Jurnal Mantik, 7 (3) (2023), ISSN 2685-4236 (Online)

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik

Management information system modeling within the framework of the accreditation dashboard based on key performance indicators

Puspoko Ponco Ratno[1], Moh. Zainal Fanani[2]

[1,2]Program Studi Manajemen Pendidikan Islam, Institut Agama Islam Negeri (IAIN) Kediri, Indonesia

A R T I C L E I N F O

Article history:

Received Oct 23, 2023
Revised Nov 06, 2023
Accepted Nov 14, 2023

Keywords:

Accreditation Dashboard;
Management Information System;
Prototyping Method.

ABSTRACT

Accreditation is a quality guarantee or assessment of the suitability of study programs and higher education by the National Accreditation Board for Higher Education (BAN-PT). At the time this research was created, the Study Program at the Faculty of Tarbiyah was still processing and collecting reports manually, namely by using Ms. Excel and Ms. Word. This process still needs to be more effective regarding time and data accuracy. This research aims to produce prototype models of several accreditation criteria modules such as finance, facilities, infrastructure, and learning systems as part of SIMAKRE to make it easier for study programs to manage, process, and collect the data. The method used in this research is the Prototyping method using the web-based Laravel framework. Testing was carried out using the Black-box method. The test results of this system show that all functions run well according to user needs. The accreditation dashboard application aims to enhance efficiency in the accreditation process, especially ini Tarbiyah Faculty. This system can integrate data, show information in a style that is easy to grasp, and simplify the reporting process

Corresponding Author:

Puspoko Ponco Ratno,
Program Studi Manajemen Pendidikan Islam,
Institut Agama Islam Negeri (IAIN) Kediri,
Jl. Sunan Ampel No.7, Ngronggo, Kec. Kota, Kota Kediri, Jawa Timur, 64127, Indonesia.
Email: puspoko.ponco@iainkediri.ac.id

1. INTRODUCTION

Today's rapid development of information technology has provided various facilities regarding effectiveness, efficiency, accuracy, and information innovation. Information technology has become a very dominant factor as a solution for an organization to solve the problems it faces. An information system is a type of software that is expected to play a role in the future of IT and can be used to address the challenges at hand (Fajarwanto et al., 2023; Ibrahim et al., 2020). Some forms of information systems, especially in the world of education, which today we can feel benefits such as Academic Information Systems (SIAKAD), E-Learning, Library Information Systems, and many more examples. Information systems become an absolute necessity for any organization or institution, whether governmental or private because the whole activity carried out requires

information (Diningrat et al., 2022; Stair RM, 2012). *Information* is an organization's absolute resource to support the entire management process to achieve a predefined goal (Dewi Octavia Sakti & Dwihanus, 2023; Mahato & Yadav, 2023; Taeza Cruz & Ballera, 2023)

A college requires accreditation as a form of evaluation of the eligibility of a program in an educational unit. According to the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 59 of 2012 on the National Accreditation Board for Higher Education (BAN-PT) Article 1 No. 8, accreditation is an activity of assessing the eligibility of programs and higher education units based on the standards that have been established to provide quality assurance of higher education (Badan Akreditasi Nasional-Perguruan Tinggi, 2017; Nugraha et al., 2023; Salbiyath et al., 2022).

Accreditation is a form of assessment (evaluation) of the quality and suitability of higher education institutions or departments carried out by organizations or independent bodies outside higher education (Kelembagaan Riset, Teknologi, 2016) . This assessment is used as a quality benchmark for all departments and higher education institutions ranging from state and private universities that provide professional and academic programs. A better accreditation score will impact outsiders' views regarding the quality of the department and higher education institutions (Habib et al., 2021; Yazidinni, 2019). The aim and benefit of higher education institution accreditation is to provide guarantees that accredited higher education institutions have met the quality standards set by the National Accreditation Board for Higher Education (BAN-PT) to protect the community from higher education institutions that do not meet standards. Then, encourage universities to make improvements and maintain high quality continuously (Kelembagaan Ristekdikti, 2016; Yusuf et al., 2022). The accreditation results can be used as consideration in credit transfers, proposals for assistance, and allocation of funds, as well as obtaining recognition from interested bodies or agencies. The accreditation process is carried out over a certain period and needs to be updated six months before the accreditation period ends (Badan Akreditasi Nasional-Perguruan Tinggi, 2017; Habib et al., 2020).

The accreditation system is one of the parameters for knowing the quality assurance of a college or a study program, where the assessment of accreditations is determined by the National Accreditation Body of Colleges (BAN–PT), known as the Key Performance Indicator (KPI) (Habib, A., Satya, R. ., & Hariadi, 2022; Saputro et al., 2012a) . The quality assessment is based on the KPI standard that has been made by the BAN-PT, with the aim that the college or the study program can evaluate its internal condition based on that standard. A common problem that is often faced in the run-up to the accreditation process, whether it be college accreditations or study programs, is the spread of data – the data required for the accreditation process, so it takes time to organize the data – based on the criteria that have been established (Mansyur et al., 2020; Ujakpa et al., 2022). In order to manage information systematically, the experts have developed a new orientation in the field of information management known as "management information systems" that are tasked with organizing the information needs and data required in the evaluation process, as well as displaying the results in the form of an exciting and user-friendly visualization, known as the Dashboard System (Nwakesiri, 2022; Yusuf et al., 2022). Through this dashboard system, the internal parties of the college or study program are expected to monitor and control the data and information needed for the accreditation process effectively and efficiently.

