

# The Research for Using Some Opportunities of Cloud Computing in Distance-Learning (module of State University of Agriculture in Mongolia)

Bat-Erdene Nyandag<sup>1</sup>

<sup>1</sup>Department of Computer Sciences, Inner Mongolia University, China

*Abstract - Rapid development of information technology has been rapidly changing education system of worldwide. Mongolia has 1.566.600 km<sup>2</sup> territory and 3 million populations. Nowadays, 104 universities, institutes and colleges have been running out the activities in Mongolia. 67 universities and institutes of these were accredited and 172798 students have been learning in these universities and institutes. Sparse population in wide territory of our country makes problem for distributing publicly education. Therefore cloud technology should be introduced in distance-learning based on management system of the training is being used in universities and institutes of Mongolia. Using cloud technology in distance-learning have following advantages such as provide demand for learning of students or learners, share source or exchange information as well as cooperate. In the article, we considered that modules of some trainings using cloud technology in distance-learning met with requirements or features of universities and institutes of Mongolia. This module will directly access from mobile devices and computers based on resource of management system of basic training. Therefore this module can be fully used in service of training of universities and institutes. To study possible result doing module training of the system for distance teaching.*

**Keyword**– cloud technology, cloud module, distance teaching, education and information technology.

## I. INTRODUCTION

Education is the integral part of our life and it gives all chances in order to achieve dreams. Some forms or models of current traditional education don't meet with requirements of social and educational development and changes of demand for learning.

Development of modern advanced technology is granting this opportunity. One of these is cloud computing. Cloud computing can be used the technology using in limited condition of resource. Using cloud computing with correct system gives following chances such as expand by dynamics and use effectively resource. Cloud computing is used in order to simplify following items such as improve capacity of processing or access software in internet, decrease expenses, increase automation system as well as serve service of basic technology. It is the process that will unit information technologies such as computing of network, computing of program, web service with business development.

Four basic factors for education based on cloud computing. Including:

1) Cloud computing will decrease load of hardware and software by ways of increase saving capacity and computing power.

2) Increasing rapidly articles, archiving, tools of sciences and education in internet constitute huge amounts of data or information.

3) Selections of service for cloud computing increased because of using Web 2.0 program.

4) Smart phones have been used commonly in the training based on cloud computing in educational sector.

Recent customers have been using from personal computers and smart phones. Network of and programs of self-phones have been improving in connecting with it. Therefore we can study from school, working placers and home connecting with mobile society using tools of telecommunication.

Aim of this article is to decide limited condition of current traditional training met with requirements of learners in educational sector of Mongolia. Therefore new model of the system for distance-learning has been formulated using cloud computing. This is the model system of distance-learning used some opportunities of cloud computing based on management system of basic training.

This model should be used in distance-learning of all educational organizations and it will be constituted opportunities such as to simple exchanging or sharing of information and knowledge, run out the trainings in various conditions of the trainings.

Structure of this article consists of followings. Including: Chapter I to study basic requirements and usage of the research work, Chapter II status of cloud computing used in education, scientists' research and analysis in theory and modules, Chapter III model basic structure of distance-learning based on cloud platform, Chapter IV introduce system model of distance-learning based on cloud platform, Chapter Бүлэг V introduce the result of the model, Chapter VI conclusion, recommendation and suggestion of further research work.

## II. THE RESEARCH OF CLOUD COMPUTING IN DISTANCE-LEARNING

Recent years cloud computing brought technological advances in computer sector. Aim of the cloud computing is to be source of computing for providing customers' demand [1]. Cloud computing can be expanded and to be source of virtual for accessing customers [2]. Cloud computing is new technology that can affect in teaching and learning conditions [3]. Customer can use free private cloud and it is made for accessing in frame of enterprises [4]. Praveena and Betsy introduced usage of cloud technology in universities and institutes [5]. Also Delic and Riley studied knowledge management of current enterprises, how to be reliable and effective infrastructure using cloud computing in worldwide [6]. They considered architecture and programs.

Main features of cloud computing were showed by following comparative.

