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Development of a Web-Based Dashboard System for Monitoring Study Programme Accreditation Instruments

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Abstract: Accreditation is a form of assessment or evaluation of the quality of education, both at the level of study programme and higher education institutions, conducted by independent organizations or bodies external to the universities. BAN-PT is one such external agency responsible for accrediting higher education institutions in Indonesia. However, many universities encounter challenges during the accreditation process, such as the absence of a monitoring system and data integration in the preparation of some documents, which are essential for accreditation. To address this issue, researchers have recognized the need to design and build a system that can aid in the preparation and monitoring of accreditation forms. The system was developed using the Extreme Programming model, which adopts the agile concept as the core of application development. The Extreme Programming model consists of four key activities, namely system planning, system design, code writing, and system testing. Based on the black box testing results, the developed system was found to operate as intended. Based on the benchmark results for each aspect of the UEQ, Attractiveness has a value of 1.69 with the good category, Perspicuity has a value of 1.57 with the above average category, Efficiency has a value of 2.11 with the excellent category, Dependability has a value of 1.68 with the good category, Stimulation has a value of 1.29 with the above average category, and Novelty has a value of 0.86 with the above average category.

Keywords: Web-Based Dashboard, Accreditation, Extreme Programming, UEQ

INTRODUCTION

The legislation explains that higher education institutions are entities responsible for providing education at various levels, including diploma, undergraduate, master's, doctoral, specialized, and professional programs, all structured according to the standards of the Education program (Mulyani & Haliza, 2021). According to Government Regulation No. 3 of 1990, these institutions are considered educational units that offer higher education, research, and community service. The Higher Education Law No. 12 of 2012 defines the four main goals of higher education, such as to develop students' potential to become individuals who are devoted to God, possess noble character, are healthy, knowledgeable, skilled, creative, independent, competent, and culturally aware for the nation's benefit (Temon Astawa & Sukerti, 2021). Secondly, to produce graduates who are proficient in various fields of Science and Technology to meet national needs and enhance the nation's competitiveness. Thirdly, to generate scientific knowledge and technology through research, taking into account and applying humanistic values for the progress of the nation, civilization, and the welfare of humanity. Fourthly, to

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realize community service based on reasoning and beneficial research, contributing to the advancement of public welfare and the intellectual development of the nation.

At the smallest unit of a higher education institution, direct interaction with students occurs within the study programme. Colleges manage and organize education through academic units known as study programme. Proper management of these study programme contributes to the overall success of the institution in achieving its objectives (Sulaiman, Nurdin, & Zulyadi, 2021). Accreditation and reaccreditation processes play a crucial role in maintaining the quality of the education provided.

Accreditation is a form of assessment or evaluation of educational quality, conducted by independent organizations or bodies outside the institution. Other forms of external quality assessment include accountability assessments, granting of permits and licenses by specific bodies, data collection by government agencies for specific purposes, and surveys to determine the ranking of institutions (Lessy, Riaddin, Supriadi, & Sehuwaky, 2022). One of the national accreditation bodies is BAN-PT (National Accreditation Agency for Higher Education). BAN-PT is a government external agency responsible for monitoring and evaluating the quality of higher education institutions and their study programme. The assessment process conducted by BAN-PT covers both the institution as a whole and its specific study programme. The assessment involves the program's support elements (program management or institution and faculty members), and the accreditation team reports all processes using a standardized form.

Currently, the accreditation process for study programme employs the Accreditation Instrument for Study Programme version 4.0, known as IAPS 4.0, which was established by BAN-PT through Regulation No. 5 of 2019 (Herawati, Ulum, & Juanda, 2020). Unlike previous accreditation instruments that focused on input-process and used seven standards as assessment criteria, IAPS 4.0 is based on output-outcome and employs nine assessment criteria, including Vision, Mission, Objectives, and Strategy; Governance and Cooperation; Students; Human Resources; Finances, Facilities, and Infrastructure; Education; Research; Community Service; and Outcomes and Achievements.

The Institut Sains dan Teknologi Nahdlatul Ulama Bali (ISTNUBA) is one of the higher education institutions in Bali under the BP2ISTNUBA Foundation. Being a relatively new institution formed in 2019, the institution is still in its developmental phase. It offers three programs such as Information Systems, Statistics, and Environmental Engineering. Presently, all the study programme holds only minimum accreditation and, soon they will need to undergo the reaccreditation process using IAPS 4.0. Based on Quality Procedures, each program will conduct the reaccreditation process by forming an ad-hoc team comprising policy stakeholders and the program itself. This team will be responsible for preparing the LED and LKPS documents and compiling other relevant accreditation materials. One of the challenges faced during this process is monitoring, as different teams handle each criterion according to policy stakeholders. Coordination between criteria is necessary to avoid overlapping data and descriptions. Moreover, close supervision during the document preparation phase is essential to ensure that the LED and LKPS are completed on time.

LITERATURE REVIEW

Study Programme Acreditation

The government, through Regulation No. 32 of 2016, Article 3, sets guidelines for accreditation at both the Study Programme and Higher Education levels, based on the standards outlined in the National Higher Education Standards. These standards encompass national education standards and those related to the three pillars of higher education: teaching, research, and community service. According to Article 7 of Regulation No. 32 of 2016, the accreditation instrument serves as a reference for assessing both Study Programme and Higher Education accreditation. To oversee and evaluate higher education institutions, the government establishes the National Accreditation Agency for Higher Education, commonly known as BAN-PT. BAN-PT is empowered to assess the eligibility of higher education institutions, as well as to develop accreditation instruments based on the Higher Education Standards. Their supervision and evaluation encompass both Higher Education Institutions and Study Programme.

