Evaluation and Effect of Cloud Computing on E-Commerce

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Abstract: Over the past few years, cloud computing has created a lot of hype in the IT industry. It has enhanced resource efficiency and used creative cost-cutting strategies. Though there is a long list of clients and service providers who have developed different service architectures globally using cloud infrastructure. Many companies are still apprehensive to employ cloud computing services, though. The e-commerce sector is a key driver of economic development in India. These industries' needs for information technology (IT) have increased throughout time, leading to a rise in the need for corporate IT solutions that are more effective, highly available, and scalable. These kinds of solutions, which cloud computing offers to the e-commerce sector, could be quite helpful. In India's e-commerce sector, cloud computing is still in its infancy as a relatively new technology. Consequently, most of them are reluctant to adopt. This study examines the challenges and problems associated with adopting cloud computing services, as well as the potential benefits of cloud computing for the e-commerce sector. The adoption of cloud computing has been studied using the Technology-Organization Environment (TOE) paradigm, primarily from the perspective of innovative technology. Methods such as surveys and interviews were employed to collect data for analysis. In order to get insight into the various IT services or IT applications used by the e-commerce business, five IT service/cloud service providers were interviewed, and information was gathered from 111 SMEs in the auto component manufacturing sector. The research hypotheses were tested by the analysis. The study's conclusions indicate that in order for SMEs to benefit from cloud computing technologies, general awareness needs to be improved.

***Key Terms**:* Cloud Computing, E-Commerce, SMEs.

1. INTRODUCTION

Human evolution can be traced back to multiple historical periods, including the mechanical, plant, and data length eras. length of data with an emphasis on recent developments that are bridging the world. Rethinking and sharing data are impeding progress in the world of information technology. Providing customers with a clear and easy way to save and share data servers in any format—news, events, photos, videos, and more—our file storage and sharing service offers both file storage and file sharing capabilities. Modern computing consists of a range of services that are provided and sold in a manner similar to that of conventional utilities like electricity, gas, water, and phone.

The terms "cloud" and "computing" are combined to form cloud computing. A network of computing equipment nodes was represented by the image of a cloud by the CSNET secondary network (Diagram of CSNET, 1981) and by the ARPANET main network (Internet History, 1970s). The predecessors of the Internet are CSNET and ARPANET. The term "cloud" became widely used to refer to distributed computing when AT&T and Apple side-effect General Magic used it to describe their two new technologies, Telescript and PersonaLink, in early 1993. Computing is the act of utilizing computer technology to finish a task or calculation. Figure 1 illustrates how the Internet was described as a word cloud and how a network was indicated by their form.

