A study of the current situation of adoption of Cloud based services in Indian SMEs

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Abstract

This paper evaluates the current situation of adoption of Cloud based services by Indian Small and Medium Enterprises (SMEs). Cloud based services are a set of services that provide software, infrastructure and a platform for internet media and storage using a third party server. Cloud based services provides many benefits as it saves costs associated with investing in hardware and software, provides anytime accessibility, is flexible, and provides scalability. However, it also faces major challenges such as the loss of privacy and security, as well as legal and regulatory challenges. SMEs are said to be the essence of any vibrant economy. They are known to be the economic drivers of developing countries such as India. Cloud based services have grown in developed economies and are starting to pick up in India. This paper analyses the current situation, benefit and challenges of Cloud based services adoption for Indian SMEs. The target population for this study is SMEs in India using Cloud based services, regardless of the field of industry each enterprise is involved in.

 Keywords: cloud based adoption, small and medium enterprises (SMEs), India, economy, challenges.

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1. Introduction

1.1. Small and Medium Enterprises

Small and Medium Enterprises (SMEs) play a key role in local and national economies, and therefore contribute to the world economy [1]. As SMEs provide employment, create new jobs, and contribute significantly to a country's GDP, governments are naturally concerned regarding their well-being and vitality [1]. In both developing and developed countries, SMEs are also necessary for creating employment [2]. In developing countries, SMEs are the main supply of income, a breeding ground for entrepreneurs and a significant supplier of employment [2].

The Indian government uses the term MSME instead of SMEs, although Micro Enterprises will be excluded for this research. The Indian government defines Micro, Small and Medium enterprises as per MSME Act 2006, based on their investment in plant and machinery (for manufacturing enterprise) and on equipment for enterprises providing or rendering services [3].

According to Venkataramanaiah [4], SMEs are defined in the Indian context as enterprises with investment ranging from Rs. 2.5 million to Rs. 100 million, and manpower ranging from 25 persons to around 400 persons. Zaidi [5] states that the "SMEs sector of India is considered to be the backbone of the economy contributing to 50% of industrial output, 40% of India's exports, and employing 60 million people". Rao and Popli [6] state that there are approximately 40 million SMEs, and these SMEs would like to be able to access reliable, easy to use and scalable IT applications that assist them to develop and grow in their business sector. SMEs in India produce 8000 plus products for local and international markets. The tendency of local and foreign investors to fund SMEs, the availability of innovative technology that assists with the growth of the SMEs, and the existence of trade portals and directories that help facilitate trade between buyer and supplier are some of the factors that contribute to the growth of the SMEs in India [7]. SMEs are considered to be the backbone of the Indian economy.

2. Discussion

2.1. Literature Review

According to Armbrust [8], Cloud based services is a way of offering IT services for customers as a utility. This technology allows and enhances the capabilities of consumers through a wide range of services and products. The cloud is the part which consists of hardware and infrastructure. In Cloud based services, the applications, hardware and data are hosted by a third party. The National institute of standard and technology defines Cloud based services as follows:

"Cloud based services is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service-provider interaction." [9]

According to Mell and Grance [10], when Cloud based services is adopted, users can focus on their core businesses and day to day work without spending too much effort on computers and information technology. Users do not have to worry about the software licences, software updates, hardware installations, hardware repairs or any sort of businesses. As per Rawal [11], Cloud based services is like consuming electricity for day to day use without worrying about whether electricity is generated from hydraulic power or solar power. Thus Cloud based services provides freedom and flexibility to users to focus on their main business, while providing the advantages of advanced technology for their enterprises. Adoption of Cloud based services is a cost and benefit involving task. Hence proper cost benefit analysis should be performed before adopting Cloud based services for small businesses. The business model should be restructured and the organization structure should be reshaped to gain maximum benefit from Cloud based services adoption [12].

Cloud based services enable the IT industry to provide computing as a utility rather than a product. Cloud based services is a way to improve capabilities and expand capacity without adding expensive infrastructure and recruiting, training new personnel or investing in new software. This feature encompasses subscription basis or pay per use basis services that suit SMEs needs. SMEs do not have the capability to invest hugely in Software and IT infrastructure. Hence Cloud based services can be a good solution for India's SMEs [13]. This paper shows the current situation of adoption of Cloud based services in Indian SMEs.

