Research on Big Data-Based E-Learning Contents Authoring Services

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Abstract

Online learning began to spread of the Internet in the 1990s. Online education has now changed into a smart learning Smart learning has requested an extension to the mobile environment in a number of e-Learning content that has been fixed to the existing web environment. It was learning to enable anywhere, anytime, regardless of location, and the user has enabled the study of the interaction to the content. In this study, we studied the e-learning authoring tools that meet the requirements of the mobile environment. It is provided to the user in the form of SaaS, and it provides a method for creating the e-learning content made HTML5 technology. In addition, we analyze big data of various learners, the goal is to provide the personalized learning as integrated e-learning solutions.

Keywords: E-learning, contents, authoring, big-data base

1. Introduction

As the mobile device is development, it is a tool to study the e-learning content is extended to mobile devices with a variety of sensors. The user can learn the time from anywhere with mobile properties. And the user is made possible through the interaction with the learning content. Infrastructure is rapidly expanding and changing, however, e-learning is unable to expand into smart learning in a mobile environment. There are two reasons [1].

First, the greater the cost of the infrastructure extension. Most of the e-learning has been made with Adobe Flash, mainly used in desktop or laptop. Content produced in Adobe Flash is not suitable for mobile learning. Therefore, the content has to be made again to the service in a mobile environment, and the cost is required too much.

Second. There are no e-learning content authoring tools for mobile devices. There is no authoring tool for interaction with the learning content and supporting N-screen. Even if it's there, content creators would be difficult to maneuver [2-3].

So we developed an easy authoring tool that can be used to provide a variety of functions on a mobile device. This is provided to the user in the form of a SaaS (Software as a Service), it provides a method for creating the e-learning content composed of HTML 5.

Furthermore, we analyze dig data of variety learners. We provide integrated e-learning solutions to personalized individual learning possible.

2. Related Work

Authoring tool market is growing, related technologies are actively developing. There are variety of contents authoring tools, but they are mostly provided as its LMS system.

E-learning tools are typically utilizing a variety of rich media (images, video, HTML, Text, *etc.*), types of data authoring and editing content, and the type of classification can be classified based on the HTML-based and screen capture [3-8].

Table 1. Features of Contents Authoring

Type	HTML Base
Feature	
• HTML documents and video synchronization	
• Difficult lecture files management	
• Lack delivered a vivid lesson	
• Create a file of low capacity	
Type	Screen Capture Base
Feature	
• Lecture and teaching video screen in one movie clip • Easy file management • vivid lesson • Creation of a high-capacity file	

2.1. 4CSoft's YODA Services

This is an adaptable standard e-learning content authoring tool based on HTML5 N-Screen. This service was designated based HTML5 to provide interactive services in Flash. It can be operated in a separate web browser without the viewer [4].

The authoring tool is sold with its LMS. Therefore, there is a disadvantage that must be considered in order to replace the LMS using authoring tools.

Figure 1. YODA Offered Features

2.2. Tekville.com's WebCAT

This service provides the content through a web-based HTML5 content, e-learning authoring tool. The content is operated in both the PC and mobile device. The service is provided to cope with the trend of mobile ease reduces development time, maintenance, and management [5].

Figure 2. DashBoard of WebCAT

2.3. Silverstream Producer

The service converts the PowerPoint to Silverlight. This can make the animation effects used in PowerPoint. But, animation using the e-learning content is limited because making the power point to a base.
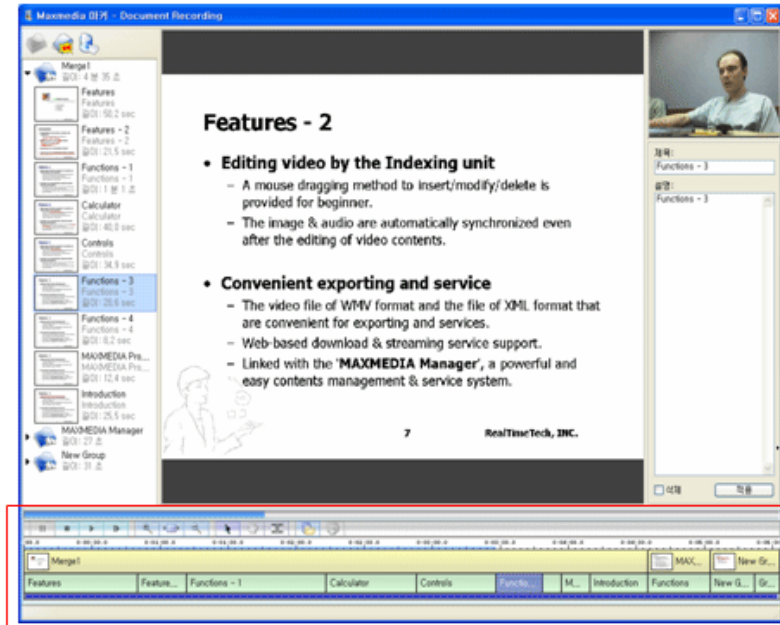

