



Development of GKM Workspace Application

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Abstract

At the department level, the Quality Control Group (GKM) is an extension of the Quality Assurance Institution. Implementing the Internal Quality Assurance System (SPMI) within the department is GKM's primary responsibility. With reference to the National Higher Education Standards (SN Dikti) and international quality assurance (IQA), the SPMI policy seeks to be a commitment of higher education institutions to sustainably maintain and improve the quality of higher education providers in order to fulfill the vision and mission and satisfy stakeholders through the application of the Tridharma of higher education. In the PPEPP cycle (Determination, Implementation, Evaluation, Control, Improvement), GKM is crucial to maintaining quality standards. GKM keeps an eye on and assesses every application of quality standards. However, the GKM Team has not been able to perform its duties as effectively as they could in its implementation. The restricted amount of time and teams available is one of the causes. This study is to support the GKM's responsibilities, particularly with regard to monitoring and assessment. In order for GKM to perform its tasks more readily, effectively, and efficiently while saving time. The "Development of GKM Workspace Application" research will be used at Andalas University's Faculty of Information Technology's Information Systems study program.

Keywords: *Webbased, Database, Workspace.*

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1. Introduction

In the PPEPP cycle (Determination, Implementation, Evaluation, Control, Improvement), GKM is crucial to maintaining quality standards. GKM keeps an eye on and assesses each quality standard implementation. Through the creation of a quality assurance system and the implementation of monitoring and assessment of study program performance, GKM is entrusted with progressively and sustainably raising academic quality in order to ensure that it meets the set criteria. Aligning the intended quality standard with the actual implementation of that standard in the field is essentially GKM's primary duty. Of course, GKM's responsibilities and role are very strategic, as the Faculty's Strategic Plan (Renstra) and related programs will be developed by analyzing the Faculty's past operations. In addition to other supporting variables, the study conducted by GKM must be considered in the Faculty's strategic strategy. GKM's position in the process must therefore be strengthened in order for it to fulfill its objectives as best it can. The purpose of this study is to support GKM's activities, particularly with regard to monitoring and assessment. The "Development of GKM Workspace Application" study will be implemented in the Faculty of Information Technology's Information Systems study program at Andalas University in order to facilitate GKM's ability to perform its obligations.

Software and Modeling Tools Used

a. Laravel Framework

One of the PHP programming frameworks, the Laravel framework, has a set of program components that are grouped together so that they can be utilized to assist in the creation of whole applications without requiring the creation of all the code from the beginning. Consequently, developers and programmers may design websites more quickly and easily [5].

b. My Structure Query Language (MySQL)

One of the most widely used kinds of database servers is MySQL. MySQL's use of SQL as the primary language for database access is what makes it so popular. The GNU General Public License (GPL) makes MySQL free. RDBMSs (Relational Database Management Systems) include MySQL. For this reason, MySQL uses the phrases table, row, and column. One or more tables can be found in a MySQL database [15].

c. Business Process Model Notation (BPMN)

The BPMN standard is used to model web services and business processes. BPMN was created with web services in mind and is intended to be simple to use and comprehend. It may also be used to describe

intricate business processes. All business users may easily understand the BPMN notation. BPMN typically presents the process from the viewpoint of a business analyst, who is more focused on communicating the requirements to software developers and IT analysts. Based on flowchart methodologies for business process model creation, BPMN offers BPD (Business Process Diagram) [16].

d. Use Case Diagram

A use case diagram illustrates how actors and the system interact. A use case diagram can explain how one or more actors interact with the system that will be developed. In addition to showing an actor's interaction with the system, a use case diagram can be used to determine the functionalities of a system [19].

The three parts of a use case diagram are as follows:

1. System, defines the parameters of the system with respect to the actors using it (outside the system) and the needs for its features (within the system).
2. Actor, anything outside the system that will use the system to accomplish a task is an actor. It could be a person, system, or gadget that contributes to the system's ability to function successfully.
3. Use Case, the use case itself is a system's functional description. As a result, both consumers and system users will comprehend the purpose of the system under development.

