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Cross Platform Learning Management and Information System

Adi Chandra Syarif
Faculty of Information Technology, Atma Jaya University of Makassar,
Jl Tanjung Alang No. 23 Makassar, Makassar, Indonesia

Abstract: Lecturing management process is the process of arranging, planning and supervising the application of the curriculum in achieving the Learning Objective (LO) on an ongoing basis and is part of the internal quality assurance system. Quality assurance itself does not guarantee the achievement of continuous improvement as the concept of continuous improvement requires a management and supervisory system that relies on input data on the academic process of implementation in a transparent, accountable and responsive manner. In general, universities have implemented a model of management system and lecture supervision process that relies on evaluation of outcomes of the process, whereas to achieve continuous improvement, it requires a supervisory system that relies on input data from the process itself. This research aims to develop a management system with the ability to perform data collection and provide information on the ongoing lecturing process baesd on the application of Student Center Learning (SCL) Model with cross platform based design method. This research resulted in a system with the ability to monitor the ongoing process of lecturing implementation concurrently to fulfill the principle of monitoring the performance of curriculum application that is transparent, accountable and responsive.

Key words: Higher education learning management, control, cross platform, software engineering, SCL, model

INTRODUCTION

Higher education institution is an educational unit that organizes higher education. Higher Education management itself is defined as the arrangement, planning, supervision, monitoring and evaluation of process to achieve the higher education objectives based on the standards of higher education set by the goverment. The implementation of higher education is carried out by universities. The function of arrangement, planning, supervision, monitoring and evaluation on implementation of academic process including lecturing activity is a very important part for the achievement of higher education objectives. Atma Jaya University of Makassar (UAJM) itself has an internal quality assurance system which in its implementation has been supported by the Academic Information System (ACIS). Supervision, monitoring and evaluation of the academic process including lecturing activities has been done by using ACIS but the function of supervision that can be handled effectively based on ACIS data is the supervision and evaluation of the result of the academic process, especially in the implementation of lecturing activities, supervision as mentioned above which based on output data (output) better known as feedback control or feedback control. Supervision and monitoring on the implementation of the ongoing process or concurrent supervision of the academic process and lecture activities itself is still difficult to be implemented effectively because the mechanism and model of supervision and monitoring systems are generally still in the form of written data on implementation results such as student attendance data, attendance data Lecturers, subject data or news events and value data or assessment process, so that, improvements or improvements to management and planning or management processes depend more on the outcome of the process than on the implementation of the process itself.

Seeing these problems, it is necessary to develop a system that can make arrangements, planning, supervision, monitoring and evaluation of the running of academic processes, especially, lectures. The system of management and data service of lecturing process is an effort to develop a system of supervision, monitoring and evaluation of electronic-based academic process on activities in the implementation of lecturing process to support the function of planning, supervision and evaluation of educational implementation, especially, at UAJM. The system of management and data services of the lecture process will integrate the faculty curriculum structure to the lectures by facilitating the development of lesson plans, monitoring of implementation and achievement of the concurrent learning objectives, monitoring of attendance along with supervision of

digital lectures, evaluating the implementation and appropriateness of curriculum application to course materials and transparency of the final assessment process of the learning process and methods.

The development of management system and data service of lecturing process aims to produce an architecture of management system and data service that can perform data collection and concurrent data processing on the course of lecturing process. This system of management and oversight of the academic process considers the existing computer network infrastructure, the integration of academic data and standards in the Internal Quality Assurance System (SPMI) and the utilization of information communication technology in performing the functions of supervision and data services in a concurrent.

Literature review

Higher education management: Higher education management system itself is a model system of organizing and planning the implementation of the curriculum in the implementation process include the academic achievement of Learning Objectives (LO) on any subject through the monitoring of the implementation of lesson plans and assessment in the teaching and learning process. According to Daniel Mohammad Rosyid a Professor of ITS, education management often encourages the practice and culture of education into the curriculum is implemented which could be contrary to the objectives of the curriculum planned that looked good on paper but is seen "heavy poor content process". Therefore, an effective education management should be oriented towards the improvement and enhancement in the process not only on the improvement of the content and outcome of the academic process which has been carried out.

