Information system for learning media management with participation via social media channel

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Abstract- **The research aims to develop innovations on information technology for education. After gathering information on problems occurred from the usage of the existing information system, the researcher would like to develop a system to manage participatory learning media via online channel. The prototype of this innovation has been developed by integrating learning media management with the present modern technology. The researcher has developed open source software to support display on every tool as a free space to disseminate the leaning media for online teaching. Users can access to the software via Facebook accounts, which enables users in every age group to use it. This leads to knowledge sharing and encourages teachers freely use their learning media. Moreover, it supports display of mixed learning media and provides the tools for the convenience of teachers. The researcher tested the system by organizing a knowledge sharing workshop, demonstrating how to use the system and evaluating the system efficiency with 2 groups of people as users that are specialists and general users, who are teachers and students, totaling 195 persons. It was found that the mean was 4.49, standard deviation was 0.54, and system efficiency was in good level as it could be applied for learning management efficiently.**

I. INTRODUCTION

Nowadays information technology has an important role in our daily lives. The information technology covers these following two fields. The first one is computer technology that refers to the development of computer equipment, making it smaller, faster, and cheaper, which enhances people's affordability. The other one is communications technology which connects computer equipment to exchange multimedia data and support rapid communication. This technology enables the borderless communication; there can be connection anywhere and anytime. It then results to online communication with unlimited or free connection, which is very popular at present.

Thailand has implemented the 20-year national education plan focusing on development of various aspects including education management for social and national security, research and innovation to strengthen the country's competitiveness, and development of educational system efficiency. All aims for every Thai to be educated, have quality lifelong learning, and live happily, which complies with sufficiency economy philosophy and the changing world in the 21st century [1].

The researcher has an idea to develop information system to manage participatory learning media via social media channel, which integrates knowledge on information technology, communications, and information development on network system. This aims to connect educational personnel, enhance educational quality, create innovations to disseminate knowledge, and promote educational opportunity. Popularity in every age and group can access to knowledge, and lifelong learning will be promoted widely to upgrade and develop professional potential as well as collecting. The concept of the system is shown in Figure 1.
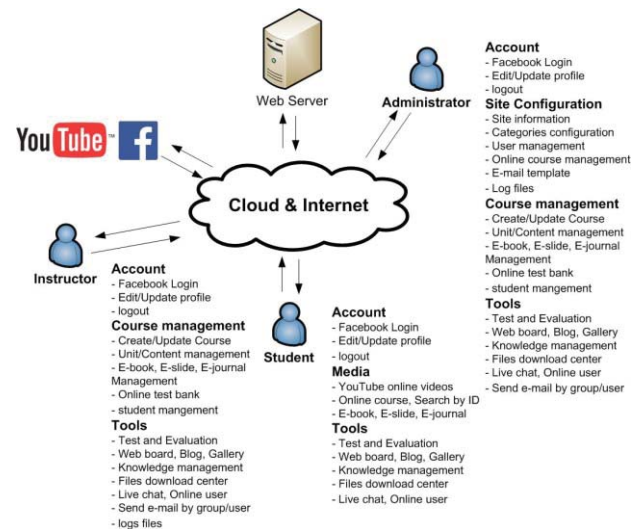
Figure 1. Concept of information system for learning media management with participation via social media channel

The research aims to create educational innovations by developing information system to manage participatory learning media via social media channel using important tools in Learning Management System: LMS in which leaning media is in the form of e-Learning. The information technology and online media such as YouTube and Facebook are integrated. [2] E-learning can be used in various channels such as satellite television, while the content can be in the form of computer assisted lesson, online lesson, or learning from video and website. According to Alias and Zainuddin [3], LMS can be

defined as "a software application or Web-based technology used to plan, implement, and assess a specific learning process". The experience gained from solving challenges and finding information 24 hours a day [4].

II. MATERIALS AND METHODS

This research applied ADDIE Model with System Development Life Cycle: SDLC the details follow:

A. Analysis

1) Problems of the existing systems, for the analysis process, the researcher started from studying the problems of the existing systems by asking those who used the general learning management systems. It has been found that some systems are difficult to use with complicated member subscription. Moreover, they can support only some media and cannot be displayed on smartphone. [5] Other systems act as teaching tools for teachers without consideration on learners' differences such as their background knowledge, motivation, leaning characteristics, and methods. Some small schools cannot afford a server to install software for their own learning management, while lesson analysis can be implemented by teachers who independently manage their own learning media. The fundamental analysis is comprised of (1) Profile management, (2) Site configuration, (3) Course management and (4) Course tools.

2) Current technology, the computer network enables users to access to internet system conveniently. Most learners and teachers own well-known social media

accounts such as

Facebook and YouTube, while the developer can connect to Facebook account and download data to an application for the users to connect and access to the system via Facebook accounts without registration. Besides, YouTube allows the developer to download online video to display on personal application.