2.2. Cloud based awareness in Indian SMEs

A survey was carried out to identify the level of awareness amongst SMEs by the Indian Institute of Technology Bombay. 63 SMEs participated in the survey and the results of the survey showed that the awareness about information technology and Cloud based services among SMEs is very low. According to the survey, 44.5% claimed that the employees had no awareness about how to use ICT tools. Only 51% were aware about Cloud based services. Even though 51% were aware about Cloud based services, only 24% among them were interested in adopting Cloud based services to their enterprises [14]. The survey shows that even though Cloud based services can benefit SMEs in India in numerous ways, a lack of awareness and reluctance to change and adopt Cloud based services makes it difficult to penetrate through SMEs. More awareness about the ICT sector and Cloud based services can educate small and medium enterprise owners and employees. There are both pros and cons about using Cloud based services for SMEs which will be discussed in this paper.

2.3. Cloud based services in India

Cloud based services has grown at a faster rate with the development of information technology in India. As per the springboard research report (Jan 2009), software as a service (SAAS) recorded an annual growth rate of 76% within the 2007-2011 time periods. India is a niche to Cloud based services since the Indian market has more than 35 million small and medium enterprises which have not experienced Cloud based services. These enterprises are keen to move forward with the help of information technology, especially those companies who are based on the internet. Cloud based services can be a very good help for these enterprises since they are looking for more reliable, yet scalable applications that help to expand and grow their business. India is the fastest growing SAAS market in the ASIA-PACIFIC region [14] .

Jeremy Cooper from Salesforce.com states that the market for SAAS has been growing exponentially since 2005. With the huge demand for Cloud based services in India, IBM launched a Cloud based services center in Bangalore in September 2008. They provide infrastructure services for web based enterprises. Since 2008 IBM has introduced innovative technologies targeting the Indian market in collaboration with Kanpur IIT. Bharti Airtel also launched Cloud based services. Some other companies like Reliance mobile, HCL technologies Private limited, TCS, Wipro electronics, Netmagic limited, Verizon mobiles; Novatium etc. have also introduced Cloud based services to the Indian market. In addition, there are many other companies yet to provide Cloud based services in India [14].

Cisco [15] reports that the Cloud market in India is growing superfast. IDC, a research company who conducts technology research, found that in 2012 the Cloud market in India was worth 688 million dollars. They expect that in 2016 the value will reach up to 3.5 billion dollars. According to this research all of the large corporations in India run at least part of their business in the Cloud. Successful small and medium businesses like bookmyshow.com, redbus etc. has set an example to other small and medium businesses to enter into the Cloud market [15].

Even though there are roughly 50 million startups and small and midsized businesses in India more than 43 million are traditional small businesses which don't even have internet connections. Hence there is still a huge barrier to entering Cloud based services for SMEs. According to the 2013 report of broadband commission, India is ranked as number 122 in the

world for fixed broadband penetration. As a percentage, only 1.1 per 100 has access to fixed broadband facility. If fixed broadband connectivity can be increased, the Cloud adoption will be high. Nevertheless there are 900 million mobile subscribers who use Cloud resources using their mobile phones [16].

According to a study carried out by Intuit India, Indians resist Cloud adoption due to various reasons. Cost and affordability, low ICT skills, concerns about return on investments, the unwillingness to take risks, lack of awareness of benefits and capabilities, lack of innovative thinking etc. are the main reasons for reluctance. But researchers have found that 50% of the startups are willing to adopt Cloud based services for their businesses [17].

