

Design and Development of LAMDIK Accreditation Information System

Asmunin^{1,*} Yuni Sri Rahayu² Muchlas Samani¹ Ekohariadi¹ Ari Kurniawan¹

¹ Faculty of Engineering, Universitas Negeri Surabaya, Surabaya, Indonesia

² Faculty of Mathematics and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

*Corresponding author. Email: asmunin@unesa.ac.id

ABSTRACT

LAMDIK is an independent accreditation agency that accredits study programs in the field of education. SIMAK is a web-based application for the administration and automation of the accreditation process, can synchronize with PD-DIKTI, multiuser (assessor, study program, validator, facilitator), and can display a dashboard of data related to accreditation. This research was done in five steps, requirement, design, implementation, testing, and maintenance. The main reference in the development of accreditation application is the accreditation instrument which consists of buku 1 Naskah Akademik, buku 2 Laporan Evaluasi Diri, buku 3 panduan penyusunan laporan evaluasi diri, buku 4 panduan dan matrik penilaian, and buku 5 prosedur akreditasi. The design and design of SIMAK is made with a procedural and object oriented approach. SIMAK is developed on the Linux operating system, using the Laravel framework and MySQL database.

Keywords: LAMDIK, Accreditation, SIMAK, Laravel, Web Application.

1. INTRODUCTION

LAMDIK is an independent accreditation agency that accredits study programs in the field of education. As a new organization, a lot of things have to be prepared to operate such accreditation instruments, procedures, costs, and accreditation management application. LAMDIK is obliged to guarantee the quality of higher education in the field of education with the number of institutions reaching 1,578 and study programs in the field of education totaling 5,883. Integration of information technology is necessary so that the accreditation process is quick, transparent, and efficient. one of which is to create and develop an accreditation management system (SIMAK), a web-based application that connects parties involved in the accreditation process. SIMAK is a web-based application for the administration and automation of the accreditation process, can synchronize with PD-DIKTI, multiuser (assessor, study program, validator, facilitator), and can display a dashboard of data related to accreditation.

LAMDIK has been in the process of preparing itself to be approved by BAN-PT so that it can carry out the study program accreditation process. Preparations that have been made: preparation of accreditation guidebooks, academic manuscripts, guidelines and

assessment matrices, making websites, making accreditation and financial applications, application guidelines, and having conducted a sampling test involving 15 study programs. Research related to accreditation has been carried out by [1]–[3].

2. METHODS

This research was done in five steps, requirement, design, implementation, testing, and maintenance as show in Fig.1. The first stage, requirements analysis, aims to collect all application requirements from users by conducting user requirements analysis, document analysis, business processes, and analysis of systems that have been running. The result of this stage is the application requirements document. The system design stage aims to translate application requirements documents into system designs which include DFD, Flowchart, ERD, Input/Output design, Technology design, and IPO (Input, Process, Output). the next stage is implementation, writing program code based on the design made in the previous stage. The testing stage aims to conduct trials and ensure the program runs well and has zero errors.

The main reference in the development of accreditation application is the accreditation instrument

which consists of Academic Manuscript, Self Evaluation Report, guide for preparing self evaluation report, guide and assessment matrix, and accreditation procedure. These application can be used by UPPS, study programs, assessors, validators, and the board of directors, as show in Figure 2.

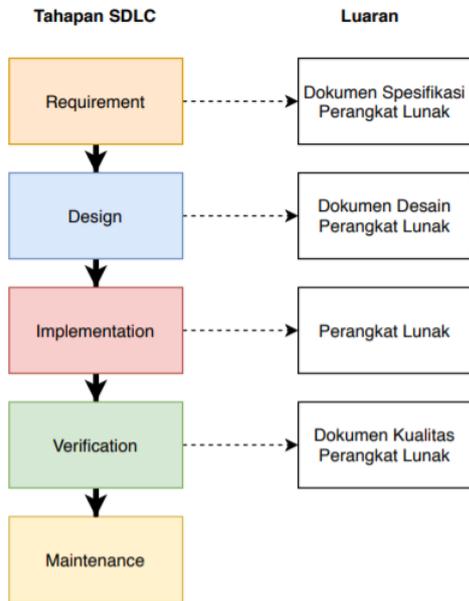


Figure 1 Stages of Research.

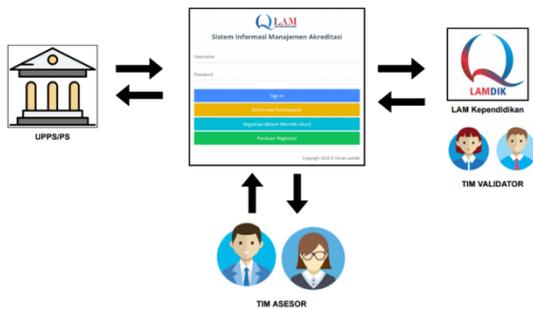


Figure 2 Application architecture.

