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Analysis and Modeling of the Internal Quality Audit Information System Islamic University of Kuantan Singingi

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ABSTRACT

Internal Quality Audit (AMI) is an integral part of the Internal Quality Assurance System (SPMI) for Higher Education (Dikti), aimed at evaluating the implementation of Dikti standards. AMI plays a crucial role in examining the compliance with Dikti standards during their implementation phase. The AMI system encompasses numerous processes, including desk evaluation, visitations, requests for corrective actions, and documentation. Moreover, AMI activities ideally should be conducted annually for every Unit at Islamic University of Kuantan Singingi. Due to the limited number of auditors, it is necessary to develop an information system that enables easier monitoring and decision-making processes. This will ensure efficient and sustainable management. The unstructured archiving of audit results increases the risk of data loss and complicates information access. To address this issue, it is necessary to develop an information system using the System Development Life Cycle (SDLC) approach, which involves four major phases: planning, analysis, design, and implementation. The AMI system developed aims to support the AMI process in higher education institutions, especially at Islamic University of Kuantan Singingi (UNIKS). Before the implementation of the information system, several challenges were faced, such as difficulties in quickly obtaining information related to quality improvements for each unit periodically. This research produced a design for an information system that integrates various AMI requirements, including scheduling, self-assessment (desk evaluation) by the institution, visitations, corrective actions, and reporting.

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1. Introduction

The rapid advancement of technology significantly enhances the ability of higher education institutions to improve security and ease of information storage [2]. Information is a crucial factor for any institution, be it government or private, in making decisions or policies. With valid information, the policy-making process becomes much more manageable [3]. Information systems offer management and organizational solutions, leveraging information technology, to address challenges in their environment.

Effectively implementing information systems requires a comprehensive understanding of the organization, management, and information technology that constitutes the system [4].

Quality assurance in higher education involves the consistent and sustainable process of planning, fulfilling, controlling, and developing higher education standards. This ensures that both internal and external stakeholders of the institution—including students, faculty, staff, the community, businesses, professional associations, and the government—can be satisfied with the institution's performance and outcomes. This quality assurance activity embodies accountability and transparency in the management of higher education institutions. According to Law Number 12 of 2012 on Higher Education, the Higher Education Quality Assurance System (SPMPT) consists of the Internal Quality Assurance System (SPMI) developed by the respective higher education institution, and the External Quality Assurance System (SPME) conducted through accreditation [5]. Internal quality assurance is carried out through five main steps, abbreviated as PPEPP: setting, implementation, evaluation, control, and improvement of Dikti standards. The Internal Quality Audit (AMI) is an activity within the Implementation Cycle of Dikti Standards. AMI activities involve examining the compliance with Dikti Standards during their implementation phase. The process of internal quality assurance starts with the preparation of the necessary instruments, the appointment of executing auditors and the determination of the implementation schedule, followed by the audit execution, and finally the analysis and reporting of audit results. This entire process takes considerable time from the preparation phase to the creation of the audit report [6],[7].

The Internal Quality Audit (AMI) is one of the audits conducted by higher education institutions as a form of self-evaluation. The purpose of the internal quality audit is to review the conformity and effectiveness of the implemented quality assurance system. The results of this audit will serve as the foundation for establishing the institution's quality strategies and objectives, which will be documented in the quality manual.[8]

The AMI information system is designed using the System Development Life Cycle (SDLC) approach, which consists of several phases: planning, analysis, design, and implementation. Research on information systems and quality audits has drawn the interest of many researchers. For instance, it has been explained that information systems should be implemented to integrate quality assurance systems, thereby enhancing success and producing accessible information. Additionally, information systems have been described as useful tools for controlling business processes, positively impacting internal control and offering solutions related to audit implementation. Generally, the AMI information system design can be utilized for all higher education AMI needs. However, this particular AMI information system is specifically designed to meet the requirements of Untan in implementing the evaluation cycle of Dikti standards.[9][10][11].

