**CLOUD COMPUTING: SERVICES AND ITS APPLICATION IN OUR SOCIETY**

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**(ST/CS/ND/21/094)**

**A SEMINAR REPRESENTED TO THE DEPARTMENT OF COMPUTER SCIENCE, SCHOOL OF SCIENCE AND TECHNOLOGY, FEDERAL POLYTECHNIC MUBI, ADAMAWA STATE, NIGERIA**

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**Abstract**

*This seminar describes Cloud computing services, its application on the society Cloud computing is a new general purpose. Internet-based technology through which information is stored in servers and provided as a service and on-demand to clients. At the foundation of cloud computing is the broader concept of* [*converged infrastructure*](http://en.wikipedia.org/wiki/Converged_infrastructure) *and* [*shared services.*](http://en.wikipedia.org/wiki/Shared_services) *Cloud resources are usually not only shared by multiple users but are also dynamically reallocated per demand. With cloud computing, multiple users can access a single server to retrieve and update their data without purchasing licenses for different applications. Cloud computing involves deploying groups of remote servers and software* [*networks*](http://en.wikipedia.org/wiki/Computer_network) *that allow centralized data storage and online access to computer services or resources. The paper also recommends that the Governments could enhance these benefits by subsidizing the adoption of cloud computing solutions.*

**Keywords:** Cloudcomputing, Cloud storage, Information technology.

**Introduction**

Cloud computing is the trending technology that companies decided to implement to grow in the market and achieve new business heights. In number of ways, we can see this new technology as an innovation (Andrikopoulos *et al*., 2013). According to the statists portal, the total number of cloud-based users are approaching 3.4 billion, which is about half of the total population of the world in 2018. This statistical data clearly shows that the cloud computing technology is expanding exponentially, and it will soon dominate the information technology market. Because of the tremendous growth of this technology, every type of business should be well aware of the wave which is largely shaking the whole industry (Sundee, 2018). Cloud computing always has a great impact on the company. This technology not only impacts its global performances but also its internal organization especially IT sector. This technology is enhancing the usual methods of backing up of data. Cloud computing is bringing new methods and tools for the company that is using it (Sahandi *et al.,* 2013).

According to Obinnaya *et al.* (2016) the cloud is simply a network of computers. It refers to a network of computers owned by one person or company, where other people or companies can store their data. On your personal machine, everything is stored on one physical storage device – your hard drive. Cloud storage refers to a virtual storage area that can span across many different physical storage devices. When you use cloud storage, some of your files may be on a physical server in New York while other files are on a physical server in California. Since most users do not know where their physical files are, using cloud storage can be thought of as a vague, untouchable thing – much like a cloud itself.

Most data you access via the internet that is not stored on your personal computer is part of the cloud. For example, if you use an internet-based email service like Gmail, Yahoo, or Live, you can access your email anywhere you have an internet connection. This is because the data is stored on servers owned by the respective e-mail providers, not your local machine. Although, the cloud is more like an idea than something you can physically touch, the computers that make up the “cloud” require physical space. The facilities that store the physical equipment used by the cloud are called data centers. Sometimes you may also hear the term server farm. Data centers can be anywhere in the world. They are generally in warehouses that have complex cooling systems to keep the computers from overheating (Sundee, 2018).

Cloud storage is a model of data storage in which the digital data is stored in a logical pool, the physical storage spans multiples servers (and often locations), and the physical environment is typically owned and managed by a hosting company (Butler & Brandon, 2013). These cloud storage providers are responsible for keeping the data available and accessible, and the physical environment protected and running. People and organizations buy or lease storage capacity from the providers to store user, organization, or application data (Gartner, 2010)

As Adams (2013) put it that “the expression cloud is commonly used in science to describe a large agglomeration of objects that visually appear from a distance as a cloud and describes any set of things whose details are not inspected further in a given context”. Another explanation is that the old programs to draw network schematics surrounded the icons for servers with a circle, and a cluster of servers in a network diagram had several overlapping circles, which resembled a cloud. In analogy to the above usage the word cloud was used as a metaphor for the Internet and s standardized cloud-like shape was used to denote a network on telephony schematics and later to depict the Internet in computer network diagrams.

Cloud storage is a service where data is remotely maintained, managed, and backed up online (Hassan & Qusay, 2011).

