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# THE FUNCTION OF CLOUD COMPUTING TECHNOLOGY: AN INVALUABLE WEAPON AGAINST COVID-19

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## ABSTRACT

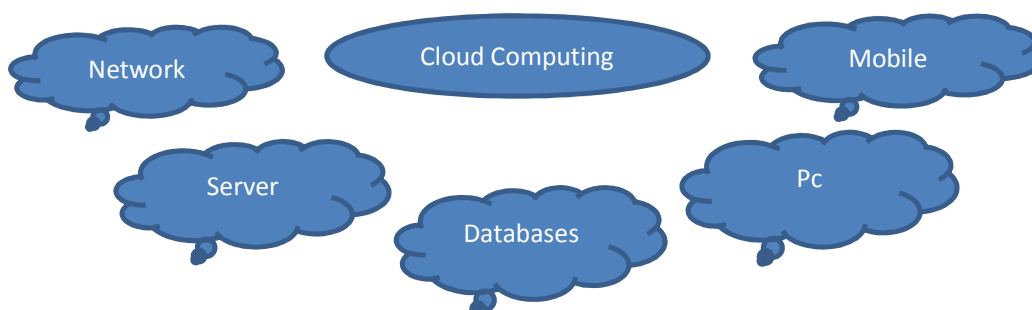
This study looks into how important cloud computing is to reducing the difficulties brought on by the COVID-19 epidemic. As the workforce becomes more reliant on digital solutions and works remotely more frequently, cloud computing becomes a vital tool for maintaining flexibility and company continuity. The study examines how cloud-based technologies, like scalable infrastructure and tools for remote collaboration, are being used to meet the extraordinary needs of distant work environments.

**Keywords:** cloud Computing, COVID 19 epidemic, Scalable, Digital Solution Remote Work.

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## Introduction:

Prime Minister Narendra Modi had declared curfew on March 20, 2020 for control the spread of corona virus, everything was closed due to this pandemic and everyone was worried about how to manage everything from home. The covid-19 pandemic set up how organization will work, Organization manage the employees work from home but then there was another problem of storing and managing big data there was only one industry which was continually working in COVID and that is IT industry which helped and manage our economical position during Covid and that Because of Cloud Technology. Cloud computing is a technology that allows users to access computing resources (such as servers, storage, databases, networking, Software, intelligence) over the internet.



## I. Cloud History:

**1. 1960s- 1980s Early Concepts:** Utility computing first appeared in the 1960s, which is when the idea of cloud computing first appeared. Multiple users shared the first mainframe computers, which established the idea of remote access to computing resources.

**2. 1990s Internet Expansion And web Hosting:** The popularity of web hosting services increased as the internet spread. Businesses began to provide web-based services and apps, which was the first step toward the remote access of computer resources.(Bairagi, Ankur. (2015)).

**3. Early 2000s Grid Computing and virtualization:** Cloud computing's forerunner, grid computing, attracted notice. It emphasized resource sharing and distributed computing.

**4. 2000s Amazon web Services:** Amazon launched AWS in 2002, initially as a way to provide computing power and storage solutions to developers.

**5. 2006-Elastic Compute Cloud:** Amazon introduced EC2, a scalable virtual computing environment, allowing users to rent virtual servers on- demand.

**6. 2008- Google App Engine and Microsoft Azure:** The introduction of Microsoft Azure and Google App Engine in 2008 considerably broadened the scope of cloud computing. Platform as a service (PaaS) and infrastructure as a service (IaaS) were two of the many services provided by these platforms.

**7. 2010 Cloud Maturity:** The cloud was widely used in a number of businesses in the 2010s. Market leaders included AWS, Microsoft Azure, and Google Cloud Platform. Over time, cloud services have expanded to offer a multitude of services, ranging from computer power and storage to artificial intelligence and machine learning.

**8. 2020s Cloud Hybrid:** The rise of edge computing in the present decade has brought computational resources closer to the end user. Organizations looking for flexibility and control are increasingly using hybrid cloud solutions, which combine cloud services with on-premises infrastructure.

## II. Key component of cloud Infrastructure

a. **Data Centers:** Massive data centers with plenty of servers and networking hardware are kept up to date by cloud providers.

To improve availability, redundancy, and dependability, these data centers are dispersed geographically.

b. **Servers:** Through the use of virtualization technology, resource usage can be optimized by running several virtual computers on a single physical server.

c. **Storage:** Cloud service providers provide a range of storage solutions, such as file, block, and object storage.

Storage resources are easily provided or de-provisioned in response to demand since they are scalable.

d. **Security:** Security in the backend refers to implementing different security mechanisms for secure Cloud systems, resources, files, and infrastructure to the end-user.

- e. **Monitoring and Management Tool:** Resources can be managed and scaled dynamically with the help of tools and services that track their availability, performance, and overall health.
- f. **Databases:** For managing and scalably storing and retrieving data, cloud-based databases offer solutions. Included in them are NoSQL, in-memory, and relational databases.
- g. **Networking:** Infrastructure for connecting and transferring data between servers, storage, and users. This includes routers, switches, load balancers, and content delivery networks (CDNs) to ensure efficient data flow

