

Design of Contents Authoring Tools for Smart-Learning

Jin-tae Park¹, Jun-soo Yun¹, Oh-young Kwon¹, Il-young Moon¹, Byeong-jun Kim²

¹ 1600, Chungjeol-ro, Byeongcheon-myeon, Dongnam-gu, Cheonan-si,
Chungcheongnam-do, 330-861 Rep. of KOREA

² 2ANCLE Inc., Cheon-an 1228-3, Korea

¹ {wlsxo05, yuntn55, oykwon, iymoon}@koreatech.ac.kr

² {lycos}@ancl.kr

Abstract. e-learning means the system that user can study based on their own level without limitation of time and region. Due to development of Data Communication Technology, types of e-learning are changed, and Smart-Learnings which are based on Mobile devices are on the rise recently. Smart-Learning should provide learner-centered education environment and smartlization of e-learning services. But existing learning contents which developed by Flash or Video are not suitable for Mobile devices, Most of LCMS to authoring contents are not optimized for Mobile devices, it has a weakness that hard to authoring contents immediately. So in this paper, we suggest a Contents Authoring Tools that optimized for Smart-learning and learner-centered education environment. And we expect that these tools can cause Smartlization of contents which provided for Smart-Learning.

Keywords: Smart-Learning, e-learning, Content Authoring, Mobile Device, LCMS

1 Introduction

e-learning means the system using Data Communication Technology for whenever, wherever, whoever can study based on their own level. Comparing with traditional education, e-learning has same meaning as ICT application education. For examples, e-learning has expanded learning space and learning experience. e-learning also reinforces Learners Self Directedness. Due to rising penetration of smart devices, Smart-Learning which using smart devices for e-learning is emerging. It considers learners various learning types and develops learners thinking power, communication skills and problem-solving skills. Also, it is enjoyable learning method which makes opportunities for collaborative learning and individual learning. And it is effective learner-centered smart fit education which is based on ICT, human and contents[1]. The field of learning market and learning contents will be continued to develop. And learning market will be expanded rapidly as professional and differentiated business market based on quality content, education market and cultural market[2]. The world's market of e-learning contents are crowing 20% annually. And that is bigger

than whole market of digital content's growth(15% annually)[3]. But most learning contents which developed by Flash or Video are not suitable for Smart-learning based on Mobile devices, most of LCMS to authoring contents are not optimized for Mobile devices, it has a weakness that hard to authoring contents immediately[4]. So in this paper, we suggest a Contents Authoring Tools that optimized for Smart-Learning. With providing Tools based on Mobile device, users can authoring contents immediately, and using HTML technology, users can do cross platform.

2 Related Research

2.1 Existing Contents Authoring Tools

Content authoring tools most in use today are WebCAT provided by Tekville.com. WebCAT is under planning by 'Making Collaborative e-learning ecosystem' for helping e-learning companies to authoring easier, faster and cheaper Smart-Learning contents[5]. And it also provides web standards, HTML5. Existing e-learning contents which authoring by Flash are not suitable for Mobile devices. So if we want to authoring contents for Mobile, we need to use MP\$ and HTML5 technology for now. But it wastes a lot of time and money to authoring a contents with HTML5, e-learning companies converts existing Flash contents to Video(MP4) and services to Mobile users.[6][7]. WebCAT is HTML5 contents authoring tools for Smart-Learning, it has a merit. If you authoring HTML5 contents with WebCAT, you can use them on PC and Mobile device. It also contains Basic course development process. So anyone can authoring contents quickly and easily, and function for learning contents development, it promotes user's ease. Suggested contents authoring tools in this paper, it builds Cloud environment using WebCAT's technology. This system has no limitation of capacity because it builds server using virtual space of cloud service. It has a merit that it is easy to build frameworks for analysis learners using gathered contents authoring records and user's usage records data. And it can get cost cutting effect, expandability effect and automation effect by managing the servers polysynthetically. It aims building big data platform which focusing on the Future stored data.