2.4. Advantages & Disadvantages of Cloud based services for Indian SMEs

In the past few years, SMEs have started to become aware of Cloud based services and the financial benefits it can provide [18]. Apart from these, SMEs obtain some advantages in saving on infrastructure and technology, easier scale-up of services and applications, and also faster upgrades of software [19]. According to Richard [20], it was predicted that by 2013 more than half of SMEs will use Cloud based services. In some shape or form Cloud based services offers both time and cost saving, and suits SMEs IT service's needs. Development of SMEs is important in countries like India with huge unemployment within urban sections of the economy [21]. In spite of these advantages, many organizations worldwide have not yet adopted Cloud based services. The figure below compares some of the benefits SMEs obtain with Cloud compared to the traditional IT infrastructure model.
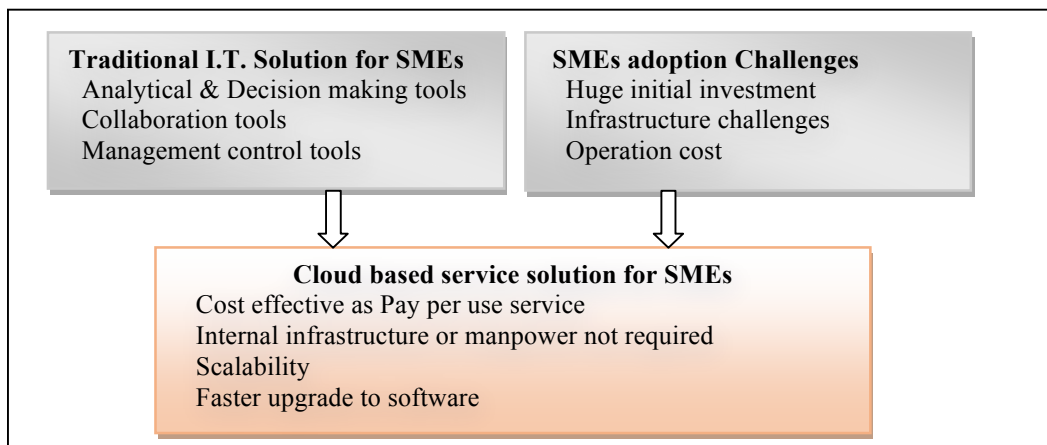

Figure 1: Cloud based service solution to Indian SMEs compared to traditional IT based solutions

One of the best reasons for considering Cloud based services is the scalability. Cloud based services can be easily used to scale down the business infrastructure to save its capital costs and maintenance costs [22]. Furthermore, the cost of hardware that needs to run the business such as computers, servers, etc.; software and licensing etc.; and skilled workforce can be reduced when Cloud based services is adopted. Cloud based services also provides secondary benefits like low power consumption. Since Cloud can host a very large amount of data, the efficiency of the organization also improves [23-25]. Since Cloud based services is very fast and proactive it helps business to be more responsive in operations [23]. Gangwar [26] illustrates that Cloud computing adoption also provides strategic advantages such as mobility, pay per use and scalability to SMEs. Since Cloud based services are mostly adopted as a pay per job procedure, cost flexibility is high. Hence SMEs can easily get the required service without spending an extra amount of money for unwanted facilities. For example Google mail can be utilized free of charge for communication within the company [27]. Cloud based services offers many services according to the client's requirements.

Cloud based services is fully customizable, which effectively benefits SMEs that adopt Cloud

based services for their businesses. Cloud based services are also innovative and flexible. Hence, adopting Cloud based services may attract more businesses to SMEs. Moreover, the adoption of Cloud based services can uplift the quality of the business [23].

As with every other system, Cloud based services have their own advantages and disadvantages. The security of a Cloud is one of the main barriers for adoption of Cloud based services by many organizations. Breach of security of the Cloud infrastructure may disclose more important and classified data of customers as well as stakeholders such as business partners, suppliers, owners, shareholders etc. The organization's data ownership is the main concern when adopting Cloud based services [28].

Cloud based services can make businesses feel insecure, and this is heightened by the ever growing existence of Cyber threats. Assurance of privacy of the employee's data and integrity, and consistency of the retrieved data are main reasons for organizations to have second thoughts about moving to Cloud space. When dealing with more than one Cloud service provider the reluctance can become severe. Lack of transparency of Cloud services is another disadvantage [29].

Another disadvantage is the compatibility, as most of the existing applications are not compatible with Cloud space and applicability is a huge issue [30, 31]. For example, most of the SMEs use typically available software packages for day to day work while Cloud services use entirely different platforms. The problem arises when the two platforms are not compatible. Hence Cloud service providers need to be more flexible when providing services [32]. It is more important for organisations that operate daily on a Cloud platform. But failures in Cloud servers can jeopardise whole businesses. Any delay or error in the Cloud server can also shut down the business. Hence the risk involved with Cloud based services is very high [23, 32, 33].