The accreditation assessment standards, consist of nine criteria, such as vision, mission, and strategy (standard 1), governance and cooperation (standard 2), students (standard 3), human resources (standard 4), finances, facilities, and infrastructure (standard 5), education (standard 6), research (standard 7),

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community service (standard 8), and outputs and achievements (standard 9). These assessment standards provide a framework for study programme and higher education institutions to continuously enhance and develop their quality.

Dashboard Application

A dashboard is a visualization of a collection of data that presents essential information in the form of tables, reports, indicators, and alert mechanisms, showing management performance used in the supervision and management of business activities (Wahyudi & Syazili, 2021). Another definition states that a dashboard is a visual display of vital information with the purpose of achieving one or more objectives, combining and organizing information into a single screen so that it can be viewed simultaneously at the same time (Matheus, Janssen, & Maheshwari, 2020). From the above dashboard definitions, it can be concluded that a dashboard represents various data, information, and knowledge in different visual forms combined on a single screen, incorporating features like Performance Management Systems, Performance Measurement Systems, Business Process Management suites, and Business Intelligence Platforms within its components. There are three types of performance dashboards: Strategic Dashboard, Tactical Dashboard, and Operational Dashboard.

Using a strategic dashboard, organizations can monitor each key performance stage related to achieving strategic goals. This dashboard type emphasizes summaries consisting of multiple tables, up-to-date and global graphs, external trends, and growth measurements. Strategic dashboards are based on the balanced scorecard methodology, providing a means to measure organizational goal achievements. Tactical dashboards are employed to monitor the progress and trends resulting from strategic initiatives. They also track the progress of critical projects undertaken by the organization, always measured against the set objectives. These dashboards are expected to assist both internal and external stakeholders in monitoring crucial organizational initiatives. On the other hand, operational dashboards focus on monitoring business processes, activities, and complex events. They display daily or weekly up-to-date information, real-time graphs, and reports illustrating the status of business or manufacturing processes. Operational dashboards are commonly used at the operational work level rather than at the senior executive level, where strategic or tactical dashboards are more suitable.

User Experience Questionnaire (UEQ)

The User Experience Questionnaire (UEQ) is a comprehensive system testing model designed to assess various aspects of a system, ranging from usability to user experience (Gunawan, Putra, & Damayanthi, 2021). This framework allows researchers to gather valuable data about users' experiences while using applications through a questionnaire format (I. M. A. W. Putra, Gunawan, Suyasa, Suarnatha, & Putra, 2023). The UEQ facilitates direct and rapid measurement of user experience for interactive products. It has been applied in various research contexts, such as evaluating business software, websites, web services, and social networks. With 6 factors and a total of 26 items presented in a seven-stage semantic differential format, the questionnaire randomizes the order of positive and negative statements to ensure consistency in respondents' answers.

METHOD

The research in this study employs the concept of Extreme Programming, where this method applies the agile system concept as the core for application development. This makes it an ideal approach for application development that emphasizes features and speed. Extreme Programming is a development framework that encompasses a set of rules and practices within four main activity phases (Akhtar, Bakhtawar, & Akhtar, 2022). These phases include Planning, Design, Coding, and Testing phase.

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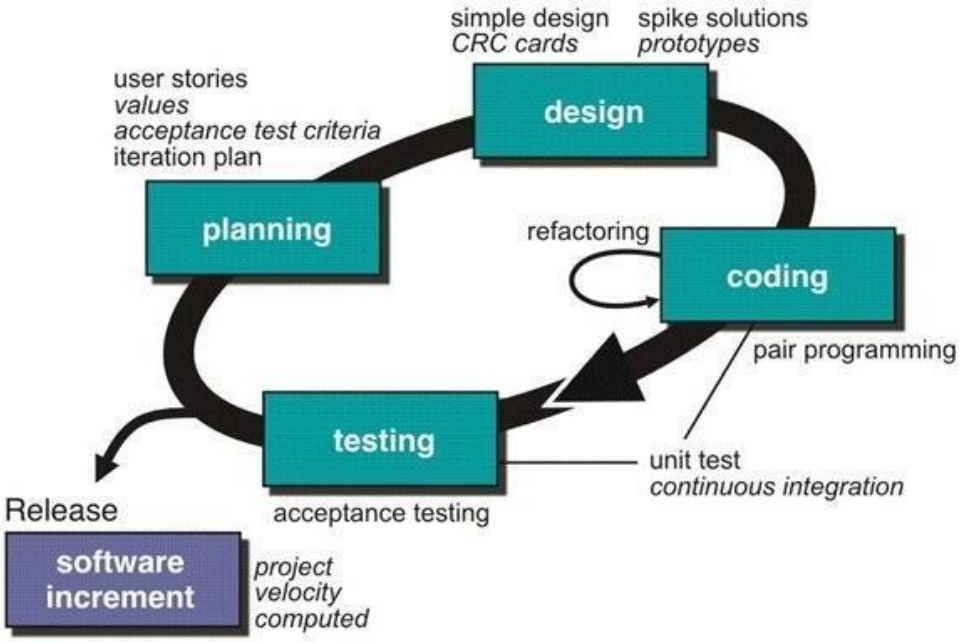

Fig. 1 Extreme Programming Model (Source : (Septiani & Habibie, 2022))

Planning Phase

This stage is focused on outlining the features and functions that the upcoming system will possess. Data collection is carried out through interviews with the Head of the Study Programme, Vice Chancellor for Academic Affairs, Rector, and other parties involved in the accreditation process. Subsequently, field observations are conducted to understand the business processes in action. Finally, the design of functional and non-functional requirements is accomplished.

