



## A STUDY ON CLOUD COMPUTING AS AN EMERGING FORCE IN THE TECHNICAL EDUCATION

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### ABSTRACT:

*The emergence of relatively new technical advancement is cloud computing technology in the field of education, which took a drastic worldwide change and improvement in the smart and digital classrooms and reshaped most of the processes related to learning, teaching, administration, storing and retrieving the documents. Cloud computing is one of the most popular trend of the current era due to its latent to enable information accessibility, progress association and reinvent traditional Information Technology structures. The concept of cloud computing has its various interpretations and applications. Cloud computing mainly refers to technology that delivers powerful computing resources through the Internet. Educational institutions all over the world have already adapted the cloud to their own settings and made use of its great potential for teaching and technical innovation. Cloud based tools also helps the students to involve in reliable research work to be carried out as a part academics. This paper mainly focuses on the services, applications and the important role in the field of Technical Education for higher studies.*

*Keywords: Cloud Computing, Technology, Technical Innovation, Computing Resources*

### I. INTRODUCTION:

Cloud Technology helps [1] to use and share virtualized resources, which are highly scalable. Cloud Computing, which is a new current technological trend is going to have a significant impact [2] on teaching and learning environment. Few institutions are still lacking resources for practical learning to support the research and educational activities in developing countries like India. Cloud, at this moment can become a viable solution. From the economic perspective, Cloud Computing would be the best solution. Developing and adopting Cloud technologies in the technical education and research field will facilitate the scholars and students to gain the knowledge. Cloud Computing is a network of computing resources and can be shared anywhere. The quality in technical education can be improved far better in regional colleges using the Cloud Computing. Student activities can actively be monitored using the Cloud Computing. The sharing and delivering of learning or study materials can be focused with the help of current Cloud-Based Education Systems.

### II. CLOUD SERVICES

To reduce the complexity in the field of Technical education, present systems can be replaced with the Cloud Computing services [3]. So, that the colleges can attain significant benefits.

The following study of various types of services [4][5] will help to gain the knowledge of Cloud Services, in which the flexibility and quickness of migrating the sensitive data to into the remote and cloud itself can be expressed.

**1. Infrastructure as a Service(IaaS):** This Service helps to satisfy the infrastructure needs for students, teaching staff and academic researchers in the field of Technical education. The

main services like caching, Networking, Security, Legacy and System Management are available with IaaS.

**2. Platform as a Service(PaaS):** Students, teaching staff and academic researchers can be permitted to build their own applications without the cost and complexity of buying and managing the underlying hardware and software layers. The services like application development, decision support, web, designing and streaming can be provided with PaaS.

**3. Software as a Service(SaaS):** This is the most interesting service for the technical education group. User can interact with a web browser, Application services like Email, Customer Relationship Management (CRM), Collaborative applications, Enterprise Resource Planning (ERP) can be availed with Software as a Service.

**4. Computing as a Service(CaaS):** Raw Computing power on virtual servers can be provided. Students and research scholars can utilize this service for computations.

**5. DataBase as a Service(DBaaS):** In this, DataBase can be run on the service provider's physical infrastructure. Here, the provider can handle database maintenance and management of data. Students and researchers can gain the access to this type of service and can easily retrieve the data for analysis purpose.

Cloud	Enterprise
SaaS	Applications (SAP, Oracle BS)
PaaS	Middleware (DB, ESB, App Srvr)
IaaS	Virtualization / Hardware / OS

Figure 1: Basic Cloud Services

### III. DEPLOYMENT MODELS

The deployment models of Cloud Computing [6] are:

- 1. Private Cloud:** In the Private Cloud deployment model [7], the infrastructure is provisioned for exclusive use by a single organization comprising of multiple consumers. Infrastructure may be owned, managed and operated by the organization or third party. Infrastructure may exist on or off premises. Private Clouds are driven by security measures and concerns. Private Cloud will keep the infrastructure and assets within the firewall.
- 2. Public Cloud:** The Cloud infrastructure [8] is provisioned for open use by the general public. In the Public cloud, service providers use the internet to make resources such as applications and storage.
- 3. Hybrid Cloud:** In Hybrid Cloud, infrastructure is a composition of two or more distinct cloud infrastructures.

