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The economic benefits of cloud-based E-commerce in Indian service small to medium businesses (SMBs)

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Abstract

This research paper investigated the economic benefits of Cloud-based E-commerce in Indian service small to medium businesses (SMBs). The emergence of the new concept of Cloud computing has greatly changed the way in which organisations are managing their services. Cloud computing primarily includes the process of providing computing resources as a service rather than a product in an organisation. They provide different opportunities to the society which include reduction of poverty, development of rural areas, and generation of job opportunities, entrepreneurship, and export of nation and so on. Hence, it is necessary to adopt new technologies so as to enhance their business performance, improve competitiveness and reduce cost. However, service SMBs are facing several issues in India which are ultimately due to lack of sufficient resources. For this purpose, an online survey was conducted to evaluate the level of economic benefit is obtained by Indian service SMBs.

Keywords: Cloud computing, cloud-based E-commerce, Indian service small to medium businesses (SMBs), economic benefits.

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1. Introduction

Cloud computing is seen as an emerging concept that has transitioned from being just an emerging technology to a mainstream powerhouse that is used by both the big and small enterprises throughout the world. With numerous business enterprises going digital, Cloud computing has proven to be beneficial to not only the enterprise, but to the workforce, and thus has been seen to enhance speed, increased access to information and reduced costs Marston, Li, Bandyopadhyay, Zhang & Ghalsasi [20]. Besides, Cloud computing has been to be essential for businesses since instead of organisations running their applications on the PC, they run it on a shared multi-tenant platform [6]. This has given the organisations an advantage in the way they provide their services to their consumers. Through this platform, the small and medium businesses (SMBs) can customise the platform according to the customer needs and demands. In India, the SMBs are considered to be vital to the economy since they contribute to about 8% to the Indian GDP and 45% of the country's manufacturing output [26]. For this reason, this paper is going to focus on the economic benefits of Cloud-based E-commerce in Indian service SMBs.

2. Literature review

The emergence of Cloud computing in the modern society has significantly changed the way enterprises are operating the businesses. According to Kuada, Adanu and Olesen (2013), the adoption of Cloud computing has been evidenced to enhance the aspirations of the SMBS to enter into competition with the big business firms. This means that the adoption of emerging technologies is paramount for any business firm since it can result in enhanced efficiency, innovation and productivity [19]. However, despite the rapid advancements in technology, the SMBs are traditionally disadvantaged given that they are limited in their resources and hence have challenges regarding adopting the right kind of the systems. Cloud computing is seen to be quite expensive for the SMBs given that they require the use and adoption of high-technology systems, costs and changing usage models. Therefore, because of resources, size, IT expertise and other constraints, Cloud computing is perceived to have the certain advantage to the Small and Medium Enterprises (SMEs) globally [9]. Besides, the adoption of the Cloud computing in E-commerce with the associated internal information technology data migration is associated with numerous risks and challenges that can affect the operations of the SMBs [21]. However, with the associated benefits of Cloud computing, various SMB have adopted the use of Cloud-based E-commerce.

With the advantages of the use of Cloud computing services, about 74% of the companies that have adopted the use of Cloud-based computing services indicate that the adoption of this platform would have a measurable impact on their businesses [7]. In the UK, the adoption rates of the Cloud computing services are seen to be high (88%) as compared to the U.S. This number was up from about 54% in 2015 and 62% in 2016 [14]. Besides, it was seen that most of the Cloud-based user organisations had adopted the hybrid approach (58%) to IT and 54% remotely hosting their Cloud-based services [7].

2.1. Type of Cloud computing in SMBs

According to Buyya, Broberg and Goscinski [3], the Cloud computing platform offers firms with various types of Cloud computing which they can select from. This can be classified under various Cloud-based service platforms, as mentioned in Table 1.

Table 1. Type of Cloud service

Infrastructure-as-a-Service (I)	Platform-as-a-Service (P)	Software-as-a-Service (SaaS)
<p>This kind of Cloud computing service mainly involves the delivery of virtualised resources (computing/storage) based on the demand and is primarily considered as one of the most fundamental types of Cloud computing service models among business firms.</p> <p>This framework involves the consideration of a Cloud user as being primarily responsible for the maintenance and patching of the application software and operating systems (Lin, Fu, Zhu & Dasmalchi, 2009).</p>	<p>The Platform-as-a-Service (PaaS) is another Cloud computing platform for the SMBs which delivers a computing platform that mainly involves the software development model and the operating system (Lin et al., 2009).</p> <p>This type of framework is majorly interesting for the developers since it provides a higher level of Cloud abstraction (Durkee, 2010; Lin et al., 2009).</p>	<p>Through this type of Cloud computing service, the application software is first installed by the Cloud providers, and then the consumers are provided with an opportunity to access the application software through the use of their Cloud client software (Lin et al., 2009). The use of the SaaS requires that the maintenance and the support, and upgrading of the software applications are performed by the end users.</p>