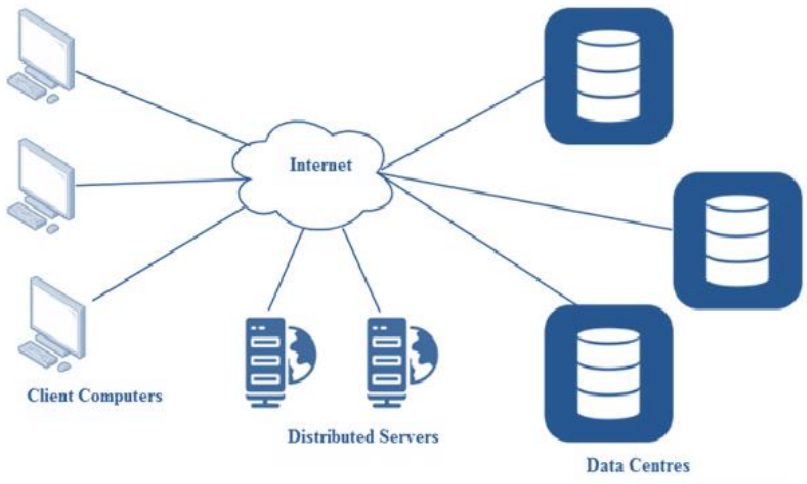

Figure 1: Components of Cloud Computing

2. LITERATURE REVIEW

Majed Balkhi (2014), in his research paper discussed his view on cloud computing. He describes capacity of cloud computing as its capability to convey resources as the clients are added to the cloud. In future, cloud computing will not only develop as monetary revenue but it can be also highly secured computing. Cloud computing will make a payment to humanity and will lend a hand to the corporations in their objectives to grow based on profit. Cloud computing is a promising perception and will develop the proposal of outsourcing to a novel altitude. The outlook of cloud computing is in the hands of researchers carrying research on cloud security and the threats faced by hacking information.

Tinankoria Diaby & Babak (2017), have reviewed the basic concepts of cloud computing, its characteristics, roots of cloud computing, its service model and its deployment model. The major five characteristics they have reviewed are on demand self-service, broad network access, resource Pooling, elasticity and service measure. They have discussed the roots of cloud computing as grid computing, hardware virtualization, autonomic computing and service Oriented architecture.

Muhammad et al. (2016) have reviewed the challenges and explanation while designing software architecture for cloud. The authors also have recognized a few set of quality attributes like security and privacy which have not drawn much consideration but are becoming too significant. So researchers can carry on research in these quality attributes. They also have explained the taxonomy of software architecture on cloud computing. The number of papers published on various journals and the cloud environments used to build this software architecture are also presented. They also presented the challenges faced in data security and resource management.

Chunye *et al.* (2010) have presented the characteristics of cloud computing which make cloud computing different from other research areas. They have given a clear insight to this evolving technology which will help academics and researchers. They have explained the conceptual characteristics, technical characteristics of various aspects, economic characteristics and user experience characteristics. The conceptual service oriented characteristic outlines the particulars of cloud computing employment. The loose coupling and strong fault tolerant are the foremost technical characteristics. Preserving the business model is the main discrepancy associated with other academic researches and supports cloud computing thriving. The ease in use for the user and characteristic benefits of cloud computing are extensively recognized by non-computer professionals.

Saurabh *et al.* (2016) in their research survey say that the publicity of cloud model is changing the IT industry. Cloud computing provides a lot of assistance to companies and organizations. Although cloud has a lot of advantages it is highly susceptible to security challenges. Based on these challenges on security the authors have shown various

security challenges, vulnerabilities, outbreaks and pressures that hinder the acceptance of cloud computing. They have analyzed the security crisis that arises from cloud characteristics like virtualization of resources, resource pooling and sharing of cloud environments. They have also presented the existing countermeasures to avoid security vulnerability. The authors have proposed architecture to improve the security in cloud

Rania (2014) presented organized literature assessment to discover the existing important disputes associated with cloud computing approval. The author reviewed numerous permitted moral, and inter-organizational or institutional problems that are essential to be examined concerning advances of laws and standards. Agreeing to the evaluation of cloud computing adoption issues that have been estimated, somewhat more than the procedures, a huge number of uncertain issues continue. For example, there is an encounter concerning the affiliation between the business size and the probability to adopt cloud computing.

Keke & Saier (2013) reviewed cloud computing based on the technical literature by involving the descriptions, characteristics, procedures, security management, service authority, and development styles. The authors also described the impact of cloud computing by explaining the benefits and drawbacks of cloud environments. The first impact is that to cloud permits the organization and companies to utilize the computing resources which are not owned or maintained by them. The second impact is that the companies or organization do not need to build whereas cloud computing provides prebuilt components required.

Rajani & Rajendar (2014) presented a review and survey of cloud computing, with numerous security fears, security problems, in the presently used cloud technologies and security solutions. They discussed the computing technologies like Microsoft Cloud Technologies, Oracle Cloud Technologies and Google Cloud Technologies. They also presented various security issues like data confidentiality issue, data availability issue Data integrity issue , data security issue, trust issue etc. The review also includes solution for the above security issues discussed in cloud computing.