Design Phase

In this phase, the objective is to establish patterns for the development of a system. These patterns must adhere to the outcomes of the planning phase. The system design stage defines the input-output functions that will be present and utilized within the system. Unified Modeling Language (UML) is employed for the system design, encompassing use case diagrams, activity diagrams, and design interface systems. The use case diagram illustrates the relationship between actors and the system, while the activity diagram outlines the business processes within the system (I. M. A. W. Putra & Gunawan, 2021). Finally, the design interface depicts the layout and appearance of the system's interface.

Coding Phase

This phase will translate the conceptual system design into actual program code, which will later be compiled into a web-based application. During this stage, the code will be created using HTML, PHP, and CSS scripts. The planned processes from the design phase will be implemented into functional procedures. HTML is typically used as a language for structuring information, in a way that Web-browsers can interpret and construct a visual presentation of it for the user to peruse (D. M. D. U. Putra, Mahendra, & Mulyadi, 2022). PHP is a widely used open-source general purpose programming language and specially designed for web development and its code can be embedded directly into HTML (Lailiya, Ginantra, & Mahendra, 2022). CSS script is executed on the following specifications such as color, length, width, etc (Desmayani, Wardani, Nugraha, Indrawan, & Mahendra, 2022).

Testing Phase

In this stage, testing will be conducted involving users who will operate the system to gather direct feedback on the system's functional suitability based on the previously prepared design (Indrawan, Widiartha, Nugraha, Mahendra, & Digita, 2022). The system testing is conducted in two stages. The first stage involves functional testing of the system, also known as black-box testing. In this phase, the

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application's details such as appearance, functionality, and the alignment of the desired user flow are tested without examining the underlying source code (D. A. Putra et al., 2023). Black-box testing focuses on the external interface of the application as perceived by users (Mahardika et al., 2023).

The second stage of testing employs the User Experience Questionnaire (UEQ) to gauge users' experiences while using the system. The UEQ is a quick and effective tool to measure user experience. It consists of six scales categorized into three aspects: attractiveness, pragmatic quality, and hedonic quality. Pragmatic quality assesses perceived benefits, efficiency, and ease of use, including aspects like perspicuity and dependability. On the other hand, hedonic quality relates to stimulation and novelty.

RESULT

Planning Phase Results

An analysis of the problem is conducted to gain an understanding of the features and functions of the system to be developed. The issues identified are as follows: firstly, the document preparation process still relies on both hardcopy and softcopy, which are then uploaded to a cloud drive. Secondly, the institution lacks a system that can efficiently store and monitor these documents. Thirdly, the assessment process still relies on manual spreadsheets. To address these challenges, a solution is proposed in the form of developing a structured document storage system that meets the desired criteria. Additionally, the assessment process will be automated and integrated into the system.

Based on the conducted problem analysis, a system has been developed to assist accreditation by study programme through a web-based dashboard application. The system involves three main actors: administrators, study programme, and internal assessors. The administrator's features include a Login Menu for user authentication, a Dashboard Menu to display study programme that will undergo accreditation or reaccreditation, a Study Program Settings Menu for viewing, adding, editing, and deleting study program accounts, an Admin Settings Menu for managing admin accounts, an Information Settings Menu for viewing, adding, editing, and deleting information, and a Logout Menu to log out users from the system.

Study programme have access to features such as a Login Menu for user authentication, a Dashboard Menu to view the status of instrument filling, an Instrument Filling Menu to input instrument form data into the system, an Assessment Submission Menu for submitting internal assessments along with the required accreditation documents to be evaluated by internal assessors, an Information Settings Menu to view guidelines for instrument filling, accreditation-related regulations, and the status of study program accreditation, an Account Settings Menu to change user passwords, and a Logout Menu for logging out of the system. Additionally, they can use the Assessment Results Menu to view assessment outcomes based on the inputted forms.

Internal assessors, on the other hand, can utilize a Login Menu for user authentication, a Dashboard Menu to view information about study programme to be assessed, including attached accreditation documents, an Internal Assessment Menu to evaluate the filled instruments provided by the study programme, referencing the BAN-PT assessment matrix, an Account Settings Menu to change user passwords, an Information Settings Menu to access guidelines for instrument filling, accreditation-related regulations, and the status of study program accreditation, and a Logout Menu for logging out of the system.

Design Phase Result

In the system design process, the modeling is conducted using UML, which includes the Use Case diagram, Activity Diagram, and interface design. The Use Case diagram and Activity Diagram serve the purpose of facilitating the researcher in transforming the system's functions into a programmable code. The use case diagram is displayed in the Figure 2.

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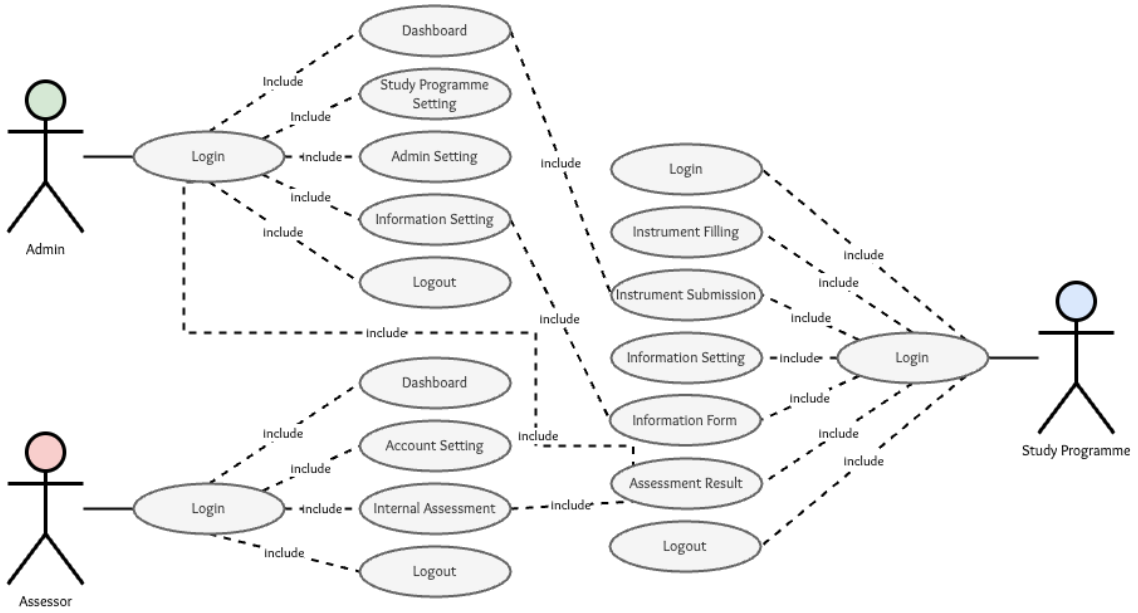

