A SURVEY ON LEARNING TECHNOLOGY OF EDUCATION SYSTEM USING CLOUD COMPUTING

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Abstract-Numerous nations because of poor financial conditions cannot pay their tenants because of advance technologies created by pc framework and for each individual's, computer education is needed essentially. Automation techniques, network technology, virtualization and many more are part of traditional computer technologies, which have made tremendous development. Government, business and education are adopting many applications because of the rapid growth in advance technology. To improve the standards and activities in education cloud computing can be utilized. In this paper we study the research problem that exits in education institution in adopting cloud computing and do survey on different learning technologies. We have summarized in the table benefits, equipment used, focus, framework, impact on different learning technologies which are essential for adopting cloud computing in educational institution.

Keywords: Cloud Computing, Education, Learning, Architecture, Institution.

I. INTRODUCTION

As cloud computing is internet based computing system which provides software, infrastructure and platform devices on pay-as-you –use. All the information will be available in the systems as it isbeing offered to provide a service in the cloud. User can access the required information whenever they need, they can also spend time on business processes than spending more time on resource.

Education is an important component of life because all that is needed to make our dreams come true. In today's world education system has been expanded, and education object has slowly turned into social staff. Education system can be made easy with the support of cloud computing, where it provides everything which is been thought with methodologies like chalk-black board, classrooms.Teaching has been transformed into online and most efficient way of learning, which helps the user to take class in any hour is an advantage of learning using technology. Education system requires ELearning and online solution.

In this paper we study the factor that affects the education institution in adopting cloud computing and do survey on different learning technologies. We have summarized in the table benefits, equipment used, focus, framework, impact on different learning technologies which are essential for adopting cloud computing in educational institution. Section 1 describes about education system and cloud computing. Section 2 describes about cloud computing in education research problem. Section 3 explains about various learning

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technologies of education system using cloud computing. Section 4 we have summarized the various learning technologies in the table and in Section 5 we have concluded with our present and future work.

II. CLOUD COMPUTING IN EDUCATION RESEARCH PROBLEM STATEMENT

For any institution large manpower and financial investment is required for monitoring, maintaining and purchasing computing assets. Cloud computing provides centralized computing assets which is an option that centralizes computing assets, lower the manpower and costs for the organizations. Currently, many institutions are interested in using cloud computing capabilities, but they do not know where to expect changes when choosing for the cloud computing concept[1].

Benefits of Cloud Computing

1.   High return on investment(ROI)
2.   Reduced implementation and maintenance costs
3.   Increased mobility for a global workforce
4.   Scalable and Flexible infrastructures
5.   Short time to market
6.   IT department transformation (focus on innovation vs. Maintenance and implementation)
7.   "Greening" of the data centre
8.   Increased availability of high-performance applications to small/medium-sized businesses [2]

III. TYPES OF LEARNING TECHNOLOGIES

A.   Architecture of Cloud Computing for Education System in Bangladesh-

The Computer Education is indispensable for people of every stratification but due to the poor economic condition many countries are unable to introduce their inhabitants with rich technologies and innovation developed by a computer system. The author Shahid Al Noor et al. has introduced an architecture for the education sector using cloud computing and discusses the impact of the architecture on the availability of widespread resources present around the country [3].
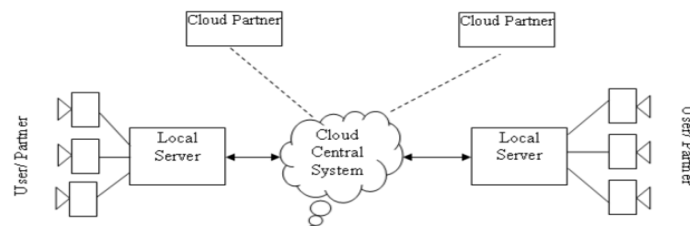

Figure1:Cloud Computing Architecture

The Shahid Al Noor *et al.*,proposed system is built by cloud partners, local servers and cloud central system, and each individual pc act as a cloud partner which provides necessary resources to the cloud system whereas each of the individual PC is the property of the education system. These individual PC are connected locally to the local server which executes the request to the cloud via the local server[3].

•   Request Initialization Procedure

The local terminal communicates the local server to get services from the cloud side.

