

A Study on Efficient Mobile Education Service Platforms

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Abstract

Modern society is a society of knowledge.informationalization. We require autonomous, creative and subjective talents who will lead this globalization.informationalization age. However, the conversion to the education system which accords with the stream of this age is necessary so as to bring up such Korean people. This thesis suggested the effective cyber education service model which is suitable to the Ubiquitous age on the center of the mobile education system, designed a new MCQPS client-server system for solving problems of existing mobile client-server models, and carried out the experiment and the performance evaluation about it.

Keywords: Mobile, Ubiquitous Education, Ubiquitous Network, u-learning, Cyber Education

1. Introduction

Recently thanks to the development of IT technologies, computers are soaking into people, things and environments. As they are connected to a network, the Ubiquitous environment which helps human lives is being opened. In ubiquitous environment, the textbooks which are made of paper are not necessary any more, and the electronic media will complement existing media such as a blackboard & paper. The electronic media can bring about a revolution to classroom lessons by overcoming the limit of time & space. Also a joint work will be possible on another space, and it will be possible to receive differentiated educations according to achievements of schoolwork. In the early 20th century, lessons were performed only in the classroom, but in the late 20th century the learning information can be acquired through Internet. As all living-spaces are changed into a learning space in the future u-learning classroom, a learner will be able to receive the education which he wants freely in every time & place.

This research has the purpose of suggesting the direction so that the design education of schools can be familiar with the realized ubiquitous environment and can be reborn into the educational base with the type of the developed country.

This thesis suggested the efficient cyber education service model which is suitable to the ubiquitous age on the center of the mobile education system. Also this thesis designed a new MCQPS client-server system so as to solve problems of the existing mobile client-server model and did experiments & performance-evaluations.

In the Chapter 2 of this thesis, the concept, traits & attributes of cyber education, and theories related to cyber education were examined & described. In Chapter 3, Ubiquitous education models were explained, and the new demand production & educational administration of ubiquitous age, the comparison of educational models and the efficient operation devices of cyber education were suggested. In Chapter 4, a new MCQPS client-server model was designed through the theoretical contemplation of the ubiquitous cyber education service model, and this thesis proved that this model is better than existing mobile client-server models by performing the performance evaluation within the

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experimental environment which this thesis presents for the superiority of this thesis. Finally in Chapter 5, the conclusion of this thesis was drawn.

2. Cyber Education

2.1. Definition of Cyber Education

Cyber education means to offer educational services through utilizing Internet. The cyber education which connects internet to education is called in various concepts, but the concept as u-learning is used most universally. Besides it, it is understood as the concept which includes the digital cooperation which emphasizes the web-based education and the interactive education & cooperation in an enlarged sense of the internet-based education.[1][4] Namely, it means all the educations which makes use of IT so as to assist or deliver all or some parts of instruction & education as a special unit of learning in a broad sense. Thus the cyber education is commonly used as the u-learning, the distance education, the virtual education, the online education, the web-based education, and so on, and also is used as WBI (Web-based Instruction) & IBI(Internet Based Instruction).

Due to constructive traits of cyber education, the learning which the cyber education implements also means the switchover from the vertical viewpoint that a professor delivers & educates knowledges to students to the horizontal viewpoint that a student himself finds out necessary matters and learns them. The concept of learning to which this cyber education orients itself is conceptualized into the content respect of cyber education through extended interpretation as to the e of u-learning. Namely, 'e' isn't "Electronic" which indicates only simply electronic help or technological respect of web, but indicates the "Engagement" that learners participate positively in learning activities. This means to pursue the interesting & useful edutainment and to provide unique learning experiences which are distinguished from off-line by offering & encouraging the opportunity of expressing the results of learning for a learner himself.

2.2. Trait of Cyber Education attribute of cyber education

The easy access that everyone can approach the information & resources of all the world at every time & in every place through a computer enables the share of various styles of resources such as each kind of instruction-learning programs, libraries, documents and experts which are connected to a computer. In addition, it can lift a learner's active participation & motive-induction. Internet is a treasure house of information of enabling to get the latest data and vivid materials of multimedia type, and this function can make a great contribution to instruction-learning. Actually students can come in contact with vivid information as to events or phenomena which occur there through communications with the natives who are in a distant place without going to a specific place.

The cyber space is a space which is based on a two-way direction interaction. Here the interaction doesn't mean only the interaction between user and multimedia learning resource, but comprehends all the interactions between schools, between students, between teachers, and between student and expert which are connected to internet. For example, that a learner asks an expert matters which he himself is eager to know, or exchanges opinions between learners on the center of joint concerns, can be made easily without limit through internet. This easiness of interaction is basically based on talks, communications, negotiations, cooperative learning, or is helpful to the implementation of an educational type which aims at improving it.

As in the cyber space, information doesn't move in one way direction from one point to another but the two-way or many-way direction exchange of various types occurs, a learner's role comes to change from a passive hearer to an active doer. Namely, a learner demands new information on the basis of a deeper understanding which is obtained in the process of understanding & examination which he himself holds about a specific subject. And the expert or the computer, which offers information

responding with it, comes to play a role of a learning resource. This new environment doesn't only assist & promote the interaction which a learner leads, but also makes a learner express own thoughts and exchange intentions & thoughts with other people. Moreover, it offers the space which enables cooperation.