2.2. Influence of Cloud computing applications and services on E-commerce businesses

E-commerce is primarily defined as the process through which products and services are exchanged through the internet [25]. With the rapid pace of the emerging technologies, the SMBs have been seen to adopt the use of Cloud-based computing services to enhance their operations in the market. First of all, Cloud computing has enabled the E-commerce businesses to rent the hardware and the software rather than purchasing them, and thus helping them reduce the cost of system building [25]. According to Grossman [11], average utilisation efficiency is less than 10% that results in the waste of IT resources. However, with the Cloud computing platform, the enterprises can be able to integrate their idle IT resources and even rent them to the consumers. This results in reduced costs of operation of the e-commerce firm and prioritises the allocation of resources to certain business units. Traditionally, the e-commerce firms had to purchase the required hardware and software, which resulted in high operating expenses for these firms. However, through Cloud computing, these organisations can virtually rent the IT services and products depending on its demand, and thus being able to compete favourably in the market. Second, the Cloud computing platform has been seen to solve the problems of utilisation efficiency [25]. For the e-commerce organisations, it is crucial to invest in specific hardware and software utilities to maintain and increase operations. However, with increased investment, the organisation can witness efficiency problems.

2.3. E-commerce and SMBs in India

According to Sharma and Sharma [22], E-commerce is emerging as a medium to help SMB to compete in the market and contribute to the economic growth. Furthermore, it can increase business opportunity, enhanced competitiveness and provide better access to markets. Recently, SMB adoption to E-commerce is growing due to better access to the technical and communication infrastructure. The emergence of robust payment gateway, new mobile technologies and Cloud-based application has enhanced e-commerce business application. In India, Google pioneered the advertisement-based revenue model and Amazon gave a whole new dimension to e-business based on Supply chain logistics (Hegde, 2015). Social media with sites like Facebook, Twitter and YouTube use multiple platforms to reach their audiences, building an opportunity for businesses. Cloud computing and mobile application as digital technologies had also emerged as a catalyst for rapid economic growth (Sindhu, 2017).

In India, it is approximated that there are about 48 million SMEs which is twice the number of the small enterprises in the U.S (23 million) [1]. According to KPMG (2015), the increase in technologies has resulted in most of the India firms adopting the use of e-commerce and Cloud computing services to enhance their operations. This has resulted in the growth of the e-commerce sector in the country over the years. As a result of this, the e-commerce sector in the country is estimated to contribute up to about \$80 billion by 2020 (KPMG, 2015). This follows the fact that there has been an increase in the usage of the Internet and the penetration of the smartphones, and thus increasing the market awareness of e-commerce. In around 2014, there were an estimated 281 million internet users in the region which is estimated to rise up to 640 million by 2019. With the availability of smartphones, it is estimated that India is going to outpace the United States, to become the second largest internet user-based country (KPMG, 2015).

With this growth in the number of users, the India e-commerce sector is estimated to grow further. The increase in the internet usage has also resulted in the growth of SMEs/SMBs utilising the e-commerce platforms. The SMBs in India are dependent on the internet technologies, and it is estimated that approximately 43% of the SMBs participate in online sales (KPMG, 2015). This is because the web-based SMBs are believed to make higher profits since they have enhanced customer reach and increase employment opportunities. According to the survey conducted by KPMG, it was seen that more than 56% of the SMBs believed that the use of the internet technologies is paramount for business growth as compared to 22% who were not aware (KPMG, 2015).

2.4. The importance of SMBs to the Indian Economy

The Indian economy is considered as the fastest major economy throughout the world owing to the increase in the number of SMEs/SMBs in the region (KPMG, 2017). The SMBs are considered to be the backbone of the country's economic growth. According to the 2015–2016 annual report, the Micro, Small, and Medium Enterprises were estimated to be more than 51 million and contributed to approximately 37.5% of India's GDP, and 37% of the manufacturing output (KPMG, 2017). The digital transformation witnessed in the country has become the major landscape in which the SMBs operate, and this has resulted in increased revenue growth in the country. Besides, the government's support of the digitisation of the SMBs has resulted in increased e-commerce operations in the region by more than 50%–60% (KPMG, 2017). As a result, it is estimated that the contribution of the SMBs to India's GDP could increase from about 10% to more than 46%–48% [4].

The SMBs are seen to play a critical role in driving regional development. Despite operating with minimal capital and infrastructure, the increased digitisation is seen to enhance the operations of these enterprises. Besides, the SMBs in India are seen to engage in diverse trades which has resulted in the employment of more than 117 million people and 37% output in the manufacturing sector (KPMG, 2017).