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- Resource Monitoring Procedure

This procedure provides the facility like identifying unused resourcesand sharing.

- Resource Allocation Procedure

Here the server collects the requests from the client and all together it summarizes the request and send all the requests as one to the cloud server. The cloud system as soon receives the request from the server, it just sends the request to the client after necessary verification.

B.   Smarter learning content management using the Learning Content Hub-

The word itself says smart learning as learning with less cost and smart ideas i.e. with less expense and easier access to the technology. The author D. Contractor et al. mainly explains on how students learn and progress through their education. With the large amounts of digital learning content available, teachers are increasingly turning to sources such as online tutorials and eBooks for their teaching needs [4]. Schools often make use of a Learning Content Management System (LCMS) to store learning material. However, the amount of content indexed in the LCMS is often limited so D. Contractor et al. describe LCMS called the Learning Content Hub (LCH), The LCH includes well-designed user interfaces that facilitate document ingestion and retrieval[4].
DBPedia and WordNet-refers to knowledge bases that can be used to retrieve syntactic and semantic information about words.POS refers to Part of Speech tags, and "regex" denotes regular expressions that are used for pattern matching.

C.   Taiwan's Digital Learning Initiative and Big Data Analytics in Education Cloud-

The concept used here is Digital Campus i.e., Broad internet access in the campus. So that students and teachers can make use of the network to study online anytime with the help of digital devices, then ubiquitous learning came into picture where students can use digital learning resources on the cloud. Teachers can implement innovative ideas with the application of digital learning. The centralized learning model is used to have equal digital learning opportunities within the students. Education cloud (Edu Cloud) is the main source for the digital learning initiative.

Stephen J.H. Yang *et al.*,Taiwan's Digital Learning Initiative includes three dimensions[5]

1.   Fair digital infrastructure
2.   Open cloud resource service
3.   Learning model with innovative ideas.

D. Seamless blended learning using the Cognitive Learning Companion-
J. Mutahi*et al.*,mainly focussed on the study of mobile enabled blended learning techniques called Cognitive Learning Companion (CLC). It was mainly discussed from field studies with teachers and students. These studies led to two key high-level requirements[driven cognitive decision-making in education[6].

1.   seamless support for different modes of learning and teaching in a blended scenario
2.   support for tracking student engagement and sentiment during this blended learning journey, and the interplay of these affective processes with the concept and skill-building processes as part of learning.
The main discusesare to find a finding from the field study and demonstration of user awareness and support for data-.
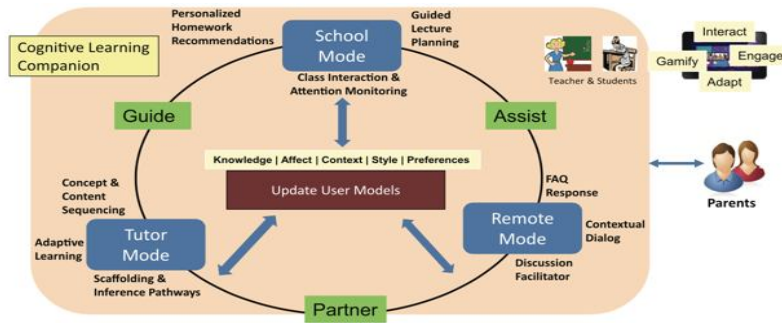
Figure 2: Cognitive Learning Companion conceptual view and use cases.

Mainly CLC has 3 modes of learning

1.   School Mode
2.   Remote Mode
3.   Tutor Mode

J. Mutahi*et al.,*had designed a system that was sufficiently flexible to adjust its level of functionality based on the learning context, and this context would be different when the student is at school ("School Mode"), outside of school but engaged in teacher-assigned work ("Remote Mode"), and when the student is ready for self-paced learning ("Tutor Mode")[6].

