

## Research of MOOC Platform Based "Internet +"

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**Abstract.** This paper is devoted to examining the construction of MOOC platform based "Internet +". It firstly introduced the "Internet+" model, the "Internet + education" influence and the significance of education. Then, it analyzed the existing problems in the development of the current MOOC, and put forward the model of "Internet + MOOC" through the method of software engineering. It explored the advantage of "Internet + MOOC" mode and promoting the function to the education teaching. This paper put forward the framework of "Internet + MOOC" platform model, and point out the problems need attention in the construction of the platform.

### 1 "Internet +" model

In recent years, with the rapid development of computer technology, people's work and life more convenient. The changing of the Internet technique makes the transmission of information increasing rapidly, the Internet changed the way people's work and life. Distance education based on Internet technology, online education, online college education mode booming, has a huge impact on traditional classroom education. The age of the Internet is known as the era of knowledge explosion.

#### 1.1 "Internet +" concept

"Internet +" is the Internet to develop new patterns, new form of innovation 2.0 environment, and it is a form of Internet evolution, driven by the knowledge society and innovation 2.0 birth of new patterns of economic and social development. "Internet +" is to further the practice of thinking of the outcome of the Internet, it represents a kind of advanced productive forces, promote the evolution of economic patterns occurs continuously, thus boosting social and economic vitality entity, reform, innovation and development and provide a vast network platform.<sup>[1]</sup> Popular, "Internet +" is the Internet + various traditional industries. It is the use of modern information technology and the Internet platform that enables Internet and depth of integration of traditional industries, creating new ecological development. E-commerce, e-government, Internet banking, online travel, online open class and so on, are the "Internet +" and the depth of integration of the results of traditional industries.

#### 1.2 The concept of "Internet + education"

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The 21st century is the information into the main features of the knowledge economy. Along with the rapid development of computer technology, network technology, multimedia technology, mobile communications technology and Internet technology, each industry is under "Internet +" engaged in promoting the reform and development, the education sector as well. The first generation of education in the book as the core, the second generation of educational materials for the core to the third generation of education in counseling and case mode appears, now the fourth generation of education, is the real student-centered. Chinese education is moving towards 4.0 era.<sup>[2]</sup> A school, a teacher, a classroom, which is the traditional education. An educational private network, a mobile terminal, hundreds of millions of students, selecting any schools and teachers, this is the "Internet + education". This model can be truly student-centered learning, you can learn anywhere, anytime. In MOOC represented, such as micro-lessons, flipped classroom, online classrooms, mobile classroom, e-learning platforms are the result of the "Internet + Education". "Internet +" Time triggered mode of education reform wave has arrived, and the competition has broken borders, worth thinking about how to respond.

### 2 MOOC development history

#### 2.1 MOOC introduction

MOOC is a massive open online courses, is a newly emerged an online curriculum model. Unlike traditional online courses, MOOC idea is to open education in communication theory and network-based learning, a large-scale, open courses and online courses three characteristics. MOOC with students as the center,

quality-based curriculum resources, rich network resources, supplemented by the use of a gradual approach MOOC offer different courses for different learners, and the use of real-time communication and under classroom after school to discuss the combination. MOOC establish performance through classes and homework curriculum evaluation system, and promote teachers to improve teaching and learning materials and improve the quality of teaching, and ultimately improve student learning efficiency and learning.

## 2.2 MOOC development

MOOC emergence and development manager of a short but long-term process of birth, to be exact, it can be traced back to the 1960's. In 1962, as American inventor and innovator knowledge, Douglas Engelbart presented a project called "Enhancing human intelligence: a conceptual framework for the Stanford Research Institute". In this research project, he stressed the possibility of the computer as a tool to enhance collaboration wisdom be applied.<sup>[3]</sup> In 2008, MOOC name is a senior fellow at Wagner Gennaro, director of communication and innovation with the National Institute of Humanistic Education Technology University of Prince Edward Island jointly proposed, the main purpose is to use the Internet to offer online courses, drew a large number of learners cited.<sup>[4]</sup> In 2011, Stanford University's "Introduction to Artificial Intelligence" course online free MOOC get established as a representative of a breakthrough development. Subsequently, by the famous university participation, the impact so far of Udacity, Coursera, edX have established, they opened the curtain MOOC education reform. 2012 has been called MOOC year.

