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***Abstract*--Cloud computing has become an important tool not only in the business world but also in our day-to-day activities. Most businesses have opted to cloud computing as it is considered safer and more reliable especially in inventory tracking. Cloud computing is the on-demand provision of services that includes data and projects can be put away and gotten to easily. Amazon is at the forefront in providing cloud-computing services globally using a service called Amazon Web Services (AWS). It allows customers to store data on the platform. However, AWS has a major shortcoming, which is denial of service, which may be risky especially for businesses that heavily rely on the platform to conduct their businesses. Cloud computing, is important in helping SMEs (Small and Medium size Enterprises) utilize emerging opportunities, thus giving an advantage to compete evenly in business. Most SMEs are seen to prefer AWS over other service providers as AWS is efficient and more affordable. As a result new and up-coming companies are more likely to use AWS as their service provider for cloud computing. Despite the advantage cloud computing offers, there are worries as to the safety of stored data and ease of use. In this paper, the advantages and disadvantages of the cloud computing, cloud storage systems, and infrastructure using web services such as Amazon Web Services are elaborated.**

Keywords: Cloud computing, Amazon web services, Small and Medium size Enterprise, Cloud storage systems.

I. Introduction

Cloud computing alludes to an innovation through which data and projects can be put away and gotten to without the requirement for information banks at the client terminal. NIST characterizes distributed computing as "a model for permitting helpful, on-request network admittance to a shared pool of configurable registering assets that can be quickly provisioned and delivered with negligible specialist co-op communication". NIST can possibly be a very important innovation for people with restricted assets and associations with bigger computational requirements. It is a more" financial and quick cycle contrasted with customary strategies for putting away and getting to information" and related administrations .

AWS (Amazon Web Services) is a cloud computing stage and cloud storage service that allows companies, governments, and individuals to store their data and offers API (Artificial Programming Interface). API is an Amazon subsidiary, with its physical data centers located throughout the world. API is preferable by most customers due to its efficiency to deliver services. As reported by [13] "Amazon claims almost 50% of the public-cloud framework market worth over $32 billion". Amazon Web Services serves thousands of customers is more than 190 countries [9].

Another major factor that makes AWS the primary choice is that its services are very cheap in comparison to other providers. Given the extensive market presence and prominence of the company, evaluating the subject area in the context of AWS can enable the development of easily generalizable findings.

II. Justification for the study

Noticed that distributed computing has emerged as a potential problematic converging of advances in registering power, information transmission speeds and the utilization of web and portable interchanges demonstrated the issue valid. Distributed computing is portrayed as a "type of rethought shared-asset registering, in which figuring is pooled in enormous outside server farms and got to by a scope of clients through the web" [12] conducted a study to review the user needs from the system and found two dimensions of customer desires from cloud computing services, as listed below.

The Technological component of cloud

a. Equivalence

The longing to get a specialized assistance, which is at any rate same (as far as security, inertness and accessibility) to that, accomplished when utilizing a locally running conventional IT frameworks.

b. Variety

The craving to get a help which furnishes assortment comparing with the utilization for which the administration will be put.

c. Abstraction

The longing to get specialized administrations which theoretical away superfluous unpredictability for the administration they give .

d. Scalability

The craving to get an assistance which is versatile to satisfy need.

The administration measurement of cloud

e. Efficiency

The craving to get an assistance that assists clients with being more productive financially.

f. Creativity

The longing to get a help which helps advancement and innovativeness.

g. Simplicity

The longing to get an assistance, which is easy to comprehend and utilize.

Source [12]Since then the field of cloud computing has evolved tremendously and so has the needs of the users and there is a need to identify those needs in a more generalized manner so as to identify areas of further research and development.

