), National Small Industries Corporation Ltd. (NSIC), Confederation of Indian Industry (CII), Federation of Indian Chamber of Commerce and Industry (FICCI), PHD Chamber of Commerce and Industry (PHDCCI), Small Entrepreneurs Promotion and Training Institute (SEPTI), Small Industries Development Bank of India (SIDBI) etc.
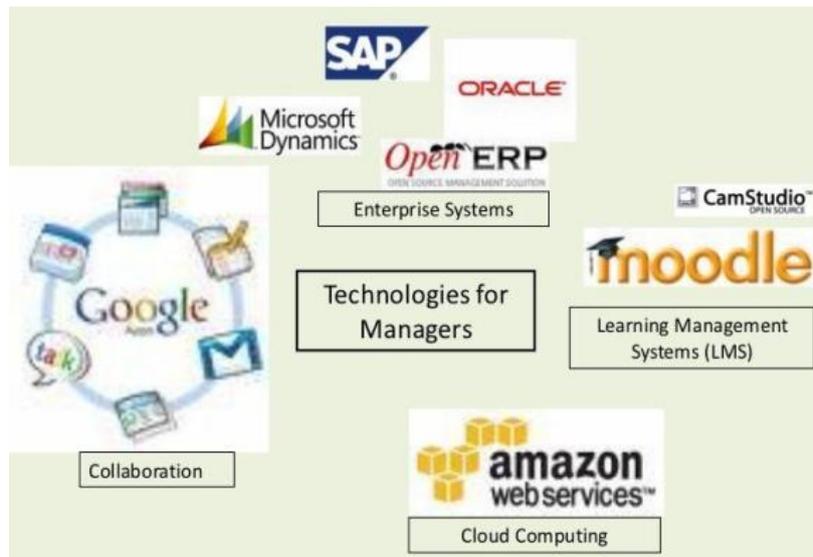
Figure- 1.2 Logical Diagram of Cloud export of cloud related services

III. IMPORTANCE OF THE SME SECTOR

Small and Medium Enterprises (SMEs) play a vital role for the growth of Indian economy by contributing 45% of industrial output, 40% of exports, employing 60 million people, create 1.3 million jobs every year and produce more than 8000 quality products for the Indian and international markets. SME's Contribution towards GDP in 2014 was 27% which is expected to increase to 38% by 2016. There are approximately 40 million MSME Units in India and 22 million persons are expected to join the workforce in the next 3 years. SMEs are the fountain head of several innovations in manufacturing and service sectors, the major link in the supply chain to corporate and the PSUs. By promoting SMEs, the rural areas of India will be developed.

SMEs are now exposed to greater opportunities than ever for expansion and diversification across the sectors. Indian market is growing rapidly and Indian entrepreneurs are making remarkable progress in various Industries like Manufacturing, Precision Engineering Design, Food Processing, Pharmaceutical, Textile & Garments, Retail, IT and ITES, Agro and Service sector.

IV. HYPOTHESIS DEVELOPMENT

The Cloud Computing is web based subscription model enabling the users to pay as per their need 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.
H2 : Cloud Computing Service Provide higher per user annual cost than traditional ERP system.
H3 : Cloud Computing Service are more flexible than traditional ERP systems.
H4 : Cloud Computing Service are less flexible than traditional ERP systems.

V. RESEARCH METHODOLOGY

This paper is a study of the scope of cloud computing for SMEs in India. The Main purpose of this paper is to examine and analyze the Scope of cloud computing for the SMEs in India. So, this research paper aims to develop a research model which would justify this papers affinity towards the use of cloud computing for Indian SMEs. One of the major challenges was to get the financial data of some SMEs and another was to understand which data to choose for analyzing the scope.

This research paper adopts a "Descriptive Type" of research. The research methodology used for the paper was kept very simple. Primary data was collected by conducting Telephonic interviews and by questionnaires sent through email and Secondary data was collected from the internet, news papers, magazines and journals. T- Test was applied on the collected data to test one of the hypothesis of this paper that using cloud computing based ERP software would cost the SMEs lesser than the traditional ERP software does. Factor rating method was used to test the other hypothesis that traditional ERP systems involve higher level of difficulty in terms of adaptability than the Cloud computing services.

5.1 Data Collection Methods:
1. Primary data: The Primary data for this Research paper was collected using telephonic interview with Some IT personnel from about More Then 40 Indian SMEs. It was a Structured Interview which comprised of sequenced questions. An E-mail based questionnaire was also used to collect the primary data. This questionnaire was sent to users of various traditional ERP software's in the above 40 Indian SMEs to get the general user view used to test the hypothesis H3.

2. Secondary data: The Secondary data was collected using

- ➢ **Internet:** The Sites of all ERP providing software's using SaaS technology were visited and the cost per user for each of them was collected via this method. The SAP By Design Software's site was well studied and even non numbered data was collected from the site.
- ➢ **Journals:** White papers from emerald Journal were used to collect the data.
- ➢ **News Papers:** the Business Standard daily business, Economics Times news paper was also used as a source for secondary data collection.

VI. ANALYSIS AND INTERPRETATION

Analysis Starting from the above mentioned information that SMEs will incur lower cost by using cloud computing services than by using traditional on premise ERP systems, the hypothesis H1 and H2 are analyzed as: In order to get the information about the ERP implementation cost, those SMEs were targeted where the IT investment cost ranges from 70 to 95 lakhs. The data that was collected was about per user per year cost incurred by the SMEs and the cloud computing prices offered by the different companies for the same units. This is illustrated in Table 1 and Table 2 respectively.