Figure 3. DashBoard of Silverstream Producer

2.4. MAXMEDIA Producer

The service converts the PowerPoint to Silverlight. This can make the animation effects used in PowerPoint. But, animation using the e-learning content is limited because making the power point to a base.

Figure 4. Authoring of MAXMEDIA Producer

2.5. iSpring

This service converts PowerPoint files to Flash or HTML5 utilizes animation effects used in PowerPoint. It provides a plug-in program for PowerPoint, animation using the e-learning content is limited because making the power point based. Also, because the synthesis of video and content is not possible, it is impossible to manufacture a complex e-learning content [6].
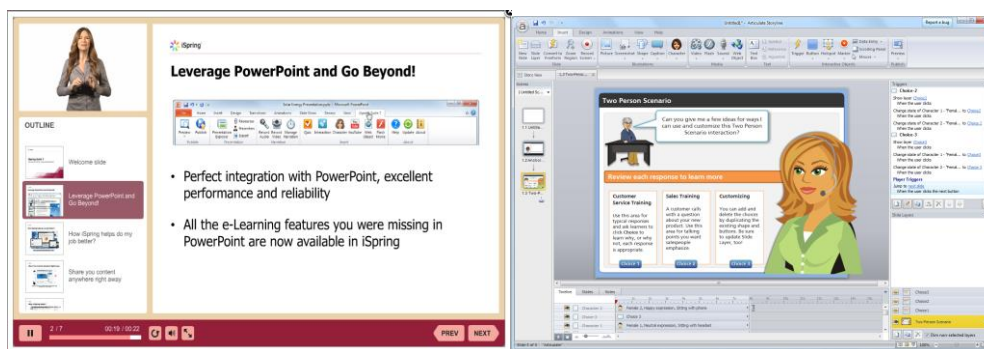

Figure 5. The Production Process through the Ispring

2.6. TOC6

When a user uploads lectures content sources (video) to the Web, it is automatically encoded into files suitable for a variety of devices. This is a cloud-based lectures platform that n-screen services possible. It also provided that the student status and attendance management for such courses in web management.
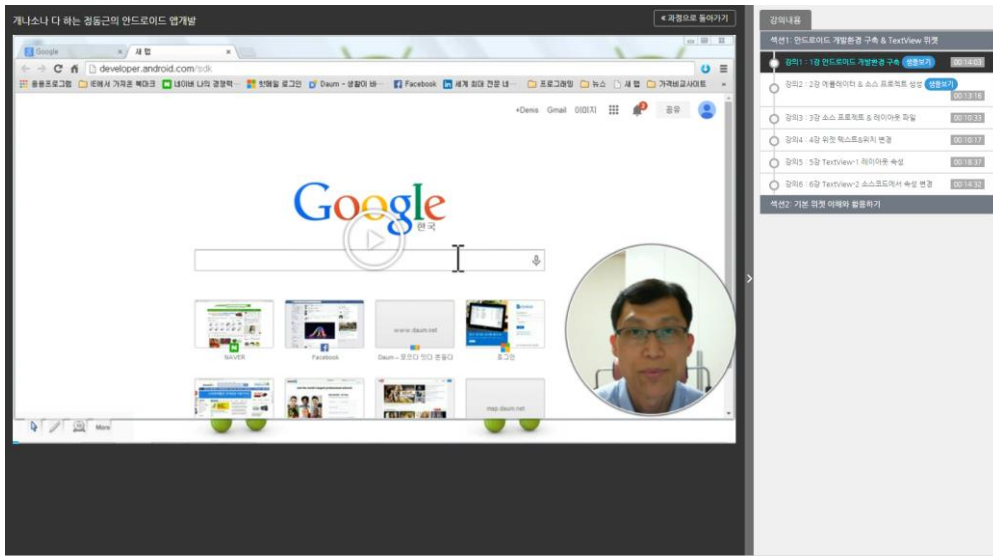
Figure 5. The Production Process through the Ispring