Alok (2012) reviewed the vision of cloud computing and presented it as the latest technologies which are built on the concept called virtualization. The service providers provide the resources to the customers based on their required parameters. The author has discussed the user‟s entities, brokers, SLA resource allocator, virtual machines and physical machines which are essential for market-oriented resource allocation. The locality and responsiveness of web servers across the world are improved by Content Delivery Network. The Meta-Content Delivery Network delivers the resources efficiently and provides high performance in the form of response time, throughput and reliable content delivery for consumers.

Amit & Sara (2009) have surveyed Map Reduce framework which permits IT workers to identify a map function that routes a key/value pair to produce an in-between key/value pairs, and a reduce function that combines all the in-between key/value pairs to create the essential output. They also presented an execution overview of map-reduce and map-merge. The authors also have concentrated on Dryad which is a framework offered by Microsoft. The challenges faced by cloud like data confidentiality, data retrievability and availability, trusting computation and accountability were discussed

Bhaskar et al. (2009) presented taxonomy to describe cloud computing architecture. In cloud architecture the different layers like IaaS, Paas and SaaS were described. The concept of virtualization technology used in cloud was discussed. Different types of services offered by cloud and its fault tolerance in case of failure of resources were discussed. Security is the major concern in the case of cloud related to civil obligation and illegal burdens. They also presented other major issues like load balancing interoperability and data storage. A comparative study of the different types of cloud services and platforms were carried out. Although different technology was carried on by each provider for multitenancy, the ultimate aim of the provider is to provide resources as per the request from the customer.

Won (2013) presented an overview of architectural components of cloud. The basic requirements of cloud like high performance, scalability, reliability and availability were considered while scaling out the architectures. Regarding availability requirement of the cloud, the cloud architecture wants to provide redundant infrastructure in case of failure. When physical infrastructure fails, the backup has to carry on the task immediately. The major technology involved in cloud is virtualization which needs additional architectural consideration like VM migration and VM backup. Migration of a VM is done by manually moving the disk files of the VM, and the memory state of execution of the

company operating system and applications. VM required to be backed up on a consistent basis in order to recover the data from system cracks. Finally, the authors have presented the cloud service management functions, which include the management of infrastructure resources and services provided to the user by the cloud

Harold *et al.* (2009) stated the issues that feedback control creates in a cloud computing infrastructure unlike the feedback control used in other computer system. The authors have presented a novel control policy called proportional thresholding that is a policy specifically for coarse grained actuators delivered by service providers. The control system prototype presented by the authors carries out better than traditional integral control and static thresholding.The proportional thresholding addresses the static thresholding problem because the target range changes dynamically.

Yanuarizki et al. (2013) proposed cloud architecture mainly concentrated on service management as an important function of service management. The architecture consists of six key actors and governance. The six actors in cloud are cloud consumer, cloud provider, cloud developer, cloud broker, cloud auditor and cloud carrier. These six actors in cloud environment have their own responsibilities and activities. Governance in cloud computing is associated with cloud services and these services should be managed, controlled, and maintained properly for better quality and performance. The important functions of cloud service management are to manage and operate cloud service for the customers. The support services that help cloud service management are architecture service, business support, and operational support.

3. RESEARCH OBJECTIVES

This investigation's primary objective is to gather information about the challenges and barriers associated with cloud computing adoption, as well as the various aspects that impact e-commerce companies' decision to use cloud computing. In a similar vein, to appreciate the potential of cloud computing for e-commerce.

1. To gain further insight into the on-premise systems and IT infrastructure used by the e-commerce sector, as well as their present IT requirements.
2. To learn more about people's perceptions and level of knowledge regarding cloud computing.
3. To determine the issues and barriers related to the use of cloud computing services.
4. Offer insights and suggestions to cloud service providers and the e-commerce sector based on the results.

4. METHODOLOGY

This study integrates information from interviews with Cloud computing suppliers and service providers with quantitative and qualitative data from a survey of IT heads, IT managers, and network administrators from SMEs in the auto component fabricating business in the Pune area.