**Table I: From traditional computing to change into innovation of cloud computing.**

Models	Traditional Computing	Cloud computing
Acquisition Model	Buy Assets Build Technical Architecture	Buy Service Architecture included
Business Model	Pay for Assets Administrative Overhead	Pay for Use Reduced Admin Function
Access Model	Internal Network Corporate Desktop	Over the Internet Any device
Technical Model	Single-tenant, non-shared Static	Multi-tenant. Scalable. Elastic. Dynamic
Delivery Model	Costly, Lengthy deployments Land and expand staffing	Reduced deployments time Fast ROI

Several educational organizations of the United States of America have been using cloud platform in order to cost savings and improve efficiency of education sector. Also Li, professor of the People's Republic of China, proposed that "Cloud Computing Assisted Instruction" in 2008 suggestion [7]. Educational organizations have started using cloud computing of low level for keeping data. Other usage of cloud computing using in educational sectors is to locate management system of the training in cloud [8],[9].

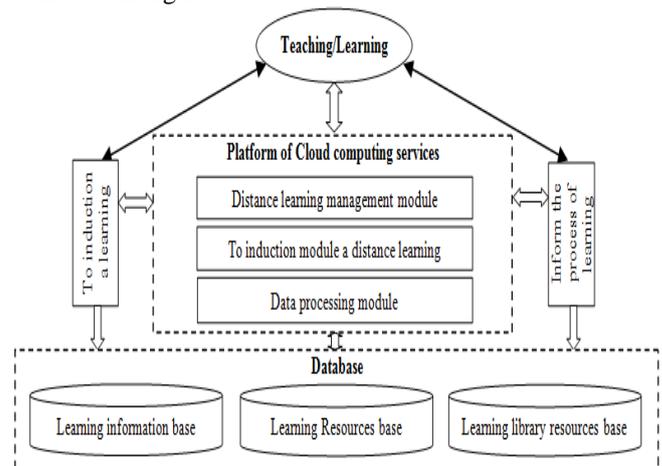
S.Ouf introduced ecosystem of e-training of innovation based on cloud computing and Web 2.0 technology [9]. He analyzed in services based on the largest clouds such as Google App Engine, Amazon Elastic Compute Cloud (EC2) also Windows Azure which serve service of public computing conditions. Also he studied advantages of infrastructure of 2.0 program of e-training. Chandral studied issues on architecture model of current e-training and programs [10]. In his creation, was introduced traditional classroom training using on infrastructure of cloud computing, online training and mixed infrastructure met with program of e-training. Also he

suggested transferring module of mixed cloud in order to implement issues mentioned in the research work. Aim of the module is to increase opportunities or expand flexibility of e-training through introducing purpose of cloud computing in educational sector.

## III. STRUCTURE OF DISTANCE-LEARNING BASED ON CLOUD PLATFORM

Module of this system was formulated based on information and resource of current educational management. But this system will be changed innovations in new contents, principles, methods, technologies and tools and cannot fully execute teachers' rules. Teachers have main obligation for using cloud technology in distance teaching. Formulating strategy of mixed training must be improved the actions. Also must be verified interactive content and quality of virtual cooperation.

System of distance-learning based on cloud computing gives all changes or provides various information or knowledge for individuals during their training. Module of system structure of distance-learning based on cloud platform was showed in fig 1.



**Fig 1. Structure of the system for distance-learning based on cloud platform**

**Database:** the database will be used for saving various information bases. Including: general curriculum for subjects, standard plan, training distribution, total credits and hours, topics for subjects, subtopics for subjects, lectures for subjects, guidelines for practice working, reading materials, experiments and questions of time or timeless examination, information of training, materials of training, base of libraries, access of books, researching materials for provide various information or data and books.

**Information bases of training:** aim of this is to constitute graphics of individuals' knowledge. Include all information in connected with trainings. Including: information in connected with admission issues of learners and directions of training, learners' rules, processing of training and result of training. Also save decisions and data computing based on learners' motivations attendances and participation in training, encourage and assessment for learners. Save information of

learners' characters and personal features. This is helped for analyzing processing of training.

**Resource base of training:** there includes all bases in connected with subjects and trainings. For examples: lectures and materials of subjects, specialized knowledge, inquiry of documents, videos, audios for materials of trainings. Also to provide more chances for finding desired information of learners through search of internet. Therefore there has main responsibility for rules of organizing.