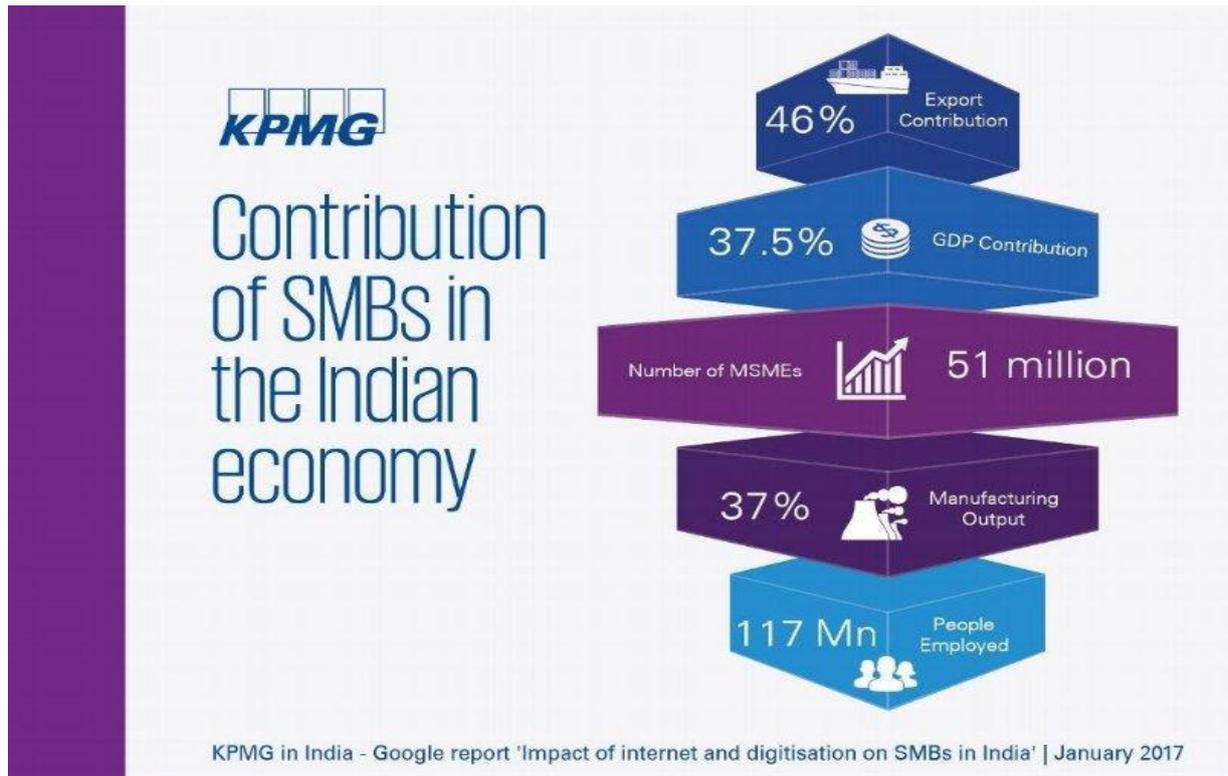


Figure 1. Contribution of SMBs in the Indian Economy (Source: KPMG, 2017)

With increased consumption and employment opportunities in the region, SMBs has been able to reduce the poverty levels in the country and driven increased economic growth. This can be seen in Figure 1.

3. Research data

Despite research on the importance of SMBs to the economic growth of the country, little research has been done on the economic importance of Cloud computing to the SMBs. Therefore, this study sought to identify the economic importance of Cloud computing to the Indian SMBs. To understand this, a survey was conducted among the Indian SMEs to identify the use of Cloud computing in these enterprises, using Google Forms. The invitation was sent to random 500 SMBs to complete the survey, to improve the response rate reminder to complete the survey was sent after 2 weeks.

During the study, a total of 42 responses were obtained from various sector respondents. To identify the industry in which the companies operated, the respondents were asked to indicate where their companies were characterised as shown in Figure 2. From their responses, it was seen that a high number of the SMBs ($n = 8$, 19%) were in the Advertising, Banking and Education Institute sector. However, there were no SMBs in the telecommunication sector with the construction, law/legal, logistics, manufacturing, media and the NGO sector making only about ($n = 1$, 2.4% each).

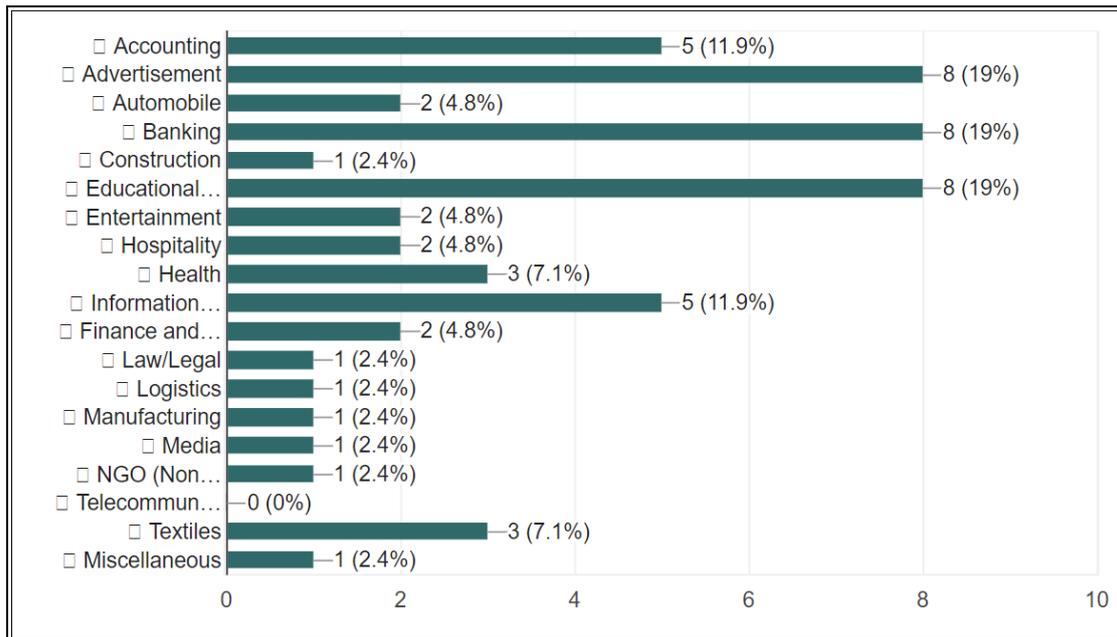


Figure 2. Characterisation of the SMBs per industry

To understand if the SMBs had adopted Cloud computing in their organisation as shown in Figure 3, about ($n = 16, 38.1\%$) indicated that they were planning to adopt the platform while ($n = 15, 35.7\%$) indicated that they were currently testing the platform. In the other sense, only about ($n = 7, 16.7\%$) indicated that they were currently using this services as compared to ($n = 5, 11.9\%$) who were not using Cloud computing services.