2. RESEARCH METHOD

The method for developing this information system is the Prototyping paradigm. The Prototyping Method is a software development method carried out repeatedly with repeated evaluation and feedback. The Prototyping Method is a software development method that follows the development stages: communication, quick planning, modeling

quick design, construction of prototype, and deployment delivery and feedback (Pressman RS., 2010), which can be seen in Figure1.

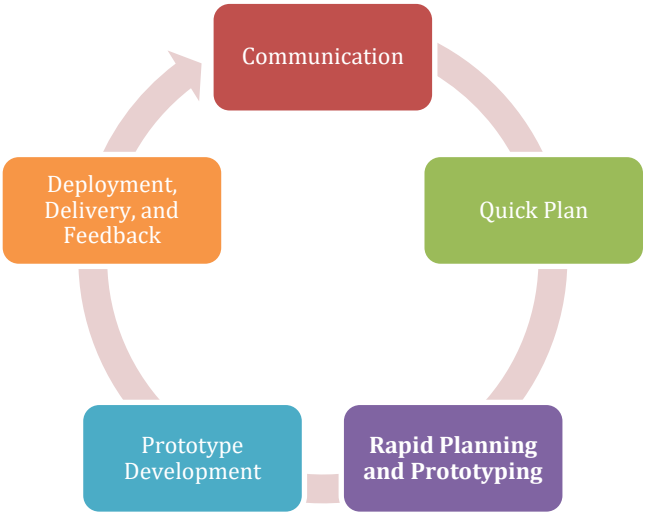

Figure 1 Paradigm of the iterative prototyping process starting from communication, quick plan, modeling quick design, construction of the prototype, then deployment delivery & feedback (Pressman RS., 2010)

2.1 The stages of this research are:

a. Communication

At this communication stage, the developer conducted interviews (Saputro et al., 2012b) with the Head of Administration (KTU) of the Tarbiyah Faculty, the Head of the Islamic Education Management Department (MPI), and the Head of the Quality Assurance Institute (LPM). Communication to determine software requirements, identify currently known requirements, and delineate further areas for further iteration. Some of the questions asked by developers include: (a) Who holds this study program's financial data, infrastructure, and information systems (b) How is data processed, and financial reports, infrastructure, and information systems for accreditation will be reported to the Tarbiyah Faculty (c) What are the obstacles faced (d) What are the financial calculations for the use of funds

b. Quick Plan

After communication, the planning stage is carried out. The quick plan stage focuses on representing the aspects of the software that will be visible to the end user(Yazidinni, 2019). The quick plan contains a use case diagram, use case description, and activity diagram regarding the system that will be created Standard 5 (finance, facilities, infrastructure, and information systems) and Standard 6 (Learning Systems) modules.

c. Rapid Planning and Prototyping

The quick design modeling stage is the basis for starting prototype construction. Rapid design consists of designing functional requirements, namely class diagrams, sequence diagrams, and interface design with mockups for Standard 5 and Standard 6 modules (Wibowo & Andri, 2021).

d. Prototype Development

At this stage, the implementation of the system to be created is carried out(Dian Septama et al., 2021). Implementation of the development of Standard 5 and Standard 6

in the accreditation management information system for the TARBIYAH FACULTY undergraduate program. This development uses the PHP programming language with the Laravel 5.5 framework and MySQL as database management.

e. Deployment delivery & feedback

At this stage, testing, deployment, and delivery of the system is carried out, which is a process carried out by stakeholders to evaluate previously created prototypes and provide feedback which is used to improve the system requirements specifications(Diningrat et al., 2022). Iteration occurs when developers make improvements to the prototype. The repetition ends after two repetitions

3. RESULTS AND DISCUSSIONS

The method used in developing this system is prototyping. The stages in prototyping are communication, fast planning, fast design modeling, prototyping, distribution, delivery, and feedback (Camburn et al., 2015). The development of this system according to the Prototyping method was carried out twice.

3.1 First Repetition

a. Communication

At this stage, interviews were conducted with the Head of the TU Department of the Tarbiyah Faculty, the Head of the MPI Study Program, the Head of the PAI Study Program, the Head of the Quality Assurance Group (GPM) of the Tarbiyah Faculty, and also the Quality Assurance Institute (LPM) IAIN Kediri, as well as several Accreditation Team members who were members of the implementation or creation team 3A accreditation form. In stakeholder interviews, information was obtained regarding the accreditation system for study programs and at the Tarbiyah Faculty of IAIN Kediri. In the initial stage, each study program creates a team to create 3A forms. Teams consist of lecturers or employees, and each team is divided into tasks based on standards, for example, KTU or Facilities & Property and PKU for Standard 5. Each lecturer or employee is assigned to collect, process data, and make reports regarding the standards. Data processing and form creation are still done manually, namely by using Ms. Excel and Ms. Word. This process still needs to be more effective regarding time, completeness, and accuracy of reports. Even for faculties, making the 3B form requires data from the study program, which is an obstacle in making the accreditation form.

This communication stage carries out a system needs analysis regarding Standard 5 of accreditation for finance, facilities, infrastructure, and information systems and for Standard 6 regarding learning systems. The results of the user needs analysis can be seen in Table 1.

Tabel 1 The results of user needs analysis.