**Library base of training:** there includes all services of the libraries will be used in training of school. There has service for locating additional materials for training.

Service platform of cloud computing has three sub-modules such as managing distance-learning, introduce distance-learning and formulate data.

**Managing module of distance-learning:** it is the part for managing quickly training during the training. Manage organizing of subjects based on purpose of learners' training. To prepare training based on sub-aims of subjects met with knowledge level and learning standards. Also include learners' information, teachers' information, and arrangement of courses and managing of others daily management. It will help for organizing training met with real conditions. To do statistical calculation based on information of various trainings.

**Module for introducing distance-learning:** detail explained part for advantages and disadvantages of distance-learning at the beginning of training. Explain correctly or clearly directions, sequences, aim and objectives of subjects during the training. Therefore there should be planned subjects of training, independent works and period of examinations.

**Module for formulating data:** formulate data about processing of the training and learners in the trainings. Also inform or announce problems sourced during the training on time. Main advantage of formulated distance-learning system is to analyze in each learner's personal features and quality of training. Need to make detailed analysis in all information of training. Possible detect mistake and fault or failure sourced from requirements and demand of learners. Also help for changing methods of training, decrease mistake or faults, define learners' interests and cognize level of knowledge. It grants chance for managing fully process of teaching during the training of learners.

**Introduce the training:** there will introduce capacities of the training such as opportunities of this training system, information base of training, resource base of training and libraries of training. Also provide information about activities of module for formulating data, introducing or managing distance-learning to learners in training.

**Inform process of training:** response inform management of training, about process of training between teachers and learners during the training. For instance: study detailed analysis on students' private information, information of registration for participation of learners in training and data of

training process. It should be informed by e-mails to learners according to fixed frequencies. Basically result of the module for formulating data will be reached to customers.

#### IV. MODULES OF DISTANCE-LEARNING BASED ON SUGGESTING CLOUD PLATFORM

The first appropriate selection or solution to be used in educational organization will be introduced private platform of cloud computing. Private platform based on cloud computing is used by leaders, teachers and learners. Each customer has possible that consider on frame of direction of own activities in order to participate in basic training. Including: to consider directions or training conditions of training leaders, teachers and learners. Learners will be supported participating in training using private information technologies. Suggesting architecture was showed in fig 2.

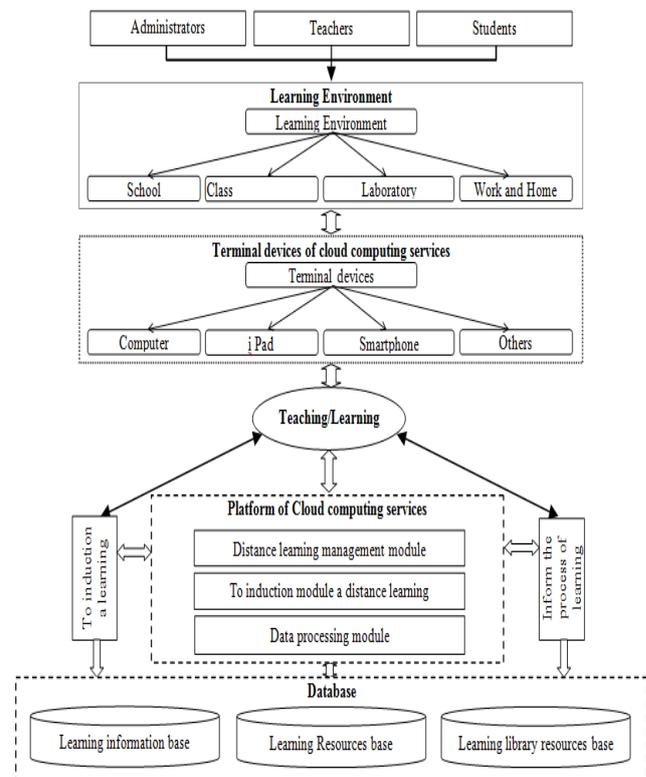


Fig 2. Model of distance-learning based on cloud platform

**Condition of training:** participants in training of distance-learning should create training condition by themselves. Teachers and learners can participate in the training from school, classroom, laboratory, work office and home so on. Students can control assessment of subjects, process of subjects, participate organized activities, study on real time, select course and materials of subjects. It constitutes the condition of individual training.