The implementation of the Internal Quality Audit (AMI) in higher education institutions should ideally follow the guidelines set forth by the national Internal Quality Assurance System (SPMI). However, the operational procedures and detailed execution of AMI must be regulated independently by each institution, including the Islamic University of Kuantan Singingi (UNIKS). At UNIKS, the AMI process has traditionally been conducted manually, involving physical document audits and direct field visits. While this approach has been functional, it presents several challenges in practice, particularly regarding efficiency, documentation management, and audit control. One of the most significant issues is the difficulty in quickly retrieving accurate and up-to-date information related to the quality improvement efforts of each unit. This delay can hinder timely decision-making and corrective actions. Additionally, although AMI activities are ideally scheduled to take place annually for every Faculty, Study Program, and Bureau, these activities often fall short of the target due to the limited number of trained and certified auditors available. As a result, the process lacks consistency and does not fully support the continuous improvement cycle that AMI is intended to foster. Addressing these challenges requires a shift toward more systematic and digital solutions to enhance the effectiveness and sustainability of the AMI process at UNIKS.

2. Research Method

The research methodology employed in this study follows a structured and systematic framework designed to guide the research process through a series of well-defined steps. This framework is composed of several interconnected stages that must be carefully followed and completed in a logical sequence, in accordance with the core issues or problems being investigated. Each stage of the methodology is purposefully designed to address specific research objectives and contribute to the overall aim of the study. By adhering to this structured approach, researchers can ensure that the study remains focused, coherent, and aligned with the research questions and goals. Furthermore, the use of such a framework allows for continuous monitoring and evaluation of progress throughout the research process. The achievement of each stage can be measured against predetermined indicators and criteria that reflect the intended outcomes. This makes it possible to assess whether each step has effectively contributed to the research objectives and to

identify any necessary adjustments. Overall, a structured research methodology enhances the reliability, validity, and credibility of the findings by providing a clear roadmap for conducting the study and ensuring that each aspect of the research is thoughtfully and thoroughly addressed[12]. The research flow can be illustrated in the figure 1 below :

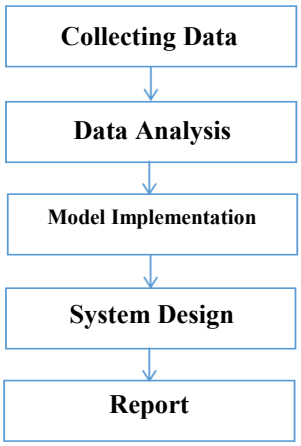

Figure 1 Research Flow Design

2.1. Data Collection Techniques

The techniques employed by the author in this research are as follows:

1) Observation Conducting direct observations at the research site, the Center for Educational Development and Quality Assurance at Islamic University of Kuantan Singingi (PPPPM UNIKS), to identify the existing issues.
2) Interview The researcher engages in face-to-face interviews with key informants to ask direct questions. Interviews are conducted with the Head of PPPPM UNIKS, who is responsible for internal quality audit activities.
3) Literature Review At this stage, the author searches for data based on references from books and journals related to this research..

3. Result and Discussion

The system design utilizes the Waterfall model, a structured and sequential approach often likened to a cascading waterfall. This method begins with system requirements and proceeds systematically through phases of analysis and system modeling.

For system modeling, the author employs UML (Unified Modeling Language), which includes:

1. Use Case Diagram
2. Activity Diagram
3. Sequence Diagram
4. Class Diagram
5. User Interface Design

3.1 Use Case Diagram

A use case diagram illustrates the actors interacting within the system, outlining its functional and operational aspects by defining usage scenarios agreed upon by both users and designers. It serves as a fundamental tool in system modeling, allowing stakeholders to visualize how different types of users, or "actors," engage with the system's various functions. The purpose of the use case diagram is not only to describe what the system will do, but also to clarify the interactions between users and the system in a clear, structured manner. This helps in identifying user requirements early in the system development process, reducing misunderstandings, and ensuring that the final design aligns with stakeholder expectations.