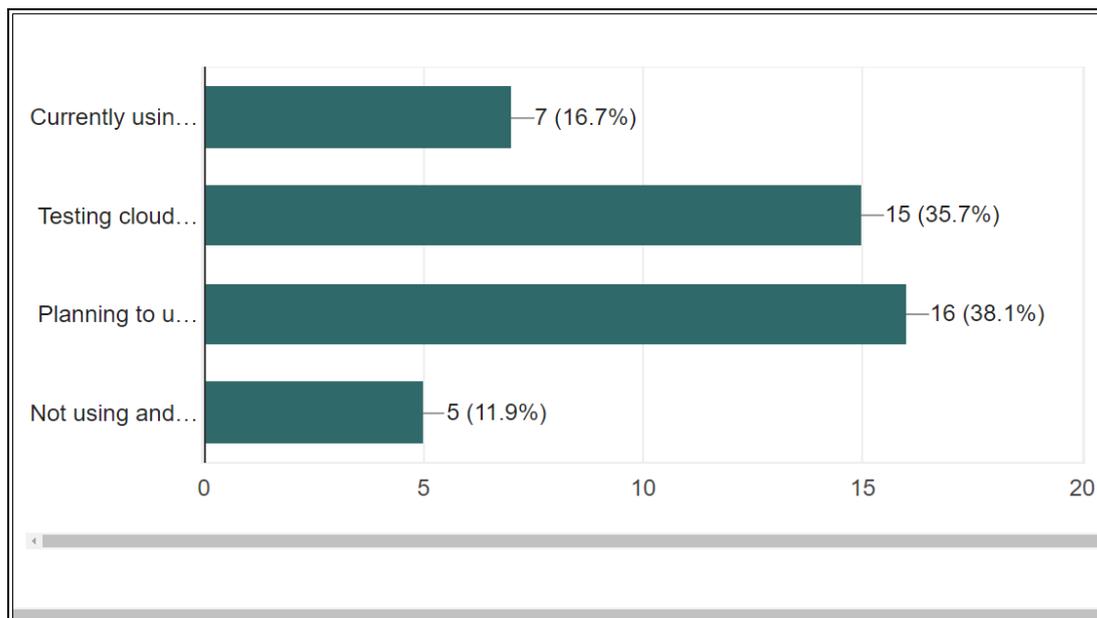


Figure 3. Adoption of Cloud computing services by organization

In the quest to understand the type of Cloud computing services that the organisations were using as shown in Figure 4, it was evident that two Cloud computing services were mainly adopted by these

organisations. From the study, it was seen that ($n = 21, 52.5\%$) used the Platform-as-a-Service (PaaS), while ($n = 18, 45\%$) used the Software-as-a-Service (SaaS). This can be seen in Figure 4.