From the research by Ali Muhi Hanapiah, it can be concluded that the quality of academic services simultaneously influenced by the values of transparency, accountability and responsiveness (Hanapiah, 2011). Where the values are above encouraging members of the organization to provide the best capabilities in the ministry and contribute to the academic culture itself. Therefore, academic services at a higher education institution must be imbued with the values of transparency, accountability and responsiveness. To achieve this, we need a monitoring system pelayananan function that supports those values.

Quality control system and continous improvement: According to Anthony, Dearden and Bedford, supervision intended to ensure that members of the organization carry out what was required to collect, analyze and evaluate information and use it to control the organization (Dearden and Bedford, 1993). Supervision is an effort to establish standards of performance in planning to design a system of information feedback, compare actual performance with the prescribed standards, to monitor whether there has been a deviation as well as taking the necessary corrective actions to ensure that all resources institutions have been used as effective and as efficiently as possible in order to achieve the objectives of the institution. Deming himself stated that the supervision and monitoring should be carried out by an organization in order to understand the system as well as existing problems of running the system (Latzko *et al*., 1996). This understanding is followed up with improvement planning process. Cycle of planning, monitoring, evaluation and implementation known as the Shewhart cycle (Fig. 1).

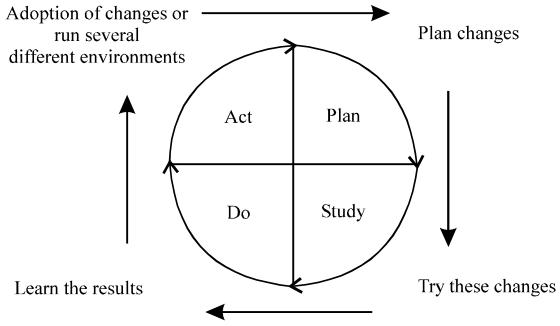

Fig. 1: Shewhart cycle

This concept was introduced by Dr. Edward Deming in his book "The New Economics for Industry, Government, Education" which is where the concept of planning, supervision, monitoring and evaluation should be made on the process not the outcome (Deming, 2000). This is what will be the cornerstone of continuous quality improvement.

Technology in higher education: The development of mobile technology makes smartphone into a technology that greatly affects the activities of the community, so, the demands in the increasingly competitive smartphone development, Smartphone has become the main communication media today. This technology keeps us constantly updated whenever and wherever we are. According to Leader Business Planning Mindshare Asia Pacific Deepika Nikhilender and Head of Insights Yahoo India and Southeast Asia David Jeffs announced the results of their research related smartphone users in Indonesia. The survey, conducted mid-2013, "There are about 41.3 million smartphone users in Indonesia

Smartphone, not feature phone," according to Leader Business Planning Mindshare Asia Pacific Deepika Nikhilender at Yahoo! office. That in 2009 Indonesia showed the highest growth in the ASEAN Region for the sale of mobile devices and smartphones. It is estimated that in 2015 Indonesia will become the Smartphone Market Leader in ASEAN Region (Anonymous, 2013). The smartphone device itself relies on the operating system as its brainware where one of the most widely used mobile operating systems is Android. Android is an operating system on mobile phones that are open and based on unix operating systems. Android provides an open platform for developers to create their own applications that will be used on a variety of mobile devices.

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MATERIALS AND METHODS

This research will begin with an analytical approach to the management system and academic data information services on a university, in this case, at UAJM, by taking into account ACIS structures that are running and will be focused on supervision and transparency of the lectures process with targeted outcomes is a system with infrastructure technology design and information services lectures process that can produce concurrent supervised data that can be used as the basis for the development of data management system with the following design stages: stages of analysis and design. At this stage analysis of the process and the common problems that occur in the lecture.

Stages of system engineering. There are two approaches used in the engineering of the lecture management system that are object oriented approach, Unified Modeling Language (UML), covering business process modeling, writing classes in specific programming languages, data structure schemes and the components required in system using Jave (J2EE) and Android language as well as structured approach using HTML, PHP scripting language and Javascript. Stages of development of information technology communication architecture. Analyze technology choices and develop integrated ICT architecture and pilot infrastructure technology support systems developed on small scale.

The research objectives in this development is the Chairman of the study program, Lecturers, students and parents/guardians at the University of Atma Jaya Makassar in particular at the Faculty of Information Technology. Where the data collection methods used in the study consisted of:

Interview: Interviews were conducted at the beginning and at the end of the study housed in the FTI-UAJM. The interview itself is conditioned in accordance with the idle time of each of the respondents (Lecturer and Head of the study program).