3) Users, from the system analysis, the users can be categorized into 3 groups which are system administrator, users who are teachers, and users who are learners.

4) Media, the researcher designed the system which enables the teachers to use the learning media independently and support various forms of integrated learning media such as instruction videos, demonstration videos, electronic books, slides, supplements, handouts, academic books, academic articles, research, and YouTube videos.

5) Learning media access for the convenience, the developer focused on the access to learning sources via many channels such as main website, a search using course number, and QR code connection.

B. Design

1) The database design is shown in Figure 2. The objective of this research was to develop the supporting system by admitted the assessment from computer expert. This research used data flow diagram (DFD) in system work analysis and used entity relationship diagram (ER Diagram) in designing structure (Schema) database system, The developed system possessed more features including the search, insert, update and delete for learning management system than the old one.

Figure 2. The database design

2) The user interface design, to solve the problem from using different sizes of tools, the researcher designed the system to support display in every tool. The developer chose Bootstrap Framework which is free of charge and popular among developers.

C. Development

System Development Life Cycle: SDLC is implemented for the quality software. The developer defined the problem, analyzed system, and designed the system in the earlier process. Then there was a development using code open software with PHP language together with MySQL database and screen display with Bootstrap Framework and Jquery, as well as using AJAX technique to support display in every tool including personal computer, notebook, tablet, and smartphone.

After that, there was installation on the server under the domain of Rambhai Barni Rajabhat University with the name RBRU Academy which can be accessed to via http://academy.rbru.ac.th. The website is shown in Figure 3.
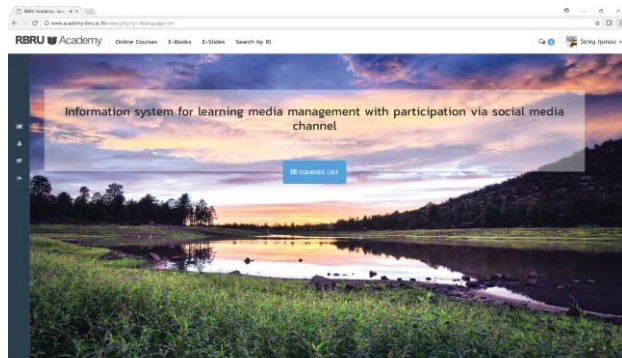

Figure 3. The website of the system

To develop the prototype, the developer follows information technology philosophy, quality science that integrates the present high technologies and uses the mentioned processes to solve the defects of the existing systems and gradually enhance effectiveness.

D. Implementation

After the development and installation, the researcher tested the system by getting teachers from various faculties of Rambhai Barni Rajabhat University to use the system in which they created online lessons for their teaching. The efficiency of the system was then evaluated to define all problems and defects for improvement, shown in Figure 4, and the workshop is shown in Figure 5, 6.

Figure 4. Tested the system by getting teachers from various faculties of Rambhai Barni Rajabhat University

Figure 5. Real implementation at ANNA Resort, Kohchang, Trad, Thailand

Figure 6. The workshop for knowledge transferring to general users in 35th WUNCA

E. Evaluation

The researchers collected and analyzed information provided by experts in the field of information technology, to develop the system which could mostly fulfill the users' demand. . The performance testing was used by a Black-Box testing. The tester was splited into 2 groups:

specialists, general users who are teachers, and who are students.

The efficiency of the system was tested on four aspects as follows: (1) function requirement test, (2) function test, (3) usability test, and (4) security test by using questionnaire.

III. RESULTS

F. The developed system

The developed system's specifications is shown in Table I.

TABLE I
System Specifications

System Tools	Administrator	Teacher	Student
1) Profile Management			
- Registration	☑	☑	☑
- Facebook login	☑	☑	☑
- User login	☑	☑	☑
- Edit profile	☑	☑	☑
- Account management	☑	☑	☑
- Profile image	☑	☑	☑
- Blog	☑	☑	☑
- Logout	☑	☑	☑
2) Site configuration			
- General information	☑		
- Categories configuration (course, content type, user type, blogs, KM, web board, pdf)	☑		
- User management	☑		
- Online course management	☑		
- Email template	☑		
- Log file	☑		
3) Course Management			
- Online course	☑	☑	
- Unit management	☑	☑	
- Content management	☑	☑	
- YouTube online video management	☑	☑	
- E-book	☑	☑	
- File download management	☑	☑	
- E-slide	☑	☑	
- Online test bank	☑	☑	
- Student management	☑	☑	
4) Course Tools			
- Search course	☑	☑	☑
- Course categories	☑	☑	☑
- Search by id	☑	☑	☑
- Test and Evaluation	☑	☑	☑
- Web board	☑	☑	☑
- Knowledge management	☑	☑	☑
- Gallery	☑	☑	☑
- White board	☑	☑	☑
- Screen recorder tool	☑	☑	
- Logs file	☑	☑	
- Course statistics	☑	☑	☑
- QR code	☑	☑	☑
- File download center	☑	☑	☑
- Live chat box	☑	☑	☑
- Online user status	☑	☑	☑
- Send email by group/user	☑	☑	☑