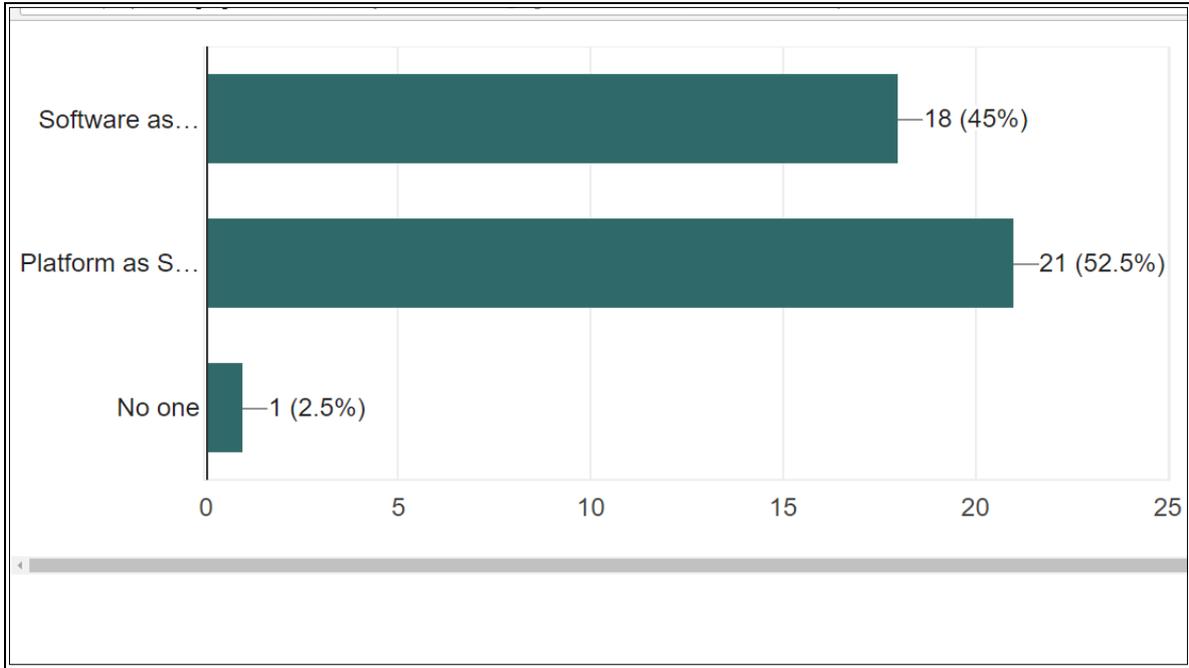


Figure 4. The type of Cloud computing services used by organisations

Regarding the current IT expenditure on Cloud computing in the organisation as shown in Figure 5, most of the firms are evidenced to spend more than 5% of their budget ($n = 8, 19\%$) on Cloud computing. A few organisations ($n = 1, 2.4\%$) are seen to spend between 1% and 2% and more than 10.5%.

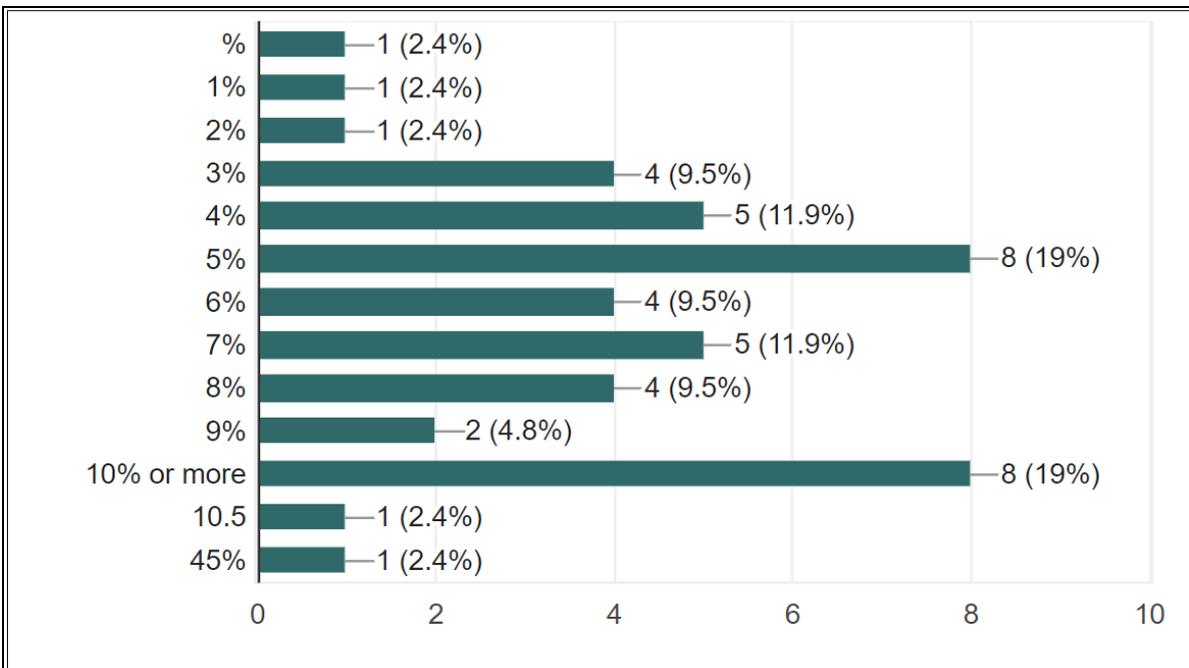


Figure 5. The IT expenditure on Cloud computing in the organization

For the organisations that were using the Cloud computing services, they were asked to indicate the reasons why they were using the platform. From the responses, as shown in Figure 6, it was evidenced that a high percentage ($n = 11, 26.2\%$) adopted the platform as a result of scalability and flexibility of the platform. Besides, others ($n = 10, 23.8\%$) indicated that they used the platform to reduce the IT costs in their organisations. However, only a few ($n = 2, 4.8\%$) indicated that they used the platform since the core processes were executed in a standard way.