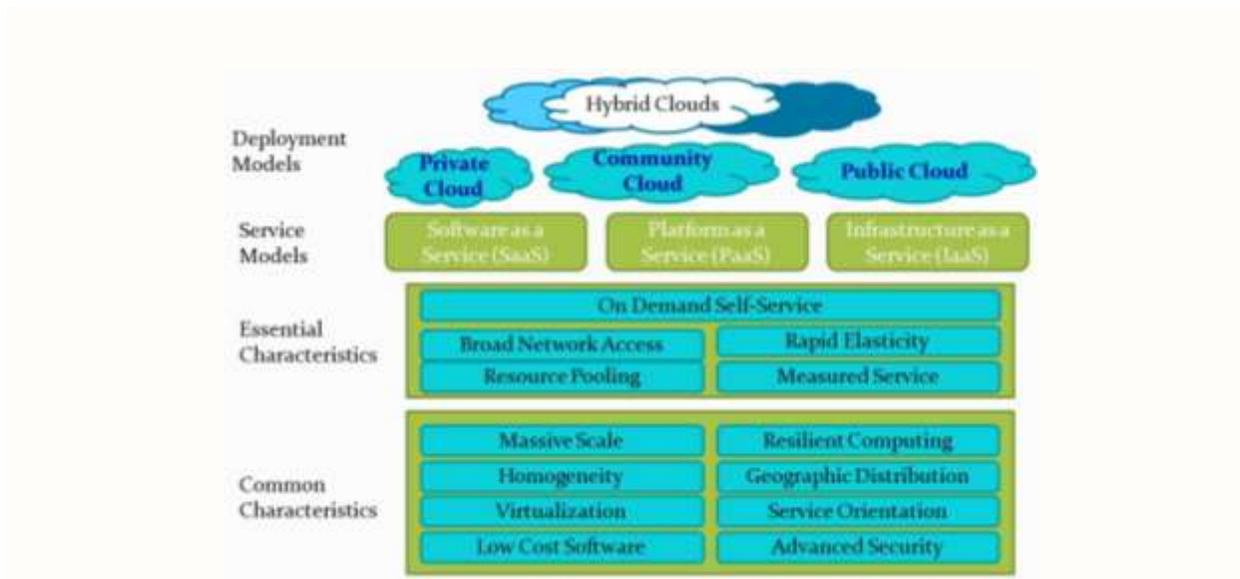


Figure:2: Image Source: National Institute of Software Technology (NIST) Cloud Definition Framework

#### IV. CLOUD TECHNOLOGY IN EDUCATION SYSTEM

Usage of Cloud Technology in the field of education system [9] is becoming an important aspect in the today's technical education. To operate virtual labs for the students, researchers and teaching staff, the cloud technology can play a vital role to increase the technical skills and abilities.

The cloud features [10][11] like availability and scalability are the most significant in various applications, which are providing a good and sound interface for the students to successfully do their tasks in cloud computing environment. The content of the cloud will be controlled and managed by the service providers and students or scholars can get the content like scientific experiments, technical experiments, virtual tests, textbooks, encyclopedias and soon upon the request.

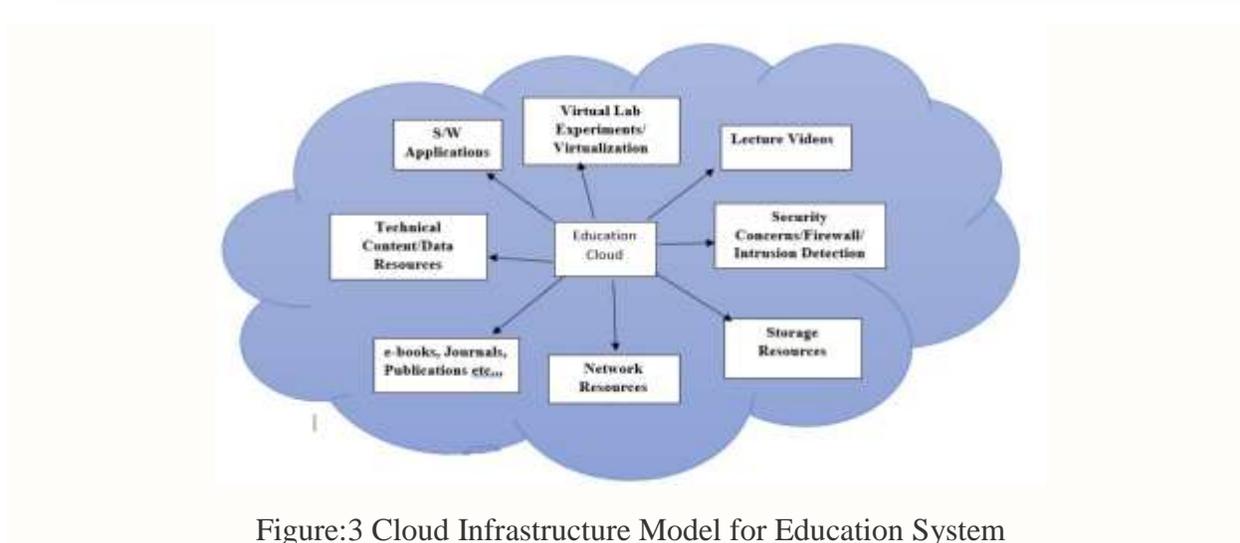


Figure:3 Cloud Infrastructure Model for Education System



## V. CHALLENGES

The cloud computing services [12][13] needed to deliver the majority of Information Technology services needed by the students and researchers do not yet exist. The constraints and problems related to service level agreements and applications is a major challenge for the service providers, the students and researchers in such cases are not interested to gain the services from cloud. The security concerns [14] is also a one of the challenge in the public cloud deployment model. Education perspective cloud services are not vastly implemented when compared to the other cloud services provided by the customers. Capability of technological levels is not same, it is different with different service providers.

## VI. CONCLUSION

Cloud has become a current research topic, that allows to access a file or application or infrastructure or data resources at any time without needing a particular machine or installation. In this paper, the services provided by the cloud, deployment models like private, public and hybrid, cloud technology in the field of technical education and the challenges are discussed. The implementation of cloud in the universities and colleges of the technical education can improve the quality and skill abilities in the student as well as researchers. In the near future, the cloud technology can play a vital role in the field of technical education.

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