The use case diagram for the Internal Quality Audit Information System modeling is designed to include four actors, each representing a distinct role within the system's workflow. These actors typically include the System Administrator, Auditor, Quality Assurance Officer, and Auditee. Each actor interacts with the system in different ways, depending on their responsibilities. For example, the System Administrator manages user accounts and system configurations, while Auditors are responsible for inputting audit data and generating reports. The Quality Assurance Officer oversees the audit process and ensures compliance, and the Auditee responds to audit findings and provides necessary documentation. By mapping these roles in a use case diagram, the system design becomes more transparent and organized, allowing for better communication among developers, users, and other stakeholders involved in the development and implementation of the Internal Quality Audit Information System.

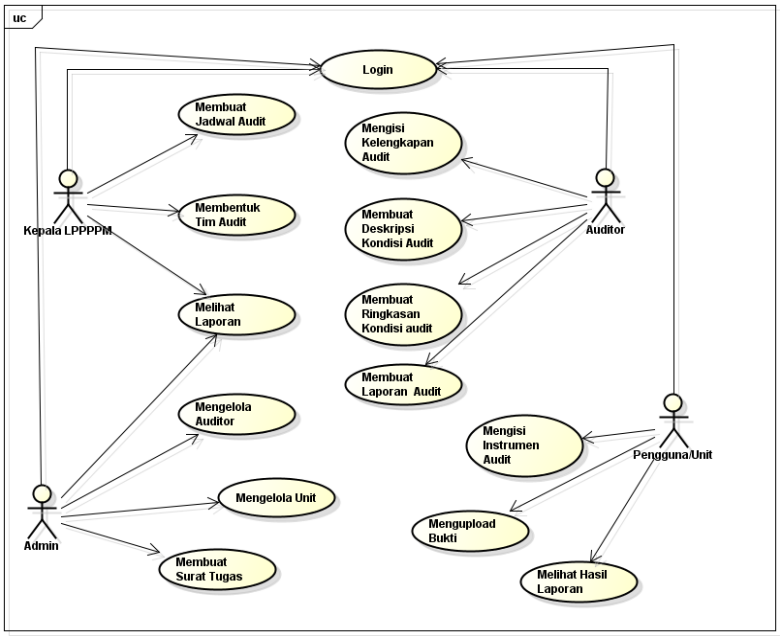

Figure 2. Usecase Diagram

The admin manages the data of the unit in the university, informs the user or unit to fill in the AMI instrument on the System, then the admin makes a letter of assignment addressed to the auditor to check the audit data, then the auditor fills in the completeness of the audit data, makes a description of the audit condition, makes a summary and makes an audit report and finally the head of PPPPM makes an audit schedule, forming an audit team and viewing audit reports made by auditors.

3.2 Activity Diagram

Activity Diagram depicts the workflow or activity of a system[14],

3.2.1 Activity Diagram Login

The login activity diagram represents the initial step that occurs when the application program is launched. This process is fundamental to the system's functionality, as it ensures that each user accesses the system according to their assigned roles and permissions. Every user, regardless of their position—whether administrator, auditor, quality assurance officer, or auditee—must complete the login process to gain access to the system's features. This step not only secures the system by authenticating user credentials but also ensures that the user is directed to a personalized interface that corresponds to their specific duties and responsibilities within the system.

Once a user successfully logs in, the system automatically identifies their role and redirects them to a corresponding dashboard or main menu. This role-based navigation is essential for maintaining the integrity and clarity of the workflow, as it prevents unauthorized access to functions that fall outside a user's scope. For example, administrators will be directed to a menu that includes system configuration and user management tools, while auditors will access forms and modules related to audit planning, implementation,

and reporting. Similarly, quality assurance officers may be provided with oversight and evaluation tools, whereas auditees are guided to interfaces where they can respond to audit findings or upload necessary documentation.

By modeling this process through an activity diagram, developers and stakeholders can clearly visualize the sequence of actions and decisions involved in user authentication and access management. This contributes to building a more secure, organized, and user-friendly system.

