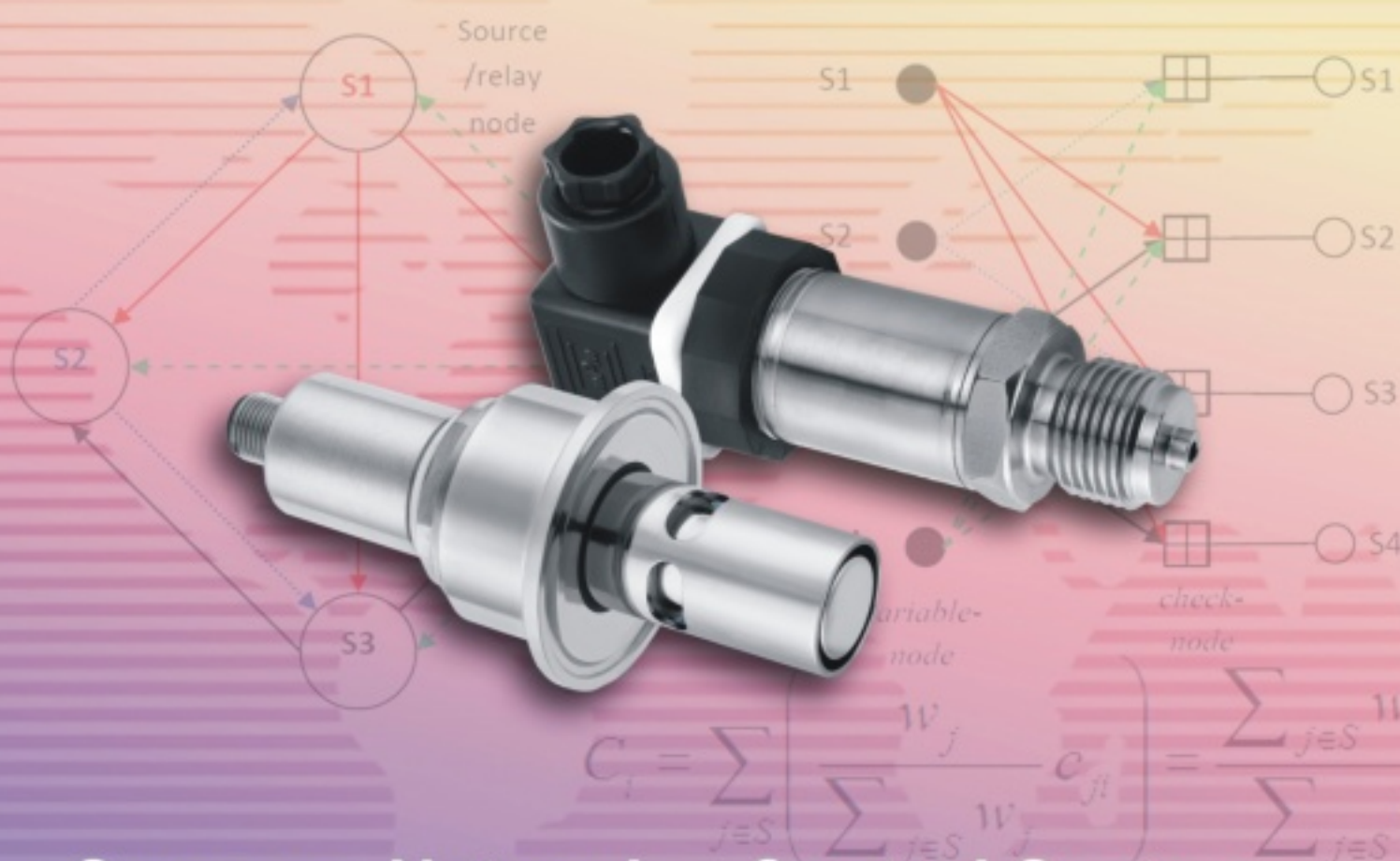


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The Study of Elderly Informational Education under “Cloud Computing”

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Abstract: With the accelerated development of China's aging population, China is about to enter the aging society, the elderly education has increasingly become a subject which can not be ignored, and the elderly informational education is particularly important in all elderly education. Facing a series of problems that exist in traditional elder informational technology education, this paper will give a new network technology to solve these problems, namely introduce "cloud computing" technology in the elder informational technology education. We will begin to explore the impact produced by "cloud computing" for elder informational education resources construction and the change of teaching methods, study the "cloud" of elderly informational education to build the elderly informational technology education. *Copyright © 2013 IFSA.*

Keywords: Cloud computing, Elderly, Informational education, Study, Network.