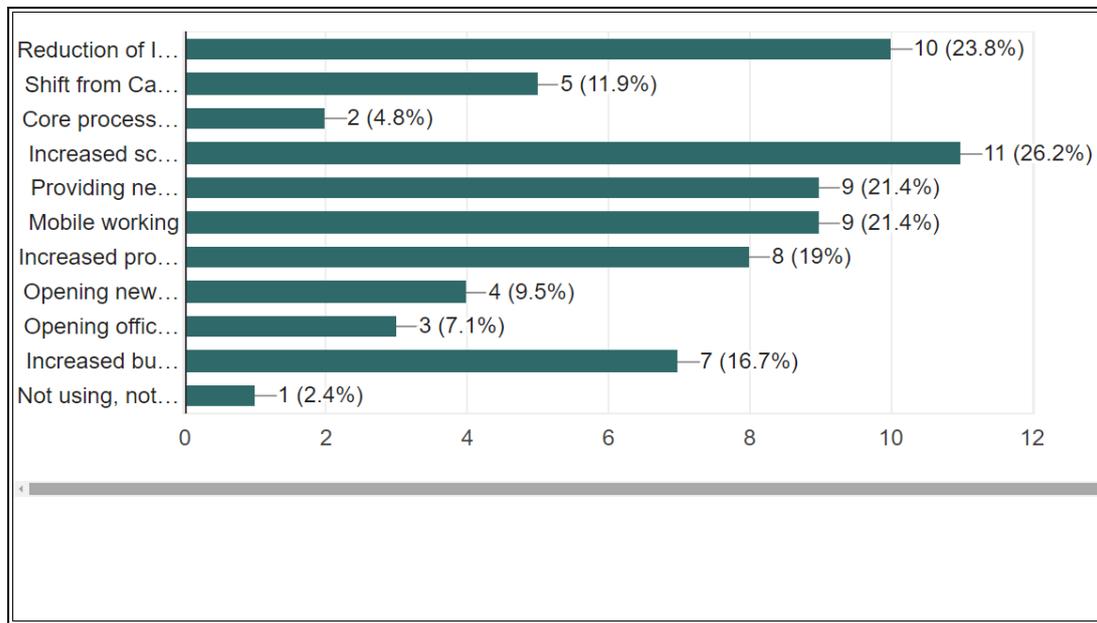


Figure 6. The purpose of use of Cloud computing platform

To understand if there was any impact on the use of Computing following increased IT expenditure as shown in Figure 7, about ($n = 18, 45\%$) indicated that there was indeed an impact as compared to ($n = 16, 40\%$) who said no.

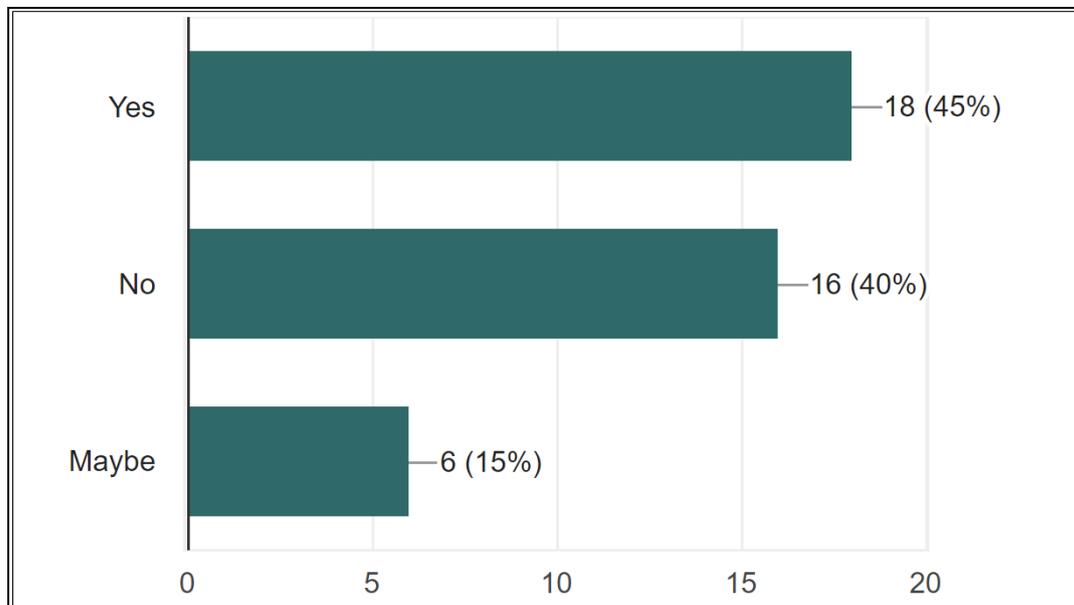


Figure 7. Impact on the overall IT expenditure due to the adoption of Cloud computing services

Regarding if there were a reduction in costs due to investment in IT infrastructure due to the adoption of Cloud-based services, a high number of the respondents as shown in Figure 8 indicated that they strongly disagreed that the Cloud-based services had resulted in decreased capital expenditure in the organisation as compared to those who agreed. In terms of if the Cloud-based services decreased investment in the new infrastructure an equal number ($n = 10$) of those who somewhat agreed and disagreed respondent. In the other sense, only one respondent agreed with this as compared to three individuals who disagreed with this statement. When asked to indicate if there were any additional barriers as a result of the adoption of Cloud computing in the organisation, a high number ($n = 17$, 40.5%) indicated that there were no additional barriers as compared to ($n = 14$, 33.3%) of those who said yes.