Another perspective that needs revision is that of security in the use of cloud computing [7] Mosca, et al. (2014), is the identification of the three challenges in adoption of cloud computing and storage: “clients at this point don't hold the actual control on equipment, programming, and information"; "information having a place with various clients might be put away in a similar actual machine. Enemies can misuse this weakness to dispatch different assaults, for example, calculation break and flooding assault." and "due to monstrous information and concentrated calculation … customary security instruments may not do the trick" [5].

There are several aspects that need to be evaluated to understand the security specifications of the cloud computing standards like cloud risks API concerns account hijacking [3] noted that the impression of the clients with respect to the nature of the cloud administration incredibly impacts the fulfillment of the clients. As such, it is clear that the dimensions of cloud services that influence quality perception need to be identified and evaluated for their degree of perceived quality. As a result, academics and developers are able to understand the areas that need to more attention on and tasks that need priority.

Customer needs and perception are the aspects addressed in the following sections and thus form the rationale for the study.

III. Aims and Objectives of the Study

The point of investigation is to identify the specific technical and service needs of the users, from cloud computing and understand the specific parameters that affect customer perception of quality.

The objectives of the study are:

- To analyze the service offerings of AWS
- To review the existing perception of users regarding the service
- To identify the customer needs from contemporary cloud computing services
- To identify the parameters that affect quality perception regarding cloud computing
- To identify areas of further research to boost quality perception

IV. Research Questions

Based on the set aims and objectives the following research questions drafted provide a guide for the study.

- *What are the services AWS is offering?*
- *How do the users perceive the existing services from the company?*
- *What are the parameters that influence the decision-making or perception formation processes for the users?*

V. Exploration of the Issues

A. AWS and its services

AWS enables the users to make their applications better and easy to use with its smooth interface, it provides a smooth structure for every industry. Managing own infrastructure could be very difficult and requires a huge investment. Under the reflection of [7] AWS eliminates this issue for the users. It offers a platform for every user belonging to diverse industries to make their work scalable and attractive. Its users involve content delivery, e-commerce, media hosting, search engines, web hosting, and many more. It could be referred to as a collection of services that are available altogether.

Amazon EC2 (Elastic Compute Cloud) is considered to be a web service that offers compute capacity to the cloud which could be resized. Amazon Simple Storage Services (Amazon S3) is one of the divisions that is used to access a large amount of data from anywhere at any time. The developers are provided with strong access, fast and reliable data storage system. The system is used by Amazon and operates using its services. The availability of the content while extracting the details must be constant and the source must not break. The risk of data loss during the transmission process is reduced. Amazon SQS (Amazon Simple Queue Service) manages the transmission of machinery, the data complexity along with the biomedical statistics are being taken to the cloud. Amazon Web Services help provide the system operators with CUP, memories, networking, and operational system. However, despite the advances made, there remains some fundamental issues of scalability and security considering the petabytes of information messages to keep the data intact while the message is transmitted from one computer system to another.

B. *Amazon Web Services as Biomedical Computing*

According to [6] the biomedical sector and divisions are being data-driven and all the associated components moved over the cloud. Security and easy accessibility being the prime reasons. One of the disadvantages of the system is that estivating cost structure for projects that generate large amount of data is difficult upfront as the data might need to be stored in perpetuity [11]. In contrast, physical resources cost can be estimated up front and amortized over the next 4-5 years and can also be used for other projects. The fundamental unavailability of cost estimations and uncertainty regarding the price structures in the future remains of the most notable disadvantages of the AWS system for biomedical computing. Challenges are present in budgeting grants, which are awarded up front whereas the cost structure for AWS requires subsequent periodic payments, which might be hard to pre judge.

C. Amazon Web Service over other providers

One only needs to pay as per its usage over the web services.[12] Amazon Web Services is one of the most popular and trusted clouds preferred by users. Using a cloud system helps the users to save their investment into complex, data storage infrastructure. AWS is considered a more secure and easy to operate system in comparison to many other providers. AWS offers easy individually accessing machines; it also provides the service, to be readily available locally and globally.