3. Proposed System

E-learning authoring tool of this research are called 'TLINKS STUDIO'. The e-learning content produced by it consists of HTML5. E-Learning content creators will be able to produce the same quality of e-learning Flash content within a short period of time in easier way.
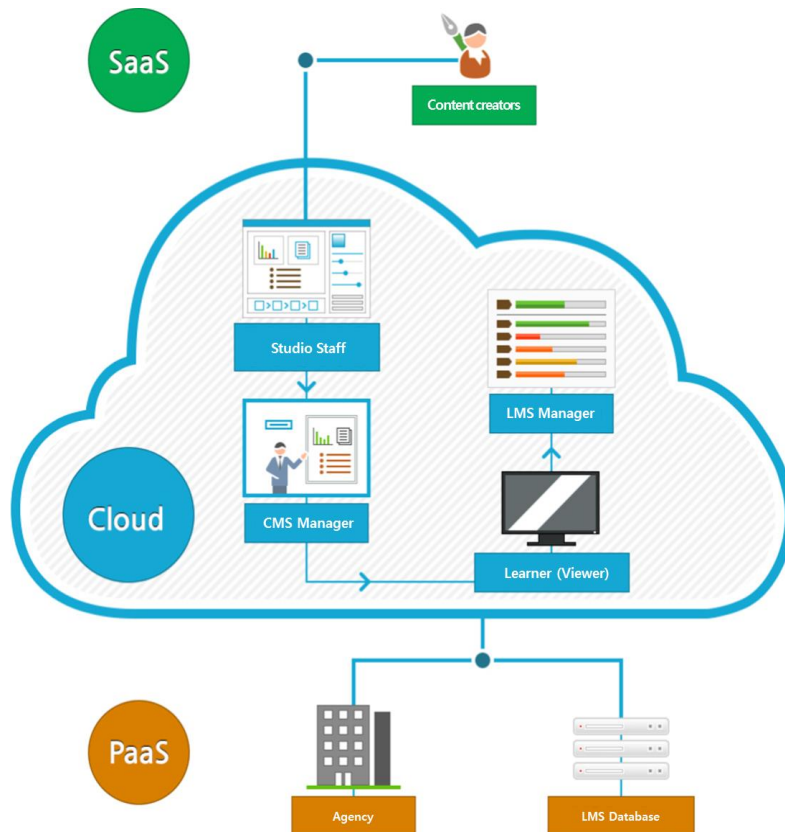

Figure 5. Overview of 'TLINKS STUDIO'

E-learning content consists of HTML5 is to have the same expandability of HTML5. In other words, it has the advantage that it can operate on various platforms. The content created once has the expandability that can be used in multiple environments like web, iOS, Android *etc.*

Furthermore, we are developing a cloud system 'TLINKS CLOUD' that allows you to configure the smart learning environment without additional plug-ins. And we aimed to establish a variety of LMS consisting of e-learning content made with this TLINKS STUDIO. Moreover, the new service by analyzing the data of the big variety of learners can be provided an integrated e-learning solutions tailored to the individual study possible.

Same as the picture above, this study consists of a large 'TLINK STUDIO' and 'LINKS CLOUD, these have their own purposes in the user area and the service area.

LINKS STUDIO is available to users in the form of SaaS (Software as a Service), there is provided a method for creating e-learning content consists of HTML5. The e-learning content production to LINKS STUDIO is available through or is distributed directly to a user LINKS CLOUD.

CLOUD TLINK is provided to users in the form of PaaS (Platform as a Service), it is possible to provide an e-learning content in the existing LMS. Cloud infrastructure provided by service assists enables the expansion / reduction of the user's flexible service, by analyzing the data of the learner accumulated through the service configuration allows for a personalized learning system.