2. Research Methods

The Software Development Life Cycle (SDLC) approach is used in this study. The Software Development Life Cycle (SDLC) comprises software development tools, processes, and steps. Needs analysis, design, implementation, testing, and software maintenance are the five processes that make up the SDLC [9]. The goal of implementing this SDLC is to create high-quality software within the budgeted time and cost constraints. A software development process model is used to implement SDLC. The waterfall model is one of various varieties of software development process models. According to [9], every step of the waterfall model is completed in phases. Figure 1 illustrates the waterfall development process concept.

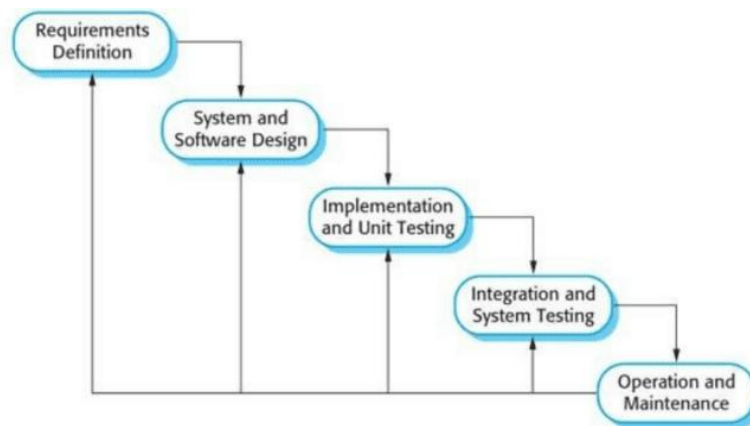


Figure 1. Waterfall software development process model

The steps involved in creating the application are described in the flowchart in this study. The study's flowchart is divided into multiple phases, beginning with a review of the literature on issue formulation, followed by data collection through interviews, observation, and the gathering of relevant documents to support the research. Next, move on to the application development phase, which starts with the requirements analysis phase and the business process model based on the previously gathered data. The next step was idea determination, during which the developer created an application for tracking and assessment. The next step is design, when an application is created based on user requirements. The application testing phase was then carried out to see if it complied with user preferences and to check for problems in the program's functionality. The application is saved on storage media during the final stage, known as implementation. If it is completed, the report's last phase of findings and recommendations must be added. Figure 2 displays the research flowchart.

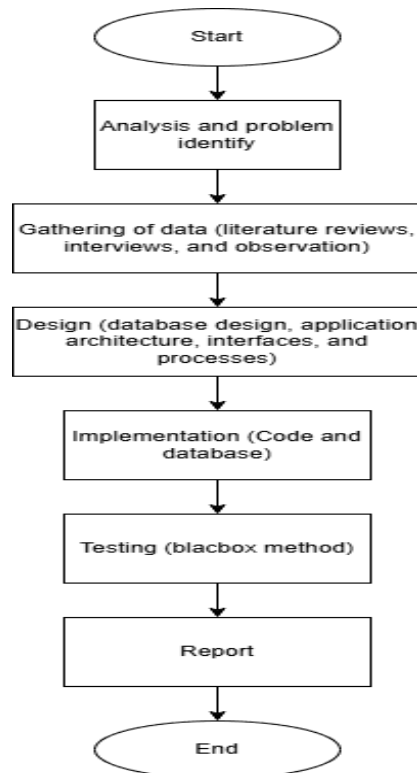


Figure 2. Flowchart Research

3. Results and Discussion

3.1. System in Running

a. Completeness of Lecture Document Collection Model

Complete lecture papers are gathered through a manual submission process by the course lecturer to the verifying lecturer as part of the lecture monitoring and evaluation process. The findings of the monitoring and assessment are then handed to the Head of GKM for the report on the outcomes of the monitoring and evaluation to be presented to the Head of the Department once the Verifier Lecturer has confirmed the gathered lecture documents. Figure 3 shows the current process model for gathering complete lecture documents.