The system was developed with PHP linked to MySQL database system, it was developed by AJAX Web Technology. The developed system has many tools to promote education such as content management, exam bank management, web board system, curriculum evaluation, knowledge management system, galleries, the center of downloaded files, online conversation system, private blog, and email system. The learning process via integrated leaning media is enhanced, while teachers can manage the learning media conveniently and support display in every tool, for smart phone is shown in Figure 4.

Figure 4. Developed system support display in smart phone

G. The efficiency of the system

The developed system analyzed and designed the system by using central database system and connected via the computer network. The system was tested for its efficiency by 2 groups for tester, namely specialist and general user, it was found that follow:

1) Specialist who are expert in computer technology, the efficiency testing by specialist users was used by a Black-Box testing, totaling 5 persons. The mean was 4.58, standard deviation was 0.50 and system efficiency was in very good level, shown in Table II.

TABLE II
The efficiency testing by computer expert

Computer expert (n=5)			
Aspects	Mean	Standard Deviation	Efficiency
(1) Function requirement test	4.52	0.51	very good
(2) Function test	4.60	0.50	very good
(3) Usability test	4.56	0.51	very good
(4) Security test	4.64	0.49	very good
Totals	4.58	0.50	very good

2) General users, the efficiency testing by general users who are teachers, and users who are students, following :

Who are teacher totaling 70 persons. The mean was 4.42, standard deviation was 0.58 and system efficiency was in good level, shown in Table III.

TABLE III
The efficiency testing by general users who are teacher

Teacher (n=70)			
Aspects	Mean	Standard Deviation	Efficiency
(1) Function requirement test	4.32	0.60	Good
(2) Function test	4.43	0.57	Good
(3) Usability test	4.39	0.60	Good
(4) Security test	4.54	0.54	very good
Totals	4.42	0.58	Good

Who are student totaling 120 persons. The mean was 4.39, standard deviation was 0.60 and system efficiency was in good level, shown in Table IV.

TABLE IV
The efficiency testing by general users who are student

Student (n=120)			
Aspects	Mean	Standard Deviation	Efficiency
(1) Function requirement test	4.27	0.61	Good
(2) Function test	4.41	0.58	Good
(3) Usability test	4.35	0.62	Good
(4) Security test	4.51	0.57	very good
Totals	4.39	0.60	Good

The efficiency testing by general users who are teachers, and users who are students totaling 190 persons. The mean was 4.41, standard deviation was 0.59 and system efficiency was in good level.

IV. CONCLUSION AND DISCUSSION

A. The efficiency of the system.

The researcher tested the system by organizing a knowledge sharing workshop, demonstrating how to use the system and evaluating the system efficiency with 2 groups of people as users that are specialists and general users, who are teachers and students, totaling 195 persons. It was found that the mean was 4.49, standard deviation

was 0.54, and system efficiency was in good level as it could be applied for learning management efficiently, shown in Table V.

TABLE V
The efficiency of the system

Users (n=195)			
Tester	Mean	Standard Deviation	Efficiency
(1) Computer expert	4.58	0.50	very good
(2) General user who are teacher and student	4.41	0.59	good
Totals	4.49	0.54	good

The system will be the center of knowledge presentation and dissemination via online media, educational service, and educational management service that people in every age and group can access to freely and equally, which enables knowledge exchange and connection. The LMS facilitates "any time, any place, any pace" [6].

B. The developed system

The developed system is beneficial for educational institutes and other sectors such as small organizations without computer server for installing leaning management software. They can access to the system free of charge.

The system is easily accessed as it is connected to Facebook accounts of students and teachers without the subscription requirement.

The system can support various media, enabling the users to use the single system for the whole semester. It is also a source to download electronic learning resources which the users can access to later.

The system supports researching in the classroom to develop the lessons used for evaluating the media displayed on the electronic system.

As it is the open source system, every people can access to it equally. The system can be set with turn-on and turn-off function, course syllabus, or the specific authority of each student in order to easily screen the students.

The system records the users' access to be downloaded for analyzing its statistical data as required by the teachers.

The system can solve problems occurred from the use of leaning management system (LMS), reduce the software installation process as everyone can access to it via internet network, reduce the subscription process with the use of Facebook account, and solve the problem of big video file storage on server with the use of online media. Moreover, it solves the problem of inability to support various media as the system can store the mixed media, enabling the students to learn from various media. It also supports the display on every tool, resulting to convenient classroom management. At the same time the system

supports various learning management, and it can be applied in the classroom efficiently.

V. References

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