This study aims to ascertain the current state of cloud computing's acceptance in the automotive component manufacturing industry. to gain greater knowledge on the elements that influence people's choices regarding cloud computing.

A literature review is also conducted to look at some international research on how cloud computing is being received in the manufacturing sector. The conclusion ought to have emphasized how crucial it is for SMEs in the auto component manufacturing sector to embrace cloud computing in order to take into account the benefits of utilizing cloud-based services.

1. OEM (Original Equipment Market): this sector comprises automakers and auto component manufacturers that produce replacement parts used in the construction of automobiles. The researcher has selected Auto component Manufacturer for the research project.
2. There are four categories of manufacturing industries: Micro, Small, Medium, and Large-Scale Manufacturing Industries. The researcher chose the Small and Medium Scale Industry
3. This study's scope is restricted to small and medium-sized enterprises in the auto component manufacturing sector, which is a subset of Maharashtra's e-commerce sector, located in Bhosari and Chakan. Cloud adoption by the selected hosen
4. SME of Auto Component Manufacturing Industries refers to companies registered with ACMA, MCCIA, or R&D and is a subset of E-commerce industries in a particular location.

5. The study found that the decision to employ cloud computing is influenced by a number of aspects, including service provider concerns, organizational perspective, Internet data transfer capacity accessibility, trained staff, and cloud awareness.

5. RESULTS AND DISCUSSION

The data presentation and analysis comprise a significant portion of the study. The beginning of the research, the design of the research, the variables of the research, the population, and the sample of the research, devices for data collection, Sampling Technique, the procedure for data collection, and factual examination done in research work are all covered in the previous chapters by the researcher. The researcher used questionnaires and interviews to collect data for the survey, which comprised primary and secondary data.

5.1 Understanding of Cloud Computing in Small and Medium-Sized Enterprises

Based on various criteria, the researcher also attempted to ascertain the level of understanding regarding cloud computing among various IT managers of SME associations. The table below provides a summary of all of these discoveries.

Table 1: Awareness about Cloud computing in SME organizations

Awareness About	Not aware		Partially aware		Fully aware	
	Count	Row N %	Count	Row N %	Count	Row N %
Cloud Computing & benefits	34	29.8%	79	72.2%	0	.0%
Cloud Computing Service models	67	57.8%	48	45.2%	0	.0%
Cloud computing deployment Models	69	65.2%	42	39.8%	0	.0%
The pricing model of cloud	85	79.4%	24	22.6%	0	.0%
Cloud Computing Application/services being used in E-commerce Industries.	89	81.3%	23	20.7%	0	0%
Cloud service provider/vendors.	87	76.5%	25	23.5%	0	.0%

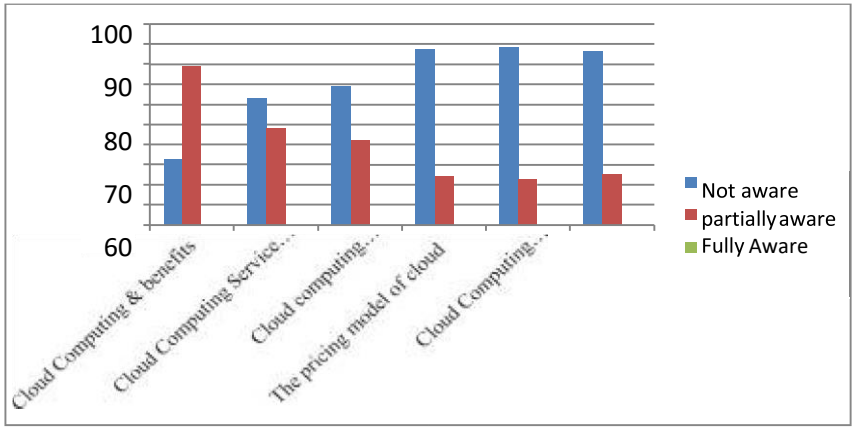

Figure 2: Awareness about Cloud computing in SME organizations

The requirement for skilled labor is another crucial aspect of the adoption of cloud computing. Additionally, data on SME organizations' opinions regarding the need for skilled IT personnel to implement cloud computing was acquired by the researcher.

