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# Applications of Cloud Computing in Different Areas

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**Abstract-** Cloud computing is an evolving paradigm which offers great computational power to the organizations which require processing of large amount of data. The growth of high speed networks have led to the rise in the concurrent transactions a day. This increasing demand is handled through large-scale data-centers. These data-centres comprise of hundreds and thousands of servers with storage and network systems. Users can store, access, and share any amount of information in Cloud. This paper summarizes the applicability of cloud computing in various areas.
**Keywords-** Cloud computing, Library automation, mobile devices.

## 1. INTRODUCTION

Cloud computing is considered as a client-server architecture where the servers which collectively called as the cloud reside remotely and are accessed via the internet. Traditionally, applications like word processors that are run locally or on a server and can be accessed via a dumb terminal. In cloud computing environment such applications are run on the remote servers and are accessed via a web browser. So cloud is considered to be a service which provides resources for storage and for computation with a shared access. Traditionally, a specific hard drive was required for storage and a specific CPU for computation. The service then maps any requests for resources to its physical resources. The service has access to a large amount of physical resources, and can dynamically allocate them as they are needed.

## 2. CLOUD COMPUTING DEPLOYMENT MODELS

There are three types of cloud deployments models: Public Cloud, Private Cloud and Hybrid Cloud.

### 2.1 Public Cloud

In public Cloud services are available to anyone on Internet. Datacenters are large which comprise of thousands of servers with high speed network to support large public domain. Google AppEngine and Microsoft Azure are the exmaples of public cloud. Public Cloud is a good solution for a small enterprise. These Clouds can handle peak loads on the local infrastructure effectively.

### 2.2 Private Clouds

Private Clouds are deployed within the premise of an enterprise or an organization to provide IT services to its internal users. There are many organizations which may want to maintain their own specialized Clouds to cater their particular needs e.g. the health care industry maintains many confidential medical data which cannot be stored in public infrastructure [9]. Thus, the private Cloud services have greater control over the infrastructure. Use of private cloud improves security because its access is limited that is only to one or few organizations.

### 2.3 Hybrid Clouds

Hybrid Clouds emerged due to diffusion of the advantages of both public and private Clouds. In this model, organizations outsource non-critical information and processing to the public Cloud, while keeping critical services and data in their control [9]. Thus, organizations can maintain sensitive information within the premises by utilizing their existing IT infrastructure, and can use public cloud to auto-scale their resources. The hybrid Cloud, applies to services that are related to IT infrastructure rather than software services.

## 3. CLOUD COMPUTING IN ACADEMIC INSTITUTIONS

Higher education is acknowledged as one of the pillars of society development. Due to the growing needs of the use of information technology, universities are facing problems in providing necessary information technology (IT) support for educational, research and development activities [5]. Cloud Computing provides universities with the possibility of concentrating more on teaching and research activities instead complex IT configuration and software systems. Cloud computing can be used to support cooperative learning using computer technologies which support collaborative methods of instruction. Cloud computing offers many benefits to e-learning solutions by providing the infrastructure, platform and educational services directly through cloud providers and by using virtualization, centralized data storage and facilities for data access monitoring [4].

The main issues in adoption of cloud computing in academic institutions: security, performance and availability. To ensure the security of sensitive data in cloud the solutions that can be performed nclude mask of the data, firewalls, encryption and key management etc. Knowledge base can be developed by attending seminars, conferences and by consulting the most recent researches in the field. With respect to the IT needs, the analysis may start from the categories of users who interact with the present IT infrastructure and their necessities [5].

**E-LEARNING**

E-Learning cloud environment provides user-oriented computing environment and software services. In e-learning cloud space, users can access digital services at any time in anywhere. The base layer of e-learning cloud shares IT infrastructure resources. The hardware layer runs like the internet. It makes the sharing and accessing of hardware resources in secure and scalable way. Virtualization technology makes the physical hardware separated from operating system to improve the utilization and flexibility of IT resource.

The platform layer of e-Learning cloud carries out the tasks of data storage and computing and it can achieve the tasks of mass data storage, business intelligence processing and so on which have been difficult to complete. The application layer of e-learning cloud provides the applications, software or services provided to a school or university.

## 4. CLOUD COMPUTING IN LIBRARY AUTOMATION

Common data can easily be shared among services and users when it is stored in a cloud. The need for local storage, backups is removed. The data that is considered to be private to a single business or organization can now be making agreements. Another benefit of storing data in the cloud is that it provides collaboration and cooperative intelligence.

With cloud computing an online information community network can be developed for libraries. The two communities are: the internal community of libraries which collaborating within a single institution and external community collabrate across institutions. The cooperative efforts of libraries will bring wider recognition for libraries and provide the platform where the libraries can innovate.

## 5. CLOUD COMPUTING FOR MOBILE HEALTH APPLICATIONS

Mobile devices are being considered as service platforms for mobile health information delivery, access and communication [8]. But there are certain limitations like computation and power supply in using mobile devices to deliver secure multimedia based health services. As mobile devices have limited computational capacity and these run on small batteries; they are unable to run heavy multimedia & security algorithms.

By adopting Cloud Computing protocol management model which provides multimedia sensor signal processing & also provide security as a service to mobile devices. Multimedia and security operations can be performed in the cloud, allowing mobile health service providers to subscribe and extend the capabilities of their mobile health applications beyond the existing mobile device limitations [8]. Multimedia sensor signal processing requires increased power consumption for it to execute on a mobile device. In the cloud computing based model complex computational algorithms are executed in the cloud and the final result is uploaded back to the mobile device and the application server (AS).

Mobile phones can provide several societal, business and governmental services e.g. applications, like bank transactions can be performed on a mobile device. Further developments will allow mobile devices with unique features that can sense the environment and physiological parameters to enhance quality of life and remote monitoring of patients [8].

## SUMMARY

Cloud computing enables outsourcing of all IT needs such as storage, computation and software through the Internet. It allows fast application development and testing for small IT companies where the IT infrastructure is small. Cloud computing enhances the computational power of the organizations which require processing of very large amount of data every day e.g. genomics research has to manage large volume of gene sequencing data. The applicability of Cloud computing in diverse fields makes it an evolving paradigm in the high performance computing. Cloud computing benefitted the organizations which have a small infrastructure and which cannot afford the high cost involved in developing information technology based infrastructure. The use of cloud computing in academic institutions motivates the innvations in research. Cloud can also be used for automation of libraries. The cooperative efforts of libraries will bring wider recognition for libraries. Cloud computing is equally beneficial in mobile health applications.

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