Observation: Direct observations were made at the beginning of the semester to identify the problem accurately and obtain an overview of lecturing process currently running on the FTI-UAJM. Other observation was done through analyzing other learning management system.

Questionaires: The questionnaire was also performed at the beginning and end of the study. The respondents of the questionnaire were students FTI-generation UAJM 2010-2013 as well as the parent/guardian of a student from the same class.

The data analysis method used in this research is qualitative and quantitative analysis. The qualitative analysis conducted on data collection from the observation of the processes and the results of interviews with faculty, Administration Chairman and Chairman of the study program. While quantitative analysis performed on collecting data obtained from the questionnaire to other stakeholders on the implementation of the academic process, students and parents/guardiansAll paragraphs must be indented. All paragraphs must be justified, i.e., both left-justified and right-justified.

RESULTS AND DISCUSSION

System design: Based on the results of data analysis on the stakeholders in the implementation of lecturing process that has been done, the lecture management system that runs on FTI-UAJM currently has limitations in monitoring and providing information on the implementation of the process itself in a transparent and measurable way. There are several parties involved in this process including the Chairman of the study program, Lecturers, students, guardians/parents and administration. The supervision of the academic process is more emphasized on the recapitulation of the minutes of lecture (BAP) and lecture attendance report which is done in writing, where the supervisory function is still constrained on the limited resources, so that, more supervisory responsibilities are delegated to the related Lecturers. This has an impact on the accountability and accuracy of the data, so as to limit the ability of the head of the study program in evaluating the implementation of the lecture process accurately and concurrently. Another obstacle that also occurs is the difficulty in monitoring the processing and transparency of the process of assessment of the course, so that, the accountability of the process also becomes very weak. Limitations in monitoring and evaluating the implementation of litigation process with accountable this is the main foundation of

engineering. Where based on the interface platform used software engineering approach can be grouped into three components namely J2EE platform for monitoring function, web-based platform for planning and evaluation function and the Android platform for information services.

The ability to collect data in a transparent, accurate, accountable and concurrent manner becomes the target of the resulting system engineering. The use case diagram of the management function component and the lecture information service component can be seen in Fig. 2-4.

The diagram presents the interaction between the process and the actor on the system designed such as the Chairman of the study program, Lecturers, admin, students and parents/guardians. To be able to access the system, the actor must first be authenticated and access the system according to its access level.

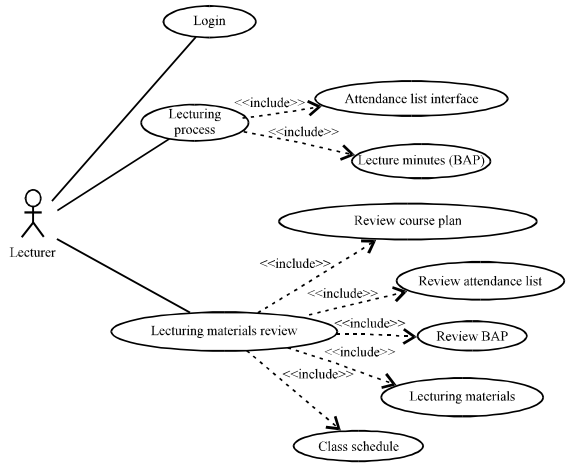


Fig. 2: Use case diagram monitoring system

System interface: The result of system engineering is divided into three interfacial display platforms, namely the display of supervisory system for devices used by Lecturers during lecturing, planning and evaluation system display which can be accessed by the head of study program and display of information service for Lecturer, student and parent/guardian which can be accessed through mobile devices whereas the display for the Prodi chair is developed web-based and the display of information services on mobile devices for Lecturers, students and parents/guardians is made using Android studio. Some key features of the management system and lecture information service services are listed (Fig. 5-13).

The monitoring system interface in lecture device Java-based (J2EE)

Menu on lectures device: The menu interface of the system provide access to lecturing management module on the lecture tablet used in the classroom process.

Course outline and grades interface: Interface of course outline and grades input by Lecturer. The Lecturer is responsible for inputting the course ouline and the grades based on the study material and the learning method being implemented each semester.

