

# Example of cloud computing research paper

[Business](#), [Company](#)



## **Introduction**

Cloud Computing is the description given to a variety of different computing concepts involving a large number of computers interconnected via real-time communication networks like the internet. Cloud Computing is a terminology that lacks a universal technical or scientific definition. The term is a synonym for distributed computing through a network. It provides the capability to run a program on several interconnected computers simultaneously. Cloud Computing also refers to services that are network based. The networked based services are served by virtual hardware that is simulated by software running on a few of the machines. Cloud Computing depends on sharing of resources to realize economies of scale and coherence akin to utility over a network. The foundation of Cloud Computing is the broad concept of shared services and governed infrastructure. Cloud centers its efforts on optimizing the effectiveness of resources a firm or organization shares. Sharing the resources in Cloud Computing not only allow multiple users to access resources, but also permits dynamic relocation of resources according to demand. This enables allocation and re-allocation of resources depending on needs within the organization. A cloud computer facility that serves one part of the world with an application during its working hours serves another part of the world with a different application. Cloud Computing helps firms with branches in different time zones to share hardware resources in providing their services to the global market

## History of Cloud Computing

The concept of Cloud Computing has revolutionized through several phases. These phases include Application Service Provision, Grid and Utility Computing and Software as a Service. The foundations that would later develop into Cloud Computing began in the sixties with the efforts of J. C. R Licklider. He came up with the concept of Intergalactic Computer Networks. Through his efforts, the computer networking society was able to develop Advanced Research Projects Agency (ARPANET) in 1969. Licklider had a vision that everyone in the globe would one day be able to access resources and programs from anywhere in the world. The vision of the computer wizard of the 1960s sounded much like the Cloud Computing that exists today.

Another contributor to the realization of Cloud Computing was John McCarthy. The researcher and computer scientist proposed the idea that computing services be delivered as public utility. Cloud Computing has developed in different lines since the 1960s. The latest of the evolutions in Cloud Computing is the Web 2.0. The internet started offering significant data bandwidth in 1995 after the World Wide Consortium lifted a ban on public use of the internet. Due to relatively little use of the internet before 1990s, dedicated development of Cloud Computing took shape in the early 2000s and late 1990s.

The first significant milestone in the history of Cloud Computing was the development of Salesforce.com in 1999. The development pioneered delivery of enterprise applications to firms via simple websites. Salesforce.com provided the conduit for mainstream software firms and specialists to deliver applications over the internet. In 2002, another major step in the

history of Cloud Computing surfaced. This was the development of Amazon Web Services. The service suit from Amazon provided cloud-based services that included human intelligence, computation and storage of data. The software suit provided these services through Amazon Mechanical Turk. The first widely used Cloud Computing infrastructure became the Amazon EC2/S3.

The year 2008 saw Eucalyptus become the first open source store for deployment of private clouds. The same year, Open Nebula became the first open-source software in the Cloud Computing to deploy hybrid and private clouds. The company also became the first to provide services for confederation of clouds. The computer and technology industry focused on developing strategies of ensuring quality of service provision in computer clouds. There were developments of real-time interactive applications to aid in speed of Cloud Computing services. The same year, stakeholders in the computer technology industry observed an opportunity to shape the correlation between those who provide IT Services, those who sell IT Services and the It services. They also observed that companies showed a paradigm shift from ownership of software and hardware services to per-use service-based frameworks. These shifts in company values emphasized the significance of Cloud Computing in the world at the time. Cloud Computing had to develop in proportion to the degree of reliance firms and organizations were expressing on it.

Later in 2009, another significant step became evident in Cloud Computing. 2009 saw the development and launch of Web 2.0. Google Corporation and other companies began providing web-based enterprise applications. The

services included many, Google Applications among them. The most fundamental development in the field of Cloud Computing is the development of “killer apps”. Leading technology corporations such as Google and Microsoft led the chore of developing these applications. The phenomenon refers to the knock-on effect felt when the technology leaders offer network-based services that are easy to consume and reliable.

## **How Cloud Computing Works**

Cloud Computing is the outcome of adoption and evolution of paradigms and existing technologies. The chief aim of Cloud Computing is to allow its users to take full advantage of all existing technologies. It labors to ascertain this service enjoyment without the need for users to have deep technological knowhow of the way the technologies work. Cloud Computing focuses on reducing costs of operation and aid the users' center on the core businesses of their careers without impediments of technological ignorance.