Table 2: Requirement of Trained Power to use Cloud Computing

	SD		D		NAND		A		SA	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Q13- Need trained IT staff in order to use the cloud	1	.9%	59	53.2%	4	3.6%	35	31.5%	12	10.8%
Q13- Training & implementation process takes a lot of time and effort to use the cloud.	27	23.2%	342	30.6%	33	30.7%	17	14.4%	0	.0%

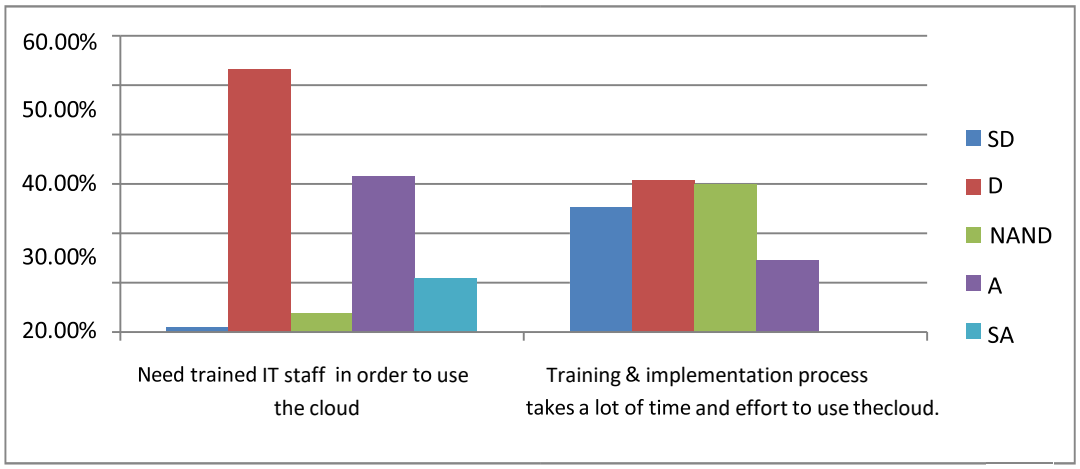

Figure 3: Requirement of Trained Power to use Cloud Computing

6. CONCLUSION

The cloud computing model is a novel perspective in the IT industry. Cloud technology saves any association information on a remote server, and projects and apps can use a shared network and pay as they go. By combining resources, the service provider can achieve economies of scale, which allows small and medium-sized organizations to receive high-quality software and IT services at a significantly lower cost than they would from much larger companies.

The results indicate that the SME sector needs to learn more about cloud computing, especially about its various models, types, and cutting-edge technology.

The study's primary finding is that in order for SMEs in the auto component fabrication industry to use cloud services, service providers need to raise general knowledge of their offerings. IT infrastructure related to the availability of fast dedicated lines and transmission capacity connections (uninterrupted internet service) is one of the obstacles preventing SMEs from adopting cloud computing. Industries may start using cloud computing for applications like CRM, business apps, IT management apps, collaborative apps, social apps like email, and so on if they are worried about security.

The bolts have been shown directly from independent variable to dependent variable to help understand the relationship between each independent variable and the typical dependent variable for each of the five hypotheses. The paper

delineates three contextual elements that impact an organization's decision-making process while using Cloud Computing: technological, organizational, and environmental. The biggest obstacles to SME cloud adoption remain loss of control, inadequate infrastructure, ignorance, and concerns about cloud vendor service. These issues need to be resolved by a massive awareness campaign, industry initiative, and dependable cloud vendor service. Cloud computing offers many benefits to the e-commerce sector, both financially and technologically.

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