2.5. The Future of Cloud based services

The future of Cloud based services is very bright in India according to the Indian industry reports. According to a report published in the 12th edition of Connect (ICT event), the growth expected over the next 3 years is more than 40%. The report states that Indian IT-BPO vendors can develop their Social Media, Mobility, Analytics and Cloud based services (SMAC) strategies and cross the $225 billion mark by 2020. SMAC will enable the Cloud for storing more volumes of multi structured data, providing more access to mobiles to work in the Cloud on the go [34].

The industry estimates the world ICT spending will hit 5 trillion dollars by the end of the year 2020. This huge investment will be driven by Cloud, analytics and social media. SMAC contributed about 20% of the total ICT spending in the year 2012. The growth rate of SMAC collectively is 18% per year which is six times faster than the rest of the IT industry. At the end of the year 2020, 80% of the spending will be for SMAC [34].

Increasing the usage of social media by consumers and businesses will help Cloud services to capitalise on growth. The demand will be focused on the analytics and Cloud based services models. The analytics will drive enterprises through handling large amounts of data sets, and analysing critical factors of businesses using intelligent Cloud models. The cost will also be more optimised in the future according to the report. Mobile internet users are expected to increase from 4.1 million in 2009 to 164.8 million in 2015. This is a massive 85% increase within 6 years' time allowing Cloud service providers to expand their industry towards mobile applications. The CII report further states that there are over 900 million mobile subscribers in India. With the development and coverage of 3G and 4G networks throughout the country, the internet accessibility will be rapidly increased [34]. Hence Cloud based services in India will grow faster than any other industry within the next few years. According to Sharma, Daniel [35] the adoption of Cloud based services by SMEs in India will grow rapidly if Cloud service providers are sensitive to the demands of SMEs.

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3. Conclusions

SMEs are the backbone of the Indian economy. Hence, the development of further SMEs in India can certainly uplift the economy of the country from its current position. Subsequently, it is very important to find ways of improving the millions of SMEs in India. Cloud based services can be identified as one of the main factors that have improved SMEs throughout the world. This research analysed the current situation as well as the benefits and challenges of adopting Cloud based services by Indian SMEs. The results of the research will help SMEs to decide whether to adopt Cloud based services or not. But more importantly what matters most is the innovative thinking and how much SMEs are ready to adopt Cloud based services to their businesses.

References

[1] Winter, S. J., Gaglio, C. M., & Rajagopalan, H. K. (2009). The Value of Information Systems to Small and Medium-Sized Enterprises. *International Journal of E-Business Research*, *5*(1), 5-91.

[2] Karabek, M. R., Kleinert, J., & Pohl, A. (2011). Cloud Services for SMEs–Evolution or Revolution?'. *Business+ Innovation*, *1*, 26-33.

[3] MSME. Definitions of Micro, Small & Medium Enterprises. 2013 [cited 2013; Received from: http://www.dcmsme.gov.in/ssiindia/defination_msme.htm.

[4] Venkataramanaiah, S., & Parashar, S. P. (2007). Enhancing the competitiveness of SMEs through industrial clusters: The Indian experience.*International Journal of Technology Management & Sustainable Development*,*6*(3), 227-243.

[5] Zaidi, L. (2013, March). Problems affecting the growth of small and Medium Enterprises (SMEs) in India. In *International Conference on Technology and Business Management* (Vol. 3, No. 2).

[6] Popli, G. S., & Rao, D. N. (2009). An empirical study of SMEs in electronics industry in India: Retrospect & prospects in post WTO era. *Available at SSRN 1459809*.

[7] Jain, V., MSMEs in India: It's Growth & Problems. 2013.

[8] Fox, A., Griffith, R., Joseph, A., Katz, R., Konwinski, A., Lee, G., ... & Stoica, I. (2009). Above the clouds: A Berkeley view of cloud computing. *Dept. Electrical Eng. and Comput. Sciences, University of California, Berkeley, Rep. UCB/EECS*, *28*, 13.

[9] NIST. The NIST Definition of Cloud Computing. 2011; Received from: http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf.

[10] Mell, P., & Grance, T. (2011). The NIST definition of cloud computing, *53*(6).

[11] Rawal, A. (2011). Adoption of Cloud Computing in India. *Journal of Technology Management for Growing Economies*, *2*(2).