The system is reliable and has efficient scalability with the offerings of automation. The security structure of AWS is very strong and has multiple layers when compared to other leading competitors.

VI. Risks and Challenges in Amazon Cloud Services

Over the years, there have been several risks highlighted by several sources likely to affect cloud services [1]. noted that Denial of Service (DoS) is a specific issue that cloud computing is susceptible to, especially given that even attacks against other entities on the same network could render the data and process of

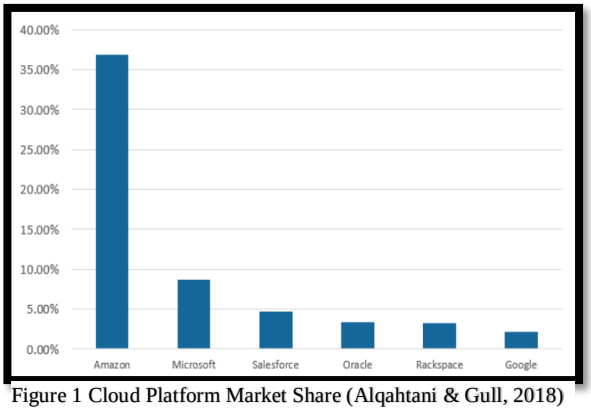

Figure 1 Cloud Platform Market Share (Alqahtani & Gull, 2018)

any user vulnerable. Others noted the scale of damage that singular issues could have considered the volume of data that is stored on shared data centers (Cloud Security Alliance 2010). [2] and released their findings on the security issues regarding Amazon EC2 service. They could have found that "customers and suppliers of public pictures can both experience the ill effects of the perils of potential security shortcomings present in EC2". [13]

Also noted the shortcomings of the infrastructure noting that users of AWS in over 180 countries had “suffered from information privacy issues”. Dutta and Dutta noted that "despite the fact that AWS leads out in the open cloud piece of the overall industry, however it is off base to guarantee it gives the top arrangements".[3] According to Gandhi and Chan’s (2015) analysis, on network performance between pairs of AWS instances hosted on all available regions, a notable variance in network performance in different regions was seen. By overlooking these variations, users of AWS concluded that applications could suffer severe performance losses. [8] Also

Vulnerability	Consequent effects
Vulnerabilities in virtualization	Bypassing the security barriers can allow access to underlying hypervisor.
Vulnerabilities in Internet protocol	Allow network attacks like ARP spoofing, SYN-flood, DoS/DDoS etc.
Unauthorized access to management interface	An intruder can gain access control and can take advantage of services to harbor attacks. Access to administrative interface can be more critical.
Injection vulnerabilities	Unauthorized disclosure of private data behind applications.
Vulnerabilities in browsers and APIs	Allow unauthorized service access.

Figure 2 Vulnerabilities in cloud computing and the resulting implications.

conducted a review on the security issues of cloud computing at varying layers and noted several insufficiencies, which are presented in the figure below.

VII. Expectations and Perception of Cloud Computing

Conducted a survey to identify the perception of cloud computing services among users at SMEs and found that advantages like “cost reduction, virtualization, and space preservation, can end up being an answer for the monetary limitations and asset troubles of SMEs".[10] Security is one of the most important dimensions of

user demands. Security is critical to the perceptions of the users especially in the use cases of governmental and security conscious entities [12] .

Also noted that there were perceptions of greater security using AWS among small companies who believe they could not afford similar security otherwise. In this regard, this can be considered a leveler for the new and emerging companies [2]. Latency equivalence was identified as an important consideration for the users. Above provides a brief summary of the findings of the study. Equivalence, Variety, Abstraction, Scalability, Efficiency, Creativity and Simplicity were identified as the dimensions of customer needs.