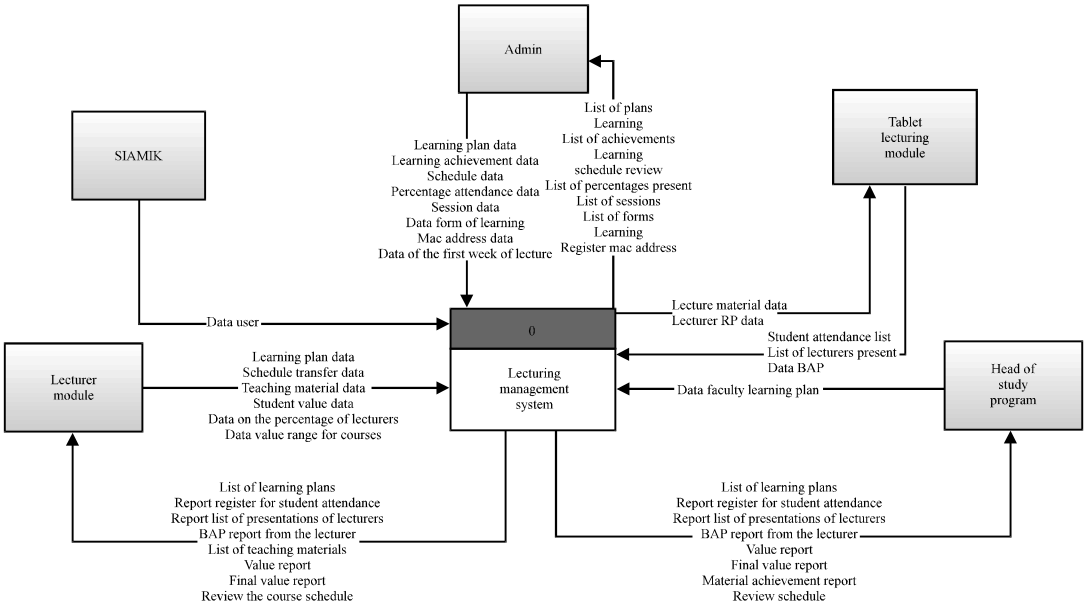


Fig. 3: Context diagram planning and evaluation system

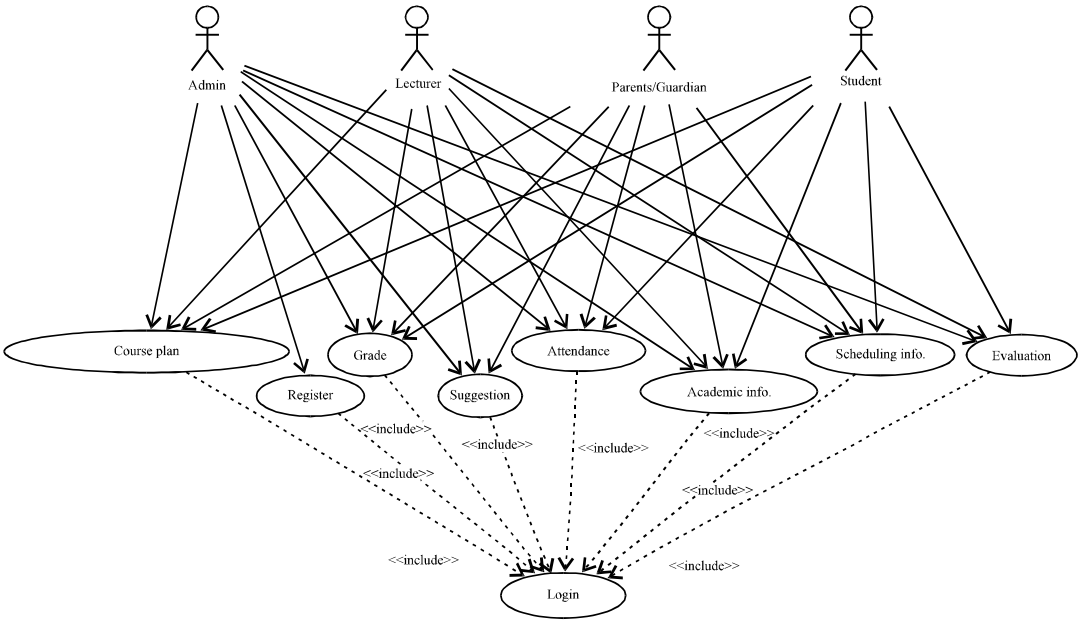


Fig. 4: Use case diagram information service on lecturing process

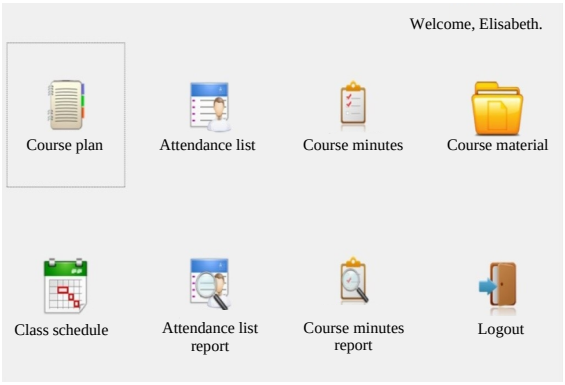


Fig. 5: Menu on lectures device

Attendance and recording interface: Attendance interface used by Lecturers to input student presences and at the same time the system will recording lecture process on the recording window.

Web-based interface for lecturing planning and evaluation

Home display: The homepage display provides three menu options based on each user's access level, ie menu for admin, menus for Lecturers modules and menus for heads of study program module, course schedule, academic information and Lecturer's profile management

Display admin menu for study program course outline: Interfaces on the menus are available in the admin page that is the input of study program course outline, schedule, the first week of classes, sessions, classes, method of learning and number of meetings. This will be display on the Lecturers tablet module and integrated with the course minutes on the module.