User Categories	User Requirements
User (Finance) Departement	View reports
Bendahara Fakultas	Addition of standard 5 data Make changes to Standard 5 data Deleting Standard 5 data Download the report based on the Standard 5 accreditation form Addition of standard 6 data
User (Bagian Pendidikan)	Make changes to Standard 5 data Deleting Standard 5 data Download the report based on the Standard 5 accreditation form
Admin	Add the user Delete user Change user Downloading reports based on form 3A

Super Admin	Add user Delete user Change the user See and and download accreditation reports of all standards based on form 3B

The user above is the primary user for entering data. Another user can replace the primary user by adding or changing users by the Admin. This user change occurs because the primary user cannot enter data for some reason. In addition, because each user's accreditation is not fixed, it will change according to the agreement on the division of tasks for each study program and faculty. Changes or differences in users for each study program mean that this system makes accounts based on standards. The accounts are determined based on standards.

b. Quick Design

This prototype design stage creates use cases, use case descriptions, and activity diagrams based on previous functional requirements at the communication stage. The use case diagram can be seen in Figure 2. This use case shows tasks that users can carry out, such as adding data, deleting data, changing data, searching for data, and downloading reports.

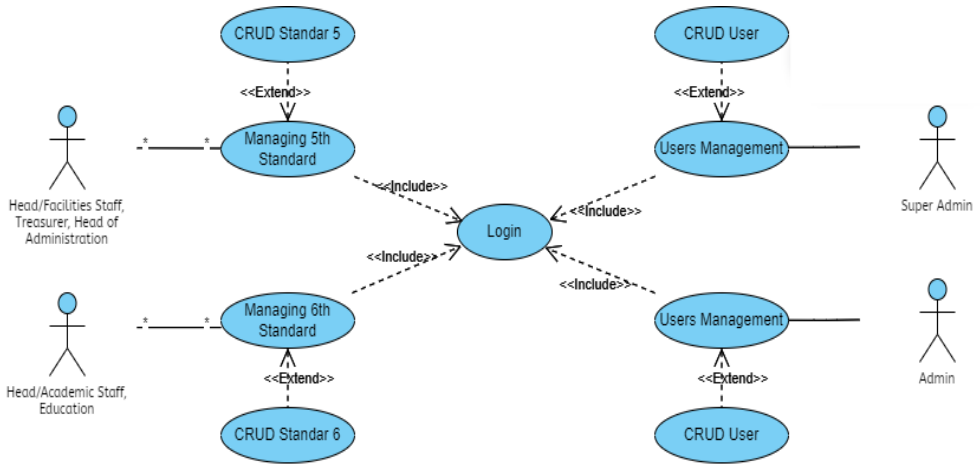

Figure 2 Use case module (ex: Standards 5 and 6), the user on the left of the image is the user for managing data, and the right user is Admin/Super Admin

Where : (a) The admin or coordinator can process users. After logging in, the user will be faced with menus and functions according to the tasks added to the system by the coordinator. (b) CRUD: *Create, Read, Update, Delete (c)* <<*includes*>>: The intended use case must pass through other use cases. (d) <<*extends*>>: The intended use case doesn't depend on any other use cases to work. *: All

A use case description is written after a use case diagram has been developed. This use case description serves as a high-level overview of the system's business process capabilities. In Table 2, we can see a sample use case describing the incorporation of monetary inflows.

Tabel 2 Use case description of monetary inflows

Use case Name:	Increase receipt of fund
Scenario:	Adding data to the accreditation table on receipt of funds (source of funds, type of funds, and amount of funds received).
Triggering Event:	Sign in/sign up and select the Funds Receipt submenu.
Brief Description:	1. User selects the Funds Receipt submenu 2. The page containing the Fund Receipts list table contains

	the source of funds, type of funds, amount of funds, and year of receipt. 3 . The user presses the add button above the fund's receipt table. 4. A capital form and monetary receipt will be generated by the system 5. After completing the form, users proceed to save their input by clicking on the proper save button.
Actors:	Cash Unit Holders (PKU)
Related Use Case:	Login and download the reports
Stakeholders:	Unit Cash Holder, Department Secretary, Tarbiyah Faculty Treasurer, Head of Department administration, Head of Tarbiyah Faculty administration, Head of department
Preconditions:	Upon successful login, the user navigates to the page dedicated to receiving funds.
Postconditions:	The Fund Receiving page will show the information saved in the database.
Flow of Activities:	1. Users select the Funds Receipt submenu Displays the Funds Receipts page which contains a list of funds received 2 User presses the add button. Displays a form containing the source and type of funds, amount of funds, and year of receipt of funds 3 User presses the save button. Sending data to the database and displaying it in a table on the funds receipt page
Exception Conditions:	If the user is not authenticated, they are unable to input any data.

In addition to the creation of a use case and use case description, an activity diagram is also generated at this phase. The presented activity diagram illustrates the sequential progression involved in the generation of reports for the purpose of accreditation. The sequence of events commences with a user input, prompting the system to execute the corresponding command provided by the user. The activity diagram is depicted in Figure 3.