Personal preferences, concerns regarding security and privacy and lack of awareness is noted as the main hindrances in the path of technology adoption [11], also noted that although no direct correlation between perceived security risks and perceived quality were established, there was significant relation between perceived quality and satisfaction using the app. Therefore, it is clear that the differences between academic understanding regarding the clear issues around security and the legible impact on user perception needs further understanding.

VIII. Conclusion

Cloud computing has enabled ease in conducting businesses and delivering services. It has also promoted the growth of Small and Medium Enterprises in great proportions. AWS proves to be the best in offering cloud-computing services for individuals, organizations and many business entities. It is very efficient and cost effective as compared to its competitors. Provision of these services affordably makes Amazon Web Services more popular and leads in the service globally. Provision of cloud computing services is not only limited to the business sector alone. The biomedical industry greatly benefits from these services. A service more popular with researchers, is the IaaS as they are able to carry out projects with large computational requirements at an affordable cost.

Security is a major concern for all customers especially due to data vulnerability. Customers are particularly sensitive about their data being accessed without their consent. However, Small and Medium Enterprises observe a greater sense of security with Amazon Web Services in addition to its affordability. As a result, AWS is a preferable option for all new and up-coming companies.

References

[1]. Awa, H.O., Ojiabo, O.U. and Orokor, L.E., 2017. Integrated technology-organization-environment (TOE) taxonomies for technology adoption. *Journal of Enterprise Information Management*.

[2]. Bayrak, T., 2013. A decision framework for SME Information Technology (IT) managers: Factors for evaluating whether to outsource internal applications to Application Service Providers. *Technology in Society*, *35*(1), pp.14-21.

[3]. Dutta, P. and Dutta, P., 2019. Comparative Study of Cloud Services Offered by Amazon, Microsoft & Google. *International Journal of Trend in Scientific Research and Development (ijtsrd)*, *3*, pp.981-985.

[4]. Gandhi, A. and Chan, J., 2015. Analyzing the network for aws distributed cloud computing. *ACM SIGMETRICS Performance Evaluation Review*, *43*(3), pp.12-15.

[5]. Kirchgaessner, S., 2013. Cloud storage carries potent security risk. *Financial Times*. *Viitattu*, *31*, p.2014.

[6] Layo, I. 2013. Cloud Computing Advantages for SMEs. Available online: http://cloudtimes.org/2013/09/18/cloud-computing-advantages-for-smes/ (accessed on 6 December 2020).

[7]. Mosca, P., Zhang, Y., Xiao, Z. and Wang, Y., 2014. Cloud security: Services, risks, and a case study on amazon cloud services. *Int'l J. of Communications, Network and System Sciences*, *7*(12), p.529.

[8]. Modi, C., Patel, D., Borisaniya, B., Patel, A. and Rajarajan, M., 2013. A survey on security issues and solutions at different layers of Cloud computing. *The journal of supercomputing*, *63*(2), pp.561-592.

[9]. Navale, V. and Bourne, P.E., 2018. Cloud computing applications for biomedical science: A perspective. *PLoS computational biology*, *14*(6), p.e1006144.

[10]. National Institute of Standards and Technology, NIST.2011. The NIST Definition of Cloud Computing. Available online: http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf (accessed on 6 December 2020)

[11]. Ratten, V., 2016. Continuance use intention of cloud computing: Innovativeness and creativity perspectives. *Journal of Business Research*, *69*(5), pp.1737-1740.

[12]. Strckland, J. (2020). How Cloud Computing Works. How Stuff Works. Available online: https://computer.howstuffworks.com/cloud-computing/cloud-computing.htm (accessed on 6 December 2020).

[13]. Su, J. (2019). Amazon Owns Nearly Half Of The Public-Cloud Infrastructure Market Worth Over $32 Billion. Forbes. Available online: https://www.forbes.com/sites/jeanbaptiste/2019/08/02/amazon-owns-nearly-half-of-the-public-cloud-infrastructure-market-worth-over-32-billion-report/?sh=4e369bf929e0 (accessed on 6 December 2020).