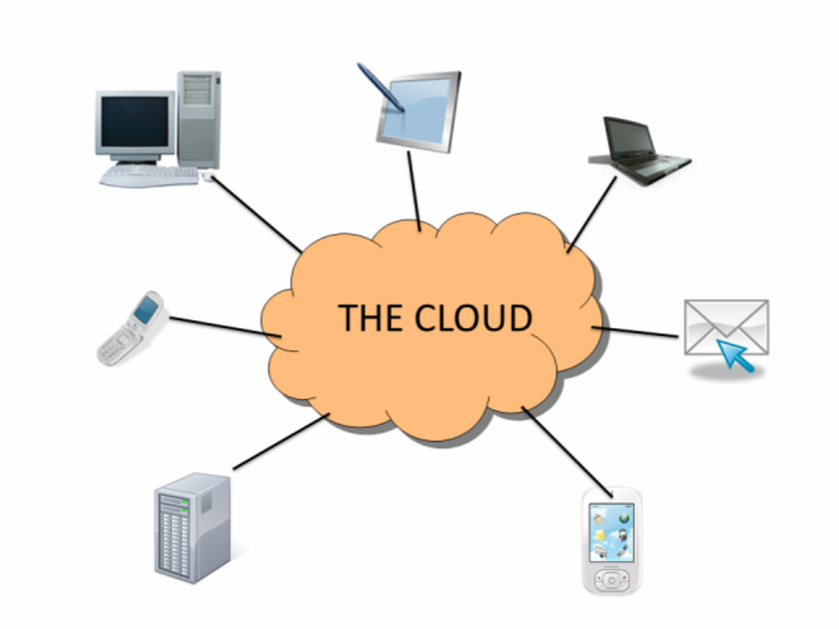


Figure1: Diagrammatical Representation of the cloud (Hassan & Qusay, 2011).

**Benefits of cloud computing**

According to Buyya *et al.* (2019), loud computing have positive impact on the business organizations as it increases their revenue and helps them to achieve the business goals. Companies prefer to use the services offered by the cloud rather than building their own infrastructure. Following are the benefits of cloud computing technology which motivates the business organizations to migrate from local infrastructure to cloud.

**Reduced cost:** Cloud computing reduces the expenses of the company as the resources are only acquired when needed and only paid for when used as the billing model works as per usage and there is no up-front cost. The infrastructure is not purchased and thus lowering the initial expenses and maintenance cost as well. The clients are not the owners of the infrastructure but can use the cloud services online (Buya et al., 2019).

**Unlimited scalability:** This is the major benefit of cloud technology as the client has the flexibility to scale up or scale down as per the needs of the organization. The companies do not need to worry about the future demands as they can easily acquire the additional services anytime. Also, if a business grows over time, the cloud can scale effortlessly to meet the increased demand over time (Buya et al., 2019).

**Flexibility:** Cloud computing provides lot of flexibility to its clients. There is an easy testing and deployment of the services over cloud. The customers are free to decide which services they need and pay for accordingly. The cloud services can better meet the changing business demands by providing various services. If any application provided by the cloud is not getting our job done, we have the flexibility to switch to another cloud. Better mobility: The users of the cloud can access the services of the cloud anytime anywhere from a variety of devices. Whenever they have the working internet connection, they can login and use the services. This benefit of cloud computing provides a flexible work culture to the employees and they can perform their duties from anywhere without the need to be physically present at the business headquarter. Improved communication: Cloud computing improves communication and collaboration among employees by having access to instant messaging, conferencing and video conferencing options. They can jointly work on documents and projects ensuring higher cohesion and team work. This is possible because of data centralization and updation of cloud servers in real time (Buya et al., 2019).

**Reliability:** As the services of cloud is available all the time and can be accessed anywhere. Also, the backup and recovery management make this technology more reliable. Increased storage: Some cloud providers offer the Storage as service to its customers. Companies can store lot more data on cloud than their local devices. If business grows and demands more storage, companies effortlessly scale up and get more storage from the cloud provider (Buya et al., 2019).

**Easier upgrades:** It is the responsibility of the cloud providers to upgrade the infrastructure and services for their customers. The new business trends and solutions are made available to the clients by cloud providers to compete in the business market by adopting latest technologies. The cloud providers maintain the system by doing different software and security updates (Buya et al., 2019).

**Disaster recovery:** Companies using cloud services need not to frame the complex disaster or failure recovery plans as the service providers take care of such issues and put the clients out of the trouble in a fast manner (Buya et al., 2019).

**Security:** The most important factor while choosing a cloud provider is the security and privacy they provide to our data. This is the main reason that these providers invest large amount on their services and infrastructure to offer better security (Buya et al., 2019).

**Cloud computing services**

There are many cloud storage services available and many offer a free plan for a limited amount of space. Depending on your needs, a free plan might be plenty for you. This is a list of just a few available cloud storage services.

**Dropbox.com**

Dropbox.com is one of the most popular cloud storage services available. It was started in 2007 by a man that kept forgetting to carry his flash drive around. Dropbox uses encryption to help keep your data secure and everything you upload is automatically private. Dropbox offers different plans for individuals and businesses but it starts off giving each individual 2 gigabytes of free storage.

**Google Drive**

Google Drive allows users to store a variety of files. It gives users the opportunity to share files with certain email addresses, publicly, or anyone that has the link to the file (for example, if you email a link to your friends). It provides 15 gigabytes of storage for free and if you have a Gmail address, you already have access to Google Drive. Google Drive also allows users to collaborate and make changes to files at the same time. This can be helpful for teams and groups (Sundee, 2018).