### III. Services of Cloud Computing

There are three Services of Cloud Computing

1. Infrastructure as a Service (IaaS)
2. Platform as a Service (PaaS)
3. Software as a Service (SaaS)

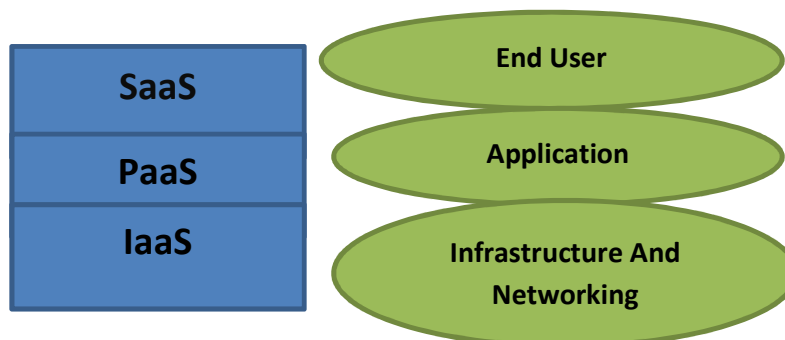
1. Infrastructure as a Services (IaaS): Through the internet, IaaS offers virtualized computer resources. Networking infrastructure, storage, and virtual machines are available for pay-as-you-go user rental. Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) are a few examples of providers.

2. Platform as a Services (PaaS): Building, deploying, and managing applications without having to worry about the underlying infrastructure is made possible by PaaS, which provides a platform that combines development tools and infrastructure.

Heroku, Google App Engine, and Microsoft Azure App Service are a few examples of providers.

3. Software as a Services: Software as a Service (SaaS) offers subscription-based online software application delivery. The software can be accessed by users via a web browser; no installation or upkeep is required.

Examples of providers include Google Workspace, Microsoft 365, and Salesforce. (Sheth(2021)).



### Role of cloud computing in Pharmaceutical Industry

Cloud platform provide secure environment for storing and managing patient health records. This facilitate easy access of patient information by authorized healthcare professionals. Healthcare professionals can use

wearable gadget data to save and analyze patient data, monitor patients remotely, and conduct virtual consultations. In the absence of health care professional Sharing patient images, report or test results he can make treatment plan.(Sheth(2021)).The best platforms for processing and analyzing medical imaging data are cloud ones with high-performance computing capabilities. In fields like radiology and pathology, this makes diagnosis quicker and more precise. As well as Cloud computing operates on Pay-as-you-go model, allowing health care organization to pay only for resources they use (Kamran (2023))

This can lead to cost saving. The creation of mobile healthcare applications that give consumers and medical staff quick access to health information, appointment scheduling, and prescription reminders is made possible by cloud-based solutions. The financial and e-commerce industries have already tested risk management techniques that the pharmaceutical industry can utilize.(Karl. (2010)).

## **Cloud computing in COVID-19**

Cloud computing played crucial role in supporting business organization, IT companies, Education Institution as well as Individuals. The world has switched to digitalization. Using cloud technology also means that IT workers won't have to worry about keeping up with software updates or maintenance. Cost-effective and prolonged access to IT resources is made possible by the flexibility to scale up or down cloud services in response to demand.(Athambawa, Ali. (2023)).

## **Advantages of cloud computing in COVID**

**Facilitating Remote Work:** Employees may access data and apps important to their jobs from a distance thanks to cloud computing. This has made it possible for the move to remote work arrangements to go smoothly during lockdowns when actual workplaces were closed.

**Scalability and Flexibility:** Without requiring physical infrastructure, businesses may scale their computing capabilities up or down in response to demand. This adaptability is essential in uncertain times because it enables firms to quickly adjust to shifting demands.

**Collaboration Tools:** Project management software, document sharing, video conferencing, and other cloud-based collaboration technologies have made it easier for distant teams to communicate with one other. During lockdowns, this has been essential for preserving connectivity and productivity.

**Data Storage and Backups:** Cloud storage services provide data backup and archiving in a safe and convenient manner. It is now crucial for company continuity to have centralized, dependable data storage because employees are working from different places.

**Cost Efficiency:** The necessity to make large upfront investments in physical gear is removed by cloud computing. It is a cost-effective approach because businesses may pay for the resources they utilize, particularly in hard economic times.

**Disaster Recovery:** Strong disaster recovery features are frequently included in cloud services. Businesses can swiftly restore their data from offsite backups in the case of data loss or system failures, reducing downtime and guaranteeing continuity.

**Resource Elasticity:** Because cloud services offer flexible resource allocation, businesses can grow their IT infrastructure in accordance with their changing needs. This guarantees that companies can adjust to abrupt shifts in customer demand or operational requirements.

**Accessibility to Advanced Technologies:** Cloud computing facilitates global connectivity, allowing businesses to operate and collaborate across borders. This has been particularly beneficial when travel restrictions and lockdowns limited physical interactions.

**Remote Education and HealthCare:** Cloud-based solutions have been instrumental in supporting remote education and telehealth services. These platforms enable the delivery of virtual classrooms, online healthcare consultations, and the sharing of educational resources.

## **Conclusion:**

Because cloud computing offered vital solutions for online collaboration, remote work, and meeting growing digital needs, it was important in the COVID-19 epidemic. The cloud provided scalable and easily accessible resources, facilitating the smooth implementation of remote work tools, video conferencing platforms, and data storage solutions as enterprises and organizations quickly transitioned to remote operations. Maintaining company continuity, assisting with healthcare programs, and meeting the increase in online activity all depended on this flexibility and scalability. Essentially, during the pandemic's exceptional problems, the cloud emerged as a basic technology that enabled resilience and adaptation.

This indicates to us that cloud computing has a significant effect on both business and society. We also learn that a great number of new technologies are developing quickly, all of which have the potential to improve humankind's quality of life while also advancing technology. (Ali(2023)).

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