STUDENT RELATIONSHIP MANAGEMENT SYSTEM OF THE NEW NORMAL BASED ON CLOUD COMPUTING

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ABSTRACT

Aim: The purposes of this research were 1) to design the student relationship management system of the new normal based on cloud computing, 2) to develop the student relationship management system of the new normal based on cloud computing, and 3) to assess the student relationship management system of the new normal based on cloud computing.

Methods: The research instrument used was the model of assessment system. The sample group of subjects were the students of King Mongkut's University of Technology North Bangkok and nine experts evaluated the system quality were selected through the purposive random sampling method from three different fields: student relationship management, cloud processing, and informative technology. The data was analyzed by simple statistics: means and standard deviations.

Results: The research found that 1) the participants of the student relationship management system of the new normal based on cloud computing were divided into three groups: students, teachers and office staff, 2) the student relationship management system of the new normal based on cloud computing consisted of four development phases, i.e., planning, analysis, design and implementation, and seven modules, i.e., calendar management module, online and face to face management module, assessment management module, representation management module, activity management module, collaborate management module and knowledge management module and 3) the overall efficiency of the student relationship management system of the new normal based on cloud computing was at a high level ($\bar{x}$ = 4.60), and the standard deviation (S.D.) was of 0.62.

Conclusion: This could be concluded that the performance of the student relationship management system of the new normal based on cloud computing was efficient.

Practical implications: Due to the pandemic of Covid-19, social distance is required and it is necessary to use this relationship management system to solve problems of the conventional teaching and learning and enhance educational efficiency. In addition to the face-to-face online classroom teaching, there are also tools to support the students' learning activities and group assignments, e.g., media devices, videos and other teaching and learning materials and also to facilitating the students and the teachers through the calendar system. The system could be implemented to overcome educational problems especially the situation of the covid pandemic.

Keywords: Student Relationship Management System, New Normal, Cloud Computing.

INTRODUCTION

The current institutes or institutions of learning have developed and use modern technologies for educational system to achieve the highest learning benefits. This is in accordance with the Strategy of Ministry of Education (2020-2022) stating in Part 6 that the management system and participation must be developed. The educational innovation resources must be implemented to access the digital platforms to meet the most updated learning resources (Bureau of Policy and Strategy, Office of Permanent Secretary, Ministry of Education, 2020).

Therefore, the student relationship management system of the new normal based on cloud computing supports and promotes the teaching and learning process and the implementation of information technology. This is an essential way and a good chance of learning during COVID-19 pandemic to create a new concept of learning or a new innovation of teaching and learning process, e.g., working from home, learning from home. When the situation becomes better, the students can learn either from home or at school or blended learning (Schwenger, 2018). Much like any crisis, the COVID-19 pandemic has triggered new possibilities. The opportunities to create new things are available. When the normal ways of life have been changed, people try to create something new to replace something old to become the new normal of life (Thongkaew, 2020). Therefore, the researcher developed the student relationship management system of the new normal based on cloud computing to enhance the teaching and learning process efficiency.

The student relationship management system of the new normal based on cloud computing could help the students, teachers and others to manage the online education system with cloud computing. The student relation management system of the new normal based on cloud computing could enhance the teaching and learning outcomes through the implementation of modules on the system, e.g., a calendar model via smartphone, and teaching supported devices, e.g., video recorders.

Due to the problems mentioned above, the researcher had the idea of creating and developing the student relationship management system of the new normal based on cloud computing to create the relationship between teachers and students and analyze the learners' data to enhance the most efficiency and effectiveness of teaching and learning process.

Objectives

The objectives of this research were 1) to design the student relationship management system of the new normal based on cloud computing, 2) to develop the student relationship management system of the new normal based on cloud computing, and 3) to assess the student relationship management system of the new normal based on cloud computing.

Scope of the Study

The research aimed to design, develop and evaluate the efficiency of the student relationship management system of the new normal based on cloud computing. There were nine experts evaluated the system quality selected through the purposive random sampling method from three different fields: student relationship management, cloud processing, and informative technology. The data was analyzed by simple statistics: means and standard deviations.