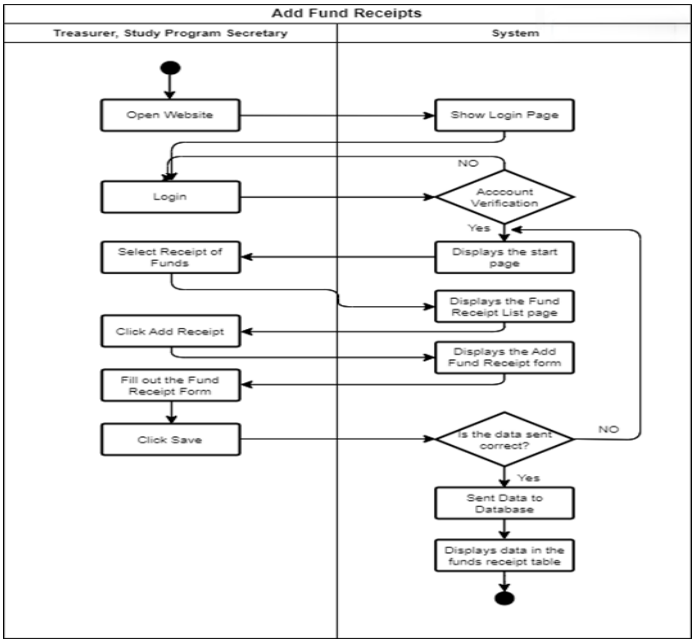

Figure 3 Activity diagram Add funds receipt, □: starting point, □: ending point, ◊: describes a decision taken, □: activities carried out by the user or system

c. Prototype Modeling

At this stage, models, class diagrams, and sequence diagrams are made. This class map shows how classes are structured and what they are used for in Standards 5 and 6. It also shows how classes relate to each other. A class is a way to group things together to describe them. There are 43 classes in this subject. Using PhpMyAdmin to set up the database on this machine, which is named db_simta. There are 43 tables in this database for Standards 5 and 6 that hold the information needed to make forms. Figure 4 shows these tables.

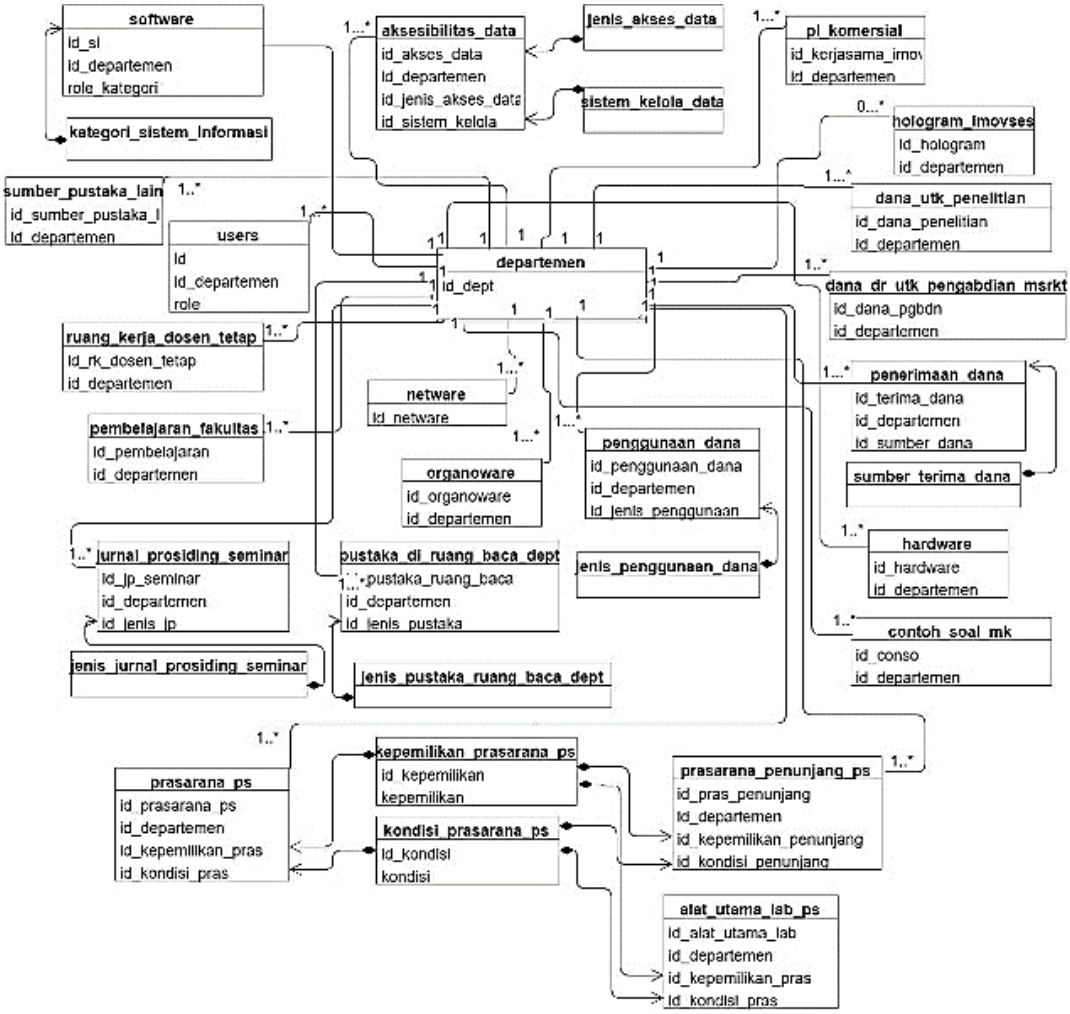

Figure 4 Domain class diagram Standar 5 and 6

The domain class diagram, as seen in Figure 4, showcases the methodology employed for class identification inside the class diagram and the interconnections between said classes. The domain class encompasses attributes and relationships about each individual class. The system exhibits associations and compositions as the primary forms of interactions between classes. The concept of association refers to a fixed and unchanging connection between two classes that have a multiplicity. Multiplicity refers to the numerical representation of the interconnectedness of objects between classes. An illustrative instance within the context of the Standard 5 table pertains to the fund_receipt, which exclusively contains data pertaining to the reception of funds. The utilization of the source_received_funds table is essential for determining the origin of funds. Additionally, the research program and user table are utilized to identify the