**Terminal device for service of cloud computing:** Leaders, teachers and students can participate by terminal form in training using mobile device. Ask questions and take quickly answers on time. They can share or exchange own knowledge

with other students and teachers. It will help to find more information between teachers and students. Also organize more effectively training on online communication. Therefore consider that make progress in content and feedback of training.

One of the advantages of distance –learning based on cloud computing will be constituted for studying conditions of local students or students’ cost savings of local schools when material bases of training no enough.

#### **A. Module of distance-learning based on suggesting cloud computing**

This architecture will create condition of cloud service in higher education sector. Basic aim of distance-learning in cloud condition grants chance for finding or sharing information or knowledge of centered resource between students on their desired time. Module of distance-learning based on cloud platform of our suggesting. It has been expressed relation between devices (terminals) of final customers and training in condition of cloud computing. Terminals can be connected with infrastructure of internal network (LAN) of universities or external network (internet). Learning Management System of university and educational resources should be connected with LAN of university. Users can enter into platform using internet or LAN of university in order to access training materials.

According to this architecture, classrooms of university should be connected with server platform and internet. Basically classrooms of universities must have following devices or equipment. For examples: computers, laptops, microphones, tablets, cameras, projectors and displays. Teachers of universities can send content of training materials to learners in distance-learning by internet besides teach subjects in classrooms of the universities. Students can connect with subjects of distance-learning from home or office of work using computers or laptops on their desired time transferring internet of high speed. Also they can be connected using GPRS, UMTS, HSPA, WiFi, WiMax or LTE so on with subjects of distance-learning.

Also all students can download necessary information or data from condition of cloud computing or platform of teachers’ prepared server transferring internet. It is the united platform for formulating web. To provide content in the network, savings, maintains or service and standard interfaces. Set of resources should be constituted in order to source platform of independent resource. Modeling of cloud system doesn’t source problem for techniques. So we should enter in process of system design in strategic system.

### **V. EFFICIENCY OF ARCHITECTURE**

Advantages of suggesting architecture:

- a) There are located various computing or information in server computer of distance –learning architecture based on cloud computing. There provides the condition for saving various information or data and simply “cloud” service transferring through internet for using students.
- b) Users can participate in the subjects entering in training

- c) system with help private using devices.
- c) Users can create own virtual conditions. Virtual is one of the most features of architecture of this type. Condition and physics for locating program has connected with platform.
- d) To create the obtaining condition of education for learning local students not enough material bases transferring distance-learning.
- e) To send by e-mails formulating in information of training process, basic data of teachers and students on time.
- f) This system should not be bought from others and can be created based on own capacity. Therefore can be solved problems on time.
- g) Main advantage of this system can be used in Mongolian.

### **VI. CONCLUSION AND FUTURE WORK**

Cloud computing can help change educational system in nations or countries. Countries of the world have trended competing by cloud computing in order to cost savings and simply educational service. We analyzed in development of cloud computing in educational sector. Based on this analysis, we are suggesting module of distance-learning using cloud computing with several advantages in educational sector of Mongolia. We are planning firstly private cloud computing or for individual in educational sector then public cloud computing. It can grant chance for finding information or data met with requirements or standards in global society of the 21<sup>st</sup> century for students of universities and institutes or colleges. Universities should introduce cloud solution in the activities in order to cost savings.

Also we introduced result or efficiency from modules of the system. The Future for this research, we should pay main attention on two issues. First, study strategy and changes of system modules based on cloud system. Second, study transferring opportunities or advantages into distance-Learning. Also we will study researches on result of training and opportunities for using this module in educational sector of Mongolia.

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#### AUTHOR BIOGRAPHY



My name is BAT-ERDENE Nyandag. I am Mongolian person. I was working Mongolian State University of Agriculture. Currently I am studying in Department of Computer Science, Inner Mongolia University for Graduate Studies Huhhot City, Inner Mongolia of China.  
(baterdene@msua.edu.mn)