Lecturer's menu display: Interfaces on the menu are available in the Lecturer's page that input the Lecturer's course plan (RP), review the attendance list, review the lecture's course minutes (BAP) and to view the schedule, course material, filling the grade and also report consisting of attendance report students, Lecturers and BAP.

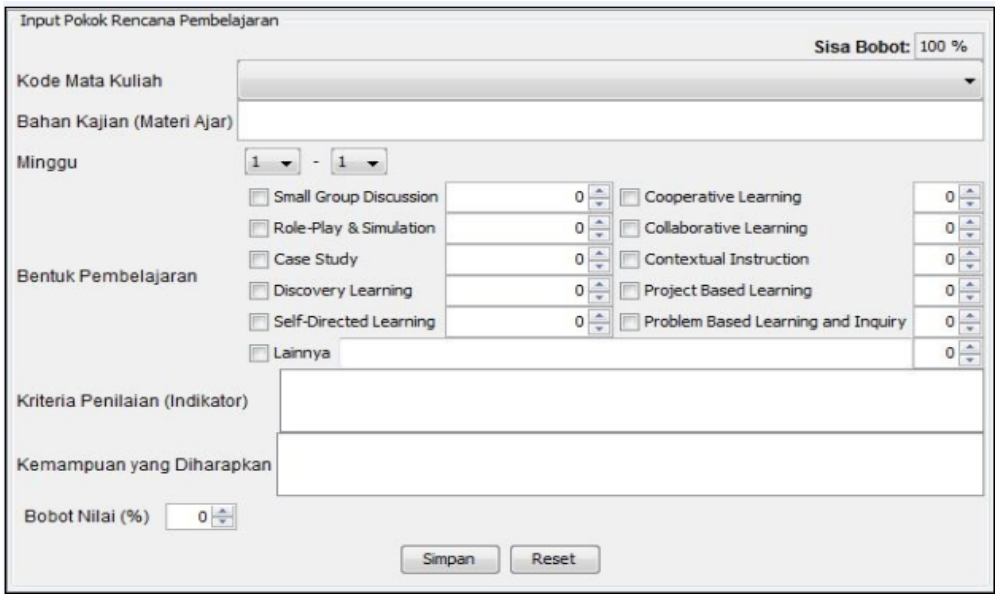
Head of study program menu display: Interfaces on the menus are available in the page for the head of study program, input modul for course plan, review the attendance list, the schedule, the lecture material, the score and also the report consisting of student attendance report, Lecturer, material progress, Lecturers's course plan as well as a list of course Lecturers.

Interface for Android-based information services

Login and mobile devices menu display: The login interface and main menu of mobile devices that give the user access to the information services on the ongoing process to the corresponding course.

