A survey on Cloud computing in E-commerce

Rashmita Jagannath Rai, Deepesh Jagadale

Abstract— The rapid development of technologies in the past few decades is bringing changes in many aspects of our life- how we connect to people, how we search for a particular information or how we buy or purchase a particular thing. In spite of the fact that shop-based retailing and purchasing is still liked by many, e-commerce has gained popularity. Meanwhile cloud computing which is a new technology and a high tech product, has played a major role in providing different services to companies. Cloud computing is known for its robust and strong support for data storage. It is also a dependable platform for a safe and secure data transfer at a low cost and with high security. An area which is hugely benefitting from cloud computing is e-commerce. E-commerce in India is one of the fastest growing sectors. The exceptional growth of e-commerce is accompanied by certain challenges such as security, shortage of manpower, absence of e-commerce laws and analyzing customer details. Cloud based e-commerce overcomes these challenges. Cloud computing in e-commerce enables the business to look large virtually and operate extensively. Cloud is impacting the growth of the e-commerce sector with its features such as scalability, speed, cost reduction, security and redundancy. This paper gives an overview of cloud computing and its service models, brief explanation of e-commerce, how both are related to each other and highlighting the benefits and challenges for applying cloud computing in e-commerce.

Index Terms— Cloud computing, e-commerce, SaaS, IaaS, PaaS, benefits, challenges.

————————————— ◆ —————————————

1 INTRODUCTION

There is no doubt that we are living in a generation where things are getting old while they are still in the top of their modernity, the pace of technological development is speeding up, and hardly a day goes by without a witness appeared on the essential changes in all sectors, including the business sector.[1] Cloud computing has evolved through a number of phases that include grid and utility computing, application service provision and software as a service (SaaS), but the overarching concept of delivering computing resources through a world network is rooted within the 1960s. Since the 1960s, cloud computing has developed along a number of lines, with Web 2.0 being the most recent evolution. However, since the internet only started to offer significant bandwidth in the 1990s, cloud computing for the masses has been something of a late developer.[2] E-commerce is another flourishing sector which has no way back. Cloud has greatly influenced the e-commerce sector with its features.

- *Rashmita Rai is currently pursuing masters degree program in Information Technology in Mumbai University, India, PH-919819234469. E-mail: rrai2550@gmail.com*
- *Deepesh Jagadale is currently a head of depatment in PHCASC, Rasayani, India, PH-9028609874. E-mail: djagdale@mes.ac.in*
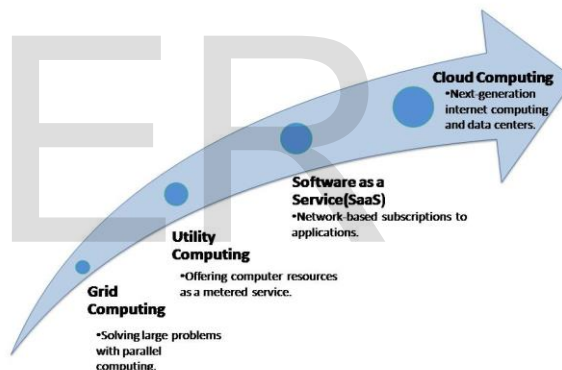
Cloud computing is making it possible for the e-commerce industries to provide a customized experience for the customers. This technology is changing the aspect of the business and the market.

2 E-COMMERCE

In the late 1970s, the term e-commerce denoted the process of execution of commercial transactions electronically which gave a chance for users to exchange business information and do electronic transactions. E-commerce actually became possible in 1991 when the internet was opened for commercial use.[3]

Louis Raymond (2001) defined E-commerce as: The functions of information exchange and commercial transaction support that operate on telecommunications networks linking business part-

ners (typically customers and suppliers).[4]

A more proper and complete definition of e-commerce is: E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals.[5]

Turban defined it as "An emerging concept that describes the process of buying, selling, or exchanging services and information via computer networks".[6]
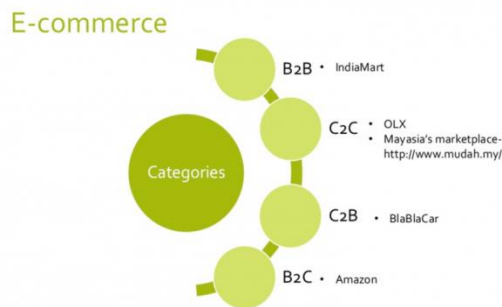

Figure 2:Types of e-commerce models[6]

The basic types of e-commerce models are:

Business to business e-commerce(B2B): The transaction or sale of services and products between businesses or companies.