MOOC formally entered China in 2013. In 2013, Tsinghua University and Peking University in May announced it has joined the online education platform edX, the same year in July, Shanghai Jiaotong University and Fudan University have announced to join Coursera. July 2013, Online Education Development (MOOCs) International Forum held in Shanghai Jiao Tong University, and Shanghai Jiao Tong University announced to build China MOOC with Peking University, Tsinghua University and other C9 universities such as Tongji University, Dalian University of Technology, Chongqing University.<sup>[5]</sup> MOOC is a new form of education, the rise and development of wave MOOC positive impact on the traditional mode of education, speed up the pace of education reform in our education.

## 2.3 MOOC problems in development

MOOC is a massive open online courses, and is a new route of knowledge transmission that traditional courses of education through the Internet opens and IT support. It is an attempt educational reform. This educational reform is successful which has been proved by practice. Its rich teaching resources, task-based learning, forms of learning

pathways and relatively complete evaluation mechanism, MOOC attracted many learners participate.

However, after a recent period of development, MOOC drawbacks are gradually revealed, in particular in the following aspects. First, MOOC still complement and expand the traditional teaching, both teachers and students adaptation it need a relatively long time. MOOC current form of teaching is still not out of network learning platform, network classroom education mode. Educational exchange student interaction than traditional classroom network has improved greatly, but only limited exchange of text, images exchange, hardly intuitive expression, emotional feelings, pan situation still lack education, teachers and students it is difficult to establish friendship. Secondly, the current process MOOC courses learners are not knowledge-based systems. Because learners MOOC courses are mostly based on need or interest, in the absence of credit constraints and other conditions, as time goes on, probably because the learner has mastered the skills needed, or interest in learning subside and give up learning. Third, the evaluation mechanism is still not perfect course. MOOC current curriculum evaluation is still a teacher to learner tests and homework assignments online case evaluation means, there is a replacement that plagiarism, on behalf of homework and other defects. Fourth, MOOC courses not yet out of a pile of such information, courseware display and other features network classroom. Currently, there are still some cases MOOC courses taught video, courseware and other information displayed, and curriculum instructional videos rational knowledge is not strong, the quality of teaching is not high. "Internet + MOOC" mode can effectively solve these problems.

## 3 "Internet + MOOC" advantage

In the era of knowledge explosion, the spread of knowledge and innovation is inseparable from the development of the Internet. The development of mobile communications technologies such as 2G, 3G, 4G, WLAN, WIFI and other network technology, combined with the Internet, is boosting the dissemination of knowledge and innovation. A new wireless network technology IEEE802.11ax being developed, the use of this technology can achieve 8 seconds to download complete 10GB of capacity.<sup>[6]</sup> IEEE802.11ax not only use the MU-MIMO (Multi-User Multiple-Input Multiple-Output) technology, but also the use of OFDMA (Orthogonal Frequency Division Multiple Access), that is orthogonal frequency-division multiple access technology, which is the next-generation high-speed wireless. Therefore, the "Internet + MOOC" mode is Internet-based, with 2G, 3G, 4G and WLAN, WIFI wireless network communications technology. In this mode, it is possible to achieve a smooth access MOOC systems used such as PC, laptop, IPAD, PDA, smart phones and other intelligent mobile terminals. Thus we will build three-dimensional forms of the "Internet + MOOC" Education mode. In this mode, MOOC courses are transparent to the learner, allowing the learner to access the Internet using a smart device and

authenticated, learner can achieve learning MOOC courses. "Internet + MOOC" network frame shown in Figure 1.