Fig. 2 Use Case Diagram

Figure 2 presents a use case diagram depicting three primary actors: the administrator, the study programme, and the internal assessors. The login menu's use case specification involves user authentication based on their access rights and includes the administrator, study programme, and internal assessors as participating actors. The pre-condition for this use case is the user opening the system, and the post-condition is the display of the login menu. Another use case specification concerns the menu dashboard, responsible for presenting information about the accreditation or reaccreditation process of academic programs. The administrator is the actor involved in this use case. Before this use case can occur, the user must log in, and the post-condition is the presentation of the admin dashboard. The study programme settings menu's use case specification focuses on viewing, adding, editing, and deleting academic program accounts, involving the administrator as the actor. The pre-condition requires the user to select the menu for study programme settings, and the post-condition is the system displaying the study programme settings. The menu information settings use case allows users to view, add, edit, or delete information. The administrator is also the actor involved in this use case, and the pre-condition is the user selecting the menu for information settings, while the post-condition is the system displaying the information settings.

Moving to the study programme dashboard menu, its use case specification involves displaying the status of instrument completion (e.g., in-progress, submitted, assessment completed). The actor for this use case is the study programme, and the pre-condition is the user logging in, while the post-condition is the system displaying the study programme dashboard. The instrument filling menu use case focuses on inputting various supporting documents into the system and involves the study programme as the actor. The pre-condition remains the user's login, and the post-condition is the system displaying the study programme dashboard. The information menu use case allows users to access information such as instrument filling guidelines, accreditation-related regulations, and study programme accreditation status. The study programme is the actor in this use case, and the pre-condition is the user logging in, with the post-condition being the system displaying the study programme dashboard.

The study programme account settings menu use case serves to change user passwords. The study programme acts as the involved actor, and the pre-condition is the user selecting the account settings menu, while the post-condition is the system displaying the account settings. The admin and study programme logout menu use case facilitates user logout from the system and includes both the administrator and study programme as actors. The pre-condition for this use case is the user selecting the logout menu, and the post-condition is the system terminating the user's access. The assessment results menu use case enables users to view assessment outcomes from assessors. All three actors are involved in this use case, and the pre-condition is the user selecting the assessment results menu, with

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the post-condition being the system displaying the assessment form.The assessment submission menu use case allows program studies to submit internal assessments by attaching relevant accreditation documents for evaluation. The actor for this use case is the study programme, and the pre-condition is the user selecting the assessment submission menu, while the post-condition is the system displaying the submission process.

An activity diagram illustrates the flow of interactions between the system and the user, serving as a form of use case development. It translates each process depicted in the use case diagram into an activity diagram, making it easier to represent the sequence of activities. In this particular research, two examples of activity diagrams, namely the instrument filling process and internal assessment process, are presented in figure 3.

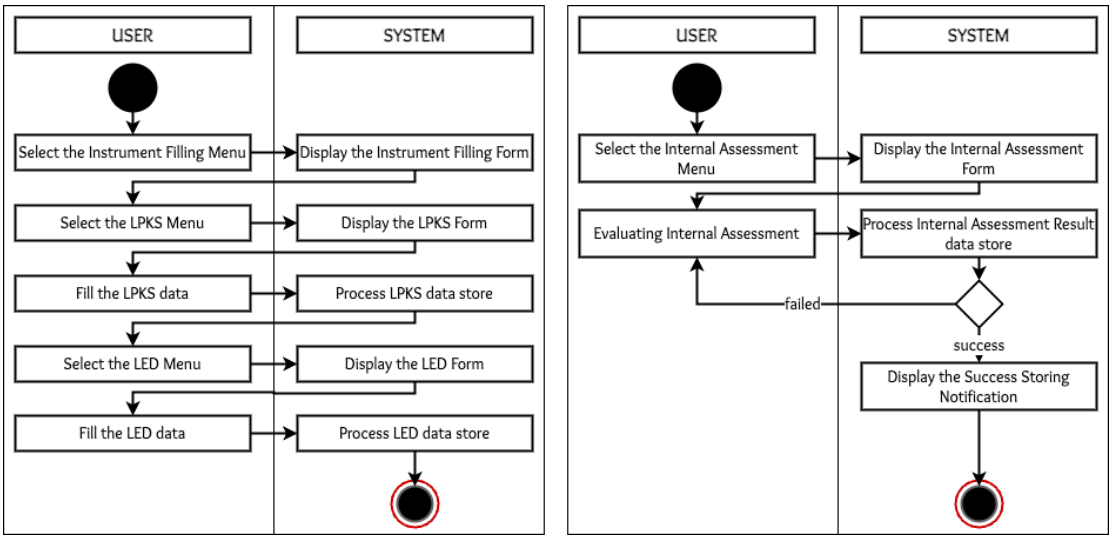

Fig. 3 Activity Case Diagram Example for Instrument Filling Process and Internal Assessment Process

Coding Phase Result

The following presents several displays and features possessed by the developed accreditation monitoring system. The login page contains fields used for entering both admin and study programme usernames and passwords. The appearance of the login page is depicted in figure 4.