2.2 Trend of research on Smart-Learning

Smart-learning become known since New Millennium, but it is a new field of study that adult participants in research. There are e-learning, u-learning and m-learning which researched recently, and also various progresses on researching which called system development of Smart-Learning, design development of Smart-Learning education contents and Application suggestion of Smart-Learning[8]. In addition, lifelong educations like adult education, business education and vocational training are on researching now. But it is true that we don't have enough researches. At first, there is limitation of participants who we need for researching Smart-Learning. It still focusing on learners. So we have to research for teachers and professors who have

been excluded. And also we need to discuss types of learning, instruction strategy and organization of educational contents and Systematization for studies of limited Smart-Learning. It has been around 10 years that Smart-Learning on the rise, so it couldn't set down roots in the market yet. So we need more researches of Smart-Learning by using this Contents Authoring Tools which suggested on this paper.

3 System Design

The design process of this system are designed as 4 stages. And each stages are noticed below. At first, this Contents Authoring Tools consist of contents authoring application for authoring contents on Mobile devices, contents authoring website for authoring on Desktop computer, System administrator management website for managing member management, contents, templates, module and LO management and data log server for storing all resources and analyzing learners. Whole system structure can create or use contents by using Smart devices or Desktop computers as shown as Figure 1. It provides library which gathering learning objects when authoring contents by using Learning Object. And it uses synchronizing technology by using cloud server made of Open stack for authoring contents which was being authored from other devices. In addition, it saves user and learner's information who used contents to analysis patterns for the next education. It provides sharing function so that authored contents by using learning object library will be converted as blackboard formed learning contents – one of the forms from LMS.

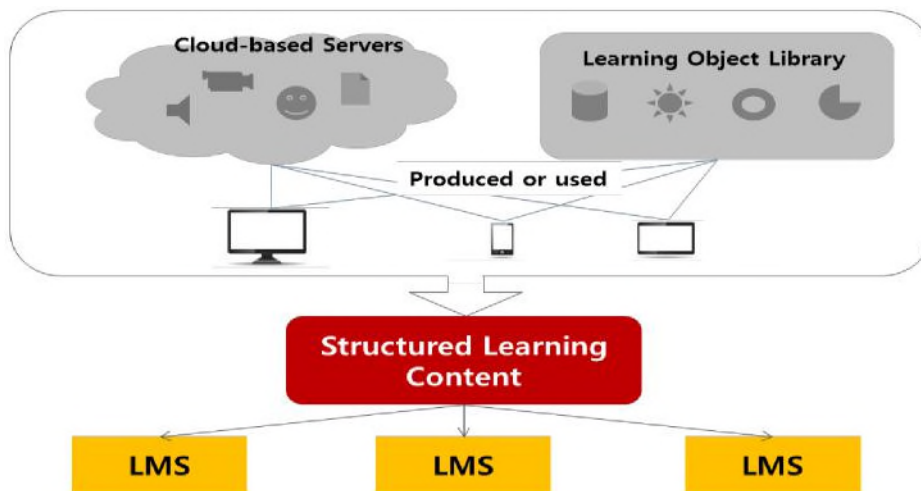


Fig. 1. Design of system

3.1 Content Authoring Application

Figure 2 shows UI/UX design about easy contents authoring on Mobile device. You can use movies, sounds and pictures which authored on Mobile device and articles which authored on desktop computer immediately after saving in cloud server. Right side of Figure 2 shows discussion, questions, testing libraries. It makes learning object easier to use when authoring. It designed for contents sharable, when you push 'Publish' button which located bottom of the right side, made contents will be published to package form that can be used on other LMS.