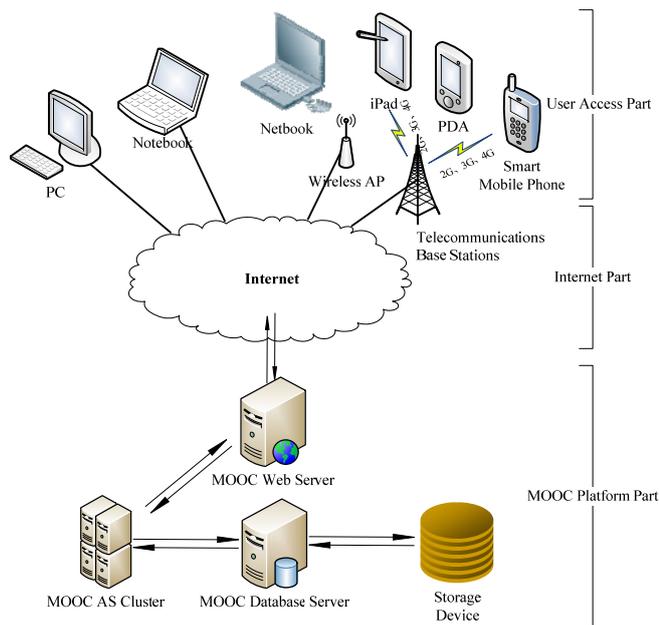


Figure 1. "Internet + MOOC" Network System Frame Chart.

Advantage "Internet + MOOC" mode is mainly reflected in the following aspects. First, this model breakthrough time and geographical constraints, to achieve a student-centered autonomous learning. "Internet + MOOC" mode Internet-based learners only need to use smart devices to access the Internet, will be able to achieve self-learning anytime, anywhere. Learners can choose their own time to arrange live classroom learning or video-on-demand learning. Second, it can achieve webcast experimental classes and operations Course. Currently, it has achieved a webcast SD or HD video, but also to achieve a multi-screen display technology. Therefore, teachers interspersed with some aspects of experimental operation has been able to achieve during the theoretical lectures. Such interludes labs, both to strengthen the students' understanding of the theory, improve the ability, but also regulates classroom teaching atmosphere, achieve a good situational teaching. Third, this model is conducive to integration and optimization of educational resources, improve teaching quality. Under the "Internet + MOOC" mode, teacher focused on the design and development of the MOOC courses, improve teaching methods. Using this model, teacher can break the regional restrictions, to achieve inter-school cooperation forum set up teacher or team of teachers hired well-known university lectures, which effectively integrates the teaching resources for learners to provide a more extensive knowledge feast. Fourth, it is well to eliminate the gap between urban and rural education resources to achieve educational equity. Based on the Internet MOOC education can breakthrough the limitation of time and place. In this way, learners that in remote villages can be accessed high-quality educational resources of developed areas via the Internet, and to carry out independent study, to some extent, to eliminate the gap between urban and rural education resources and achieve educational equity.

In addition, the "Internet + MOOC" mode compared to traditional network teaching has significant advantages, mainly in the learning process monitoring, learning evaluation, data analysis and other aspects of learning, it helps learners to long-term learning and lifelong learning.

## 4 "Internet + MOOC" platform model

### 4.1. "Internet + MOOC" platform framework design

In learner-centered "Internet + MOOC" mode, learner can achieve self-learning, mobile learning, learning process monitoring, learning exchanges under the results of the evaluation, as well as teachers and students, between students interact online and offline. Teachers focus on curriculum development and improve teaching methods, and do not care about technical issues. This model implements the scene of teaching and effective integration of educational resources, and it is good to make up for the shortcomings of traditional education process. Therefore, the framework of the "Internet + MOOC" platform we designed shown in Figure 2.

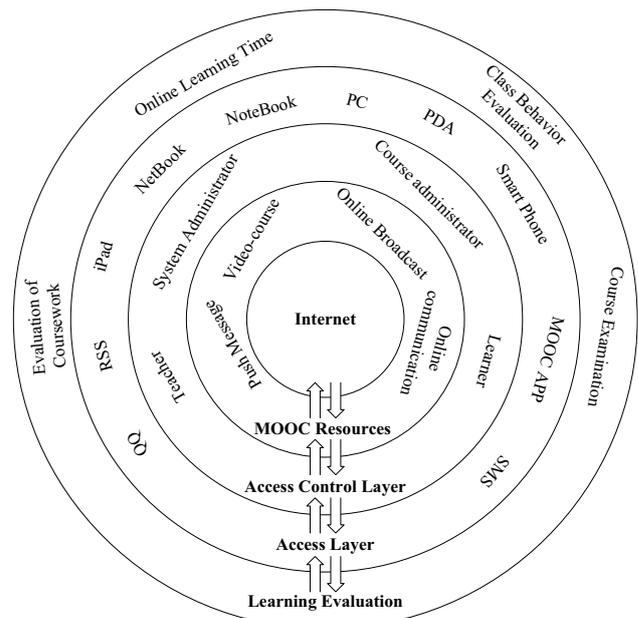


Figure 2. "Internet + MOOC" platform framework model.