UPPS and study programs register and upload accreditation documents, then the validator checks for completeness and correctness. the next process, the assessor conducts an adequacy assessment by providing a value based on the uploaded documents and quantitative data. if it passes the adequacy assessment, the next step is a field assessment. stages of accreditation in LAMDIK as follows:

- The study program registers online through SIMAK by first uploading proof of payment for phase I and proof of tax deduction. Registration is intended that the study program has an account and can upload documents for accreditation
- The study program proposes accreditation by uploading the accreditation document and

attachments six months before the end of the accreditation validity period.

- Acceptance of accreditation proposal documents. At this stage, the completeness of the accreditation documents is checked. If not complete, the study program must complete it.
- Adequacy Assessment, the assessment of accreditation documents by the Assessor Team. The AK process is carried out after the study program has made phase II payments and has been verified. If the accreditation proposal is declared unsuccessful, the study program must re-propose.
- Field Assessment, visitation activities by the Assessor Team to UPPS and study programs to verify facts and field conditions against the data/information submitted in the accreditation proposal document. AL process is carried out after the study program has made the payment for phase II and has been verified.
- Determination of accreditation results and submit accreditation results to universities/study program management units/study programs and the community. If there are objections from the study program on the results of accreditation, the study program can appeal.

Systemically, the process of accreditation of study programs at LAMDIK in a flowchart can be seen in Fig.5.

Based on PERBAN no. 2 of 2017, tentang Sistem Akreditasi Nasional, there are nine assessment criteria. They are (1) Vision Mission Goals and Targets of Higher Education, (2) Governance, Governance and Cooperation, (3) Students, (4) Human Resources, (5) Finance, Facilities and Infrastructure, (6) Education, (7) Research, (8) Service, and (9) Outcomes and Achievements The nine criteria are described in two documents, namely the Study Program Performance Report (LKPS) and the Self Evaluation Report (LED). In addition, the study program must also fill in quantitative data based on template.

The score range and category of accreditation assessment, namely Excellent (Score 361*), Very Good (300<Score≤360*), Good (200<Score≤300*), and Not Accredited (Score<200). If the study program (PS) does not agree with the results of the accreditation, it can appeal. Unlike BAN-PT, accreditation at LAMDIK is not free. UPPS/PS must make payments according to what has been determined. And to make it easier, payments are made with the accreditation stages, namely the submission of proposals for accreditation proposals, field assessments (AK), and field assessments (AL). If one of the stages fails and must be repeated, then you have to make another payment. The main features of the application are:

Table 1 Application features.

No	User	Application Features
1.	Study Program	<ol style="list-style-type: none"> 1. Register for Study Program to become a SIMAK member 2. Payment transactions integrated with the Bank 3. Registration for Study Program Accreditation 4. Upload accreditation documents 5. Revision of accreditation data and files 6. Request for accreditation 7. Providing facilitators for assistance, if needed 8. Assistance by the facilitator 9. Upload the form, management unit, self-evaluation 10. Revise the form 11. Reaccreditation 12. Appeal for Accreditati
2.	Assessor	<ol style="list-style-type: none"> 1. Assessment Assessment of adequacy 2. Upload the results of the adequacy assessment 3. Scheduling the field assessment and downloading the accreditation form assessment document 4. Upload the field assessment documents
3.	Validator	<ol style="list-style-type: none"> 1. Dashboard of field assessment validation requests by the secretariat. 2. Carry out the validation process 3. Upload the validation result document
4.	Facilitator	<ol style="list-style-type: none"> 1. Facilitator request dashboard 2. Assistance with accreditation forms from study programs 3. Revise the accreditation form
5.	Assembly	<ol style="list-style-type: none"> 1. Assembly request dashboard 2. Make a decision on the legality of the results of the study program accreditation process

The accreditation flow for study programs starts from the registration process, then gets a notification via email so that you can do the login process. After logging in, the study program can propose accreditation and upload accreditation documents, Fig.3.