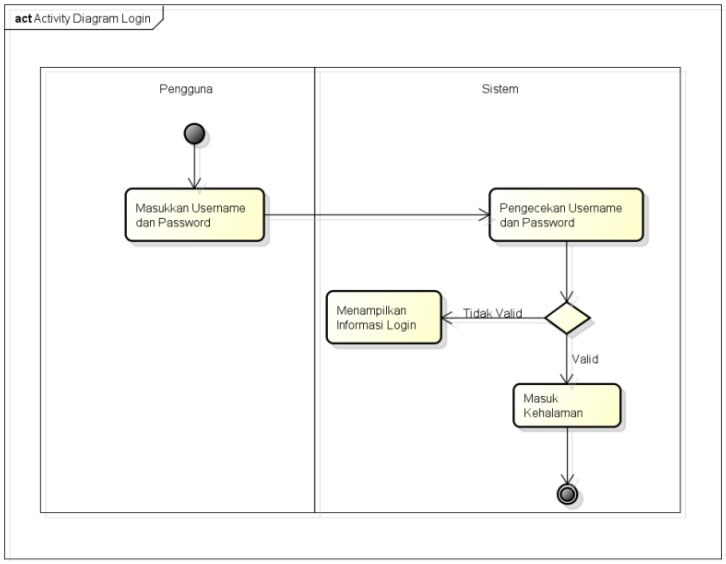

Figure 3. Activity Diagram Login

3.2.2 Activity Diagram Managing Auditor Data

Admin manages auditor data, namely adding, editing and deleting auditor data .

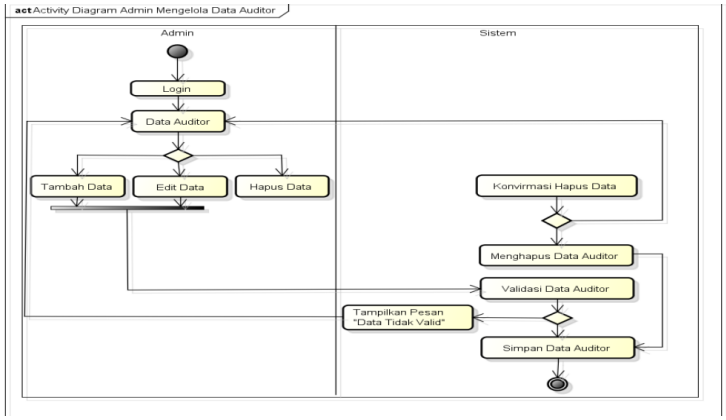

Figure 4. Activity Diagram Managing Auditor Data

3.2.3 Activity Diagram of Audit Schedule

The Head of PPPPM (Center for Quality Assurance and Development of Learning) is responsible for initiating the Internal Quality Audit process by creating a comprehensive audit schedule. This schedule serves as a formal timeline that outlines when and how the audit activities will be carried out, providing auditors with a clear framework to begin their tasks. Once the schedule is finalized, the Head of PPPPM proceeds to form an Audit Team by selecting qualified auditors based on their expertise and familiarity with the units to be audited. This team is tasked with evaluating and analyzing the data that has been previously prepared and submitted by the respective users or units. The data typically includes documentation related to academic processes, administrative procedures, and quality assurance measures. Through this structured process, the Audit Team ensures that all relevant information is thoroughly reviewed in preparation for the next phase of the Internal Quality Audit.

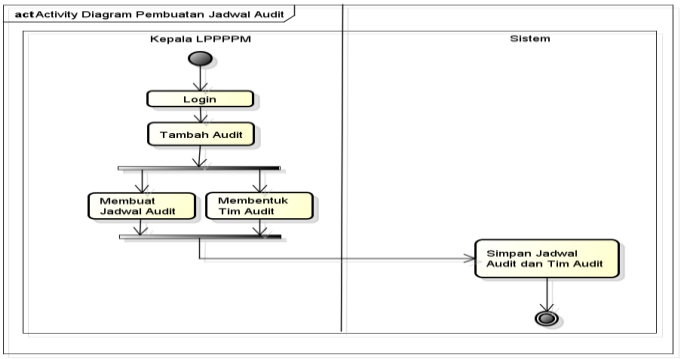

Figure 5. Activity Diagram of Audit Schedule

3.2.4 Activity Diagram Filling Instrument

This diagram depicts the User/Unit viewing the instrument filling schedule and then proceeding with filling and uploading files according to the predetermined instrument.