LITERATURE REVIEW

Jariyapoom (2018) stated that the procedure of system development had been analyzed in several studies, i.e., the studies of Aiemsiriwong (2014); Jamali et al. (2015); Cervone (2007) and others. From these studies, it could be said that the procedure of system development was the logistic process of the information technology development to overcome some difficulties and respond to the users' demands. The procedure of system development consisted of 4 phases as follows.

Planning phase was the first procedure of the system development with the information system and the system necessity through the analysis of all factors of both conventional and new systems. The demand data of the users were collected through the structed and semi-structured interviews and used for the work plans.

Analysis phase was the phase that the researcher analyzed the factors of long-term plans of both conventional and new systems and also analyzed the technical and economic feasibilities of the system.

Design phase was the phase that the researcher analyzed the factors related the system development to produce the designs, i.e., architectural design, interface design, database and file design, program design, context diagram, and data flow diagram.

Implementation phase was as the process of building and developing the system to create a prototype of the system, test the system with Black box, White box, and other procedures, fix the system problems and then create the user manual of the system. After that, the experts evaluated the system. The research later fixed the system according to the advice of a experts before put it into practice. The users' skills were assessed whether they could use the system or not. If the users could not able to use the system, the training or related skills were acquired. The system maintenance could be planned for the sustainability of the system.

METHODOLOGIES

The research methodology was the system development life cycle (SDLC) according to the four development phases: planning, analysis, design, and implementation (Jariyapoom, 2018).

Planning Phase

Planning was the first phase to develop the student relationship management system of the new normal based on cloud computing. The developer must have a sound understanding on the system to meet the necessity of creation and development in use. The researcher, therefore, divided the people involved in the system into three groups according to the following steps: 1) studied the data of student relationship management system of the new normal based on cloud computing, 2) analyzed and synthesized the data, 3) created the interview model with the system components and needs, 4) collected the system needs from the system specialists, 5) summarized the data of the system, 6) analyzed the system, 7) designed the system, (8) developed the system (9) tried the system, and 10) implemented the system. The subjects involved were divided into three groups as follows:

1. Students: The students can access the system, check, and correct the students' data. After that they can select the class, and scan QR code to attend. There is a reminding system on calendar for class attendance and submission of assignments. There is a system of online learning. There is an

instructional media. The students can do their assignments, and work as a team. The students can also check their attendance, submission of assignments, and marks of each class.

2. Teachers: The teachers can access the system and correct their personal information, course information, information of contents, and class activities. There is a reminding system of calendar for lecture. The teachers can teach in the classroom or online and implement the instructional media. The teachers can also assign homework, manage data bank of contents and test questions, assess the results of study and show the results of study on the system.

3. Office staff: The office staff can add, delete, and correct all the data on the system and also check the schedules of student registration and the results of student registration.

Analysis Phase

The data analysis was done after the planning phase. The researcher analyzed the data with the previous and current operational systems as shown in the Table 1 below.

Subjects involved	Table 1 THE ANALYSIS OF ORIGINAL AND CURRENT OPERATIONAL SYSTEMS	
Subjects involved	**Original operational system**	**Current operational system**
Students	- find the information of each course - register on the system - check the time tables of classes and examinations - realize that teaching and learning must be only conducted in the classroom - ask the teacher only when they have a question - take notes and finish their assignments - check their results of assessment from time to time	- access the ready system to register - can check the course description of each class - can learn both online or face to face - always have a reminding system a reminding system of calendar for class attendance and other activities - can find the previous contents of lecture - be able to checks their scores on the system - can do their group work - can take a test online - can check the results of their tests
Teachers	- often check the schedule of lecture - provide some recommendation when the students ask for - leave the teaching materials at school	- have a reminding system a reminding system of lecture and submission of the students' assignments - can correct most of the data - can teach both online and face to face - have the teaching materials on the system - can check the assignments online - can design the tests online - can design the activities online
Office staff	- follow the paper work from the first step until the final step	- follow the computer system, website and internet network from the first step until the final step

The Table 1 shows the data analysis of the original and current operational systems and three people involved: students, teachers and office staff. The system operates through the implementation of the students' relationship management, database system, data cloud, internet and communication network, and also the tools to comfort the learning of the students and teachers.