specific study program responsible for inputting data. This enables the data to be filtered and processed according to the respective study program. The relationship between study program classes and fund receipts is characterized as one-to-many (1…1*), indicating that a single study program might be associated with one or several fund receipts. In addition to association, the fund_receipt entity exhibits a composition relationship with the fund_receipt_source entity, whereby the fund_receipt_source entity is an essential component of the fund_receipt entity. The methods of each class are not depicted in the domain class diagram. The class diagram illustrates the methods associated with each class, specifically highlighting four methods related to receiving funds: add(), modify(), delete(), and calculate total funds ().

In addition to class diagrams, this step also generates sequence diagrams and mockups. The sequence diagram is depicted in Figure 5. The present sequence diagram depicts the interactions among various objects inside the system and its surrounding environment. A mockup refers to a fundamental system design that serves as an illustrative representation of system development. The medium-quality mockup encompasses the design and evaluation of the interactive elements, such as navigation, functionality, content, and layout. The mockup depicted in Figure 6 is observable.

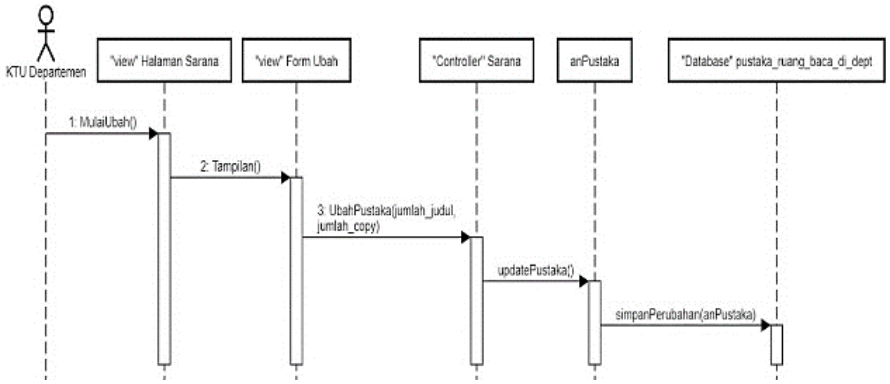

Figure 5 Sequence diagram of change Library procedure

d. Prototype Development

This phase entails the execution of the design by developing a system utilizing the PHP programming language and the Laravel 5.5 framework. The Standard 5 module consists of four primary menus and six submenus, while the Standard 6 module comprises two menus. The menu is designed in accordance with the requirements outlined in the accreditation form. The necessary menu items encompass money, facilities, infrastructure, information systems, and learning systems. Upon logging in, each user will be presented with a menu that corresponds to their specific responsibility in the process of creating the accreditation form. Access to the financial menu is restricted to the Cash Unit Holder (PKU) or Treasurer, while the infrastructure and information system menu is exclusively accessible to KTU. The learning system, on the other hand, can only be accessed by GPM. The administrative and superadministrative roles, including the KTU, GPM, Head of Study Programme, and Faculty Deans, possess the authority to access all menus and standards within the system. However, it is possible for user input to be modified or substituted by administrators and super administrators.

3.2 Second Repetition

a. Rapid Planning and Prototyping

In the current phase, modifications have been made to the alat_utama_lab_ps, journal_proceeding_seminar, and prasarana_ps tables, resulting in alterations to the class diagram. The aforementioned alterations are observable in Figures 6 and 7.

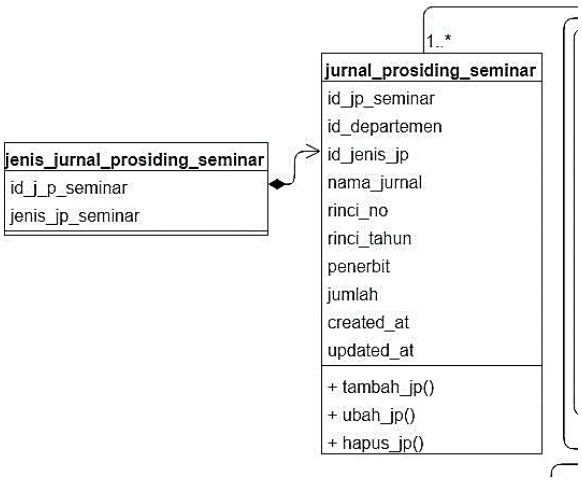

Figure 6 Class diagram adding *penerbit* attributes to the seminar proceedings journal table

Figure 7 Class diagram adding length, width attributes to the infrastructure_ps table and adding unit_price, quantity_price and purchase_date attributes to the alat_main_lab_ps table

The journal_proceeding_seminar class, seen in Figure 6, includes the addition of the publisher attribute to the system requirements specified by the user. Concerning Figure 7 presented earlier, it is worth noting that the tool_main_lab_ps class has incorporated more attributes, specifically unit_price, price_quantity, and purchase_date. Furthermore, prasarana_ps has been enhanced by the inclusion of length and width attributes.

b. Prototype Development

The current stage represents the implementation phase of the second iteration. In accordance with the second message sent to the user, this stage involves the inclusion of properties to the Journal List/Seminar Proceedings and Infrastructure Data tables. The visual representation of these modifications is observable in Figures 8 and 9.