We designed the "Internet + MOOC" platform framework is divided into five layers. The first layer is called the internet layer, and that is the base layer of the "Internet + MOOC" platform. The second layer is called the resource layer, including MOOC courses application server, database server, learning to monitor servers, which is the core layer of the "Internet + MOOC" platform. The third layer is called the access control layer, including user identity and user equipment identification. User identification is used to determine the user's identity and assign the appropriate access right, the user identity is divided into four categories of people: system administrators, curriculum administrators, teachers and students. Identify the user equipment is

mainly based on the user terminal equipment used by the access control server automatically transferred to the corresponding application server MOOC courses, to achieve a seamless connection of users, enhance the user experience. The fourth layer is the access layer (also called the user layer). In this layer, the user can use desktop computers, notebook computers, IPAD, smart phones and other mobile terminal to access a variety of intelligent MOOC learning courses via the Internet. Users can also RSS, Email, curriculum exchange forum, course text messaging, network cameras and even real-time interaction with teachers, with other learners to communicate online. Users can also receive through MSN, QQ, MOOC APP and other social, learning tools curriculum, job scheduling, and other timely information to answer more reasonable arrangements for their own learning plan to achieve personalized learning. The fifth layer is called learning assessments layer. At this level, teacher build learning evaluation model through a plurality of evaluation points time online learning, classroom performance, course work, final examination, etc., to achieve the learning outcomes of learners overall rating. Finally, the teacher combines course management, credit management, and comprehensive evaluation of academic degree awarded system to decide whether to grant the learner corresponding degrees. Of course, degree granting and recognition has yet to be further research and exploration.

#### 4.2 The main technologies

"Internet + MOOC" development platform need to use techniques include: software development technology, production technology curriculum, skills of the teacher's teaching. Software development technology including Internet technology, database technology, cloud computing, mobile development technology, network security, data storage technology. Courses production technology including multimedia technology, video production technology, courseware production technology. Skills of the teacher's teaching mainly in lecture style, well-organized and the convergence of knowledge, and grasp the extent of classroom rhythm. In these three technologies, the difficulty and the focus should lecture Art and style in teachers. Therefore, make good MOOC courses for teachers put forward higher requirements, but also to attract more learners to participate.

#### 4.3 Platform development matters needing attention

"Internet + MOOC" platform development is not a leap into the sky, but also the need for a process of continuous improvement. Especially in the beginning of the construction, it requires a certain personnel, capital investment, but also need to support certain policies. Therefore, in the course of implementation should be noted that several aspects. First, staging, implementation batches. Stage, implemented in batches MOOC construction, easy to identify problems promptly

corrected, but also conducive to the rational use of personnel and funds. Second, the recommended way to select excellent curriculum, and building high quality courses. Build quality courses in the form of courses match, innovation projects, to determine the "Internet + MOOC" course content, and ultimately launch on-line. Third, increase personnel training investment. Encourage young teachers to participate in various lectures competitions, training and learning, improve their own quality and lectures levels. Finally, from the leadership to the staff of one mind, using a variety of ways to actively promote MOOC courses.

"Internet + education" is just rising, "Internet + MOOC" is undoubtedly an important road to reform education. "Internet + MOOC" pay more attention to learner-centered learning, long-term learning and lifelong education, but also pay more attention to the learning process of learners systematic knowledge and learning situational. Looking to the future, with the development of Internet technology and computer technology, based on education in the form of "Internet + MOOC" mode will be more perfect. With the virtual reality equipment, teacher (by the virtual reality device configuration teacher model) will stand in front of the learner extremely rich teaching knowledge, answering questions.

## 5 Conclusion

The article from the "Internet +" concept paper introduces the development status of the "Internet + education", and as an entry point MOOC, elaborated MOOC development, advantages and problems. Then, the article on the problems MOOC depth analysis, with the current "Internet +" trends, elaborated the "Internet + MOOC" advantage, proposed the "Internet + MOOC" platform frame and analyzed. The paper further describes the "Internet + MOOC" platform model, implementation techniques and problems that need attention. Finally, we have the "Internet + MOOC" platform in the future. "Internet + education" must be of educational reform is the way, the "Internet + MOOC" is the implementation of educational reform, it is learn from each other with the traditional education, learn from each other until the final fusion.

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