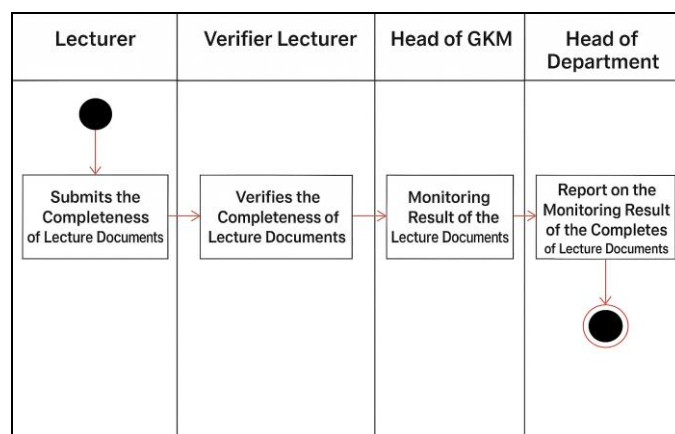


Figure 3. Continuous Procedure Model for Gathering Finished Lecture Documents

b. Validation Process Model for Exam Questions

The Verifier Lecturer receives the test questions directly from the Subject Lecturer as part of the test Question Validation Process. Following the Verifier Lecturer's validation of the collected exam questions, the Head of GKM receives the monitoring and evaluation findings for the subsequent monitoring and

evaluation report that will be sent to the Head of Department. Figure 4 shows the paradigm of the exam question validation procedure that is currently in use.

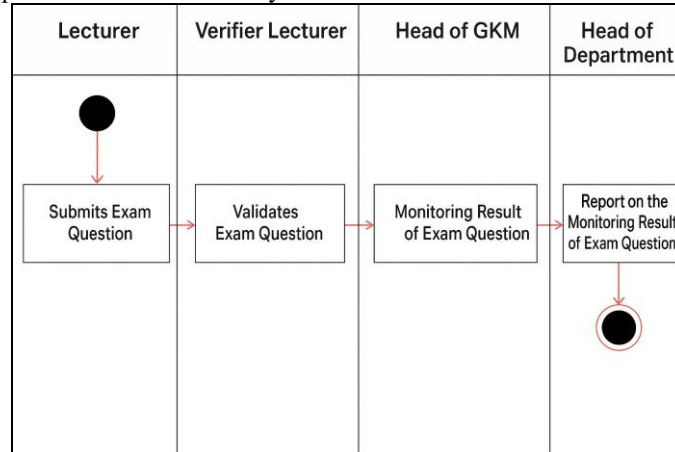


Figure 4. Model of the Validation Process for Current Exam Questions

3.2. Planned System

Based on observations and interviews that GKM and instructors conducted at the Faculty of Information Technology. To improve the effectiveness and efficiency of the Lecture Monitoring and Evaluation process, the researcher will create an interactive application. Through a web-based application, instructors can upload their whole lecture materials and exam questions. GKM then confirms that the materials are full and approves the exam questions that the instructors have provided. Figure 5 below illustrates the Process Flow for Confirming the Completeness of Lecture Documents and Validating Exam Questions that will be suggested using Business Process Modeling Notation (BPMN):