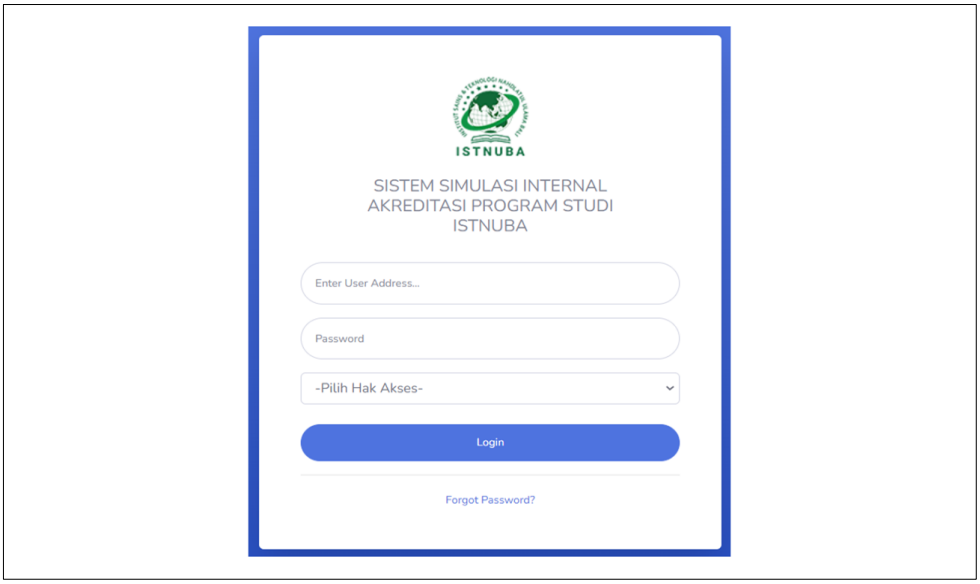

Fig. 4 Login Page

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The admin dashboard serves as the page displayed when users input their credentials with administrative access. On this page, administrators can carry out various system settings and monitor the accreditation requests of different study programme. The primary tasks of administrators on the dashboard involve managing programs, configuring administrative settings, updating information, and logging out from the dashboard. These core activities can be accessed through the left sidebar on the dashboard interface. Figure 5 depicts the admin dashboard, while figure 6 showcases the accreditation submission page.

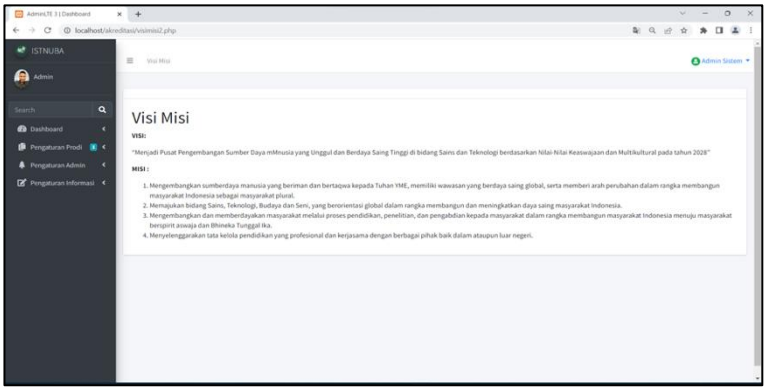

Fig. 5 Admin Dashboard Page

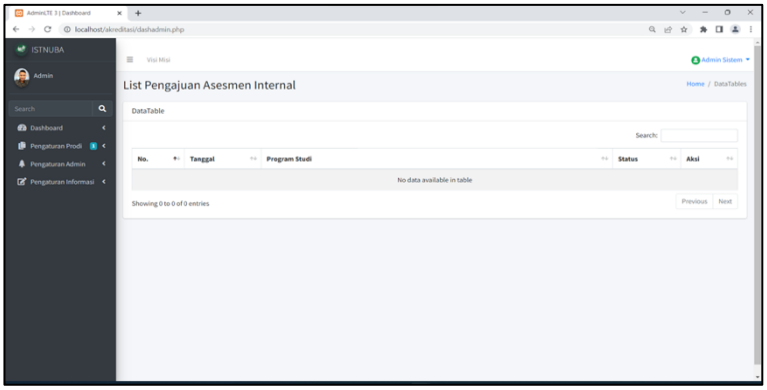

Fig. 6 Accreditation Submission Page

On the study programme settings page, the administrator has the capability to perform various actions, such as adding new study programme entries, removing existing ones, and updating the study programme data. The outcomes of these actions are displayed in figure 7.

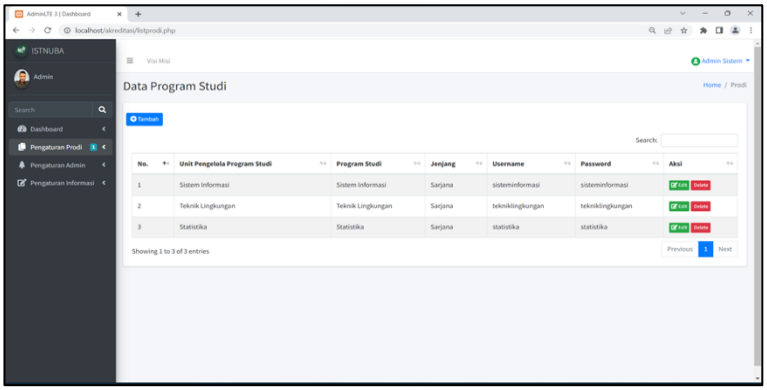

Fig. 7 Study Programme Setting Page

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On the information settings page, the administrator can view the already created information and can also initiate processes to update, add, or delete information. These changes will be visible to the study programme, and their results are shown in figure 8.