1. Introduction

With the improvement of the medical and health level, and the living conditions, the extension of life expectancy, the speed of aging of China's population is accelerated with each passing day, and the population of elder is growing, elderly education has become an important component to build a "harmonious society" under the lifelong education system [1-3].

Chinese Social Science Institute of Finance and Trade Economics published "China fiscal policy report 2010/2011", in which we can know that, in 30 years since 2011, China's aging population will be presented to accelerate, to 2030, the population of 65 years old or older in China will exceed Japan, and China will become the highest state on population aging degree in the global. By 2050, the society will be into the depth of the aging stage.

According to the latest United Nations population data forecast, in 2010 Chinese aged 60 years old and older population will reach 12 %, lower than the average of the Organization for Economic Cooperation and Development (OECD), the aging population problem is not yet obvious. However, in 30 years since 2011, China's aging population will show a trend of accelerate development, the proportion of the population aged 60 years old and over will average annual growth rate of 16.55 %, in 2040 proportion of the population aged 60 years old and over will reach about 28 %. In the past 30 years, China has entered the aging society. Until 2050, proportion of the population aged 60 years old and over will be more than 30 %, and the society will be into the depth of the aging stage [4-6].

Thus, the aging of the population has become an unavoidable society problem in China [7]. The improvement of the aging degree and the growth of the elderly population, the orderly's material and

spiritual life have been paid more and more attention. On the one hand, the material life of the elderly continue to improve: from government agencies, enterprises, nursing care, welfare and security, legal advice and so on, in these fields the measures and the system are relatively complete, the service is also relatively perfect; on the other hand, the spiritual life of elderly is also increasing, tourism of the aged and the rise of elderly toys development are reflected in the growing spiritual needs of elderly people. The computer and network has become more and more new tools for older people to get fresh information and maintain a young mind, to strengthen communication to enriching the life. "Learn computer knowledge, enjoy the Internet" has gradually become a kind of fashion in the elderly population, in the elderly education, informational education is becoming more and more popular.

Due to the progress of science and technology, the popularization of the computer and the improvement of the network source, many education institutions will change the teaching method of traditional centralized education into informational education, using network source to realize education, such as distance education, independent learning website, etc. But these informational educations have some limitations, and can be affected by geographical location, the speed of network transmission, the data processing ability of server and other factors, while in the elderly informational education there will be some special difficulties, such as the cost problems, physical problems, self-study ability and so on. Therefore the informational education is in an embarrassing situation, the original network learning platform is already out of date, and we urgently need to seek a kind of new technology to solve these problems. In this paper, we will use "cloud computing" technology in the elderly informational education, establish the cloud mechanism for elderly people, solve existing problems in the elderly education, and construct the "harmonious society" under the lifelong education system.

2. The Impact of "Cloud Computing" in Informational Education

Cloud computing is the product of further fusion development of computer science and Internet technology, and also is the key strategic technology and method to lead the future information industry innovation [8-12]. If we use this technology in the field of education, we can provide students a new way of learning, mobile learning. Mobile learning model is the use of large memory to put massive education resources together, and then using the B/S (Browser/Server) model to provide users with the mobile education services. In this model, we only need to upgrade the server equipment acted as cloud server to complete the set, not too high demands on the learners' access device, and this is good news for those elderly people who have no money.

Cloud computing has very big simulative effect on the development of education informational, students use the information technology socialization service provided by cloud computing, which can save money, manpower, server equipment and the investment of cost of fixed assets, the information technology training costs lower, education information management more convenient, higher safety, and it can help students easily build their own personalized learning environment, support teachers' effective teaching and student learning initiative collaboration, promote students' thinking ability and wisdom development, improve the quality of education. Through the application of cloud computing in education industry, we will make the education resource can be fully utilized, not only to reduce the cost of the management of user computer, but also to realize energy saving and consumption reduction by passing across personal computer, mobile phone, TV and other multiple screen personal desktop.

3. The Principle of "Cloud Computing" for Informational Education

Cloud computing construct a free extensive space, in teaching, we should not only guarantee the learner's autonomy, but also improve the effectiveness of learning [13-17]. Therefore, we should follow the following principle when we use cloud computing in informational education.