3.1. E-learning STUDIO

The studio can be manufactured by page, and implemented main canvas fills the page.

Figure 6. Dashboard and Effect of 'TLINKS STUDIO'

- GUI module that handles the image source
- Manage pages that make up the e-learning content
- Canvas image rendering application modules

3.2. CMS (Contents Management System)

The CMS performs management of e-learning course contents. It manages the production lecture, and provides information on the course correction. The CMS performs management of e-learning content production.
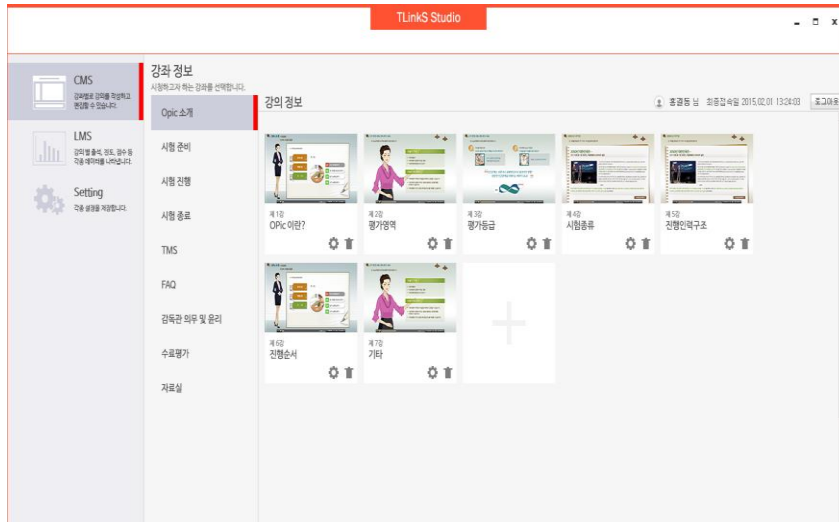
Figure 7. Screen of CMS

3.3. LMS (Lecture Management System

LMS manages e-Learning environment which actually the service. This research 'TLINKS CLOUD' of the drive to analyze the data that you store recommended an optimized e-learning to the learner content, a variety of visualization using big data analysis techniques such as e-learning content, improved methods provide learning trend analysis data provided in accordance with academic achievement It can be provided.
- Course management
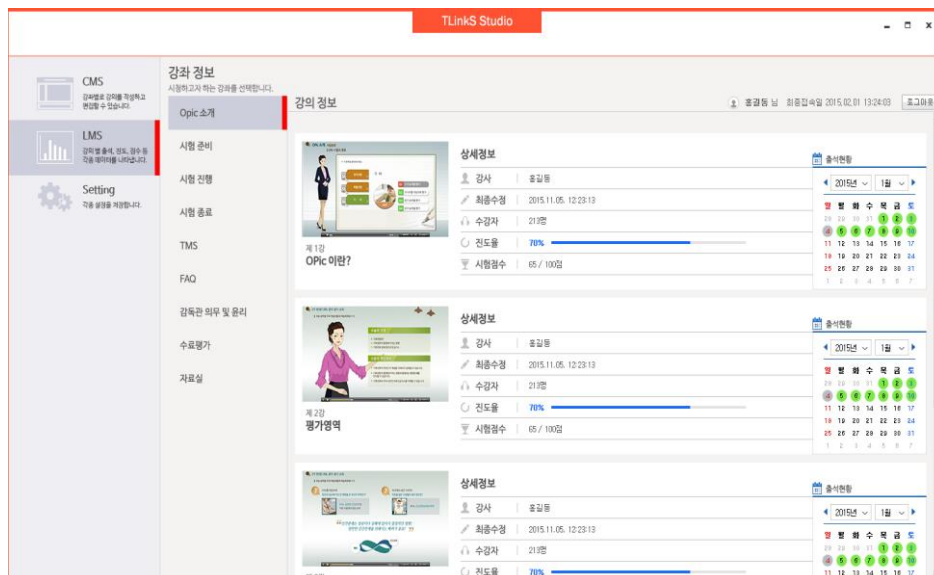: Course information such as progress rate, class size