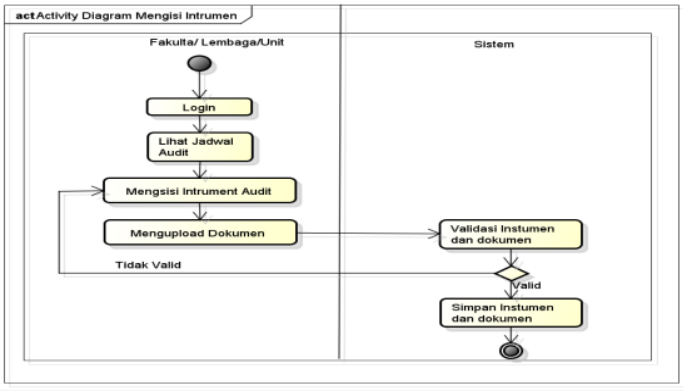

Figure 6. Activity Diagram Filling Instrument

3.2.5. Activity Diagram Checking Instrument

The Auditor team checks the instruments that have been filled in by the user and then validates the supporting files.

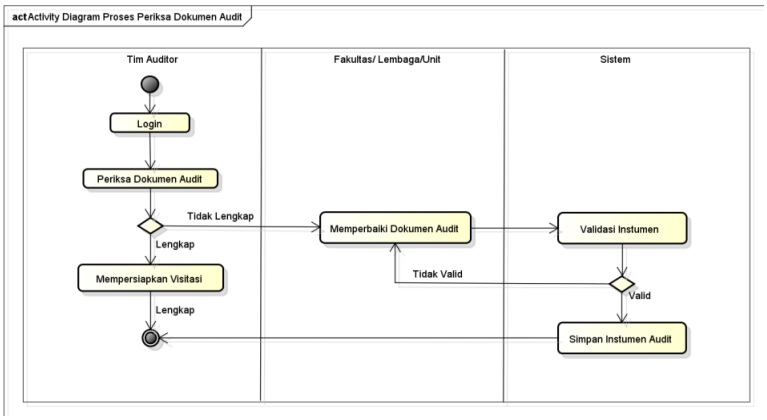

Figure 7. Activity Diagram Checking Instrument

3.2.6. Activity Diagram Filling the Audit Conditions

The audit team fills in conclusions related to the data and files that have been submitted by users.

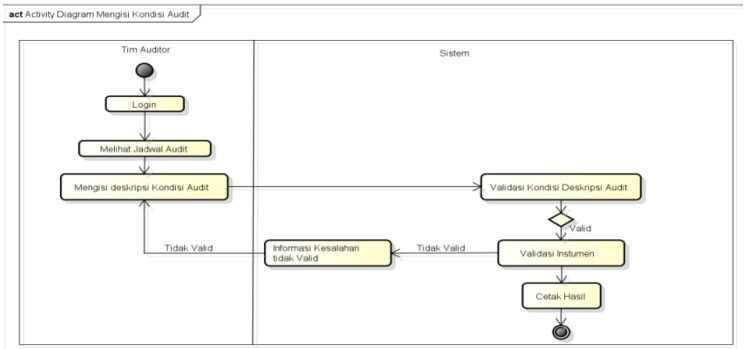

Figure 8. Activity Diagram Filling the Audit Conditions

3.2.7. Activity Diagram summarizing the Audit Condition

The auditor makes a summary of the results of his inspection and makes a report of the findings.