Virtualization is the technology that enables Cloud Computing. The technology abstracts the physical infrastructure of computing. The physical components are usually the most rigid. Virtualization makes the physical components available to users as soft components that are straightforward to use and manage. The technology provides the agility that users require to speed up Information Technology operations. Virtualization also reduces the infrastructure requirement by ensure full resource utilization. Autonomic computing is the other concept that runs Cloud Computing. Autonomic computing automates the procedures through which users provision resources on demand. This minimizes user involvement in the process of data storage and retrieval, thus reducing the likelihood of human error on

Cloud Computing.

Service Oriented Architecture (SOA) defines the other concepts that run Cloud Computing. SOA breaks down complex problems into component services that can be integrated and provide easy solutions. In addition, Cloud Computing deploys the use of utility computing to provide metrics for services the cloud uses. The metrics are the basis of pay-per-use models by the public. Further, measured services are fundamental part of feedback path in autonomic computing. Cloud Gaming enables Cloud Computing services to deliver games to computers. The gaming data is stored in a provider's server. The gaming software is independent of the personal computer the user uses to play the game. Peer-to-Peer framework enables the use of Cloud Computing without any central coordination. In this architecture, participants act both as the consumers and as suppliers of the resources.

In addition to the aforementioned models of operation of Cloud Computing, there is application of Utility Computing. This refers to the packaging of computing resources such as storage and computing. In addition, the utility gives Cloud Computing the ability to package metered services akin to traditional public utilities like electricity and telephone bills. Furthermore, Grid Computing is the other functionality within Cloud Computing that permits success of clouds. It provides for parallel and distributed computing where a virtual and super computer are composed of a cluster of interconnected, loosely coupled PCs acting in concert to carry out very large tasks. The Client-Server Model is the other framework that describes operations of the concept of Cloud Computing. The model refers to a

distributed application that differentiates between the service requestors and the service providers. In this scheme, the service requestors are the clients while the providers are the servers. Provision of reliable Cloud Computing relies on the use of mainframe computers. These large, powerful computers process data that need large memories and speed. Servers (service providers) often use these as the ability to store and dispense a lot of information requires considerable power to sustain helpful speeds. The large, powerful mainframe server computers store the information that users access on request. In addition to this, Cloud Computing provides users with an opportunity to store their data in a network and later access it on request. Accessing the data requires the user to be connected to the network.

## **Security of Cloud Computing**

Each passing day marks an increase in the security concern of Cloud Computing. The new model has become so popular that threat to Cloud Computing signifies a threat to sustainability of the universe. Efficiency and effectiveness of the traditional infrastructure of sharing and storing data is being considered as an alternative to solving security concerns of Cloud Computing. The same security issues that place the security and integrity of data in multi-user mainframe apply to Cloud Computing.

As a web-based framework of storing and sharing resources, Cloud Computing presents firms with difficult security issues concerning hacking and spread of malware. Whereas some open source software are genuine and help users reduce operational costs, some people use the development of Cloud Computing to spread malware with malicious intent. Hackers develop programs with ability to send information on a user's computer to

them and embed the malicious software in open-source software.

In respect to these malware, the security of users of Cloud Computing is not guaranteed. They stand the risk of unintentional sharing of their sensitive passwords and endangering their own existence and that of the firms within which they are employed. Cases of phishing and spear-phishing that target sensitive information of significant personalities and corporations are on the rise. There are no boundaries to the damages these malware can cause systems and individuals. If one escapes the eventuality of filtering sensitive information to the public domain, there is the risk of losing information due to detrimental viruses spread through open source software. Adware also cause constant distraction and loss of time as they keep popping on the screen.

Security concerns of Cloud Computing have pushed the stakeholders in computing field to forge ways of restoring data security and integrity. It is evident that the confidence of some users has lowered to levels that require intervention to continue reaping the benefits of Cloud Computing. There are firewalls and antivirus that act as perfect shield against malicious access to unauthorized persons. Measures are in place to guard sensitive data, bug exploitation, recovery, malicious insiders, multi-tenancy issues, management console security, data segregation and accountability. The security measures include use of multiple cloud providers, improving legal support and virtual machine support, standardization of APIs, use of Particularly Public Key Infrastructure and cryptography.



## **Ease of Use of Cloud Computing**

Cloud Computing has the main goal of ensuring that its users enjoy the benefits of all available technologies at minimum cost and with least technical knowhow. Virtualization is the technology that enables Cloud Computing. The technology abstracts the physical infrastructure of computing. The physical components are usually the most rigid.