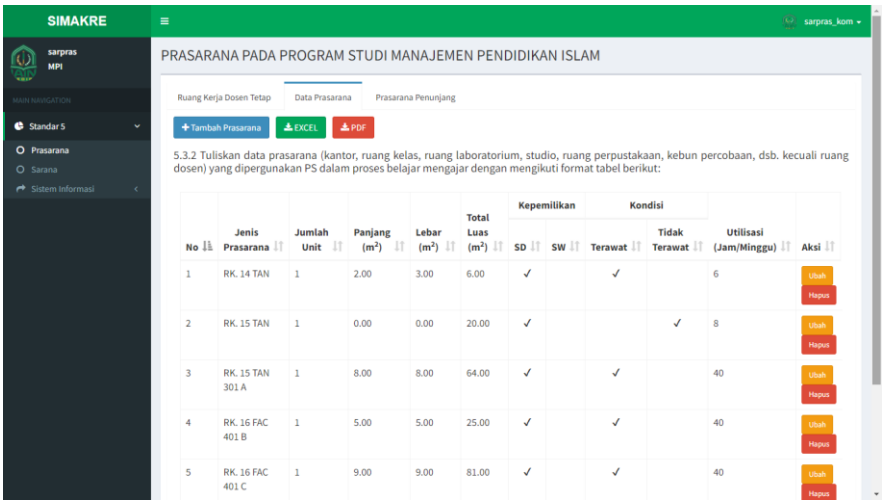

Figure 8 The Infrastructure Data menu becomes visible once the length and width attributes have been added.

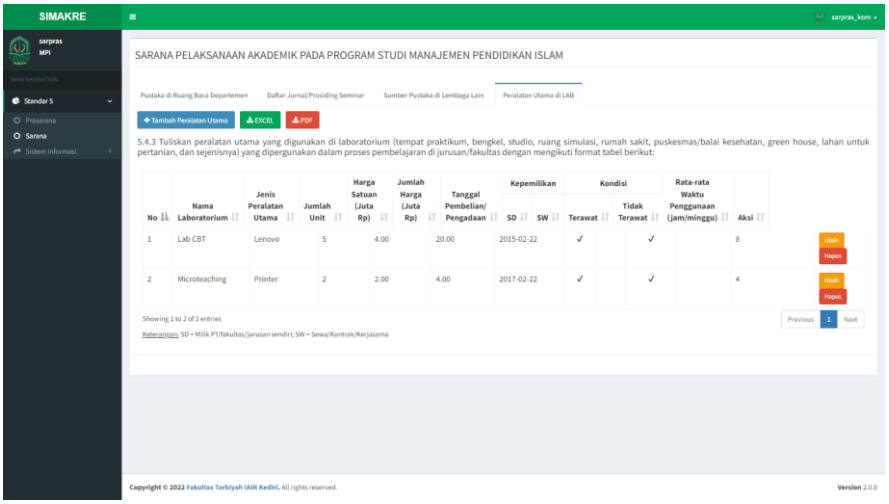

Figure 9 Laboratory Main Equipment List with Unit Price, Total Price, and Date Purchased

c. Implementation, Transfer, and Evaluation

At this point, the outcomes of evaluating the system in its whole up to the second iteration indicate that the system possesses the capacity to fulfill user requirements. The testing methodology employed in this study utilizes the black-box approach, which primarily emphasizes the examination of system operation, namely the input and output aspects.

Tabel 3 The test findings obtained by the utilisation of the black box method

Test cases	Input value	Testing scenarios	Expected data	Test results
Log in	True	Fill in email and password	The user has successfully logged in and entered the home page	Succeed
Add *user*	True	Fill in name, username, password, email and position.	User has been successfully added and has an account	Succeed
Revise the information regarding the quantity of	True	Fill in the number of titles and number of	Data has been successfully changed on the system	Succeed

reading rooms inside the department.		library copies		
Input journals/ seminar proceedings	True	Fill in the type of journal received, journal name, details of number and year, and amount	Data has been successfully added to the database	Succeed
	False	Fill with empty data	Data cannot be added to the database	Succeed
Make changes to journals/ seminar proceedings	True	Fill in the type of journal received, journal name, details of number and year, and amount	The data has been successfully changed in the database	Succeed
Delete journal data/seminar proceedings	True	Confirm yes to delete the data	Data has been successfully deleted in the database	Succeed
Input library sources at other institutions	True	Fill in the name of the library source	Data added successfully	Succeed
Add data to the main equipment in the Lab	True	Fill in the name of the lab, type of main equipment, number of units, ownership, condition and average usage time	Data added successfully	Succeed
Change permanent lecturer work space data	True	Fill in the number of rooms and total area (m^2)	Data changed successfully	Succeed
Add infrastructure data	True	Fill in the type of infrastructure, number of units, total area (m^2), ownership, condition and utilities	Data has been successfully added to the database	Succeed
Added hardware data	True	Fill in the hardware name, specifications, quantity and description	Data has been successfully added to the database	Succeed
Add information system data in the department	True	Fill in the system name, form, developer, system features, category and upload an image file	Data added successfully	Succeed
	False	Fill in the name, system, developer, features, category and upload a non-image file	Data cannot be added	Succeed
Change data accessibility	True	Changing data management systems for all types of data	Data changed successfully	Succeed
Upload examples and syllabuses	True	Upload files in pdf, docs, doc format.	Data added successfully	Succeed
	False	Upload files in image form	Data cannot be added	Succeed
Download pdf files	True	Select the download pdf menu	Displays tables according to the template	Succeed

