Android-Based Lecturer Workload Simulation Application

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Abstract. In carrying out their duties, lecturers must conduct Tri dharma education activities which include teaching, research and service according to their respective fields of science. Every tri dharma activity carried out must be reported once every semester in the form of a lecturer workload report. The number of activities contained in the rubric makes many lecturers experience confusion to calculate how the credit performance in the Tridharma activities carried out. Therefore, it is necessary to have a simulation application that helps the calculation of credit performance of Tridharma activities in accordance with the BKD rubric. The lecturer workload simulation application can help lecturers to calculate credits for the Tridharma activities that have been carried out. The lecturer workload simulation application can also provide information on what physical evidence needs to be prepared by the lecturer.

1. Introduction
Lecturers are professional educators and scientists with the main task of transforming developing and disseminating technological knowledge and arts through education, research and community service [1]. In carrying out their duties, lecturers must conduct Tri dharma education activities which include teaching, research and service according to their respective fields of science. Every tri dharma activity carried out must be reported once every semester in the form of a lecturer workload report. The process of assessing the workload of lecturers is focused on the implementation of the main tasks of lecturers and tridharma support activities, as well as the special tasks of the professor which are carried out every semester. Lecturer workloads are made in two forms, namely the Lecturer Workload Contract and the Lecturer Workload Report. For the determination of credits in making contracts and reports must be in accordance with the BKD rubric. In the BKD rubric contains details of educational performance tridharma activities, research performance tridharma, service performance tridharma, other supporting fields performance tridharma, and professors' special obligation performance tridharma. The number of activities contained in the rubric makes many lecturers experience confusion to calculate how the credit performance in the Tridharma activities carried out. Therefore, it is necessary to have a simulation application that helps the calculation of credit performance of Tridharma activities in accordance with the BKD rubric. Android-based simulation application, is expected to help lecturers in performing simulation calculation of Tridharma's performance credits, because the simulation application that can be installed on an Android smartphone can be accessed anytime and anywhere easily and quickly.
2. Literature Review

2.1. Theory / Concept
The lecturer workload covers the main activities of planning learning, carrying out the learning process, evaluating learning, guiding and training, doing research, doing additional tasks, and doing community service. Workloads as referred to in paragraph (1) shall be at least commensurate with 12 (twelve) semester credit units and a maximum of 16 (sixteen) semester credit units [2].

Android is an operating system for cellular phones based on Linux. Android provides an open platform for developers to develop their own applications that can be used by a variety of mobile devices. Android is commonly used on Smartphones and also on tablet PCs. It functions the same as the Symbian operating system on Nokia, iOS on Apple and BlackBerry OS [3].

2.2. Previous Research
Design and Development of Information Systems for Workload Assessment Lecturers explain that the lecturer workload information system can help a lecturer in his implementation as a professional educator by continuing to carry out evaluations of the activities he has carried out. lecturer workload assessment system is designed so that it can be used for lecturer tridharma data management, evaluation and assessment and reporting of lecturer performance. Processes that are managed in this system include the process of filling out data (education and teaching activities, research, service and supporting activities), assessment of BKD content by the assessor team and recapitulation of filling BKD [4].

For a tertiary institution, the implementation of the main duties of a lecturer certainly requires an oversight and evaluation as a form of feedback on activities that have been carried out so as to provide an assessment and allow for a periodic improvement as a form of accountability regarding the profession of the lecturer and for employee reporting to the leadership of the college. Performance can be a measure of how big the achievement of the work carried out to someone who is influenced by several factors between the level of motivation, ability and self-concept [5].

Workload information system is expected to assist in the archiving and management of lecturer workload documents so that the management of tridharma activities becomes more efficient and effective [6].

3. Research Methodology

3.1. System Development Method
In this study using the system development method System Development Life Cycle (SDLC) Waterfall model. This system development method uses the concept of sequential linear, systematic sequence at each stage [7]. Stages in the Waterfall method include

a) Communication
   This activity is needed to determine the problems and needs and desires that will be achieved in the development of a system, including the collection of data needed.

b) Planning
   At this stage the planned activities will be carried out, scheduling activities in the development of the system including the risks that may exist and the identification of resources needed.

c) Modeling
   This stage designs the system architecture to find out the description of a system that will be done. This design includes software architecture, algorithms, data structures to the interface design.

d) Construction
   At this stage the design is implemented into the programming language (coding) and testing is carried out to find out or find errors in the process of developing this system.

e) Deployment
   At this stage the implementation of software is implemented to the user, it is possible that there are still improvements based on feedback or evaluation to ensure a system runs according to planning and needs.
3.2. System Design Method
The method in designing this system uses the Object Oriented Analysis (OOA) model which is an approach to determine the functionality of a software that allows collaboration between objects [8].

4. Results
4.1. Use Case System
Use case system application simulation workload lecturers explain the functionality of a system that illustrates how the simulation process can be carried out by user actors. In Figure 1 illustrates the use case system of lecturer workload assessment applications.

![Figure 1. Use Case System of Lecturer Workload Simulation Application](image)

4.2. Class
A class is a classifier which describes a set of objects that share the same features, constraints, semantics (meaning). There are 15 classes in the lecturer workload application, in Figure 2 illustrates the classes of lecturer workload assessment applications

- a. Class menuA
  - It is the class menu of the application.
- b. Class homeA
  - It is the main class in the form of a login view.
- c. Class rubrikA
  - It is a class that displays the BKD rubric.
- d. Class contactA
  - It is a class that contains contact information.
- e. Class pilihansimulasiA
  - It is a class that displays BKD simulation options.
- f. Class bidangpendidikanA
  - It is a class that contains 16 fields of education.
- g. Class bidangpenelitianA
  - It is a class that contains 17 fields of research.
- h. Class bidangpengabdianA
  - It is a class that contains 4 fields of service.
- i. Class bidangpenunjangA
It is a class that contains 7 supporting fields.

j. Class bidangprofesorA
   It is a class that contains 10 fields of professors.

k. Class pendidikan1A
   It is a class that contains calculations in the field of education credits.

l. Class penelitian1A
   It is a class that contains calculations in the field of research credits

m. Class pengabdian1A
   It is a class that contains the calculation of credits in the field of service.

n. Class penunjang1A
   It is a class that contains calculations in supporting fields.

o. Class profesor1A
   It is a class that contains the calculation of the professor's field credits.

Figure 2. Classes of Lecturer Workload Simulation Application

4.3. Interface Design
The main menu displays the simulation options BKD, rubric BKD, and Contact Us, the main menu can be seen in Figure 3. The BKD rubric displays the credit assessment guide, the BKD rubric can be seen in Figure 4. Examples of calculations in the first field of research are the involvement of researchers in 1 title research, the calculation of the research field can be seen in Figure 5. An example of the calculation results of the SKS education field "PEKERI", the results of the calculation of the credits can be seen in Figure 6.
5. Conclusion
From the results of the research and discussion that has been carried out it can be concluded as follows:

a) The lecturer workload simulation application can help lecturers to calculate credits for the Tridharma activities that have been carried out.

b) The lecturer workload simulation application can also provide information on what physical evidence needs to be prepared by the lecturer.

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