E.   An architecture and algorithm for context-aware resource allocation for digital teaching platform's-

ShigetoshiYokoyama *et al.,*focuseson digital learning with the help of edubase cloud i.e. self-learning with the help of internet and edubase cloud system. This learning techniques need to infer how students interact with delivered content and understanding student behaviour, academic performance, and the way teachers react to student engagement. Several algorithms are used to determine the Student behaviour on the content[7].
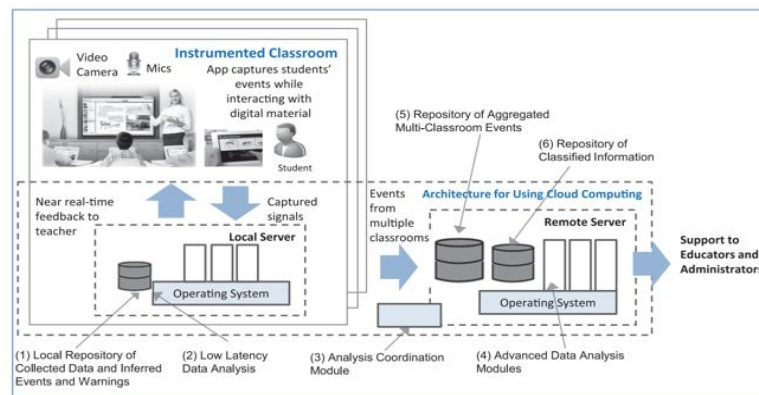

Figure 3: Architecture for using cloud computing for a Digital Teaching Platform.

There are several types of data streams are available in digital education environment. The student sentiment analysis and stress level is experimented with video capturing and environmental audio analysis. This process helps to estimate student distraction level. Moreover, event analysis is captured from students' interactions with digital content results.

F.   Edubase Cloud: Cloud Platform for Cloud Education-

Edubase Cloud is an open-source educational system whereF. L. Koch M. D. de Assuncao*et*

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al., [8]creates an environment for all the users who can access the necessary resources and can also do experiment with all their ideas. This mainly focus on open-source software and uses multi-cloud architecture. This is the platform where user can learn various skills to manage and develop cloud platforms. It has most advanced IT environment where user can easily work with this open-source interface.

It is a place to learn essential skills to manage and develop cloud platforms. A cloud platform for educating cloud engineers' must meet the following the key features as described in above figure.

1.   Exclusiveness: It is possible to acquire physically isolated IT experimental environment for themselves.
2.   Interoperability: Users can easily work with external cloud services by utilizing its open interface. It must be interoperable with private and public clouds.
3.   Alteration: The full open-source cloud environment enables customization and tuning of the platform itself.
4.   Storage Stability:Edubase Cloud has an archive function to save virtual machine images in a reusable form.

IV.   SUMMARY OF LEARNING TECHNOLOGIES OF EDUCATION SYSTEM USING CLOUD:

Paper reference no	Benefits	Focus	Framework	Impact	Research Location	Result
[4]	Distribution of resources between people of every stratum	Broad resource sharing and client side security	Shared base system	Wide spread of resources all around the country	Bangladesh	Use of limited resources in a most efficient way
[5]	E-learning with less expense and easy access to technology	Learning content Hub(LCH)	NO	NO	USA school	Document search, retrieval,security and user role management
[6]	Opportunity for teachers to grasp innovative teaching strategies with applications of digital technology.	Mobile Learning and applying big data analytics to the edu cloud.	Mobile applications.	Educloud.	Taiwan.	Making edu cloud more suitable for teachers and students.

[7]	Directions outside classes ,combination of teachers and system supervision,support for tracking student information.	Mobile enabled blended learning.	Mobile Application.	Edu Cloud.	Africa	Cognitive learning companion.
[8]	open-source educational cloud	Edu base cloud for education.	Open source software platform called edubase cloud.	Education for cloud engineers.	NO	Development of other education materials for cloud platform for deployment and cloud on cloud system.
[9]	Quick search, Accurate search.	Understanding student behaviour and teacher reacting student engagement.		Capable of collecting and analysing large volume of data.	Personalization classroom.	Accurate search

V.   CONCLUSION

Government, business and education are adopting many applications because of the rapid growth in advance technology. To improve the standards and activities in education cloud computing can be utilized. In this paper we study the factor that affect the education institution in adopting cloud computing and do survey on different learning technologies. We have summarized in the table benefits, equipment used, focus, framework, impact which are essential for education system using cloud. This helps us to understand different learning technologies that has maximum benefits, less equipment, framework needed, and having large impact on education.In future we analyse and implement the compared learning methods and check methods which give maximum benefits, less equipment, framework needed, and having large impact on education using cloud.

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