4. CONCLUSION

The present study has effectively produced a prototype model of a dashboard for an accreditation information system. This model serves as an illustration, specifically in the context of Standard 5, which pertains to Finance, Facilities, Infrastructure, and Information Systems, as well as Standard 6, which concerns Learning Systems. The

approach employed in this study is the Prototyping method. The system in question is called SIMAKRE, which stands for Accreditation Management Information System. The purpose of this system is to cater to the study programs and faculties within the Tarbiyah Faculty of IAIN Kediri, with a particular focus on the Islamic Education Management (MPI) study program. The findings from the test results revealed that the modeling of the management information system within the accreditation dashboard framework was centered around the utilization of key performance indicators (KPIs). These KPIs were employed to support the Islamic Education Management study program at the Faculty of Tarbiyah IAIN Kediri in effectively preparing for the accreditation process of said department or study program. Further work is still needed for SIMAKRE in order to fulfill many system requirements that are now unavailable. One such requirement involves enhancing the certification template inside the system, particularly if a more recent template has been released. There is an expectation that the integration of the SIMAKRE system with pre-existing data or information systems within study programs or faculties can be further enhanced. This would enable the SIMAKRE system to autonomously access data inputted into both the academic information system (SIAKAD) and other information systems on the IAIN Kediri institution. The research findings may not be readily applicable to other educational institutions that possess distinct characteristics. To optimise the development of this application, it would be advantageous to create an adaptable model that can customise the user experience and offer tailored recommendations based on the unique requirements and circumstances of educational institutions.

REFERENCES

Badan Akreditasi Nasional-Perguruan Tinggi. (2017). *Peraturan Badan Akreditasi Nasional Perguruan Tinggi Nomor 4 Tahun 2017 tentang Kebijakan Penyusunan Instrumen Akreditasi*. BAN-PT.

Camburn, B., Dunlap, B., Gurjar, T., Hamon, C., Green, M., Jensen, D., Crawford, R., Otto, K., & Wood, K. (2015). A systematic method for design prototyping. *Journal of Mechanical Design*, *137*(8), 81102.

Dewi Octavia Sakti, S., & Dwihanus. (2023). Peran Sistem Informasi Manajemen (SIM) dalam Pengambilan Keputusan. *Jurnal Manajemen Dan Ekonomi Kreatif*, *1*(1), 212–225.

Dian Septama, H., Komarudin, M., Studi Teknik Informatika Universitas Lampung, P., Lampung Jl Sumantri Brojonegoro No, B., & Lampung, B. (2021). Pengembangan Dashboard Instrumen Akreditasi Program Studi Versi 4.0 (IAPS 4.0) Menggunakan Laravel Framework. *Electrician : Jurnal Rekayasa Dan Teknologi Elektro*, *15*(3), 217–223. https://doi.org/10.23960/ELC.V15N3.2176

Diningrat, M. S. M., Simanjuntak, D., & ... (2022). Perancangan Aplikasi Dashboard Monitoring Untuk Peningkatan Akreditasi Program Studi Institusi Di Politeknik APP Jakarta. *Jurnal Informa ….* http://www.informa.poltekindonusa.ac.id/index.php/informa/article/view/226

Fajarwanto, A., Sentosa, G. A., Saputra, R. A., Widyastuti, A. R., Wardani, S. G., & Munandar, D. A. (2023). Managing Mega Project with Digital Construction Technology through Project Management Information System (PMIS) Dashboard: A Case Study of Trans Sumatera Toll Road Project. *Prosiding KRTJ HPJI*, *16*(1), 1–17. https://doi.org/10.58674/PHPJI.V16I1.340

Habib, A., Satya, R. ., & Hariadi, B. (2022). Development of Management Information System Rental Service Photography Web-Based Using PHP Native Case Study at PT Dwipa Photowork Surabaya. *Jurnal Mantik*, *6*(1), 408–416.

Habib, A., Jani, M. A., Pratama, D. A., & Ronando, E. (2020). Development of archives management information system with RFID and SMS gateway. *International Journal of Psychosocial Rehabilitation*, *24*(4), 5227–5243. https://doi.org/10.37200/IJPR/V24I4/PR201621

Habib, A., Januantoro, A., & Srimarsono, O. C. (2021). Development of Management Information System Reservations Using Simple Multi-Attribute Rating Technique (SMART) Based on Android Mobile Applications. *SISFORMA*, *8*(1), 37–43. https://doi.org/10.24167/SISFORMA.V8I1.3024

Ibrahim, M. M., Kautsar, R. D., Muwahid, S. F., Rohmah, S., & Ilman, T. N. (2020). AUDIT SISTEM INFORMASI INVENTORY PADA PT. KARINA MENGGUNAKAN FRAMEWORK COBIT 5.