Finally, another limit is a problem of the harmony between reality and cyber. There is not a cyber space which disregards reality, and the cyber educational system always has the problem of having to accept & face up to reality. As the cyber educational system must implement the ideal of education and coexist together with school-educational systems of reality, the adequate harmony between reality and cyber like sometimes compromising with reality or sometimes sublimating reality as an ideal is required in the system.

3. Ubiquitous Education Model

3.1. Creation of New Service in the Ubiquitous Era

The term 'ubiquitous' was first derived from the religious term of Latin language 'God exists in every place' and 'is omnipresent', and was stemmed by "Sakamura Gen" who was taking charge of an assistant professor in Tokyo University in 1984.

3.2. Ubiquitous and Education Administration

"ubiquitous + learning = u-learning"

To graft the merits of the ubiquitous which were mentioned above onto the educational field is just u-learning. The essence of u-learning which makes use of the technology of the ubiquitous lies in maximizing the learning efficiency & effectiveness of learners by making them learn regardless of places while living a daily living. The u-learning can form the educational environment that students can learn anywhere & anywhen regardless of contents through any terminal.

For an example, when we come to look at a cultural property during passing by, the environment of the ubiquitous which is connected to each other helps us to learn the contents related to it. The contents related come to appear in a learner's terminal because the chip of the terminal which a learner has and the chip within a cultural property are connected to each other. Namely, students can receive instructions from teachers whenever necessary, and the check of attendance & the evaluation about it are autonomously performed. Also their results are sent to students. Teachers can carry out own natural job for teaching students regardless of places. The school environment of a new style that other parts except for it are solved naturally by the ubiquitous computing system is being suggested.

4. Design of Ubiquitous Education Service Model

4.1. Theoretical Contemplation

In the mobile environment of <figure 4-1>, the general order-delivery structure expresses the model that the application client makes a request toward the server on cable network through wireless network. The C-CA-S model introduced by Coda[6] is used in the server which has the UNIX file system of a small scale and in the client of a large scale, and this client agent(CA) performs the computations of the file system which is normally carried out by the server instead of the mobile client. Also in the C-SA-S model, the server agent(SA) is the same to the proxy which exists in the cable network which performs the interface work with a server, and that proxy is called the server agent(SA).

The agent was used in the client or server side to improve the function of existing client-server models, but it isn't always easy to modify the server or the client application so as to act with the client agent(CA) during moving. What makes both agents take charge of all communications of wireless & cable network by putting agents in both sides of client & server in order to solve this difficult problem, is just the C-I-S model.

4.2. Design of MCQPS Client-Server System

The mobile client-server models which were presented in <figure 4-1> for mobile database environment tried to attain the limit conquest of mobile tools for the data processing of a large capacity, for the availability of actual data, and for the consistency maintenance of used data so as to solve problems of weak connection & disconnection of wireless network, but they weren't devices which can attain these problems perfectly. As the wireless network causes problems which don't appear in case that the connection condition is normal & stable like the cable environment, the computation of the mobile database under the environment of wireless network must be adapted to the connection state of network on consideration of these traits.

This treatise will suggest the MCQPS(Mobile Continuous Query Processing System) like <figure 4-5> as an additional object which has the function of Mobile Client-Oriented Data Warehouse besides the C-I-S which has agents in both of client and server so as to complement this weak point.

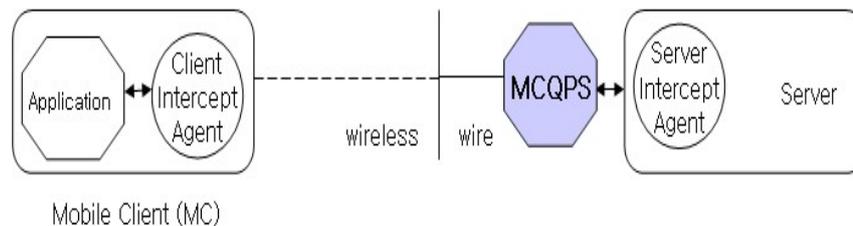


Figure 1. Mobile client-server model including MCQPS

5. Conclusion

The cyber education is an educational paradigm of a new way which is formed to develop the instruction-learning in the cyber space generated on the basis of the information communication technology.[3] The cyber education has many merits such as the possibility of the suitable education centered on learners as well as the possibilities of enlarging the access to education & participation opportunity thanks to such traits as autonomy, transcendence of time & space, two-way direction, and demander center.[5] In particular, the cyber education is coming into the spotlight as the education system which is suitable to the open education society and the lifetime education society of 21C in that the cyber education grows out of the education centered on instructors which has controlled the traditional education up to now and enables the education centered on learners.

The concern about the cyber education is being implemented into various types of cyber educational systems throughout the whole world including the U.S.A., Europe, Canada, Australia, Singapore according as the internet is rapidly spread from the middle 1990s.[4] So that this cyber education can attain the functions & roles which agree with people's expectations, the adequate system for it will have to be prepared.

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