Design phase

1. The design phase was the step that the developer of the student relationship management with the new normal based on the cloud computing must design the new system after the data analysis phase to show the relationship of the structure on the system as follows.
2. The office staff can check the members' data, registration data, course data, content of lessons, notification schedule, teaching and learning data, data of exam results, work data, and electronic bulletin board. All of these are stored in the cloud computing.

3. The teachers can check the students' data, registration data, course data, contents of the lessons, notification calendar, teaching data, data of exam results, work data, and electronic bulletin board. All of these are stored in the cloud computing.

4. The students can check their personal data, registration data, course data, contents of the lessons, notification calendar, learning data, data of exam results, work data, and electronic bulletin board. All of these are stored in the cloud computing.

Implementation Phase

1. The implementation phase was the step of creating and enhancing the system to meet the requirement and consistency of the system design. At this step, all parts of the program were developed for the implementation and it could be explained as follows.

2. Three groups of people including students, teachers, and office staff are authorized to log in the system. The PHP/hypertext preprocessor for the website and database development was implemented in the implementation phase of the student relationship management of the new normal based on the cloud computing.

RESULTS

After the development of the student relationship management of the new normal based on the cloud computing, the data, outputs and the system performances were displayed in accordance with the following objectives.

Objective 1, the student relationship management of the new normal based on the cloud computing based on the architectural design with the system performance and all other parts related to the system as shown in Figure 1 below.
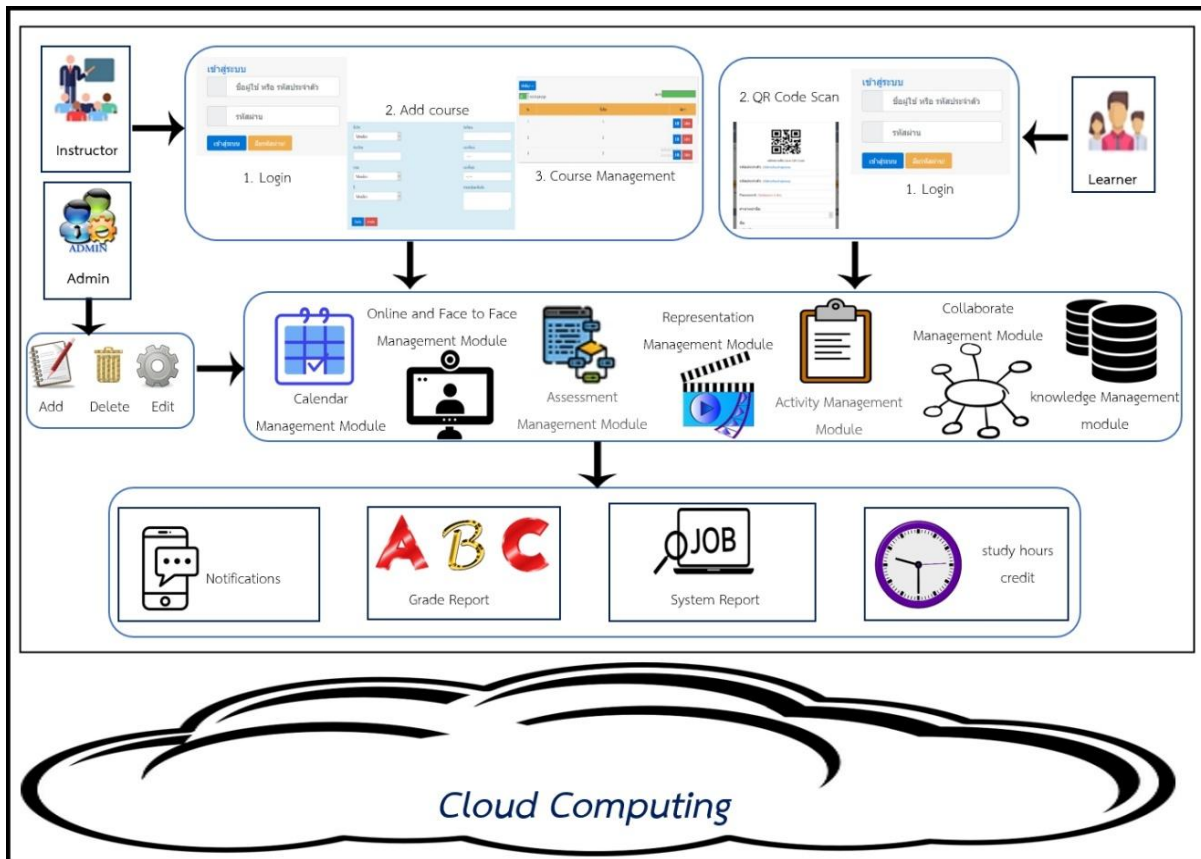
FIGURE 1
THE OVERALL ARCHITECTURAL DESIGN