Consumer to consumer e-commerce(C2C): The transaction or sale of services and products between consumers.

Consumer to Business e-commerce(C2B): The transaction or sale of services and products from consumers to businesses.

Business to consumer e-commerce(B2C): The transaction or sale of services and products from businesses to consumers.

3 CLOUD COMPUTING

Cloud computing is a widely known term now. The term, cloud computing does not have a unique definition. Each researcher or scientist has their own definition.

A popular and global research firm, Gartner Group defined cloud computing as 'A forecaster of Information technology' defines cloud computing as a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet technologies.

IEEE Computer Society defined it as : "A paradigm in which

information is constantly stored in servers on the Internet and cached temporarily on clients that include desktops, entertainment centers, computers, notebooks, handhelds, etc".[7]

National Institute of Standards and Technology (NIST), which defines the standard, defines cloud computing as, a model for enabling convenient, 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.[8]
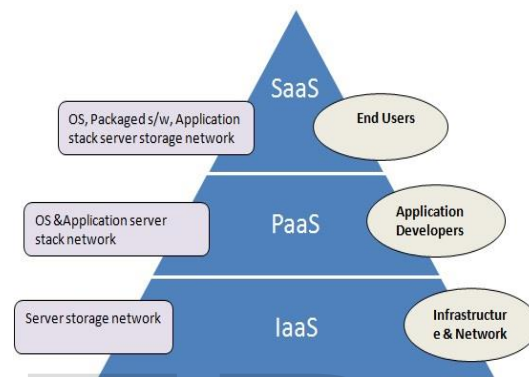

Figure 3:Service models in cloud computing.[9]

As shown in the figure above, cloud computing has 3 basic service models. a) Software as a Service(SaaS): It means that the end users are provided with the applications or software by the cloud provider. Dropbox, SalesForce and Google apps are some of the examples of Saas. b) Platform as a Service(PaaS): This service is mainly for the developers, to develop and deploy their applications into the cloud server. One of the popular examples of PaaS is Windows Azure. c) Infrastructure as a Service (IaaS): In this model, the providers give access to the computing resources such as servers, storage, etc. to the end users. Amazon Web Services(AWS) and Google Cloud Platform(GCP) are examples of Iaas. As yet, SaaS is a more presiding model in the e-commerce industry.

4 WHY DOES CLOUD COMPUTING NEED E-COMMERCE

Cloud computing services are making it possible for the e-commerce industries in achieving their objectives and providing personalized experience to the customers. Cloud even reduces the firm's cost of IT framework and also allows dealers

to do business without actually renting or buying a shop to sell their products.

The countries which adopted cloud computing in e-commerce in its business showed the transformation of traditional economy into digital economy which lead to the national economic growth.

No one can refuse the fact that cloud computing has given positive opportunities and benefits for the e-commerce enterprises. Cloud computing even allows the organization to businesses without the need to develop and retain the IT resources. Many of the e-commerce industries are obtaining the advantages of cloud computing shown in the table below.

Advantages	Description
Cost saving	Reducing IT resources, installation, and implementation.
Scalability	The business requirements are changing constantly. Cloud computing enable rapid adaptations of IT to these changes.
Efficiency	IT organizations can concentrate on its businesses and get benefits through development and innovative research
Availability and Mobility	Through smartphones, customers can access services and products anytime and anywhere.
Easy management	Maintenance of hardware, software, and even infrastructure is simplified.

Table 1: Advantages of cloud in e-commerce.[1][10]

Every technology has its challenges. So does cloud computing. Business owners should always ensure whether the cloud is a better option for their business or not. The table below shows the challenges faced in applying cloud computing in e-commerce

Challenge	Description

Security	It is the main challenge, where data can be accessed, modified, or even destroyed during processing or transmission. Until now, it is hard to protect programs and data and there are no effective solutions.
Data Privacy	It is an important challenge, until now no technical solutions to protect the clients' information.
Data Storage	The clients of cloud services worry regarding their inability to control the stored data place.
Trust	As a definition trust is "the degree by which a target object such as software, a device, a server, or any data they deliver is considered secure." Until now, it is difficult for consumers to distinguish between good and bad E-commerce sites. This situation does not encourage enterprises and clients to move to the cloud.
Connectivity	In the cloud, to access shared information or resources the user must be connected to the Internet.
Service standards issues	No available information for enterprises regarding mode of operations, technology used, and staff situation which let the clients are worrying to use cloud computing without knowing these details.