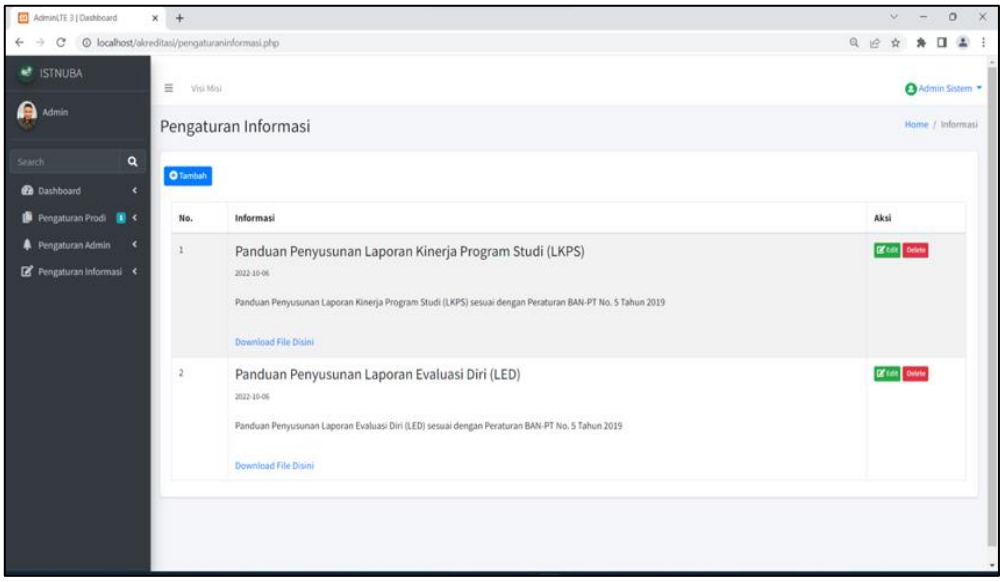

Fig. 8 Information Setting Page

Moreover, the page dedicated to the assessment results of study programme contains information about the evaluation of inputted document data, which is conducted by previously assigned assessors. The primary activities of the internal assessors on the dashboard encompass monitoring various data sets, including financial data, facilities and infrastructure, educational progress, research outcomes, community engagement endeavors, and the assessment of the institution's achievements in teaching, research, and community service (tridharma). Additionally, they monitor the external conditions, view and manage profiles of individual study programme units, apply criteria for analysis and program determination, submit assessments, and handle information and settings. All these activities can be accessed through the left sidebar on the dashboard. Furthermore, the internal assessor has the authority to log out from the dashboard. The implementation of the assessment results page is demonstrated in figure 9.

Fig. 9 Assessment Result Page

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The Study programme dashboard page contains information about the vision and mission of the respective program. Access to the Study programme dashboard is granted upon entering the correct username and password. Once logged in, users can choose from various menu options, such as submitting data requests, managing administrative tasks, and more, with the results displayed in Figure 10. The main activities of the study program on the dashboard include monitoring administrative affairs, governance, and collaborations, tracking student data, overseeing human resources, monitoring financial aspects, facilities and infrastructure, observing educational data, tracking research information, monitoring community engagement data, observing outcomes and achievements related to education, research, and community service (tridharma), and viewing profiles of study program management units. Additionally, the dashboard provides information, account settings, and a logout option, all accessible from the left sidebar. These primary program activities are conveniently displayed on the left sidebar of the dashboard interface.

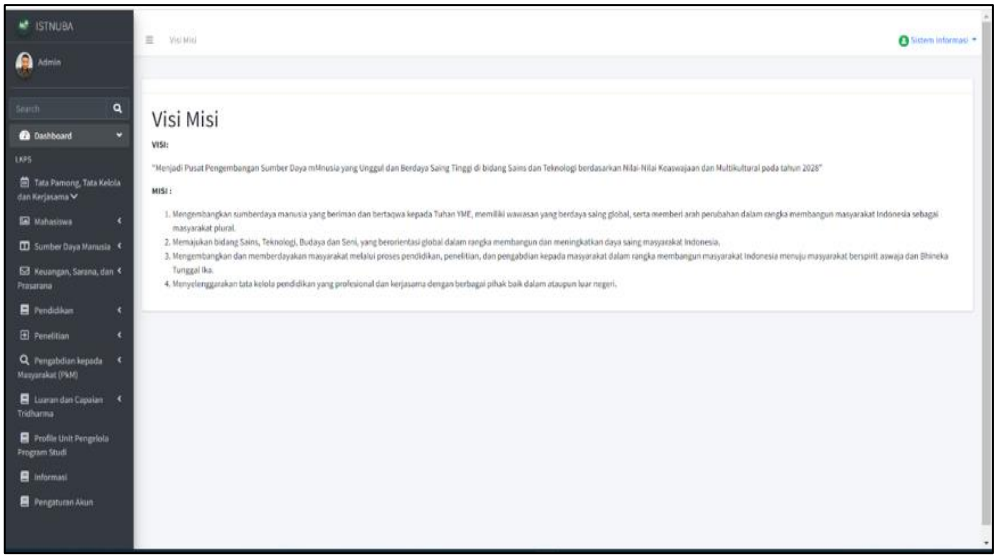

Fig. 10 Study Programme Dashboard Page

The interface is a critical component in the accreditation documentation process for study programme. It serves as the primary gateway for users to interact with the system and manage all aspects of the accreditation process. Whether it's faculty members uploading essential documents, administrators reviewing and approving submissions, or evaluators accessing program details, every element of the interface has been carefully designed to facilitate these actions seamlessly. Each element of the interface has been thoughtfully crafted to serve a specific purpose and contribute to the overall functionality of the system. From intuitive navigation menus that guide users through various stages of the accreditation process to well-organized data entry fields that ensure accurate and easy input of information, every detail has been considered. Furthermore, the user interface aims to enhance the overall user experience by providing a visually appealing and cohesive design. The layout and aesthetics were thoughtfully chosen to improve usability, reduce cognitive load, and minimize the learning curve for users interacting with the system.