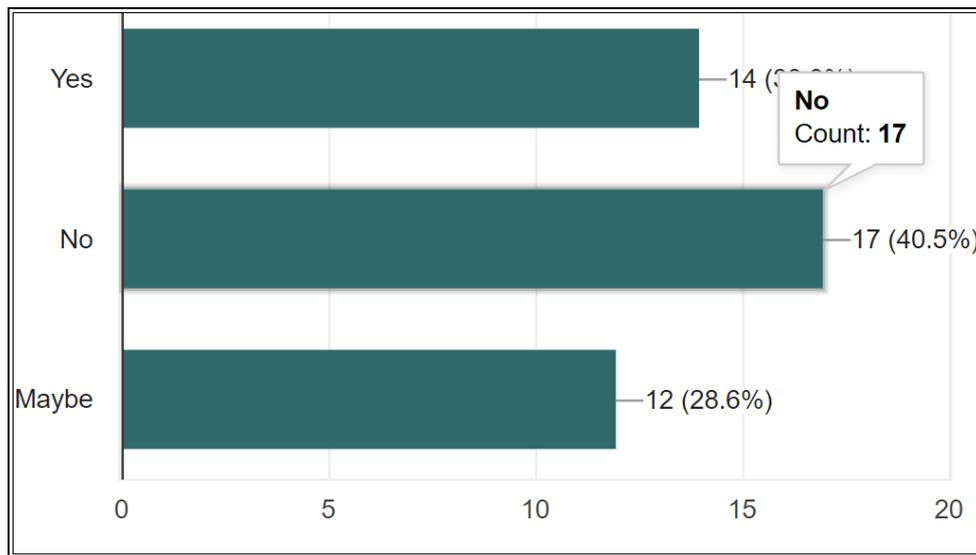


Figure 8. Barriers to adoption of Cloud computing

To get an understanding of the impact of the barriers, the respondents were asked to indicate if there were direct or indirect costs on the consumer of the Cloud-based services and the kind of costs that were likely to occur. From the responses as shown in Figure 9, it was clear that there were costs that were associated with the legal aspects of the platform ($n = 21$, 50%), direct costs related to the tailored advice on Cloud services and costs associated with the time invested ($n = 12$, 28.6%).

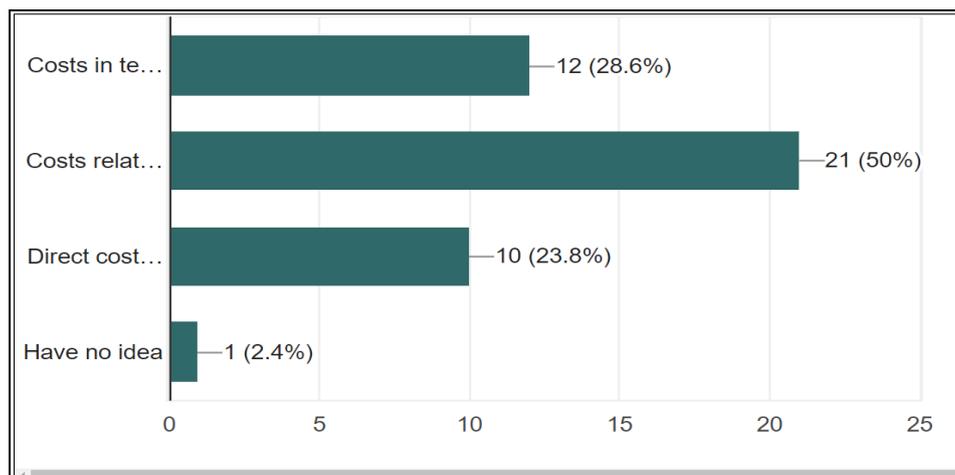


Figure 9. The costs associated with the Cloud computing services on the consumer

The economic benefits of Cloud-based services to the SMBs in India is perceived through various ways. SMBs get access to high-tech technologies which results in huge cost savings for the organisations [12]. Cloud computing has offered the small firms with business intelligence and analytics that has greatly lowered the costs of operations as compared to the traditional methods. According to Devasena (2014), some of the companies have reduced their costs of operations by 70% due to the adoption of Cloud-based services. For example, the adoption of the Amazon Web Services resulted in insignificant reduced operational cost although there was lack of competitive forces in the market. The other benefit that the SMBs have witnessed as a result of usage of Cloud-based services is that there have been reduced asset costs as a result of IT expenditure and also the maintenance costs of these IT platforms, and thus resulting in reduced entry barrier to the market. This is evidenced in the study above where the companies that adopted the use of Cloud computing services achieved increased production. The Cloud-based services allow the SMBs to access immediate software and hardware resources at a faster rate resulting in upfront capital investment, and thus faster time to market. Voith, Oberle and Stein [24] in their research indicated that adoption of IaaS in the SMBs results in reduced IT costs and capital expenses.

Cloud computing is also considered to be economically beneficial to the SMBs since it is more reliable than the traditional methods used by these firms. Cloud computing platforms provide data redundancy which is in-built in the Cloud-storage solutions so that files can be obtained at any time even when the networks are down [5]. The portability of the end-user data to another Cloud provider in Cloud computing is seen to be extremely crucial since it enhances the reliability of the system, and thus ensuring that the SMBs operate continuously even when there are inconsistencies in the system [10]. Through leveraging the SaaS and the IaaS solutions, the SMBs can stop worrying about the installation and running of their software packages given that they can contract the offerings as services at any time [2]. Besides, the SMBs can obtain access to any service levels which would have been higher than any typical on premise installation given that the Cloud-based services are most reliable. This is evidenced in the above study where the SMEs that adopted the use of Cloud computing indicated that the Cloud-based services were reliable, which led to increased production and reduced IT costs.