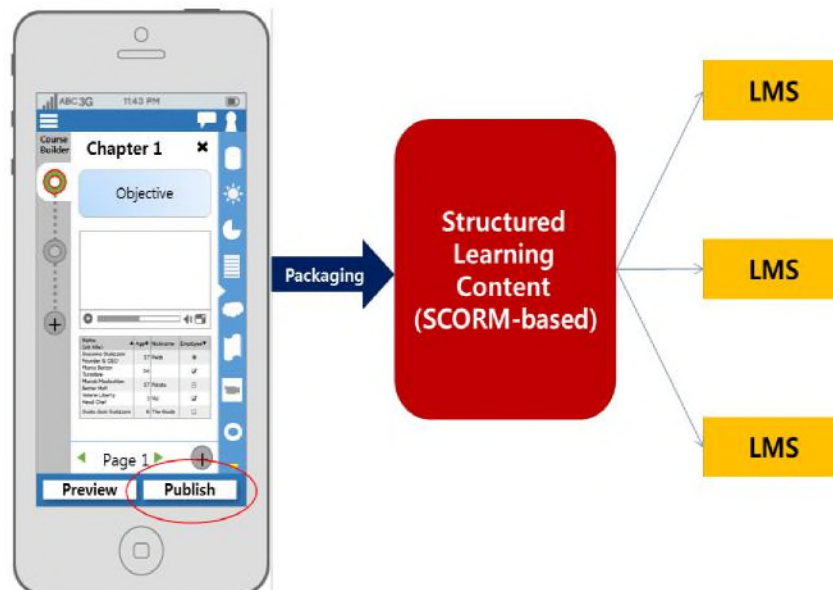


Fig. 2. UI/UX of Contents Authoring Application.

3.2 Content Authoring Web

Basically, contents authoring web is designed to operate after synchronized with application. And it focused on contents editing function. Figure 3 is the design of UI and storyboard for contents authoring website. On the top of website. There are functions for Sign Up, Login and Search box to search Guidance and Lectures. Also, list of lectures are shown on the center of website, you can manage them easily.

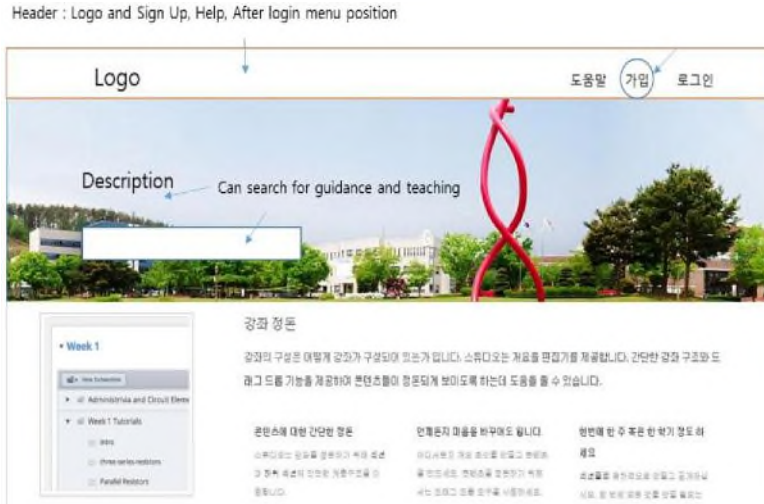


Fig. 3. UI/UX for Contents Authoring Website.

Figure 4 shows contents authoring page on website. By using ‘make lecture’ menu, you can write notifications, upload files and analysis students. And you can also add new sections for lecture by using ‘new section’ button. Basically, lectures are consist of sections, subsections and details.

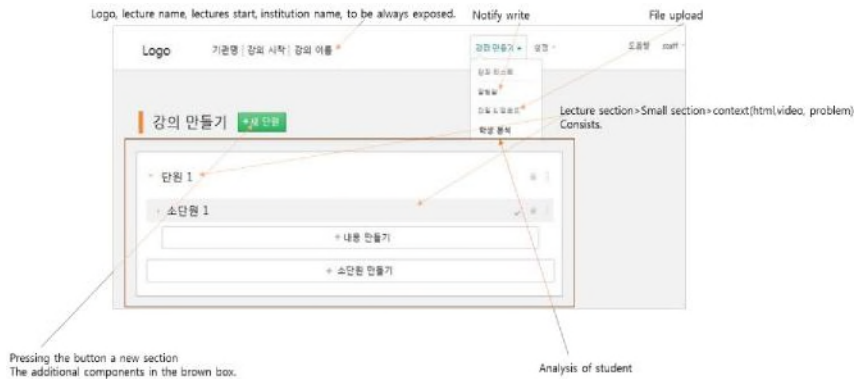


Fig. 4. UI/UX of Creating lecture with Contents Authoring Website.

3.3 System Management Web

Design module-formed management system to manage contents or users that authored by Contents Authoring Tools. Design of module for System Management Website realized as same as table 1. In user management, it designed user can use one ID by using one database from Mobile application and website. Also it saves and

modularizes learning contents as one object which includes gender, age, region, types or forms of authored contents for manage efficiently. It offers function of template management module, generate discussion module, learning object management module, generate quiz and forum module for ease of authoring. These modules offer module management function witch can add or delete modules.