Figure 8. Screen of LMS

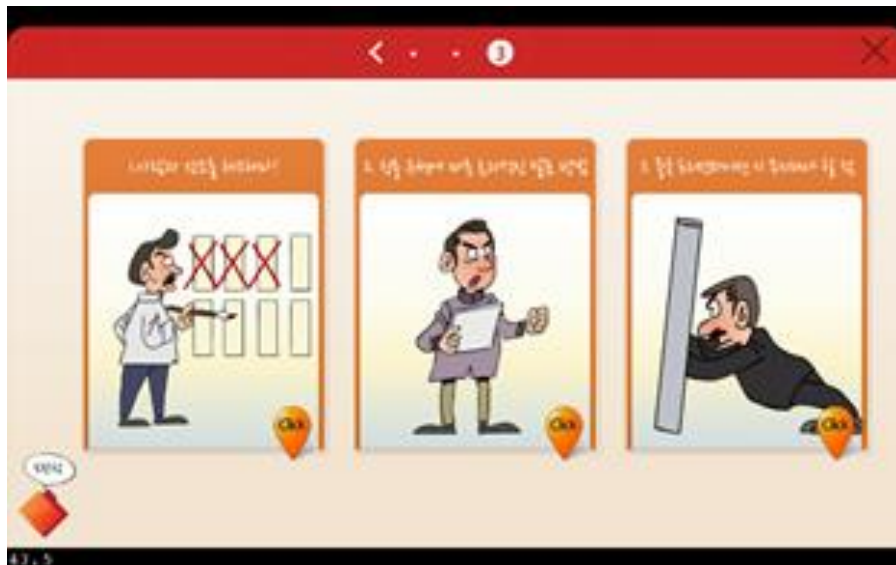## 4. Features

4.1. E-learning STUDIO

Figure 9. E-learning made by TLINK STUDIO

As a cloud service provided by 'TLINKS CLOUD' sms PaaS (Platform as a Service), not only possible to use as part of a variety of LMS, it provides a method that can be easily configured, in the LMS small.

And the authoring tool has a production mode. Studio provides the motion direction function. Directing mode is configured to produce an interaction that can be applied to a multimedia presentation and interaction that can be applied to the edited image can be applied to produce the multimedia clip is arranged to be applied.

- Edit production module
- Multimedia presentation module
- Interaction module.

4.2. Lecture Management System

It provides the ability to query a self-study course curriculum as possible. Users attend lectures by accessing the cyber classroom curriculum and learning content. These modules are required for the learner.

In addition to the LMS also supports operational support modules and management modules professor.

- Curriculum Management Module
- Lecture Management Module

The greatest feature of LMS is the individual learning system. LMS is to analyze the correlation between profile information and details of the course participants, LMS recommend the lecture appropriate for participants. Analyzes the learning aspect of the learner, the system can provide the best content for the learner.

5. Conclusion

E-learning as we know it has been around for ten years or so. During that time, it has emerged from being a radical idea—the effectiveness of which was yet to be proven—to something that is widely regarded as mainstream. It's the core to numerous business plans and a service offered by most colleges and universities. [9]

'LINKS STUDIO' as proposed in the study that produced the e-learning content authoring tool consists of HTML5, the content available on multiple platforms can be produced. E-Learning content LINKS STUDIO consisting of HTML5 will have just the scalability of existing HTML5.

This has the advantage that can operate on various platforms, this advantage has that scalability through a single Web authoring, as well as can be played in a variety of mobile environments, iOS, Android, Windows.

It is possible to connect a variety of LMS via the cloud, you can run the program from the web without a separate installation because it provided as SaaS. The service is optimized recommend e-learning content to learners to analyze training data. It also provides e-learning methods to improve the content of the academic achievement, learning trend analysis can provide a variety of information visualization using big data analysis techniques such material provided.

This will be a representative case studies of smart-learning. We will proceed with the study of the security module of the e-learning contents.

Acknowledgments

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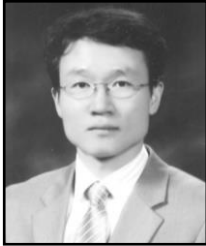
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