**Apple iCloud**

iCloud was launched by Apple in 2011. It allows users to always have access to the latest information from their Apple devices (iPhone, iPad, Mac, etc.). iCloud is particularly useful for sharing photos, calendars, etc. with other users. You do not have to have an Apple device to have an iCloud account, but you can only access your information when using an Apple device or a PC to which you’ve downloaded the iCloud software. However, you can get web-only access to your account that allows you to create new documents use ‘Pages’ to create letters, flyers, and more; use ‘Numbers’ to create spreadsheets; and use ‘Keynote’ to create presentations. You have 1 gigabyte of free storage for any documents you create in iCloud (Devasena, 2016)

**OneDrive**

OneDrive is Microsoft’s cloud storage service. It offers 7 gigabytes of free storage for new users and users can purchase additional storage space. It has Office Web Apps support, which means that users can create, edit and share Microsoft Office documents directly within a web browser (Simon, 2018)

**Amazon Cloud Drive**

Amazon.com offers a cloud storage service that gives users 5 gigabytes of free storage. If you have an Amazon.com account, you can log into the cloud storage service using your existing username and password (Butler & Brandon, 2013)

**Advantages of cloud computing**

Cloud computing offers numerous advantages both to end users and businesses of all sizes. The obvious huge advantage is that you no more have to support the infrastructure or have the knowledge necessary to develop and maintain the infrastructure, development environment or application, as were things up until recently. The burden has been lifted and someone else is taking care of all that. Business are now able to focus on their core business by outsourcing all the hassle of IT infrastructure (Buya et al., 2019).

**Cost Efficiency**

This is the biggest advantage of cloud computing, achieved by the elimination of the investment in stand-alone software or servers. By leveraging clouds capabilities, companies can save on licensing fees and at the same time eliminate overhead charges such as the cost of data storage, software updates, management etc.

The cloud is in general available at much cheaper rates than traditional approaches and can significantly lower the overall IT expenses. At the same time, convenient and scalable charging models have emerged (such as onetime-payment and pay-as-you-go), making the cloud even more attractive.

**Convenience and continuous availability**

Public clouds offer services that are available wherever the end user might be located. This approach enables easy access to information and accommodates the needs of users in different time zones and geographic locations. As a side benefit, collaboration booms since it is now easier than ever to access, view and modify shared documents and files.

**Backup and Recovery**

The process of backing up and recovering data is simplified since those now reside on the cloud and not on a physical device. The various cloud providers offer reliable and flexible backup/recovery solutions. In some cases, the cloud itself is used solely as a backup repository of the data located in local computers.

**Cloud is environmentally friendly**

The cloud is in general more efficient than the typical IT infrastructure and it takes fewer resources to compute, thus saving energy. For example, when servers are not used, the infrastructure normally scales down, freeing up resources and consuming less power. At any moment, only the resources that are truly needed are consumed by the system.

**Resiliency and Redundancy**

A cloud deployment is usually built on a robust architecture thus providing resiliency and redundancy to its users. The cloud offers automatic failover between hardware platforms out of the box, while disaster recovery services are also often included.

**Scalability and Performance**

Scalability is a built-in feature for cloud deployments. Cloud instances are deployed automatically only when needed and as a result, you pay only for the applications and data storage you need. Hand in hand, also comes elasticity, since clouds can be scaled to meet your changing IT system demands.

**Quick deployment and ease of integration**

A cloud system can be up and running in a very short period, making quick deployment a key benefit. On the same aspect, the introduction of a new user in the system happens instantaneously, eliminating waiting periods. Furthermore, software integration occurs automatically and organically in cloud installations. A business is allowed to choose the services and applications that best suit their preferences, while there is minimum effort in customizing and integrating those applications.

**Increased Storage Capacity**

The cloud can accommodate and store much more data compared to a personal computer and in a way offers almost unlimited storage capacity. It eliminates worries about running out of storage space and at the same time it spares businesses the need to upgrade their computer hardware, further reducing the overall IT cost.

**Device Diversity and Location Independence**

Cloud computing services can be accessed via a plethora of electronic devices that are able to have access to the internet. These devices include not only the traditional PCs, but also smartphones, tablets etc. With the cloud, the “Bring your own device” (BYOD) policy can be easily adopted, permitting employees to bring personally owned mobile devices to their workplace.

**Conclusion**

Cloud computing is a trending technology that if embrace by organizations and individuals it’s going to make working with data easy and convenient. Cloud computing is a modern technology trend that allows the companies to take over the market. Cloud computing is considered as an innovative and enhanced technology to run business organization. Most of businesses now-a-days are running all kinds of applications in the cloud like accounting, Custom built, communication, application development, productivity etc. Cloud based services are easy to afford for any kind of business as the customer need to pay only as per use.

Cloud computing is an easy way to cut down the company expenses and increase their revenue. The company using the cloud services has the benefit of accessing the information anytime anywhere and on any device. This has improved the decision-making capability and the productivity of the company has become faster and better. The different challenges thrown by adopting this technology can be reduced by using different encryption techniques, regular backups, proper selection of cloud provider etc

**Recommendations**

The paper recommends that;

1. Consideration be given on the information that is being put out in the cloud, who will have access to that information, and what you will need to make sure it is protected.
2. Additionally, know your options in terms of what type of cloud will be best for your needs, what type of provider will be most useful to you, and what the reputation and responsibilities of the providers you are considering are before you sign up.

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