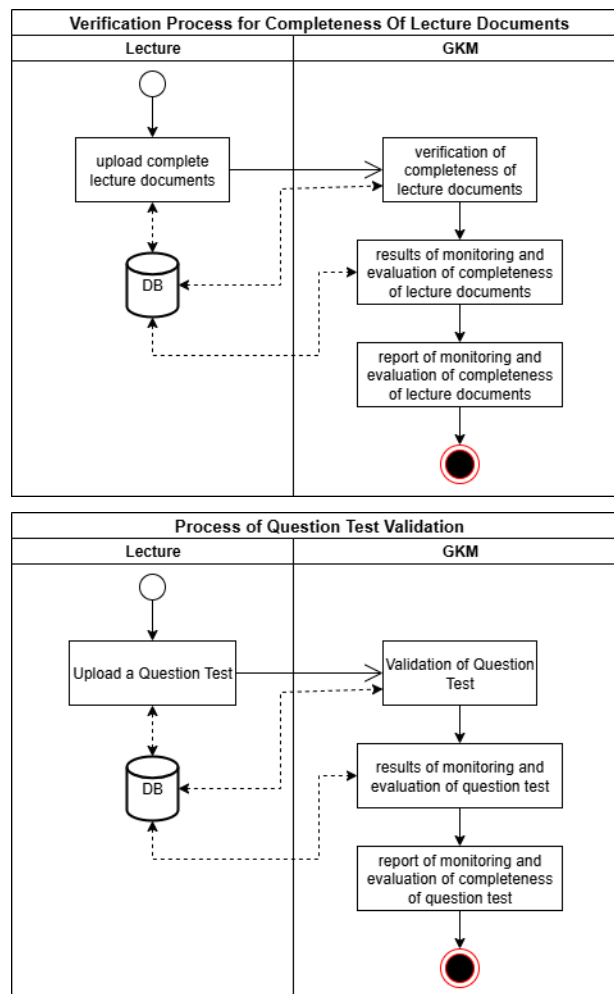


Figure 5. Process Model for Verifying Completeness of Lecture Documents and Validating Proposed Exam Questions

3.3. Application Functional Requirements

Functional requirements are generated by the proposed business model and the data collection procedure. The following functional needs are developed in light of the examination of the suggested Lecture Monitoring and Evaluation flow:

1. Users can be created and managed by GKM
2. GKM is able to design and oversee courses.
3. Full lecture papers can be uploaded by lecturers.
4. Exam questions can be uploaded by lecturers.
5. Lecture documents can be seen and their completeness checked by GKM.
6. GKM has access to the outcomes of the monitoring and assessment of all lecture materials.
7. GKM has access to reports on the outcomes of the monitoring and assessment of all lecture materials.
8. Exam questions can be viewed and verified by GKM.
9. Exam question monitoring and evaluation findings are visible to GKM.
10. Reports on the monitoring and assessment of exam questions are available for GKM to view.

3.3. Use Case Diagram Application

Use case diagram shows how the system's actors and functional components relate to one another. Figure 6 shows the use case diagram for the Faculty of Information Technology's Lecture Monitoring and Evaluation application.