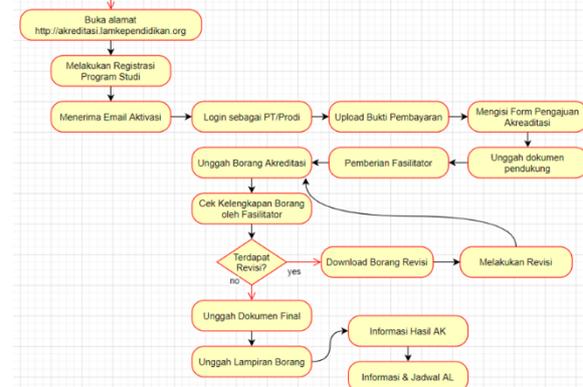


Figure 3 Study program flow in accreditation.

The accreditation flow for assessors starts with assessor registration, then logs in. After logging in, the assessor can perform asesmen kecukupan (AK) and asesmen Lapangan (AL). In the AK, the assessor conducts AK, uploads the AK value, processes the AL, and uploads the AL results, Fig.4.

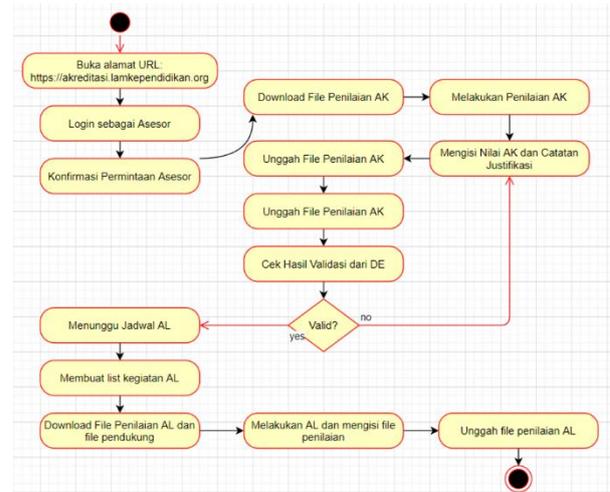


Figure 4 Assessor flow in accreditation.

Evaluation and assessment of study program accreditation are carried out through a peer mechanism by an Assessor Team consisting of lecturers and experts in the field of study program science who understand the nature of the administration and management of the study program. The accreditation process involves the study program management unit (UPPS), study program (PS), assessors, and validators which is facilitated by the SIMAK application (Accreditation Management Information System).

The first step in developing the SIMAK (Accreditation Management Information System)

LAMDIK is setting up the server and domain. The operating system used is Ubuntu 18.04.02 LTS (bionic). The reason for using Ubuntu is because it has been proven to be reliable and easy to update. What's more, the version used is LTS (Long Time Support) which has longer official support. To run SIMAK, several software were installed, namely a web server using Nginx, PHP version 7.4.10, MySQL and PostgreSQL database servers, and other supporting software. In addition, a mapping of the LAMDIK domain (lamkependidikan.org) is carried out to the server so that all applications can be accessed using address <https://simak.lamkependidikan.org>.

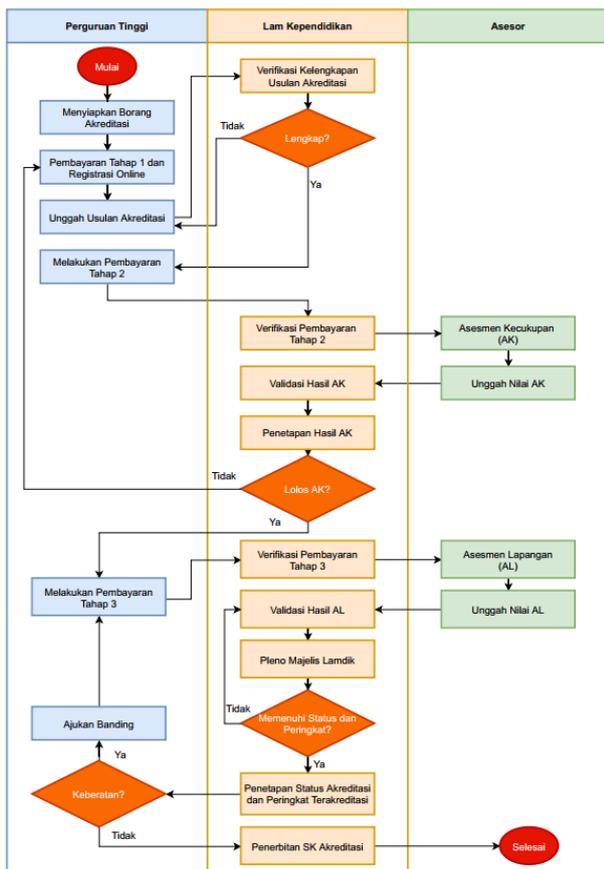


Figure 5 SIMAK cross functional diagram.