Figure 1 shows that the student relationship management of the new normal based on the cloud computing consists of three people, i.e., students, teachers, and office staff as explained below.

The students can access the student relationship management. After the students log in the system, they can edit their personal data and attend the classes through the computer system and the mobile devices through QR codes. The calendar management module is the module to remind the users in multi functions, e.g., class attendance, both before and after the submission of assignments, group work, electronic bulletin board, examination schedule, new data on the system, appointment between the students and the teachers, and exam results. The activity management module is for the individual activities, and the collaborative module for the group activities, the knowledge management module for teaching and learning activities. The students can also check the learning and teaching calendar and examination results of the students.

The teachers can access the student relationship management. After the teachers log in the system, they can check and edit personal data, subject data, and also the students' data in each subject. The calendar management module is the module to remind the users in multi functions, e.g., class attendance, both before and after the submission of assignments, group work, electronic bulletin board, examination schedule, new data on the system, appointment between the students and the teachers, exam results, and also the knowledge management.

The office staff can make the edition of the student relationship management including the calendar management module, online and face-to-face management module, assessment management module, representation management module, activity management module, collaborative management module and knowledge management module and other dimensions of the processing and result presentation for the better and effective access of both the students and teachers.

Objective 2, the development of student relationship management of the new normal based on the cloud computing was developed to enhance the access of both the students and teachers to support the group activities and the processing system and work presentation and the calendar management of other works through the seven modules, i.e., calendar management module, online and face to face management module, assessment management module, representation management module, activity management module, collaborate management module and knowledge management module

Objective 3, the researcher used the purposive sampling method to divide the users into three groups: students, teachers, and official staff. The questionnaire with five Likert scale was implemented and the quality of the system was evaluated by the nine experts as shown in Table 2 below.

Table 2 RESULTS OF THE QUALITY OF SYSTEM EVALUATED BY THE EXPERTS		
Evaluation items	Quality level	
	$\bar{X}$	S.D.
Overall	4.60	0.62
1. Performance Test	4.67	0.50
2. Functional Test	4.56	0.73
3. Reliability Test	4.56	0.73
4. Usability Test	4.78	0.44
5. Security Test	4.44	0.73

Table 2 shows the results of evaluating the quality of the student relationship management of the new normal based on the cloud computing which revealed that the overall mean ($\bar{X}$) was of 4.60 and the standard deviation (S.D.) was of 0.62. Therefore, the quality of student relationship management of the new normal based on the cloud computing was at the highest level.

DISCUSSION

In this research, the researcher developed the student relationship management of the new normal based on the cloud computing and the results of this research were discussed as follows.