[12] Brynjolfsson, E., Hofmann, P., & Jordan, J. (2010). Cloud computing and electricity: beyond the utility model. *Communications of the ACM*, *53*(5), 32-34.

[13] Bhat, J. M. (2013). Adoption of Cloud Computing by SMEs in India: A study of the Institutional Factors.

[14] Sharma, M., Mehra, A., Jola, H., Kumar, A., Misra, M., & Tiwari, V. (2010). Scope of cloud computing for SMEs in India. *arXiv preprint arXiv:1005.4030*.

[15] Cisco, CISCO. 2013.

[16] Bilbao-Osorio, B., Dutta, S., & Lanvin, B. (2013). The global information technology report 2013.

[17] Iye, E. K., Krishnan, A., Sareen, G., & Panda, T. (2013). Sectorial Adoption Analysis of Cloud Computing by Examining the Dissatisfier Landscape.*Electronic Journal of Information Systems Evaluation*, *16*(3), 211-219.

[18] Neves, F. T., Marta, F. C., Correia, A. M. R., & Neto, M. D. C. (2011). The adoption of cloud computing by SMEs: identifying and coping with external factors.

[19] Cruz-Cunha, M. M. (Ed.). (2009). *Enterprise Information Systems for Business Integration in SMEs: Technological, Organizational, and Social Dimensions: Technological, Organizational, and Social Dimensions*. IGI Global.

[20] Richard, E., Saving money with cloud applications for small business. 2011.

[21] Kannabiran, G., & Dharmalingam, P. (2012). Enablers and inhibitors of advanced information technologies adoption by SMEs: An empirical study of auto ancillaries in India. *Journal of*

Gide, E. & Sandu, N. (2015). A study of the current situation of adoption of Cloud based services in Indian SMEs. *Global Journal of Information Technology*. *5*(1), 18-24.

Enterprise Information Management, *25*(2), 186-209.

[22] Phaphoom, N., Oza, N., Wang, X., & Abrahamsson, P. (2012, August). Does cloud computing deliver the promised benefits for IT industry?. In *Proceedings of the WICSA/ECSA 2012 Companion Volume* (pp. 45-52). ACM.

[23] Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. (2011). Cloud computing—The business perspective. *Decision Support Systems*, *51*(1), 176-189.

[24] Sultan, N. A. (2011). Reaching for the "cloud": How SMEs can manage. *International journal of information management*, *31*(3), 272-278.

[25] Pandey, A., Pandey, A., Tandon, A., Maurya, B. K., Kushwaha, U., Mishra, D., & Tiwari, V. (2010). Cloud Computing: Exploring the scope. *arXiv preprint arXiv:1005.1904*.

[26] Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *Journal of Enterprise Information Management*, *28*(1), 107-130.

[27] Sultan, N. (2010). Cloud computing for education: A new dawn?. *International Journal of Information Management*, *30*(2), 109-116.

[28] Catteddu, D., & Hogben, G. (2009). Cloud computing risk assessment. *European Network and Information Security Agency (ENISA)*, 583-592.

[29] Sengupta, S., Kaulgud, V., & Sharma, V. S. (2011, July). Cloud computing security--trends and research directions. In *Services (SERVICES), 2011 IEEE World Congress on* (pp. 524-531). IEEE.

[30] Heinle, C., & Strebel, J. (2010). IaaS adoption determinants in enterprises. In *Economics of Grids, Clouds, Systems, and Services* (pp. 93-104). Springer Berlin Heidelberg.

[31] Dargha, R. (2012, August). Cloud computing: from hype to reality: fast tracking cloud adoption. In *Proceedings of the International Conference on Advances in Computing, Communications and Informatics* (pp. 440-445). ACM.

[32] Leavitt, N. (2009). Is cloud computing really ready for prime time? *Computer*, (1), 15-20.

[33] Kim, W. (2009). Cloud Computing: Today and Tomorrow. *Journal of object technology*, *8*(1), 65-72.

[34] ICT, C., Ciiconnect. 2013.

[35] Sharma, S., Daniel, E. M., & Gray, C. (2012). Absorptive capacity and ERP implementation in indian medium-sized firms. *Journal of Global Information Management (JGIM)*, *20*(4), 54-79.