Virtualization makes the physical components available to users as soft components that are straightforward to use and manage. The technology provides the agility that users require to speed up Information Technology operations. Virtualization also reduces the infrastructure requirement by ensure full resource utilization. From this, it is evident that using Cloud Computing requires no technical knowledge. It is a cheap and straightforward process that anyone can use, thus its popularity.

## **Advantages of Cloud Computing**

The advent of internet has affected businesses in their daily activities. Instead of saving files on hard drive or using software installed in a computer, cloud offer quick access through internet connection. Ability to instantly access information and data files across the globe has led to enormous growth of Cloud Computing. Storage is provided by a big remote server which provides large storage space at minimal cost. Transactions are done online in real time saving costs and time. Only a few companies are still reluctant to utilize this tool. The use of Cloud Computing has become increasingly widespread of late. It provides many benefits to companies and individuals. Convenience is one advantage of Cloud Computing. One doesn't need to pay for more software, hardware and licensing. It does not come

with unnecessary packages hence a company pays for what it requires. The scalability allows one to purchase suitable data storage and applications. There are no training costs of staff on how to use and install software. A business saves on business space especially where space is limited. Cloud Computing also enhances cost effectiveness. One only subscribes for appropriate services the cost of software, hardware and licensing fees. Many companies save on technical support cost because issues are sorted at the back end. Individuals do not need expensive hardware like memory to store data. The company cuts cost and saves resources for other activities. Cloud Computing allow data access anywhere as long as internet is available. Employees can work from different parts of the world by accessing the same database. Cloud Computing reduces alarm for storage space. Availability of large storage space reduces cost of buying storage facilities all time. Cloud Computing enhance data security. Companies providing Cloud Computing back up for data recovery in case of break down. The data is already backed up without the company or individuals required to keep storage hardware. Data recovery complexity reduces and issues resolved very fast. Data and systems protection is crucial for business continuity. Cloud keeps data safe and secure from power loss, natural disaster or other eventualities. Ability to access data again faster minimizes customer dissatisfaction and loss of productivity. Companies are also saved the task of updating and integrating software. Software customizes and updates automatically to meet individual needs. Cloud Computing is operated and adjusted with ease with minimal or no alterations. Change of direction is achieved with minimal loss in terms of

personnel, energy and time. A company can increase or reduce storage and operation to fit prevailing situation. Individual saves time for other business which could be used for system upgrade.

Collaboration gives the company ability to share and coordinate easily compared to traditional methods. Employees could use Cloud Computing if they are working on a project across various locations. Staff, contractors and other partisan parties access files at the same time. It also enables quick sharing and communication within an organization within a short time.

Collaboration means multiple staff can access, edit and share files that they are currently working on. Accessibility of cloud has rapidly increased through tablets and smart phones. Employees executing business outside offices can deliver when out in the fields.

Several advantages of Cloud Computing over traditional computing result in its widespread use and popularity. Cloud Computing is quick and simple regardless of size of data or business. Even standard browsers allow data access irrespective of employee location or time. Cost of staff training is substantially reduced since minimal training is required. Companies employing Cloud Computing is capable of responding to feedbacks within a short time. Cloud Computing offer improved security by safeguarding sensitive information from unauthorized persons.

## **Disadvantages of Cloud Computing**

Cloud Computing depends majorly on internet connectivity. It makes the business operations to be solely dependent on network. When there is no internet downtime the business activities are adversely affected. The most reliable Cloud Computing service providers also suffer outages more

frequently. Redundancy is necessary to cover in case of failure of a particular service provider. The system becomes vulnerable and business will come to a halt if connection is not restored.

Data stored in the cloud face security threats. Security of that can be volatile because of network connectivity which exposes data. Cloud Computing service providers main concern is development of security matters and systems to safeguard company's sensitive information. System hackers are continually looking for ways to break through security of major cloud providers. Most cloud providers do not meet standards required to process, send and store confidential data. These standards include PCI and HIPPA are used to measure security level. The users have limited control over the main function because cloud is run from a virtual environment. Most Cloud Computing providers lack flexibility with regard to particular applications or formats. Lack of support in case of a problem is another setback for Cloud Computing. Customer service does not respond promptly. The cost of Cloud Computing becomes high if the business has high demand for server resources to handle high volume of traffic. Server hosting costs increase with increase in the server resources demand. This may make Cloud Computing more expensive than traditional methods.

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