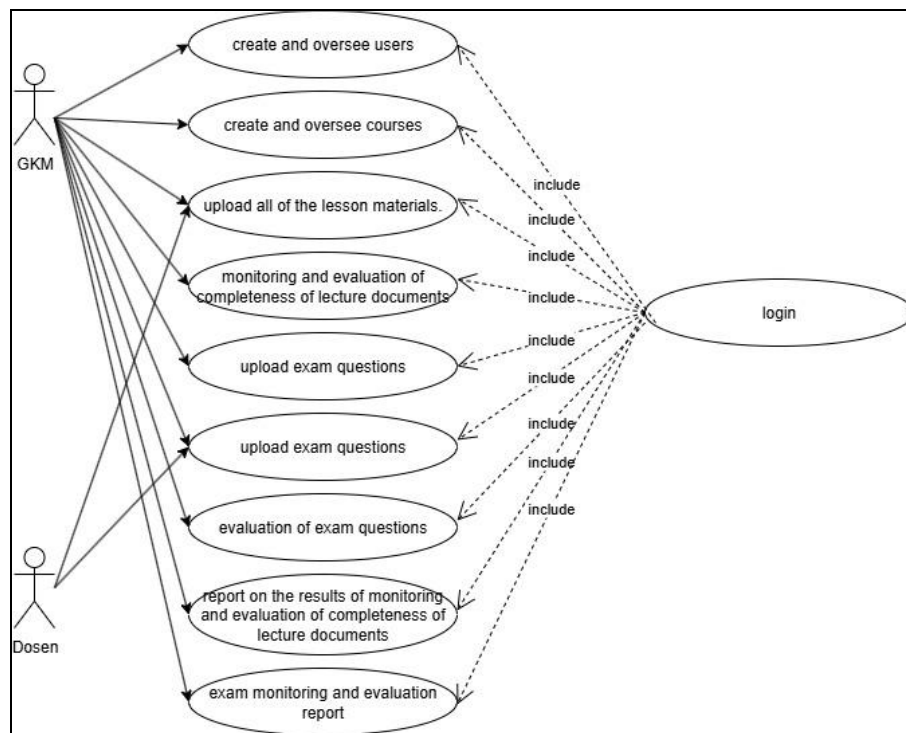


Figure 6. Lecture Monitoring and Evaluation Use case

GKM and the lecturer are the two actors shown in the use case diagram above. To access the application, each actor must first log in. This application has eight functions with relationships based on each actor's function. Create and manage users, create and manage courses, upload complete lecture documents, monitor and evaluate complete lecture documents, report the results of monitoring and evaluating complete lecture documents, upload exam questions, monitor and evaluate exam questions, and report the results of monitoring and evaluating exam questions are the eight functions of the GKM actor. Uploading entire lecture materials and exam questions are the two roles of the lecturer actor.

3.4. Actor Task Description

Three players are involved in this interactive learning application: the administrator, the lecturer, and the student, as shown in the preceding use case graphic. Every actor has a distinct role; Table 1 lists each actor's role description.

Table 1. Actor Task Description

No	Actor	Task Description
1	GKM	• Manage user data: GKM has the ability to add, edit, and remove user data. • GKM has the ability to add, edit, and remove course data. • Oversee the completeness of the course materials; GKM confirms that they are complete. • Oversee the outcomes of the monitoring and assessment of the course documents' completeness. • Examine and print the findings of the course documents' monitoring and completeness assessment. • Exam questions are managed and validated by GKM. • Oversee the tracking of exam questions and evaluation outcomes. • Exam question monitoring and evaluation results can be viewed or printed.
2	Lecture	• Ensure that lesson materials are complete. Complete lecture materials are uploaded by lecturers. • Control the exam questions. Exam questions are uploaded by lecturers. • See the outcomes of the monitoring and assessment of the full lecture materials. • See the outcomes of the exam question monitoring and assessment.

3.5. Application Architecture

The Monev system's business model and application design In order to communicate with the database server, PHP has a universal interface called PDO (PHP Data Objects) programming, which is used in this course. Because PDO is not connected to or associated with any specific database type, it is known as a universal interface.

3.6. User Interface Design

Users and the system can communicate with each other through the interface. Users can receive and receive information from the user interface to help guide the problem-solving process until a solution is found. The login page, the completeness of the lecture document upload form, the completeness of the lecture document verification form, the completeness of the lecture document monitoring and evaluation report, the exam question upload form, the exam question verification form, and the exam question monitoring and evaluation report are among the user interfaces that are currently being explained on the developed interactive learning system application.

FORM UPLOAD QUESTION TEST

Department	X(50)
Subject's Code/Name	X(50) / X(50)
Lecture	X(50), X(50), n
Credit	9
Semester	9
Academic Year	9999/9999
Question Test	upload

SAVE

Figure 8. Exam Question Upload Form Design

COURSE DOCUMENT VERIFICATION FORM	
Department	X(50)
Subject's Code/Name	X(50) / X(50)
Lecture	X(50), X(50), n
Credit	9
Academic Year	9
Semester Course Plan	9999/9999
Minutes of Lecture	upload
Student assignment plans and assessment rubric	upload
Study contract	upload
Save	