3.1. Learner-centered

Learner-centered is the core principle of informational education with the cloud computing. In the initial of the environment construction, we need to analyze the learner's needs, determine the appropriate teaching tasks, resources and collaborative activities. Environment designers should think standing by the view of application, reasonable design of each resource on the platform, such as: whether is friendly of resource presentation, whether is excessive of learning content. And they should design a more humane teaching application environment for users.

3.2. Reasonable Set of Resources

Whether teaching resources or teaching reference resources should be presented in the proper position, so that the overall interface is clear and the each resource module structure is unified, which facilitate learners to fast search and browse, and help them not trek in the cloud computing study. In addition, we should pay attention to minimize confounding factors in the learning resources especially for elderly students, and too many designs easily disrupt the attention on learning, such as adding unnecessary sound, animation and so on. We should arrange

information resource for the elderly, such as good health, travel information, current affairs information between domestic and international.

3.3. Update the Resource Timely

In informational education with cloud computing, most of the teaching resources come from the network, we should do careful screening on a large number of all kinds of network resources, try to choose the stable network resource, and prevent some network links failure because of too long time. In addition, the environment managers should pay attention to updating resources timely, ensure the novelty of the resources in learning environment to cause the attention and interest of the learner.

3.4. Realize the Sharing of Resources

Cloud resources can be created not only by the administrator, but also by the users. Each elder people have certain social knowledge and rich experience of life, which is a great treasure, how to maximize the use of these wealth, increase the cloud resource library of information for teaching, we need to provide an interface, users can use this interface to increase the information, which can realize the sharing of resources, give full play to the characteristics of environment collaboration and sharing of cloud computing.

4. Achieve the Elderly Informational Education under “Cloud Computing”

4.1. Build Cloud Resource Library for the Elderly Learner

SUN Company puts forward that future data center do not have to spend heavily in the construction of a large room, and only need to spend very little. Under the premise of the minimum requirements of user terminal, cloud computing environment requires strong versatility of data, which can avoid the “Data Island” [18-19]. So the construction norms and standards of library resource must be considered. From four aspects: First, from the view of technology development of resources, we put forward some minimum technical requirements. Second, from the view of users, to facilitate the use of these materials, we need to tag material properties, and standardize the data type and write type of the property from the considerations of operation. According to the elder people of different ages, different cultural level, knowledge level, different health status and needs, we sort out the specific needs for elder people, and select some of the most common elements with material simple and convenient. Attributes of the resource can be used as a direct basis of the resource database

management system’s data structure. Third, from the view of reviewers, we put forward the evaluation criteria of education resource as the directly basis for user to screening. Four, from the view of managements, we put forward the architecture of management system and the basic functions.

4.2. Construct the Sharing Platform for Adding Learner’s Knowledge

Foreign government and industry attaches great importance to elder people with knowledge and skills, which are regarded as an important resource of social development. In 2002, The UN aging Congress puts forward the new concept of “active aging”, and emphasize that elder people’s skills, experience and wisdom are the foundation of social development, the view of “the elderly is resource” is gaining recognition of international. China is entering the aged society, the old people generally have a lot of experience and knowledge, these knowledge and experience are a great spiritual wealth for young people, researching and building such a knowledge sharing system, how to hand down elder people's knowledge and experience to maximize the light and heat of the elderly, that have very important sense, so that it can let young people take less roundabout way, let the knowledge of elderly be shared, and let elderly people to maximize the value of self-realization. Using the platform, the elderly can easily share teaching resources, edit and finish the data resources (structured or semi-structured, even metadata) in the "cloud" with using the provided tools to suit themselves or others, and without considering their own machine capacity, computing power and software environment, so that the repository of resources can continue to add suitable and fresh teaching resources [20-22]. The specific research contents as follows:

1) Construct the elder cloud knowledge base. To study the problems may include: how to represent the knowledge of the elderly? Sometimes older people may don’t know how much knowledge they have, there is a need for a method to get the implicit knowledge to explicit, by what means can reveal the knowledge in old people’s mind, and with a good man-machine interface; Something scattered in various elderly people’s mind are not knowledge, but if we combine them, they will become knowledge, or more useful knowledge; this segment contains the meaning of knowledge innovation, such as the previously fragmented knowledge is not knowledge, after integrated they become knowledge.