SIMAK is developed using the laravel framework, MySQL database, and material abe template. There are several initial settings in SIMAK development, namely settings in the Laravel framework, initial database settings, display settings, preparing the necessary assets, and settings for collaboration. The initial settings in the Laravel framework are related to the connection with the database in the .env file. the settings made include DB_HOST, DB_PORT, DB_DATABASE, DB_USERNAME, DB_PASSWORD, and generate key. Database settings are done through the migration mechanism that is available in Laravel.

3. RESULTS

3.1. Main Page

The main display when a user open URL address is <https://simak.lamkependidikan.org>. This page is an entry point for all levels of users and a link to register for those who have an account, as show in Fig. 6.



Figure 6 SIMAK main page.

3.2. Admin Dashboard

This page is the first screen when an account with admin access level logs in at SIMAK. Through this dashboard, the admin can display all SIMAK data and access most of the existing menus, as show in Fig. 7.

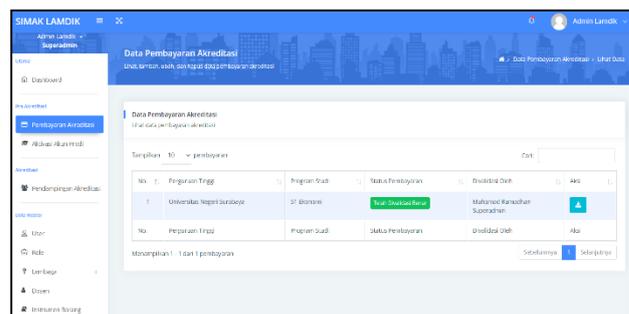


Figure 7 Admin dashboard.

Admin access level can display and approve payments by study programs, activate study programs accounts, display data on requests for facilitators by study programs and determine facilitators. In addition, the admin access level can also manage master data such as users, roles, institutions, lecturers, and accreditation boring instruments. For master data, admin access level accounts can perform CRUD (Create Read Update Delete) which is the standard in data management in an application

3.3. Study Program Dashboard

This page displays the dashboard for the study program account. When an account with a study program access level logs in and is successful, the first display that is displayed is the dashboard. Information displayed on the study program dashboard includes account info, study program data, accreditation process status, and others, Fig. 8.

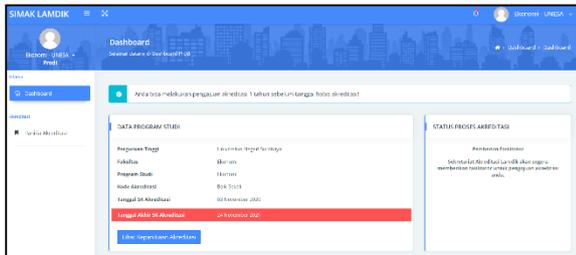


Figure 8 Study program dashboard.

Through the study program dashboard, you can also see the accreditation committee that has been filled in by the study program. If the study program requires a facilitator, the status of the provision of facilitators can also be monitored. Through the dashboard, study programs can apply for accreditation by following the stages of the accreditation process that have been determined by LAMDIK. In applying for accreditation, study programs must upload accreditation documents, quantitative data excel files, and attached documents as required.

3.4. Asessor Dashboard

This page is the first screen when a user with an assessor access level has successfully logged in. The main view of the assessor dashboard displays assessor data, offer info for Asesmen Kecukupan (AK) and Asesmen Lapangan (AL), AK and LA progress, and links for the AK and LA assessment process, Fig. 9.

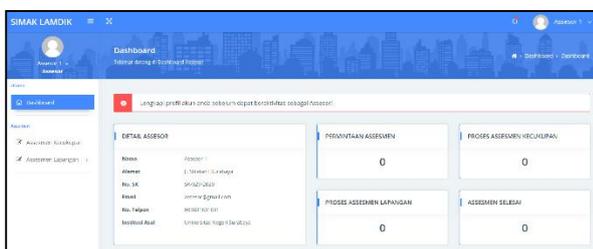


Figure 9 Asessor dashboard.

4. CONCLUSION

The design and design of SIMAK is made with a procedural and object oriented approach. The design with the procedural approach is made in the form of data flow diagrams, CDM (Conceptual Data Model) and PDM (Physical Data Model), while the object oriented approach is implemented in the form of use cases, sequence diagrams, activity diagrams, state diagrams and class diagrams. 4. SIMAK is developed on the Linux operating system, using the Laravel framework and MySQL database. Because using Laravel, there has been a separation between the model, view and controller so that the program code becomes cleaner. Template management using the blade template engine from Laravel using the HTML Annex admin dashboard template.

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