Figure 7. Form Design of Upload Complete Lecture Documents

Departmen	X (50)		
Code/course name	X (50) / X(50)		
Supporting lecturer	X (50) / X(50) . n		
Credit	9		
Semester	9		
Academic Year	9999/9999		
Exam questions	Check	Detail	Text
Question Writing Format			
Course name	Choose ☒	Detail	Text
SMS/Semester	Choose ☒	Detail	Text
Study program	Choose ☒	Detail	Text
Exam time	Choose ☒	Detail	Text
Name of the lecturer	Choose ☒	Detail	Text
Question papers use university/faculty/department letterhead	Choose ☒	Detail	Text
Exam form (open/closed)	Choose ☒	Detail	Text
How to work on questions (can be numbered or not)	Choose ☒	Detail	Text
Penalties	Choose ☒	Detail	Text
Use of mobile phones and other devices during the exam (permitted or not)	Choose ☒	Detail	Text
In the closing, there is a moral appeal, such as encouraging people to be honest, etc.	Choose ☒	Detail	Text
Question material			
Suitability of the question material with the RPS	Choose ☒	Detail	Text
Question sequence number based on difficulty level	Choose ☒	Detail	Text
The exam questions cover the competencies/learning outcomes listed in the RPS	Choose ☒	Detail	Text
The test material is in accordance with the exam period (UTS/UAS)	Choose ☒	Detail	Text
Each question includes a value weight	Choose ☒	Detail	Text
The weight of the score is according to the level of difficulty of the question	Choose ☒	Detail	Text
Compliance of questions with CPMK	Choose ☒	Detail	Text
Have a Grading Checklist	Choose ☒	Detail	Text
Validation results notes and improvement suggestions	Text		
Save			

Figure 8. Exam Question Verification Form Design

Verification Form for Completeness of Lecture Documents			
Department	X(50)		
Subject's Code/Name	X(50) / X(50)		
Lecture	X(50), X(50), n		
Credit	9		
Semester	9		
Academic Year	9		
Semester Course Plan	☐	Detail	
Minutes of Lecture	☐	Detail	
Student assignment plans and assessment rubric	☐	Detail	
Study contract	☐	Detail	
Course learning outcomes include aspects of attitude, knowledge and skills	☐	Detail	
final abilities planned at each stage of learning to meet graduation learning outcomes	☐	Detail	
formulation of objectives/indicators to support learning outcomes	☐	Detail	
study materials related to the abilities to be achieved	☐	Detail	
suitability of the selection of learning strategies with indicators	☐	Detail	
suitability of learning resources/media with indicators	☐	Detail	
suitability of time planning with learning materials	☐	Detail	
suitability of learning experiences with indicators	☐	Detail	
assessment items according to indicators	☐	Detail	
recency of references	☐	Detail	
assessment results and recommendations for corrective action			
Save			

Figure 9. Draft Form for Verification of Completeness of Lecture Documents Question Test Validation Form

3.7. User Interface Implementation

The application display in the creation of interactive learning apps for the Introduction to Technopreneur course is explained in this part. Both administrators and students can use this program. The user login page is the first page that appears when you access this application. The main page will appear if the user logs in successfully. The application display of the system constructed in accordance with the system implementation is explained in the following.

a. Admin Main Page

Once the admin user logs in, they can visit the admin user page. The admin user is in charge of managing user data, lecturer data, course data, academic year, and the monitoring and assessment of the completeness of lecture documents, exam questions, and reports on the findings of lecture document monitoring and evaluation. Figure 11 displays the admin user page's appearance.