2) The discovery and recommend community of the elderly cloud knowledge. We will use a collaborative annotation technology to realize the automatic classification of cloud knowledge to the formation of the cloud knowledge; At the same time we automatically construct a knowledge community based on the sharing knowledge subject of old people, and not man-made prior classification. Based on the

discovery of the virtual community, recommend the personalized knowledge to the users. Around the discovery and recommendation of cloud knowledge community, and with the considerations of the older people's focus and persistent, we will focus on how to make better use of such characteristics, promote the formation and development of cloud knowledge; based on the classification of cloud knowledge, study the formation mechanism of virtual knowledge community to provide new social networking platform for the elderly.

3) Develop the elderly cloud knowledge sharing system. Around the construction of cloud knowledge base, we will take the retired group from the knowledge-intensive higher university as the research object, research the motivation and resistance factors of sharing knowledge for university retired teachers; based on the existing study of old people's physiological, psychological and behavioral characteristics, combined with the demand for cloud knowledge management, put forward the man-machine interface design principle of elderly cloud knowledge. On the basis of the above research, we choose the university retired teacher and develop an elderly cloud knowledge sharing system.

4.3. Establish an Integrated Resource Management Platform to Achieve unified Management

Make full use of technology and service brought by cloud computing, construct an open transparent resource library, so users can easily retrieve various information. Setting resource storage, query, edit, call, download services, providing evaluation test of different authority for individual users, users, the administrator user and super administrator user, overcoming a series of management problem in construction of resource library, so the user can use the most simple terminal equipment and network to run the browser, and will be able to learn, experiment and data processing anytime and anywhere. Making full use of the mature Web2.0 technology to allow users achieve the maximum range of communication and interaction during use.

4.4. Build the Cloud Computing Platform

Microsoft and Google have launched their own cloud computing platform. We can use their cloud computing platform. For example, now many schools are in the use of Google earth community to carry out the geography teaching, it is a very good example of using Google cloud service. Of course, we also can hire a network space to create our own network platform, which can eliminate the need of a large number of hardware devices and the trouble of maintaining the system, and promote the diversified development of informational education, according

with current situation of informational education of our country.

We adopt four software architecture layers to build a software platform of good extension and technical standards for users, four architecture layers reasonable split system support layer, education middleware layer, application layer of the industry and user layer, so that they can be relatively independent developed and maintained to ensure the system's efficiency operation, low workload maintenance and highly scalable and expansion in future application.

Based on four architecture layers, we use MVC (data modeling, unified control, and multiple view display) software programming ideas, and use the latest version of the Struts, spring, Hibernate and other mature framework technology to develop [23].

In order to achieve an unlimited amount of cloud computing application of users, the system must achieve software cluster technology and load balancing technology. The application of load balancing can provide scalability and high reliability, by using the software of JGROUP cluster framework of JBOSS5.1, cloud computing platform of education can be deployed on the application server which is not limited, so as to realize that the scale of users is not limited. Fig. 1 is the overall technical architecture chart of cloud computing education platform.

In such mode, the user has a great deal of flexibility, can independently choose the required operating system running on the client, the server uses the popularity of PC server cluster, pre-stored all kinds of different operating platform, including the environment of the operating system, applications, and the corresponding data, each client access from a server and build the overall operating environment to meet user demand for different operating environment, as the data between users are isolated from each other, so the server cluster can select the form of relatively independent for storage, so that the whole system can be extended to large scale.

5. The Positive Effect of Cloud Computing in Informational Education

5.1. Change the Existing Pattern of Mobile Learning

The use of cloud computing can change the existing mobile learning model, and bring great changes to the mobile learning [24-25]. In the cloud computing environment, users only need to use not very high mobile devices just as mobile phone, notebook computer and so on, through the browser of these devices users can access cloud storage, and select the learning content what they are interested in. the cloud computing technology can also make full use of the cyber source, such as broadband, WIFI and so on, so that learners are no longer limited to WAP protocol, and it provides the network bandwidth guarantee better for mobile learning platform.

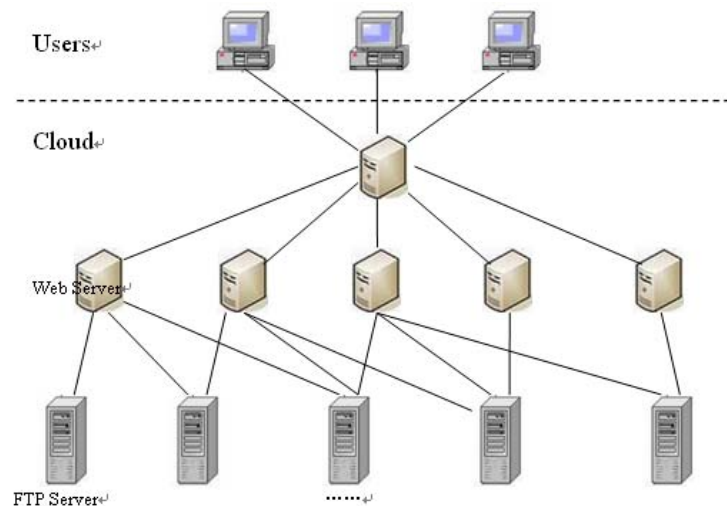


Fig. 1. The overall technical architecture chart of cloud computing education platform.