Attendance and student progress report: The student attendance information service interface on

(a)



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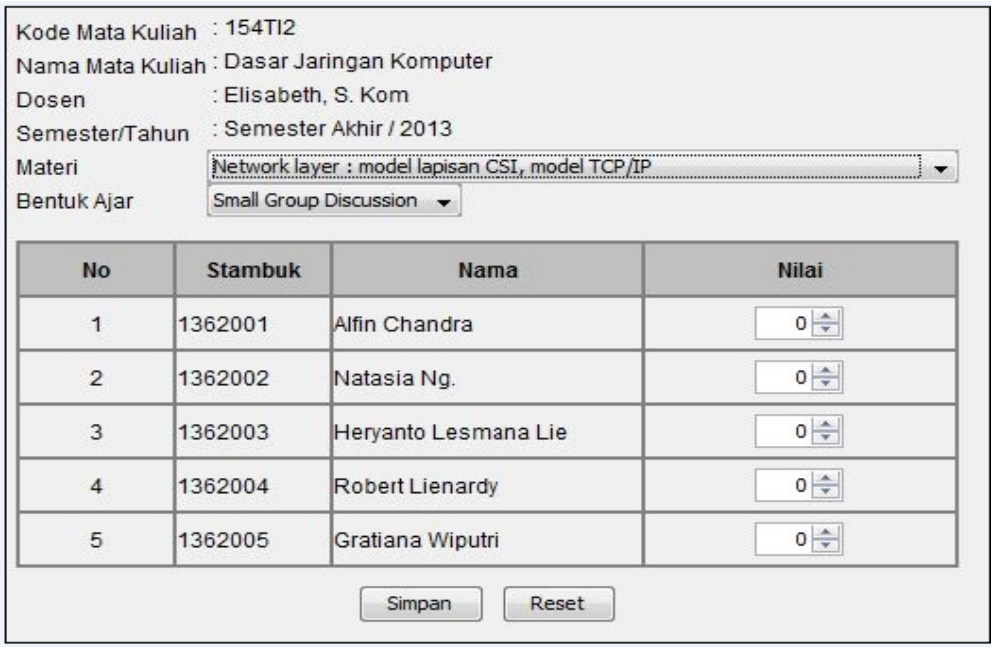


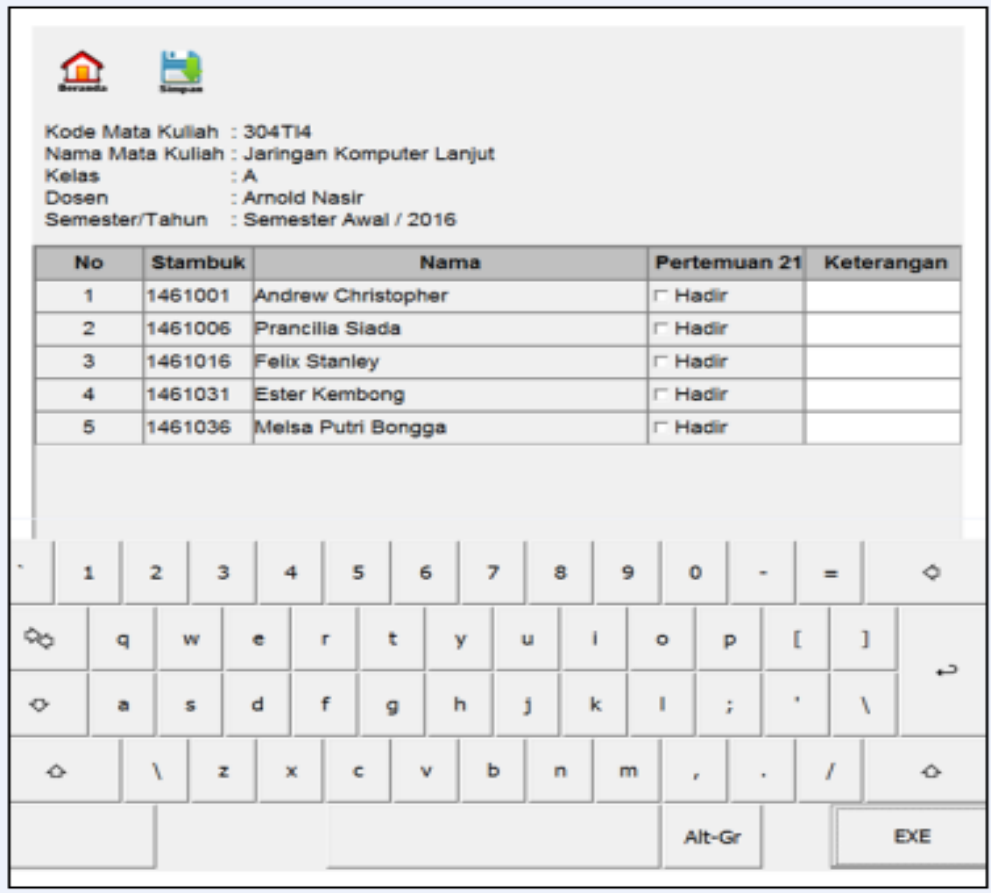
Fig. 6: Course outline and grades interface

the current semester and the student achievement progress information on each subject matter are listed.