The Development of the Student Relationship Management of the New Normal Based on the Cloud Computing

The situation of COVID-19 pandemic affects ways of life of people in the society. All walks of life tend to adapt their lifestyle to protect themselves from the infection of COVID-19 and this is the cause of the creation of modern invention, innovation, and technology and concepts, vision and daily activities of living are eventually adjusted (Promboot, 2020). This is in accordance with the study of Thongkaew (2020) stated that the educational reform is conducted during the COVID-19 pandemic in accordance to the measures of the Ministry of Public Health. The teaching and learning approach should be adjusted according to the measures, e.g., social distancing and the implementation of technology for blended teaching and learning and the teachers must adjust their roles of teaching, administration and teaching method. This is in accordance with the study of Sangsawangwatthana et al. (2020) which studied the new normal and the behavioral adjustment of the Thai people during the COVID-19 pandemic. The technology is implemented for most daily activities including online learning activity, the system of assignment submission and group work through the document system on the internet. This is in accordance with the study of Roungrong & Hwancha-aim (2015) studied *"The Use of Google Apps in The Development of Innovative Teaching"* and it was found that the use of google apps can facilitate the users. This is in accordance with the study of Tooldham & Chansopa (2016) studied *"The satisfaction of Online Teaching and Learning Administrative System in the teacher Role"* and it was found that the students satisfied with the active teaching and learning method with social media, i.e., Facebook and Google classroom along with normal teaching and learning method and this is also in accordance with the study of Jugo et al. (2014) which studied *"Using Data Mining for Learning Path Recommendation and Visualization in an Intelligent Tutoring System"* and also the study of Kirtitusana (2011) which studies Cost-benefit point of online teaching and learning course stating that the achievements of online teaching and learning activity are the same as the classroom teaching and learning activity, in accordance with Duangchurn (2020) stating that the administrators must have the education management to meet the new normal with the guidelines for management: the collaborative plan with people involved for preparation of the online teaching and learning devices and technology.

The Cycle of System Development

The cycle of the development of the student relationship management of the new normal based on the cloud computing consists of four phases, three groups of users, and seven modules. Each phase consists of its own components from the beginning to the end of the development

process. This is also in accordance with the study of Capron & Johnson (2004) stating that the system development consists of five steps, i.e., (1) system planning, (2) system analysis, (3) system design, (4) system creation, and (5) system implementation and support, and the study of Aiemsiriwong (2018) stating that the development of content management system using the network diagram or NBCLMS with the cycle system development consists of five steps, i.e., program planning, system analysis, system design, system development and system implementation. Therefore, the researcher developed the student relationship management of the new normal based on the cloud computing consists of seven major modules as the system of teaching and learning process.

The Evaluation of System Quality

The evaluation of system quality consists of five dimensions, i.e., performance test, functional test, reliability test, usability test and security test for the rapid and comfortable access of the system users in various dimensions. This is in accordance with the study of Barron & Ivers (1996) stating that the advantages of implementing the educational internet network are the reduction of paper use, cost saving, effective data recording, simplicity of data preparation and document delivery and also the development of updated data. The communication and networking are as the effective linkage of different databases. This is in accordance with the study of Kobuakaew (2020) stating that social media is used as an alternative tool of the learning and teaching management and other works to overcome the recent problems.

Recommendations

The macro recommendations are as follows.

1. The national government should have the national strategic plan for education to promote the implementation of the student relationship management of the new normal based on the cloud computing. Social distance is required in the situation of the pandemic of Covid-19 and it is necessary to use this relationship management system to solve problems of the conventional teaching and learning and enhance educational efficiency. In addition to the face-to-face online classroom teaching, there are also tools to support the students' learning activities and group assignments, e.g., media devices, videos and other teaching and learning materials and also to facilitating the students and the teachers through the calendar system. The system could be implemented to overcome educational problems especially the situation of the covid pandemic
2. The academic institution should implement the student relationship management of the new normal based on the cloud computing for the social distancing situation and the control of the COVID-19 pandemic.

The micro recommendations are as follows.

1. The student relationship management system can be implemented for the operations, of the employees, organizations, and other corporations.
2. All networking structure, the internet speed and good communication should be promoted to support the sustainability of the student relationship management system of the new normal based on the cloud computing.

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