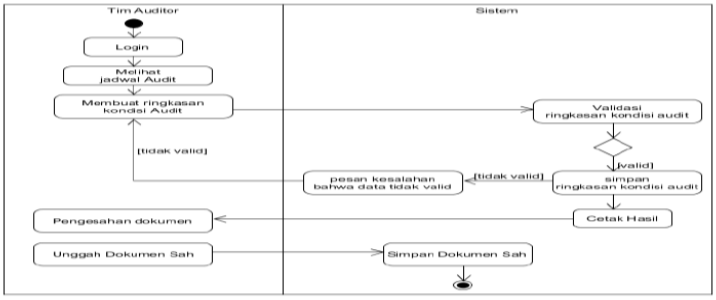

Figure 9. Activity Diagram summarizing the Audit Condition

3.2.8 Activity Diagram for Reporting

This diagram depicts an auditor creating a report.

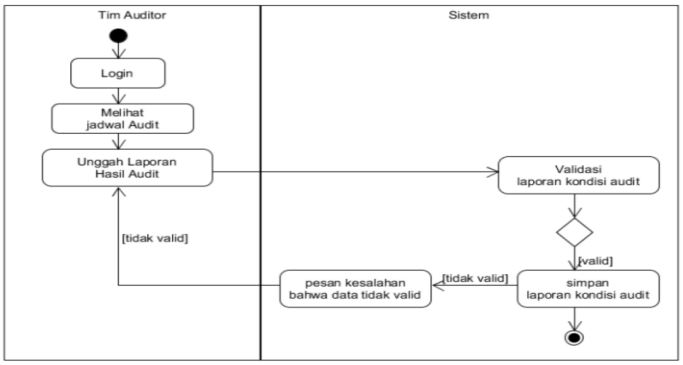

Figure 10. Activity Diagram for Reporting

3.3 Sequence Diagram

The following diagram sequence illustrates the Head of PPPPM determining the audit schedule and then managing the auditor who will conduct the audit and see the report from the results of the internal quality audit (AMI) activities.

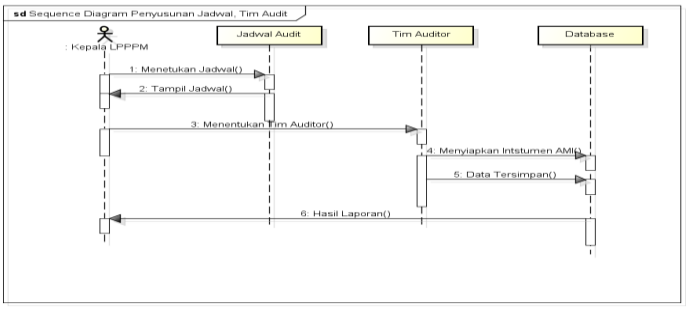

Figure 11. Sequence Diagram

3.4. Class Diagram

Class diagrams show the relationships between classes and the detailed explanation of each class in the design model of a system [15]. The description of *the class diagram* in the design of this system is as follows.

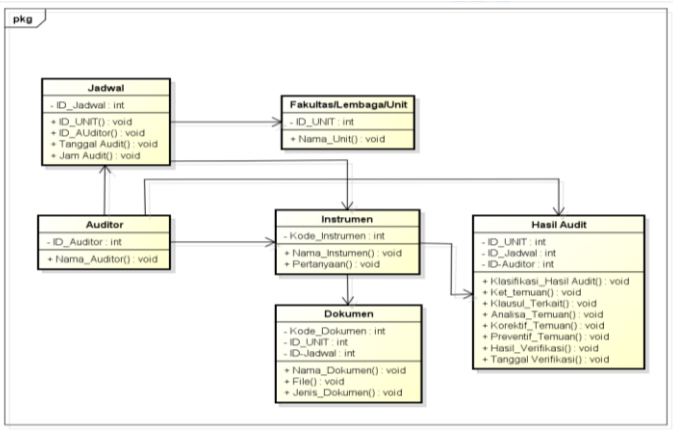

Figure 12. Class Diagram

3.5 User Interface Design

3.5.1 User/Unit Data Input Form Design

This form will be used to input data for users or units, including Faculties, Study Programs, and Bureaus within Islamic University of Kuantan Singingi.