Testing and simulation: System testing is done through simulation test of system engineering result. The system test was conducted by a small-scale implementation involving students, Lecturers, parents and head of the study program. From the analysis of the results of system tests done found that: data collection of the ongoing lecturing proses can be done easily by Lecturer throung the classroom device.

The process of uploading course material can meet the needs of lecture material data collection. This is because the course material will be stored on the server and can be accessed during lecturing and structured based on the Lecturer's learning plan. The information provided on the mobile device is appropriate to meet the

(a)



(b)

Fig. 7: Attendance and recording interface

needs of users and the information provided is useful to support the transparency and accountability of the current lecture information.

For parents this system has allowed them to be actively involved in supervising the lecturing process undertaken by students at the universitys such as values, attendance, schedules and other information that support the accountability of the akasemik process. The reports produced are in conformity with the format and standard that have been

Fig. 8: Home display

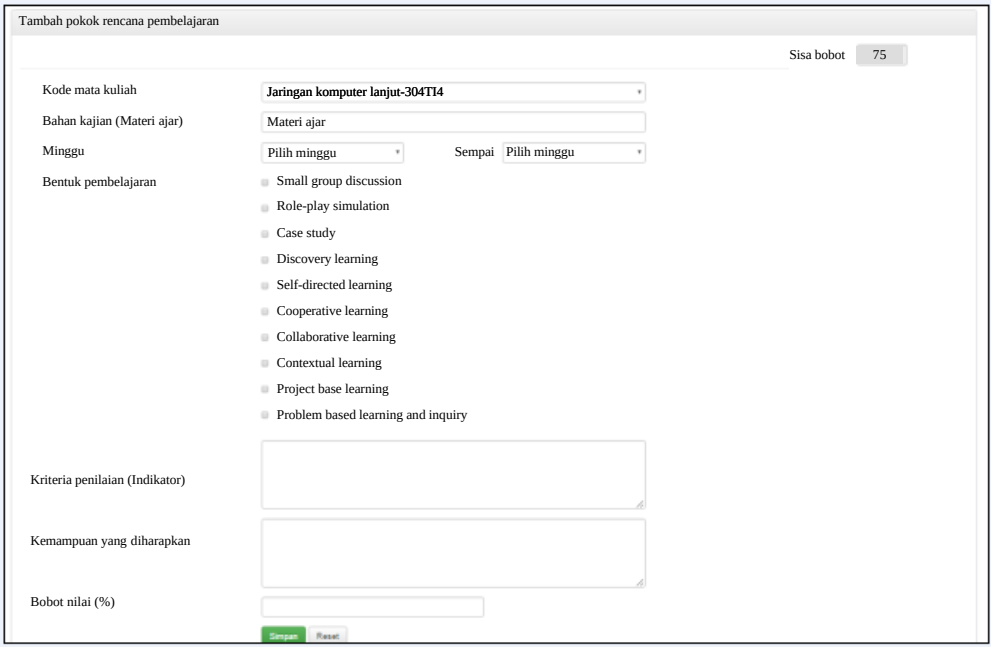


Fig. 9: Course outline input for study program

Fig. 10: Lecturer's course material input

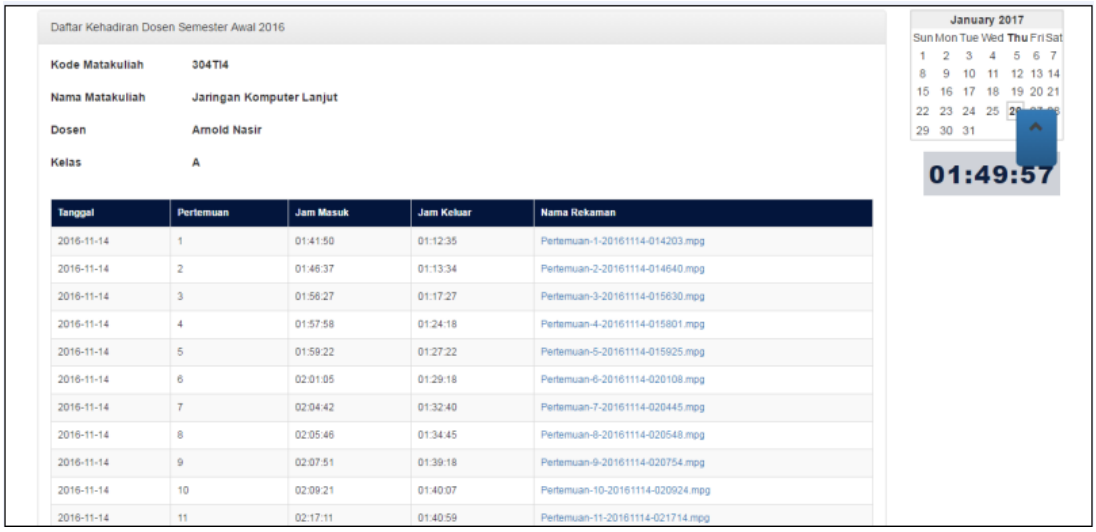


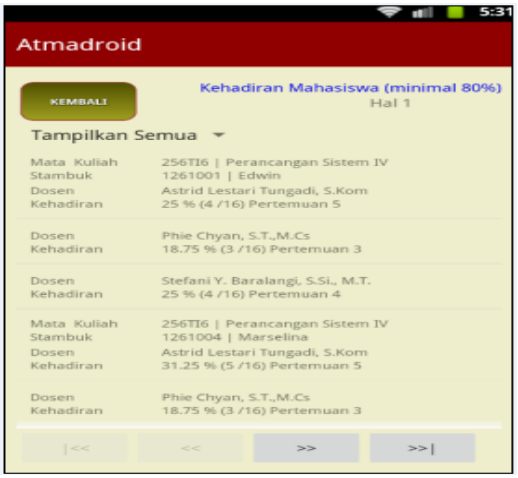
Fig. 11: Attendance report

(a)

(b)

Fig. 12: Login and mobile devices menu display

(a)



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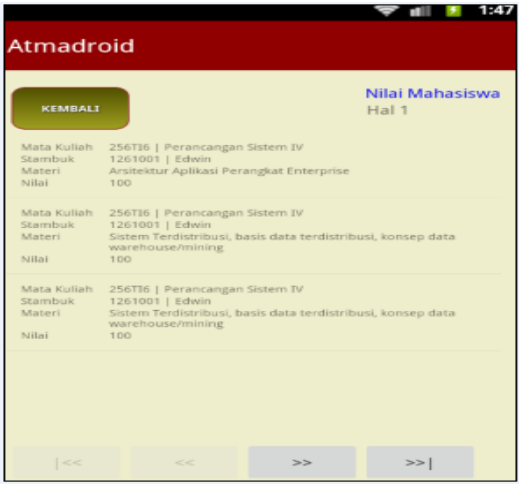

Fig. 13. Attendance and student progress report

set on the standard and procedures that have been set on SPMI UAJM in terms of supervision and evaluation of lectures.

Apart from that based on the results of the simulation tests the student and parent/guardian showed that the need for a degree of detail of the information and the transparency of the lecture will be the assessment of the resulting system has been fulfilled. Compared with other models of digital learning systems this system not only assists in the management of lecturing processes digitally but also has the capacity to perform the control and monitoring functions of the lecture process inclusively by involving stakeholders as part of the process.

This research will begin with an analytical approach to the management system and academic data information services on a university, in this case, at UAJM, by taking into account ACIS structures that are running and will be focused on supervision and transparency of the lectures process with targeted outcomes is a system with infrastructure technology design and information services lectures process that can produce concurrent supervised data that can be used as the basis for the development of data management system with the following design stages:

CONCLUSION

Through the research that has been done, it can be concluded that the engineering of the learning management and information service system can meet the need for capacity building of quality supervision and transparency function in the implementation of lecturing process, the planning, monitoring and evaluation support transparency to the assessment process and the reports is designed to meet accountability standards and is in line with the principles of the internal quality assurance system in the academic process by integrating the value of transparency, accountability and responsiveness to the quality of academic services by involving parties who have an interest in the lecturing process. This research is likely to be developed further in to the development of big data for higher education through the collected data.

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