Table 1. Design of System Management Web

Function	Explanation	Technique
User management	Sign Up, Seccession, Retouch – Using same ID on Mobile web and PC web	JSP
Learning contents Management	Management module which manage learning contents made by users	JSP
Manager management	Gives manager module login authorization to user manager, learning contents manger and website manger	JSP
Template management	Register/Retouches/Deletes templates for learning contents	JSP
Learning object management	Register/Retouches/Deletes learning Objects(which users can not generate) on system	JSP

3.4 Data log Server

Figure 5 shows outline of building cloud server. By using Hypervisor, It designs multiple virtual environment in a manner which would constitute a virtual appliance. The server which built on this system stores all of resources about authoring contents and information of authored contents. It also designed to store user’s learning time, gender, age, region, level of education and learn completion status by establishing a framework for the learner analysis. It offers better authoring environment by analyzing stored information, and it is also useful to build big data test-bed afterward.

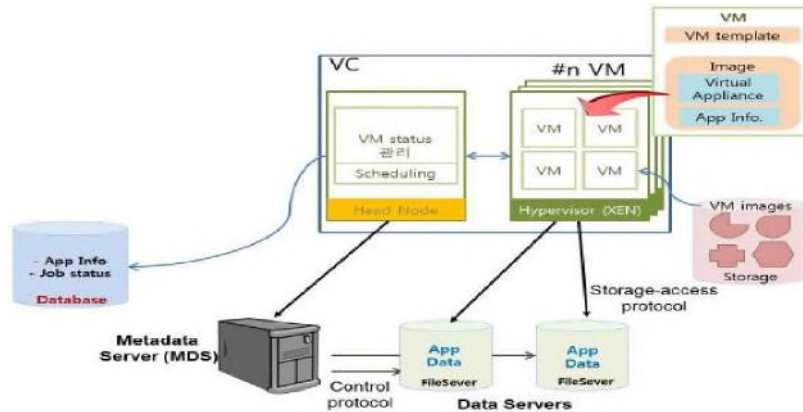


Fig. 5. Outline of building cloud server

4 Conclusion

On this paper, we suggested Contents Authoring Tools for Smart-Learning. It is not subsectional on OS by using HTML technology, designed to support cross platform and aimed to learner-centered educational environment and smartlization of e-learning services. It offers convenient functions for users by building Mobile device, web and user log server. It induces contents authoring without limitation by using mobile device and offers contents quality raising tools by using web. Also collects user behavior patterns data from server and researches a way to provide personalized service to the user by analyzing those data. We expect it will make authoring contents for Smart-Learning convenient, it will offer different way unlike existing e-learning contents authoring tools. Afterwards. We will progress actual development about system which proposed in this paper, and also we will do user satisfaction survey and usability testing by using surveys.

Acknowledgement. This research was progressed by funding of ICT/SW Creative Research Project course from National IT Industry Promotion Agency which affiliated organization of Ministry of Science, ICT and Future Planning (H0502-142007).

References

1. <http://ko.wikipedia.org/smartlearning>
2. Korea Education and Research Information Service, [http:// www.keris.or.kr/index.jsp](http://www.keris.or.kr/index.jsp)
3. Korea e-Learning Industry Association, <http://www.kelia.org/>

4. Sung-Wook Choi, Min-Seok Choi, : Design and Implementation of Effective E-Learning Education Contents Considering Multi-Platform Environment : The Korea Contents Association, pp. 1-9(2012)
5. Kwon, S.O., Kim, J.O., Ju, S.Y., Jeong, J.S., Yoo, K.H.:Design and Implementation of Educational Content Authoring Tool for Smart Devices. The Korea Contents Society, vol.13, no.12, pp.1--8 (2013)
6. Seong, D.O., Lee, M.S., Park, J.H., Park, H.S., Park, C., Yoo, K.H., Yoo, J.S.:Design and Implementation of u-Learning Contents Authoring System based on a Learning Activity. The Korea Contents Society, vol.9, no.1, pp.475--483 (2009)
7. Kim, S.Y., Park, J.A.:Designing a Framework of Multimodal Contents Creation and Playback System for Immersive Textbook. The Korea Contents Society, vol.10, no.8, pp.1--10 (2010)
8. Jo, H.J.:Published in domestic journals Smart learning Research. Kyungpook National University Thesis (2014)