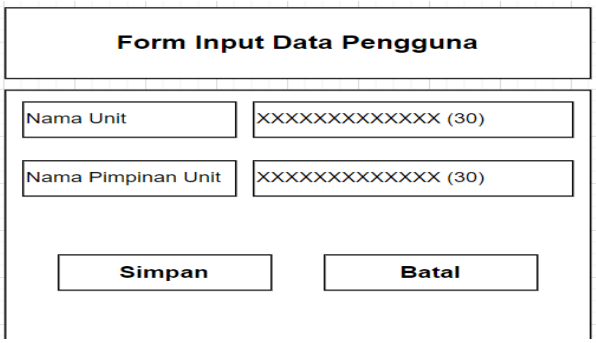

Figure 13. User Data Input Form Design

3.5.2 Auditor Data Input Form Design

This form is used to input auditor data which will later be assigned by the head of PPPPM.

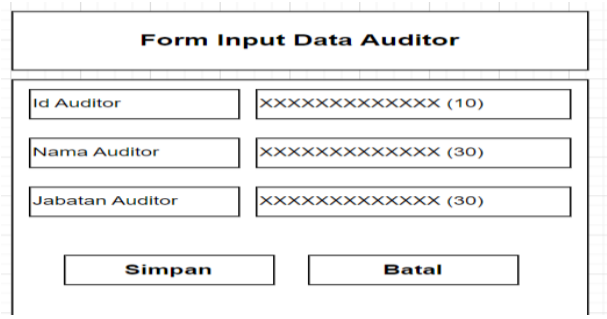

Figure 14. Auditor Data Input Form Design

3.5.3. Instrument Data Input Form Design

This form is used to input instrument data that will be imported by the user or unit to be audited.

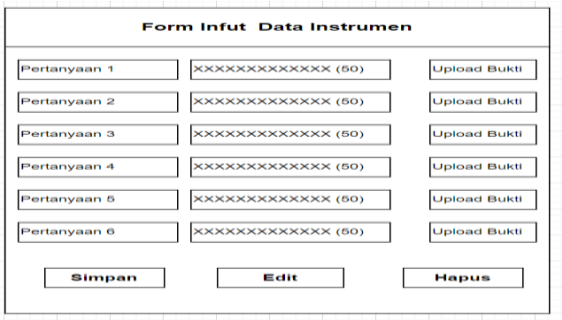

Figure 15. Instrument Data Input Form Design

3.5.4 Instrument Verification Input Form Design

This form is used by auditors to verify the instruments that have been filled in by the user.

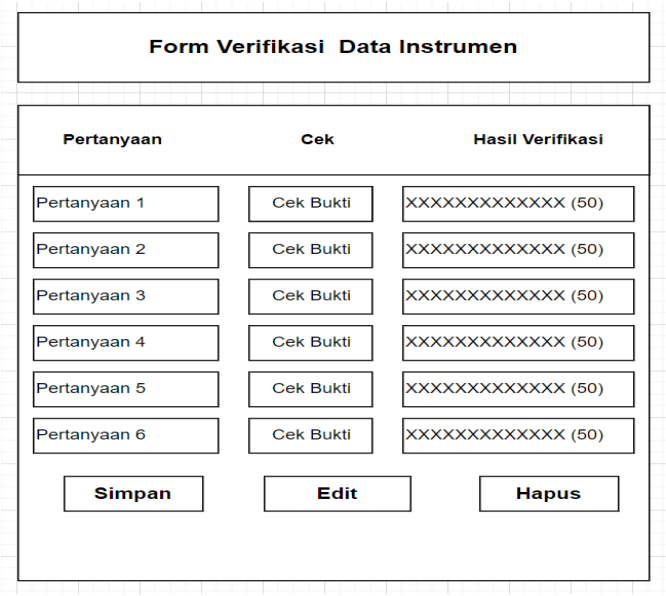

Figure 16. Instrument Verification Input Form Design

4. Conclusion

After analyzing and modeling the internal quality audit information system at Islamic University of Kuantan Singingi, the researchers conclude that this system can facilitate the development of the AMI

Information System Application at the Center for Educational Development and Quality Assurance (PPPPM UNIKS).

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