Black-Box Testing Result

The effectiveness testing of the system is carried out through two methods, namely Black-box Testing and user response instruments. Within this system, Black-box Testing will be conducted on three users: admin, assessor, and study programme. Black Box Testing is a test that verifies the results of application execution based on the input provided to ensure that the functionality of the application is appropriate with the requirements (Mahendra & Asmarajaya, 2022). Presented below are the outcomes of the Black-box Testing conducted on the admin user. Table 1 displays test case with correct flow data for admin user, while Table 2 displays test case with incorrect flow data for admin user.

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Table 1. Test Case with Correct Flow Data for Admin User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Perform Login with admin access rights	The system will check the username and password and display the admin Dashboard page	The system displays the admin Dashboard page	[✓] Correct [ ] Incorrect
2	Manage study programme (add, delete, edit)	The system will process the command based on the input and display a success notification	The system displays a success notification and returns to the page	[✓] Correct [ ] Incorrect
3	Manage Admins (add, delete, edit)	The system will process the command based on the input and display a success notification	The system displays a success notification and returns to the page	[✓] Correct [ ] Incorrect
4	Manage Information (add, delete, edit)	The system will process the command based on the input and display a success notification	The system displays a success notification and returns to the page	[✓] Correct [ ] Incorrect
5	Log out of the system	The system will process the command and display the login page	The system displays the login page	[✓] Correct [ ] Incorrect

Table 2. Test Case with Incorrect Flow Data for Admin User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Incorrect input of username and password	The system will display an error notification and return to the login page	The system displays the login page	[✓] Correct [ ] Incorrect
2	Not filling in the form fields	The system will display a notification that the field should not be empty	The system displays a notification that the field should not be empty	[✓] Correct [ ] Incorrect

Presented below are the outcomes of the Black-box Testing conducted on the study programme user. Table 3 displays test case with correct flow data for study programme user, while Table 4 displays test case with incorrect flow data for study programme user.

Table 3. Test Case with Correct Flow Data for Study Programme User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Perform login with admin access rights	The system will check the username and password and display the admin Dashboard page	The system displays the admin Dashboard page	[✓] Correct [ ] Incorrect
2	Manage study programme (add, delete, edit)	The system will process the command based on the input and show a successful notification	The system displays a successful notification and returns to the previous page	[✓] Correct [ ] Incorrect
3	Manage Admin (add, delete, edit)	The system will process the command based on the input and show a successful notification	The system displays a successful notification and returns to the previous page	[✓] Correct [ ] Incorrect
4	Manage Information (add, delete, edit)	The system will process the command based on the input	The system displays a successful notification	[✓] Correct [ ] Incorrect

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No	Test Case	Expected Result	Obtained Result	Remarks
		and show a successful notification	and returns to the previous page	
5	Log out of the system	The system will process the command and display the login page	The system displays the login page	[✓] Correct [ ] Incorrect

Table 4. Test Case with Incorrect Flow Data for Study Programme User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Incorrect username and password input	The system will display an error notification and return to the login page	The system displays the login page	[✓] Correct [ ] Incorrect
2	Leaving the form fields empty	The system will display a notification that the fields cannot be empty	The system displays a notification that the fields cannot be empty	[✓] Correct [ ] Incorrect

Presented below are the outcomes of the Black-box Testing conducted on the internal assessor user. Table 5 displays test case with correct flow data for internal assessor user, while Table 6 displays test case with incorrect flow data for internal assessor user.

Table 3. Test Case with Correct Flow Data for Internal Assessor User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Perform login with admin access rights	The system will check the username and password and display the assessor's Dashboard page	The system displays the assessor's dashboard page	[✓] Correct [ ] Incorrect
2	Download assessment submission file	The system processes the command and displays the downloaded file	The system displays the downloaded file	[✓] Correct [ ] Incorrect
3	Perform internal assessment by entering assessment scores	The system processes the command and displays a success notification	The system displays the study programme status as 'submitted'	[✓] Correct [ ] Incorrect
4	View internal assessment results	The system displays the list of assessment results and shows the 'view results' button	The system displays the internal assessment results	[✓] Correct [ ] Incorrect
5	View information	The system displays the list of information and shows the 'download' button	The system displays the selected information	[✓] Correct [ ] Incorrect
6	Manage account settings (edit password)	The system processes the command and displays a success notification	The system displays a success notification and returns to the Dashboard page	[✓] Correct [ ] Incorrect
7	Log out from the system	The system processes the command and displays the Login page	The system displays the Login page	[✓] Correct [ ] Incorrect

Table 4. Test Case with Incorrect Flow Data for Internal Assessor User

No	Test Case	Expected Result	Obtained Result	Remarks
1	Incorrect username and password input	The system will display an error notification and return to the login page	The system displays the login page	[✓] Correct [ ] Incorrect

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User Experiences Questionnaire Result

The User Experience Questionnaire was employed to assess user responses, involving the program's chair, the Rector, and stakeholders involved in formulating the questionnaire. The survey was conducted with 7 respondents, comprising 26 questions representing 6 categories. Based on the collected data, a reliability test was performed to determine the level of confidence in the obtained data. The Alpha values for each category have reliable and positive result in every category. The results of the reliability test for each category in this study are displayed in Figure 11.