Table 2: Main challenges in applying cloud computing in e-commerce[1][10]

5 HOW DOES CLOUD COMPUTING WORK IN E-COMMERCE?

Cloud computing influences the traditional e-commerce industry chain and changes the traditional e-commerce industry chain.

Commonly, the E-commerce industry chain is made up of the hardware supplier, software developer, Internet service pro-

vider, system integrating provider, and service supplier as shown in Figure 4[11]. Each member of the industry chain does its own tasks. They exist as backend of the e-commerce enterprise and offer their support separately.
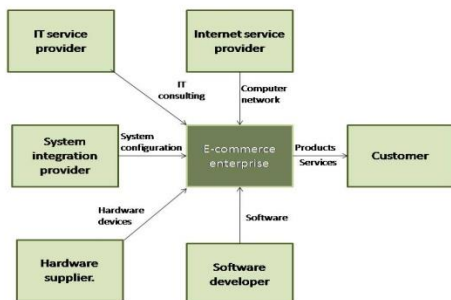

Figure 4:Traditional E-commerce industry chain.

While when the cloud computing is migrated into E-commerce, the structure of E-commerce industry chain is changed as shown in Figure 5 [11]. The cloud computing service provider provides all the necessary functionalities and services to the e-commerce enterprise. Also, the enterprise doesn't need to buy the IT resources. It just needs to rent the services needed. Thus, profiting the enterprise in a large way.
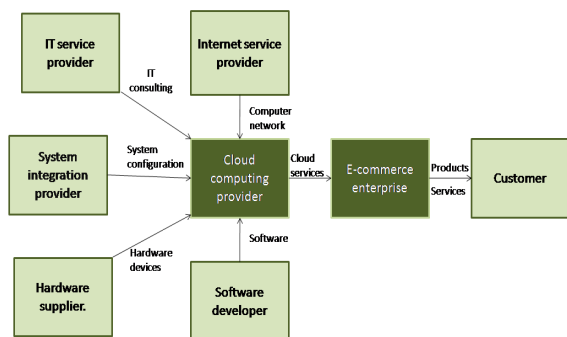

Figure 5:E-commerce industry chain based on cloud computing.

6 CONCLUSION

The cloud computing is expanding and spreading as a business solution since it's shown effective and positive results which put it within the top of information and communication technologies i.e. Flexibility within the space and large support for infrastructure and software. This innovation has many potentials that increase revenue, expand business and build

new jobs that stretch to large sectors not only within the sector. It plays a significant role within the smart economy. Without doubt it'll be the fifth utility after water, gas, electricity, and mobile phones which are always-on and paid by usage of consumer.

REFERENCES

[1] Tamara Almarabeh1 & Yousef Kh. Majdalawi1(2018).Cloud Computing of E-commerce.

[2]https://www.computerweekly.com/feature/A-history-of-cloud-computing

[3]https://www.ecommerceland.com/history_ecommerce.html

[4] Raymond, L. (2001) Determinants of Web Site Implementation in Small Business Internet Research.

[5] Chanana Nisha and Goele Sangeeta, "Future of e-commerce in India", International Journal of Computing & Business Research

[6]Turban, E., King, D., Lee, J., Warkentin, M., & Chung, H. M. (2002). Electronic Commerce Prentice Hall.

[7]https://emergeapp.net/wholesale-business/b2b-ecommerce/

[8]https://www.esds.co.in/blog/7-definitions-of-cloud-computing/#sthash.Je2rPwNB.dpbs

[9]https://www.whizlabs.com/blog/relationship-between-iot-big-data-cloud-computing/

[10]https://yourstory.com/mystory/2ab4130275-5-benefits-and-limitat

[11] Wang, D. (2013). Influences of Cloud Computing on E-Commerce Businesses and Industry. Journal of Software Engineering and Applications.