4. Research limitation and future research

This research is based on Indian service SMBs only, similar research can be applied to other field and other countries, facing a similar situation. Also, the research is based on online survey and providing quantitative data with a limited number of responses. In future, a qualitative research would also be carried out to find deep insights on the economic benefit perceived by Cloud-based E-Commerce by Indian SMBs.

5. Conclusion

It is clear that the Cloud computing adoption has made a critical effect on the micro as well as SMBs in India. This platform is seen to be currently sneaking to the business strategies of these organisations due to its perceived benefits. Although the SMBs have few resources, the integration of the Cloud-based computing services has resulted in increased convenience and improving the reliability of operations in these organisations. Besides, Cloud computing is seen to reduced costs given that the firms can only use the required hardware and software platforms for their operations. Finally, Cloud computing providers can gear to provide relevant Cloud-based services to the Indian service-based SMBs. It will enhance their efficiencies given that it allows the firms to provide services to the consumers depending on their demands.

REFERENCES

- [1] Arora, R. 2015. *Why India is the land of rising entrepreneurship*. INC [Online]. Retrieved from www.inc.com/rohit-arora/why-india-is-the-land-of-rising-entrepreneurship.html
- [2] Assante, D., Castro, M., Hamburg, I. & Martin, S. 2016. The use of Cloud computing in SMEs. *Procedia Computer Science*, 83, 1207–1212.
- [3] Buyya, R., Broberg, J. & Goscinski, A. M. 2010. *Cloud computing: principles and paradigms*. John Wiley & Sons.
- [4] Columbus, L. 2017. *Roundup of Cloud computing forecasts*. Forbes.
- [5] Devaki, S. 2011. File storage trends in cloud computing era. *Siliconindia*, 14, 34–35.
- [6] Devasena, C. L. 2014. Impact study of cloud computing on business development. *Operations Research and Applications: An International Journal (ORAJ)*, 1, 1–7.
- [7] Dungay, D. 2017. *Cloud: driving business transformation*. CommsBusiness.
- [8] Durkee, D. 2010. Why cloud computing will never be free. *Queue*, 8, 20.
- [9] Dutta, A., Peng, G. C. A. & Choudhary, A. 2013. Risks in enterprise cloud computing: the perspective of IT experts. *Journal of Computer Information Systems*, 53, 39–48.
- [10] Gide, E. & Sandu, R. (2015). *A study to explore the key factors impacting on Cloud based service adoption in Indian SMEs*. e-Business Engineering (ICEBE), 2015 IEEE 12th International Conference on 2015, IEEE, pp. 387–392.
- [11] Grossman, R. L. 2009. The case for cloud computing. *IT Professional*, 11, 23–27.
- [12] Gupta, P., Seetharaman, A. & Raj, J. R. 2013. The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management*, 33, 861–874.
- [13] Hegde, S. 2015. *Entrepreneurial opportunities for E-commerce in the retail sector in India*.
- [14] Ismail, N. 2017. *UK Cloud adoption rate reaches 88%*. Cloud Industry Forum.
- [15] KPMG. 2015. *Impact of e-commerce on SMEs in India*. KPMG International, India [Online]. Retrieved from https://assets.kpmg.com/content/dam/kpmg/pdf/2015/10/Snapdeal-Report_-_Impact-of-e-Commerce-on-Indian-SMEs.pdf
- [16] KPMG. 2017. *Impact of internet and digitisation on SMBs in India*. A study by KPMG in India and Google [Online]. Retrieved from <https://assets.kpmg.com/content/dam/kpmg/in/pdf/2017/01/Impact-of-internet-and-digitisation.pdf>
- [17] Kuada, E., Adanu, K. & Olesen, H. (2013). *Cloud computing and information technology resource cost management for SMEs*. EUROCON, 2013 IEEE, IEEE, pp. 258–266.
- [18] Lin, G., Fu, D., Zhu, J. & Dasmalchi, G. 2009. Cloud computing: IT as a service. *IT Professional Magazine*, 11, 10.
- [19] Malviya, A. & Chakraborty, N. 2013. Increased MSME and global entrepreneurship due to Cloud computing. *Global Journal of Management and Business Studies*, 3, 659–666.
- [20] Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J. & Ghalsasi, A. 2011. Cloud computing—The business perspective. *Decision Support Systems*, 51, 176–189.
- [21] Sandu, R., Gide, E. & Karim, S. 2017. An analysis of SMEs customer behavior in Cloud-based E-commerce environment *Academic Journal of Science*, 7, 281–292.
- [22] Sharma, A. & Sharma, J. 2015. E-commerce: enhancing growth for SMEs in India. *Journal of Commerce and Trade*, 10, 103–107.
- [23] Sindhu, P. 2017. Digital India Program: it's implementation. *Imperial Journal of Interdisciplinary Research*, 3.
- [24] Voith, T., Oberle, K. & Stein, M. 2012. Quality of service provisioning for distributed data center inter-connectivity enabled by network virtualization. *Future Generation Computer Systems*, 28, 554–562.
- [25] Wang, D. 2013. Influences of cloud computing on e-commerce businesses and industry. *Journal of Software Engineering and Applications*, 6, 313.
- [26] Zaidi, L. 2013. *Problems affecting the growth of small and Medium Enterprises (SMEs) in India*. International Conference on Technology and Business Management.