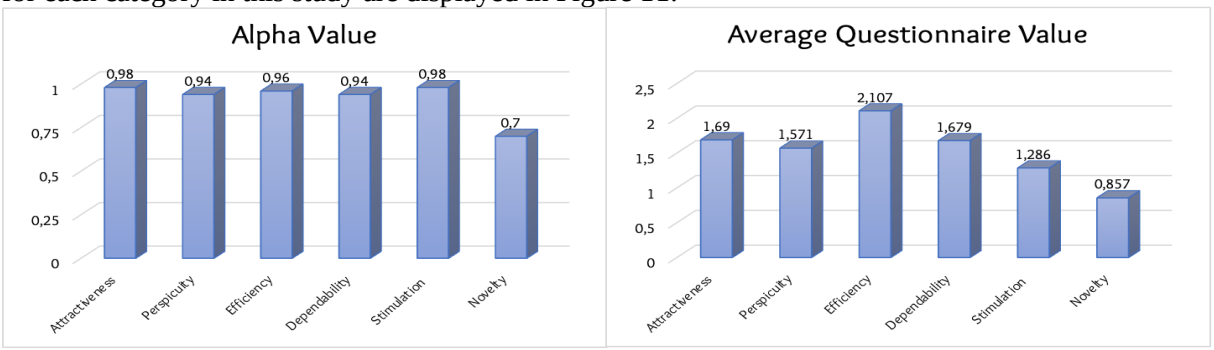

Fig. 11 Alpha Value and Average Questionnaire Value from UEQ

Based on the chart in Figure 11, it illustrates the evaluation results of each user experience measurement variable using the User Experience Questionnaire on the developed application. All aspects received an average score above 0.8, indicating a positive level of user experience. After obtaining the average scores, a comparison of alpha values for each aspect was conducted against the benchmark dataset. The following presents the outcomes of the benchmark process using UEQ analysis.

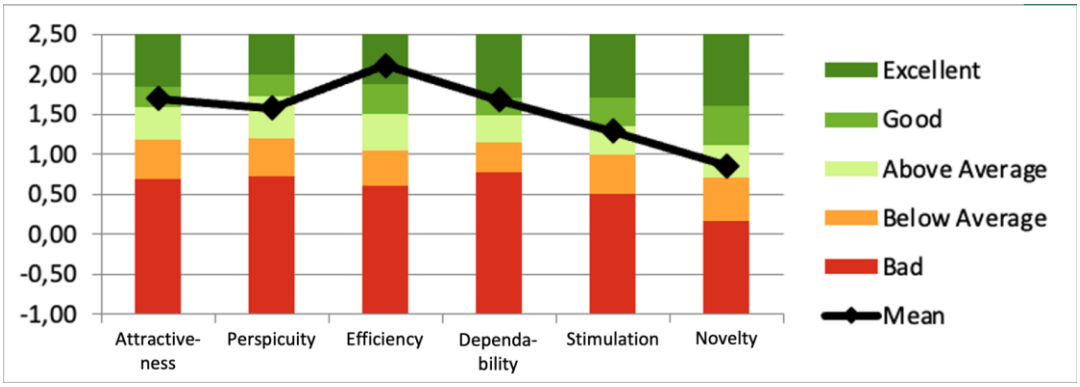

Fig. 12 UEQ Benchmark Result

DISCUSSIONS

The introduction of the system to the stakeholders within the institution was carefully orchestrated through informative and engaging presentations. Key figures such as the esteemed rector, dedicated foundation members, study programme coordinators, and the committed staff were all brought together to participate in these essential sessions. The primary goal behind this process of socialization was to ensure that all relevant parties were familiarized with the new system's functionalities, advantages, and potential impacts on their respective roles and responsibilities. During these presentations, ample opportunities were provided for stakeholders to ask questions, express concerns, and provide valuable feedback. As the system was put into action following the constructive socialization period, it quickly demonstrated its effectiveness and efficiency in carrying out its intended functions. The positive outcomes that ensued from its deployment brought about a notable transformation in various aspects of the institution's operations. Processes were streamlined, communication was enhanced, and resource allocation became more optimized. In light of the system's impressive track record and the overwhelmingly positive response from stakeholders, it has been deemed highly suitable for continuous utilization. The strategic socialization and successful implementation of the system have been pivotal in

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not only garnering support but also fostering a collaborative and innovative culture within the institution. The active involvement of stakeholders and their valuable feedback have played a crucial role in shaping the system's present state and will continue to influence its future evolution. With its enduring impact on the institution's efficiency and effectiveness, the system stands as a testament to the power of cohesive teamwork and forward-thinking approaches in driving progress and excellence.

CONCLUSION

Based on the research findings presented earlier, the following conclusions can be drawn. The built system caters to three types of users: an admin who manages the system, an assessor who evaluates the submitted forms, and a head of the study program responsible for inputting accreditation data. The data structure of the system efficiently stores accreditation-related information. The developed application performs effectively, as evidenced by positive results from black box testing. The data analysis from 7 respondents using descriptive analysis in categories of Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation and Novelty, yielded average scores above 0.8, indicating a positive level. Based on the benchmark results for each aspect of the UEQ, Attractiveness has a value of 1.69 with the good category, Perspicuity has a value of 1.57 with the above average category, Efficiency has a value of 2.11 with the excellent category, Dependability has a value of 1.68 with the good category, Stimulation has a value of 1.29 with the above average category, and Novelty has a value of 0.86 with the above average category.

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