5.2. Integration of Rich Informational Education Resources

A very important starting point of cloud computing model is integration of network information and information sharing based on the cloud server. Cloud computing will put the massive education resources together and store them in the cloud server. In this mode of learning environment, learning is like shopping in the Internet market, through the network terminal equipment connected to the cloud server, learners can choose the content they are interested in whenever and wherever.

5.3. Realize the Elderly Informational Education

The elderly could not find the relative concentration of the time and energy to go to college training and learning for multiple objective and subjective factors, but a mobile learning platform built by cloud computing service can solve this problem, it provides a platform for old people to learn without the limitation of time and space, so as to provide the guarantee for the realization of lifelong learning.

5.4. Realize the Sharing of Educational Resources to Promote Fairness in Education

In the cloud computing environment, educators can build a cloud server through one or several sets of high performance computers, and complete the integration of information and data processing of all teaching by the cloud server. The learner only use the old computer or mobile phone to access the Internet, and then they can enjoy a variety of information resources in cloud services. Because all of the data

processing are completed by the cloud server, therefore, the cloud computing can maximize the realization of fair distribution of education resources.

6. Conclusions

Informational education helps elder persons to meet the spiritual needs, and enhances the quality of life of the elderly, promotes the elderly to keep pace with the times. Informational education helps elder persons to meet the spiritual needs: for many old people living alone, if they learn to use the computer and the Internet, they will find joy, obtain information, and contact with friends and family, which would reduce their loneliness and solitude for less communication between neighbors and children; at the same time also help they broaden horizons, eliminate loneliness, reduce their sense of closure, meet the thirst for knowledge. In addition informational education can also improve the quality of life of the elderly: they can manage bank account through the Internet at home, pay water and electricity bills of daily life, deal with articles and pictures, shop online, use search engine to find the content which they are interested in. But there are some disadvantage factors in informational education for older people, if we introduce the cloud technology in informational education, we can solve a lot of problems to make old friends better enjoy various informational education resources supplied by the cloud service, to make their life more rich, so that their wisdom and ability better bring greater contribution to the society, and through which they really feel "old school, old age".

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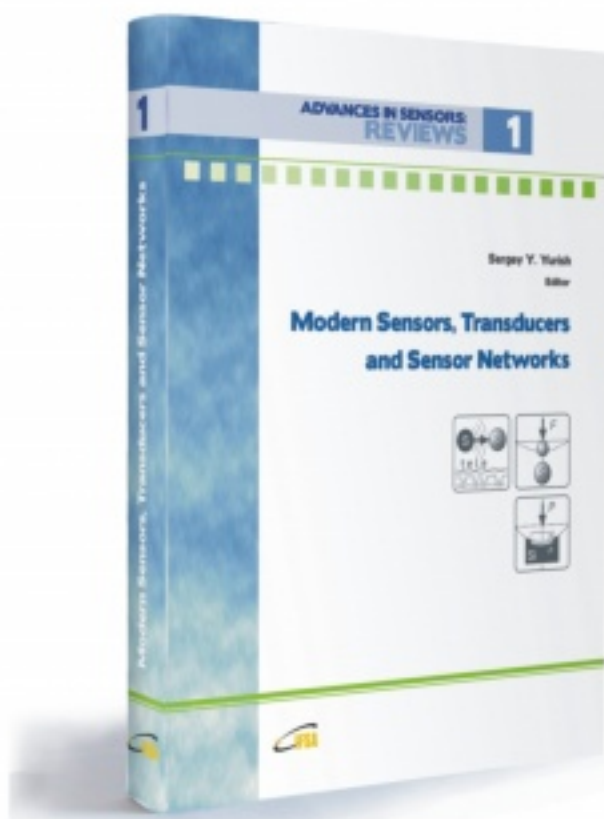
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