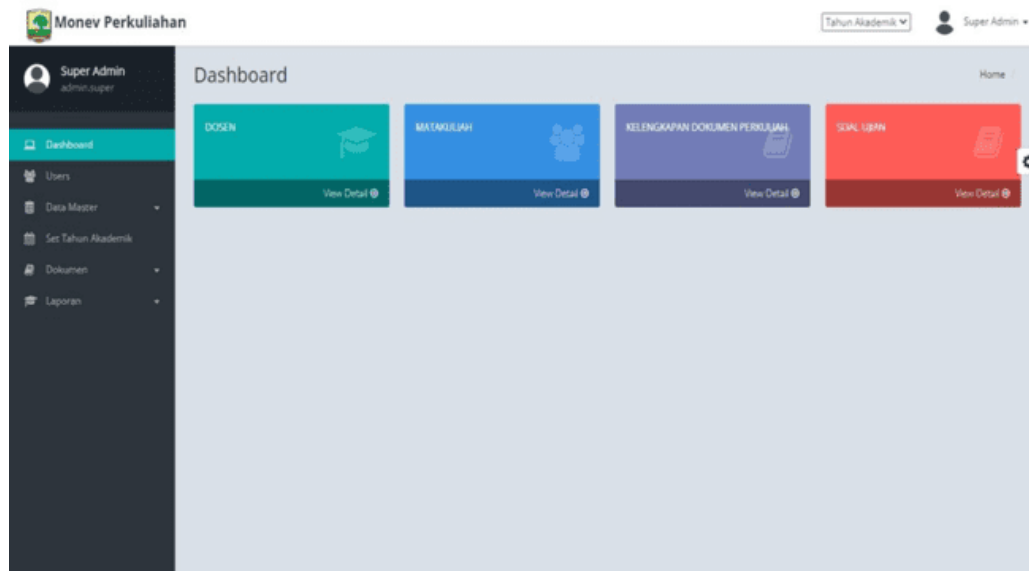


Figure 10. Display the Admin Main Page

b. Lectures Main Page

The lecturer's home page will show up after they log in. Figure 12 displays the lecturer's home page.

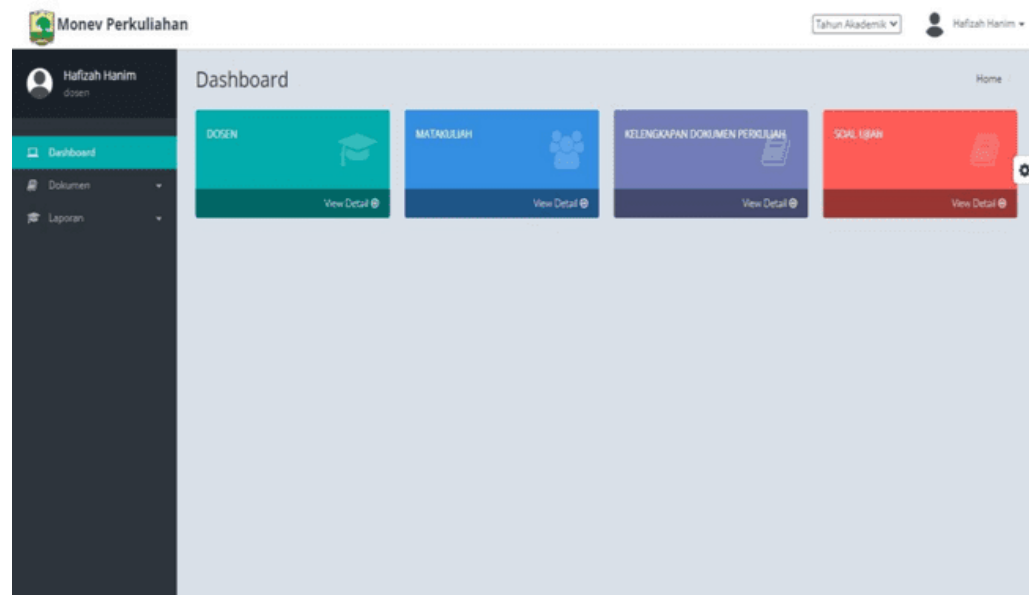


Figure 11. Display the Lecture Main Page

4. Conclusion

The Information Systems Department's GKM workspace application has been successfully developed. As cited by the Information Systems Department, the business procedure adheres to the SOP for tracking and assessing lectures at the Faculty of Information Technology, Unand. The application can go through each step of the SOP until a report on the monitoring and evaluation outcomes is received. The instructors at the GKM Department of Information Systems responded well to this application when it was implemented.

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