INFOMATEK: Jurnal Informatika, Manajemen Dan Teknologi, *22*(1), 31–34. https://doi.org/10.23969/INFOMATEK.V22I1.2749

Kelembagaan Riset, Teknologi, dan P. T. (2016). *Peraturan Menteri Riset, Teknologi, Dan Pendidikan Tinggi Republik Indonesia Nomor 32 Tahun 2016 Tentang Akreditasi Program Studi Dan Perguruan Tinggi Pasal 6*. Kelembagaan Ristekdikti.

Kelembagaan Ristekdikti. (2016). *Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 59 Tahun 2012 Tentang Badan Akreditasi Nasional Pasal 1 No 4*. Kelembagaan Ristekdikti.

Mahato, D. N., & Yadav, A. P. (2023). Introduction of Management Information System Report for Student's Performance in School of Ranchi in Jharkhand. *Proceedings International Conference on Business, Economics & Management*, *1*, 40–48. https://doi.org/10.47747/ICBEM.V1I1.1236

Mansyur, A., Hariyadi, H., & Minarno, A. (2020). Pembuatan Sistem Dashboard Akreditasi Institusi Perguruan Tinggi Standar 4 Berbasis Key Performance Indicator. *Jurnal Repositor*, *2*, 305. https://doi.org/10.22219/repositor.v2i3.491

Nugraha, M. F., Sulistiani, Y., & Rahayu, A. (2023). Design and Build an Information System for Management of Incoming and Outgoing Mail Archives Based on a Website at the Bandung Subdivre Logistics Affairs Agency (BULOG). *International Journal of Research in Community Services*, *4*(4), 153–164. https://doi.org/10.46336/IJRCS.V4I4.510

Nwakesiri, C. F. (2022). DATA QUALITY CONTROL IN EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS) IN NIGERIA: CHALLENGES AND WAY FORWARD. *Nnadiebube Journal of Religion, Culture and Society*, *2*(1). https://acjol.org/index.php/njrcs/article/view/2128

Pressman RS. (2010). *Software Engineering a Practitioner's Approach* (7th ed.). McGraw-Hill.

Salbiyath, M., Daning, ;, & Sulistyowati, N. (2022). WEBSITE-BASED CERTIFICATE MANAGEMENT INFORMATION SYSTEM DESIGN IN TRAINING AND CONSULTANT DIVISION. *Jurnal Techno Nusa Mandiri*, *19*(1), 38–45. https://doi.org/10.33480/TECHNO.V19I1.3059

Saputro, F., Saputro, F. C., Anggraeni, W., & Mukhlason, A. (2012a). Pembuatan Dashboard Berbasis Web Sebagai Sarana Evaluasi Diri Berkala Untuk Persiapan Penilaian Akreditasi Berdasarkan Standar Badan Akreditasi Nasional Perguruan Tinggi. *Jurnal Teknik ITS*, *1*(1), A397–A402. https://doi.org/10.12962/j23373539.v1i1.1141

Saputro, F., Saputro, F. C., Anggraeni, W., & Mukhlason, A. (2012b). Pembuatan Dashboard Berbasis Web Sebagai Sarana Evaluasi Diri Berkala Untuk Persiapan Penilaian Akreditasi Berdasarkan Standar Badan Akreditasi Nasional Perguruan Tinggi. *Jurnal Teknik ITS*, *1*(1), A397--A402. https://doi.org/10.12962/j23373539.v1i1.1141

Stair RM, R. G. (2012). *Principles of Information Systems* (10th ed.). Cengage Learning.

Taeza Cruz, K. K., & Ballera, M. A. (2023). Facilities Management Information System with Data Analytics and Visualization. *2023 2nd International Conference on Electrical, Electronics, Information and Communication Technologies, ICEEICT 2023*. https://doi.org/10.1109/ICEEICT56924.2023.10157626

Ujakpa, M. M., Mutalya, M. N., Osakwe, J., Iyawa, G., & Shililifa, E. N. (2022). School Management Information System (SMIS) for the Elite College. *2022 IST-Africa Conference, IST-Africa 2022*. https://doi.org/10.23919/IST-AFRICA56635.2022.9845593

Wibowo, A. S., & Andri, A. (2021). Dashboard Business Intelligence Vusialisasi Data Akreditasi Sekolah Pada SMP Negeri 1 Sembawa. *Jurnal Nasional Ilmu Komputer*, *2*(4), 249–256. https://doi.org/10.47747/JURNALNIK.V2I4.536

Yazidinni, M. (2019). SISTEM INFORMASI DASHBOARD DALAM RANGKA OPTIMASI PERSIAPAN AKREDITASI di PERGURUAN TINGGI. *Exact Papers in Compilation (EPiC)*, *1*(4), 155–160. http://ojs.unwaha.ac.id/index.php/epic/article/view/181

Yusuf, F., Hermawan, D., & Ilham, A. (2022). Implementasi Dashboard Instrumen Akreditasi 9 Kriteria BAN PT Berbasis Web pada Program Studi Sistem Informasi Fakultas Sains & Teknologi UIN Alauddin Makassar. *Jurnal Fokus Elektroda : Energi Listrik, Telekomunikasi, Komputer, Elektronika Dan Kendali)*, *7*(3), 169–171. https://doi.org/10.33772/JFE.V7I3.16