Table 1. Showing ERP Report

		ERP UTILISATION REPORT						
				(Amount Rs. In Lacs)				
		Avg. Avg	Avg.					
		Software Hardware	Connectivity		Total	No. Of	Cost	
Name Of The Company	Software Used	Cost Cos	Cost			Cost	Users	/User
Renuka Sugars Ltd.	Oracal Finance	*40.00*	*20.00*	*15.00*	*75.00*	*61.00*	*1.22*
Sigma India Pvt. Ltd	Sap	*42.00*	*21.00*	*16.00*	*79.00*	*75.00*	*1.05*
Prateek Industries Pvt.Ltd	Ramco	*38.00*	*20.00*	*14.00*	*72.00*	*50.00*	*1.44*
Hinds Motors Ltd	Peoplesoft	*35.00*	*18.00*	*14.00*	*67.00*	*52.00*	*1.28*
NBC Barring Ltd	Navision	*45.00*	*25.00*	*17.00*	*87.00*	*65.00*	*1.33*
Kusboo Chemical Ltd.	Oracal Finance	*42.00*	*25.00*	*18.00*	*85.00*	*57.00*	*1.49*
Nectors Pharma Ltd	Peoplesoft	*38.00*	*20.00*	*12.00*	*70.00*	*52.00*	*1.34*
Tirupati Textiles Ltd.	Oracal Finance	*40.00*	*22.00*	*17.00*	*79.00*	*65.00*	*1.21*

Table 2.

SAP Business ByDesign ($149 per user per month)	Salesforce Enterprise ($125/user/month)	Professional ($65/user/month)	Force.com unlimited ($75/user/month)
0.822	*0.69*	*0.358*	*0.414*

After analyzing the different cost structures of various companies offering cloud computing services it was found that charges were less than Rs.85000 per user per year approximately. Depending upon this information, t test was applied to know whether using cloud computing has low or high cost than on-premise ERP cost. On applying the test we get the following result:

Hypothesis	**H**
Mean	1.22
S.D.	0.214
T-Test	0.588
DF	9
R:t	>1.833
SL	5%
Result	**Accepted**

To determine the rejection region or acceptance region, one tailed test is applied at 5 percent level of significance using table of t-distribution for 9 degree of freedom we get the value:
R: t>1.833

The observed value of t is 0.588 which is in the acceptance region and thus H1 is accepted at 5 percent level of significance and it can be concluded that the sample data indicates that traditional on-premise ERP incurred higher cost as compared to cloud computing services.

6.1 Analysis using Factor Rating Method

In addition to the cost there are certain more factors based on which decision has to be made while implementing the cloud computing services for SMEs. So hypothesis H3 and H4 are analyzed:

To test this hypothesis factor rating method was used and the factors were analyzed on a scale of 3 in terms of difficulties faced by ERP and cloud computing customers. 1= Low difficulty 2= Moderate difficulty 3= High difficulty

Table below presents the different factors of adoption with their score and weighted score.

Table 3 Showing Analysis of factors of adoption of Cloud in SMEs

Parameter	ERP Score	Cloud Computing Score	Weights	ERP Weighted Score	Cloud Computing Weighted Score
Scalability	3	1	7.5	22.5	7.5
Availability	2	1	8.5	17	8.5
Maintainability	3	1	7	21	7
Accessibility	2	1	6.5	13	6.5
Suability	3	1	7.5	22.5	7.5
Appearance	2	1	7.5	15	7.5
Implementation	3	1	7.5	22.5	7.5
Security	1	3	8.5	8.5	25.5
Cost	1	3	8	8	24
Deployment	3	1	5	15	5
Flexibility	3	1	5.5	16.5	5.5
Intelligibility	2	2	6	12	12
Installation	3	1	7.5	22.5	7.5
Up gradation	3	1	7.5	22.5	7.5
Sum			**100**	**238.5**	**139**

VII. FINDINGS

From the above analysis based on the results obtained from t-test it is construed that cloud computing incurs lower cost than traditional ERP Systems. No capital investment for software infrastructure is required for any SaaS based ERP solution. So there are no hardware, software or implementation costs, which essentially are responsible for the unprecedented high cost of using a traditional ERP system.

Based on the financial data of the Indian SMEs that are analyzed above it is deduced that on an average these Indian SMEs would have saved approximately Rs. 35000 per user per year if they had preferred the SaaS Solution provided by "SAP Business ByDesign" instead of their already installed traditional ERP systems.

So using the cloud computing model would help the SMEs in optimizing their total cost incurred on ERP by higher per user annual savings. Based on the factor rating method it can be easily deduced that traditional ERP systems involve higher level of difficulty when analyzed in terms of adaptability than the Cloud computing services. So it is clearly evident that Cloud Computing services are more adaptable than traditional ERP systems.

VIII. CONCLUSIONS

The Main objective of this research paper was to analyze the scope of cloud computing for the SMEs in India for opportunities. For this purpose the paper analyzes per user annual cost as a parameter to compare the cost of using the traditional ERP solution and the cloud computing modeled SaaS based ERP systems. this research paper also compares the difficulty level for adaptability of the traditional ERP systems and the SaaS based ERP solution. After the analysis following conclusions are drawn:

The average amount saved by using the SaaS based ERP instead of the traditional ERP is about 35000 per user per year for the SMEs under consideration. So our hypothesis (H1) that Cloud computing service provides lower per user annual cost than traditional ERP systems is accepted.

Traditional ERP systems involve higher level of difficulty in terms of adaptability than the Cloud computing services. So our hypothesis (H3) that Cloud Computing services are more adaptable than traditional ERP systems is also accepted.

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