Cloud Based Applications in Higher Education: Scope & Need

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ABSTRACT
Now-a-days Cloud Computing is widely used in various fields of service industry. Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. In other words, Cloud computing provides everything in the form of service as per convenience.

Higher education is one of the most important service sectors having direct impact on National Growth. Therefore, it is required to enhance higher education continuously with new technologies. Cloud Computing can satisfy several needs of higher education in less cost and more effective way. It will be useful in reducing investment in infrastructure, software licenses, etc.

Cloud based application can be useful for enhancing actual education. This application can be useful for staff, students and Management. This application can be useful for Effective teaching and learning, Communication between teacher and students, sharing notes, videos and other type of study material, administration of Educational Institute and quality assessment of higher education.

KEY WORDS: Cloud Computing, Higher Education, Cloud Applications.

Introduction
Cloud Computing is now widely used in several fields. Basically, Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. In other words, Cloud computing provides everything in the form of service as per convenience of user. Cloud computing technology provides three types of services viz IaaS, PaaS & SaaS. We are focusing on SaaS i.e. Software as a Service also called as cloud based applications. These Cloud based applications are useful in almost all sectors especially in service sector.

Education sector is one of the important service sectors and it is having direct impact on intellectual growth of the nation. Especially Higher Education is now-a-days became most crucial part as it plays an important role in national growth. Effective and qualitative higher education is a challenging job for developing country like India. More research is being carried out for qualitative higher education. Therefore it is required to enhance higher education continuously with new technologies. Cloud Computing can satisfy several needs of higher education in less cost and more effective way. It can reduce investment in infrastructure, software licenses etc.

Cloud based application can be useful for enhancing actual education. This application can be useful for staff, students and Management.
Challenges for Education Sector:

1. **Developing IT Infrastructure:**
   In higher education, we need to provide adequate computing facilities to students. It requires huge investment in hardware. Developing such kind of computer lab itself is big challenge for education sector. Most of the Institutions cannot afford investment in such IT hardware infrastructure. This infrastructure is very rarely utilized with its full capacity.

2. **Software Licensing:**
   After developing sufficient IT Infrastructure, next step is provide software applications to students. Again software licensing is a challenge for higher education sector because it requires investment. Periodic renewal of these software licensing is necessary for continuing use of software.

3. **Multiple Platform Requirements:**
   While providing training to students, we need to work on different platforms like windows, Linux etc. In this case we need to share same infrastructure as using separate infrastructure is not affordable.

4. **Sharing resources:**
   In higher education, now-a-days sharing resources concept is must. Technology is changing rapidly and accordingly resources are to be developed and used by faculties and students. These resources can be notes, videos, audio lectures, e-book, pictures etc. Effective sharing of these resources is a challenge for educational sector.

5. **Effective Administration:**
   Administration in higher education Institutes is always a challenging job. We need to handle the information from student admission to their academic achievements. This information has to be maintained for long period of time and frequently some of this information is required in different format. Additionally every management has to deal with other issues like faculty development, Accounts, Teaching and Non-Teaching staff management etc.

6. **Quality Assessment:**
   Quality Management in Higher Education is now a big issue. Governing bodies like NAAC, AICTE, and NBA are continuously putting efforts to enhance the quality in Higher Education and therefore several restrictions are placed on higher education providers. Periodical assessment of quality is required in Institution and it is time-consuming and hectic job. After assessment again some improvement plans ha to be implemented by Institutions.

7. **Communication between Students and Teacher:**
   For quality education there must be effective communication between student and faculty. For this purpose, there must be a common facility for interaction and sharing ideas or concepts.

**Cloud Computing: New style of providing services**

Cloud computing in its simplest form is a model for allocating compute and storage resources on demand as shown in fig 1. It offers new ways to provide services while significantly altering the cost structure underlying those services.

**Benefits of cloud computing:**

1. **Rapid Elasticity:** Elasticity is defined as the ability to scale resources both up and down as needed.
2. **Measured Service:** In a measured service, aspects of the cloud service are controlled and monitored by the cloud provider. This is crucial for billing, access control, resource optimization, capacity planning and other tasks.

3. **On-Demand Self-Service:** The on-demand and self-service aspects of cloud computing mean that a consumer can use cloud services as needed without any human interaction with the cloud provider.

4. **Ubiquitous Network Access:** Ubiquitous network access means that the cloud provider’s capabilities are available over the network and can be accessed through standard mechanisms by both thick and thin clients.

Because of above features cloud computing results in **Lower computer costs, Improved performance, Reduced software costs, Unlimited data storage capacity and increased data reliability: & Device independence.**

### Cloud Computing application in Higher Education:

We can use cloud computing in higher education to overcome challenges.

1. **Infrastructure arrangement from cloud:**

   Cloud computing provides concept of IaaS (Infrastructure as a service). In this case, Higher Education Authorities can take infrastructure like storage, processing units, etc from cloud service providers. Here you can pay only as per your usage.

2. **Software Licensing:**

   No need to purchase any software. Cloud service provider can give you software as per your demand. Even we can use operating systems as per requirement. It is possible through SaaS (Software as a Service).

3. **Multiple Platform Requirements:**

   By using virtualization techniques we can install multiple platforms on same infrastructure. Cloud computing technology provides some tools like VMViewer (Virtual Machine Viewer) which can create virtual machine inside an application. This machine can have separate operating system.

4. **Cloud based application for Higher Education:**

   We can develop a cloud based application for providing facilities require in higher education. It may contain
   
   a. **Resource Sharing:** Here teaching-learning resources can be shared by putting them on cloud. From cloud anybody can access these resources.
   
   b. **Effective administration:** This cloud application can be accessed through browser just like a web application and it can also store data. This application will manage all administrative activities like enquiries, admission, academic progress of students, documents management, Inventory and Accounts for Institute.

   c. Each activity will be given as input to this cloud application including research activities of faculty, curricular and non-curricular activities in Institution and this information will be used to assess the quality in higher education. We can generate required information as and when required.

   d. This application can be used as a communication channel between students and teacher. We can also use online student feedback system through this cloud app.

### Limitations of Cloud Computing:

- Requires a high-speed internet connection.
- If the cloud servers happen to be backed up at that moment, or if the Internet is having a slow day, we would not get the instantaneous access we might expect from desktop applications.
- With cloud computing, all data is stored on the cloud so it runs the risk of security.
Conclusion:
Cloud will continue to evolve as the foundation for the future internet where we will be interconnected in a web of content and services. Cloud computing application will be useful for higher education sector in India. Most of problems in higher education can be reduced and can be handled properly with implementation of cloud computing.

References: