


Implementation Of Scrum And Laravel In The New Student Admission Information System At STMIK Mercusuar

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Article Info	ABSTRACT
Keywords: Information System, New Student Admission, Laravel, Scrum Method	Every new academic year, universities conduct new student admissions as a primary activity. However, at the School of Management Informatics and Computer (STMIK) Mercusuar, this process still relies on Google Forms, which is less efficient and lacks flexibility. This study aims to design a new student admission information system by utilizing the Laravel framework and implementing the Scrum methodology. The system is expected to facilitate access to new student admission information, streamline the registration process, and ease the verification of documents and selection of prospective students. The data collection techniques used in this research include qualitative research methodologies, such as observation, interviews, and literature studies. Scrum is employed in the software development process, offering flexibility and adaptability. The development of this information system is intended to simplify the new student admission process for applicants and to assist the admissions officers in managing registration, document verification, and the selection of prospective students. The use of the Laravel framework and the implementation of the Scrum methodology also contribute to creating a reliable and efficient information system. Consequently, this information system is expected to improve the quality and success of new student admissions at STMIK Mercusuar.
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INTRODUCTION

At the start of each academic year, universities conduct the New Student Admission (PMB) process as one of the primary activities that determine the institution's continuity and development. An effective and efficient PMB process is crucial for attracting quality prospective students and enhancing the university's image and competitiveness amidst the increasingly intense competition in higher education. Therefore, a well-managed PMB process is essential for every higher education institution to ensure that the selection process runs smoothly and transparently (Purba 2018).

The School of Management Informatics and Computer (STMIK) Mercusuar, established in 2003 under the Indonesian Administration Education Foundation (YPAI), currently offers five study programs at the Strata 1 (S1) and Diploma 3 (D3) levels (Mercusuar 2023). Despite having a good reputation in the field of information technology, the PMB process at STMIK Mercusuar is still conducted conventionally using Google Forms for collecting prospective

student data. This approach has several limitations, including a lack of flexibility in data processing, difficulties in verifying documents, and the absence of an integrated system for selection and payment confirmation. These conditions make the PMB process inefficient and prone to errors in data management, as well as hindering prospective students from accessing optimal information and services (Kirana 2023).

Previous research has shown that the use of information systems in the PMB process can provide significant benefits. For example, Fajri et al. (2020) in their study at the Paracendekia Nahdlatul Wathan Sumbawa College of Teacher Training and Education found that implementing a web-based information system facilitated prospective students in registering and helped the PMB admin manage new student data more effectively. Gobai et al. (2020) in their study at the School of Law (STIH) Monokwari also emphasized the importance of information systems in increasing productivity and efficiency in the selection process of prospective students, which is a crucial step in assessing students' academic abilities. Yulianto et al. (2021) further stated that the new student admission information system is a fundamental system needed by universities, serving as the spearhead of marketing to achieve the desired student enrollment targets.

In addition, the application of appropriate software development methods also plays a vital role in the success of the information system project. Setiawan (2019) dan Rohmanto and Setiawan (2022) revealed that the implementation of independent examinations in the new student admission process requires an efficient information system to ensure time effectiveness, performance improvement, and cost efficiency. Meanwhile, Wijonarko & Budi (2019) highlighted the importance of utilizing Information and Communication Technology (ICT) in the new student admission system to ensure that the student data recording and management processes are well-organized. The implementation of the Laravel framework, known for its reliability and flexibility, along with the application of the Scrum methodology, which enables adaptive and iterative software development, is expected to address various challenges faced by STMIK Mercusuar in the PMB process.

Based on these considerations, the development of a New Student Admission Information System based on Laravel with the implementation of the Scrum method at STMIK Mercusuar is expected to resolve the issues currently present in the PMB process (Rizky and Sugiarti 2022; Satriya 2021). The resulting information system is anticipated to facilitate the registration process, document verification, student selection, and payment confirmation in an integrated and efficient manner. Additionally, this system is expected to enhance the user experience for prospective students and simplify the work of the PMB committee in managing data accurately and in real-time. Thus, the implementation of this information system will contribute to improving the quality of services and the reputation of STMIK Mercusuar as a leading and competitive higher education institution in the field of information technology.

METHOD

This study uses qualitative research methods in collecting the required data sources. In system development, the Scrum Method is used as a research procedure in the implementation of the new student admission information system.

Data collection technique

In qualitative research methodology, data collection techniques that can be used are observation, focus group discussions, in-depth interviews, and case studies. In this study, the researcher used qualitative research methodology by conducting observations, interviews, and literature studies in data collection techniques.

1. Observation

Observation data collection techniques are carried out through direct observation. Researchers make direct observations on research objects that are observed using five senses and recorded in notes or recording devices. Observations are divided into three types, namely participant observation, open or closed observation, and unstructured observation. The use of observation data collection techniques is carried out ethically and respects the privacy of research objects. In this study, the researcher conducted direct observation on the research object to directly find out the actual conditions that occurred. Based on the results of the observation, it was found that the New Student Admissions System at STMIK Mercusuar had not used an information system as a whole, making the administration process inflexible and less efficient (Ramdhan 2021).

2. Interview

Interview data collection techniques are carried out directly by researchers in the form of questions and answers with informants who act as sources to obtain the data needed in the study. Like questionnaires, interview questions also need to be tested for their effectiveness so that researchers can obtain the data needed. Interview data collection techniques are carried out ethically and respect the privacy of the sources. In this study, interviews were conducted with the Deputy Chairperson of Academic and Student Affairs of STMIK Mercusuar. Through the interview, the data requirements for the software to be built were obtained.

3. Literature review

Literature study is a data collection technique that is widely used by researchers. The literature study data collection technique is carried out by collecting relevant or appropriate data needed for research from books, scientific articles, news, and credible sources and in accordance with the research topic being carried out. The literature study data collection technique is also carried out carefully and avoids plagiarism by citing the correct reference sources. In this study, the researcher uses references through journals that are related to the title of this study as the basic material for the framework of thought in designing a new student admissions information system.

Research Procedures

In designing this research, Agile Development methodology is used which has several software development methods (Al-Saqqa, Sawalha, and AbdelNabi 2020). In this study, the Agile method was chosen, namely Scrum. The Scrum method is an example of the implementation of an agile framework designed to manage projects in the software development process iteratively. The Scrum method emphasizes providing high value with optimal time.



Figure 1. Research Procedure Flowchart (Izzatulhaq 2021).

1. Literature Study

The initial stage in designing a new student admissions information system is to conduct a literature study that is relevant to the topic of developing the information system to be designed. At this stage, a clear picture is obtained regarding the problems to be solved, the development methods to be used, and what features will be built.

2. System Requirements Analysis

This stage discusses the needs required for the design of a new student admissions information system. These needs are based on data from interviews that have been conducted. The stages of analysis that will be carried out include: Analysis of the needs of features that need to be built into the new student admissions information system, analysis of hardware and software needed to build a new student admissions information system, and compilation of analysis results in the form of use case diagrams.

3. System Design

After the system needs analysis stage is completed, the next step is to design the New Student Admissions Information System at STMIK Mercusuar. The design of the new student admissions information system begins with designing an attractive appearance and continues with developing features and functions that are in accordance with the objectives of designing the new student admissions information system.

4. Implementation

After designing the system, the next step is to implement it on the website of the new student admissions information system. At this stage, the development of an attractive website appearance and features that are in accordance with the research objectives is carried out so that it can be used properly by end users.

5. Testing And Results

For the testing phase, the new student admission information system uses the Black Box testing method. Testing is carried out using all available features, such as filling out the registration form, uploading documents, implementing entrance tests, and selecting

prospective new students. This is done to ensure that the website is free from errors or bugs that can interfere with users involved when registering.

RESULTS AND DISCUSSION

System Requirements Specifications

The STMIK Mercusuar New Student Admissions Information System is a website-based online student registration system, where prospective students register online via a browser. In its design, the new student admissions information system has three actors, including prospective students, operators and admins. Each role has system requirements specifications, including:

1. Prospective Student Page
 - 1A. Account Registration
 - 1B. Login
 - 1C. Fill out the registration form
 - 1D. Uploading registration documents
 - 1E. Make a registration
 - 1F. Conducting an entrance screening test
 - 1G. Printing PMB letter
 - 1H. Confirmation of re-registration payment
2. Operator Page
 - 2A. Login
 - 2B. Verification of prospective student registration
 - 2C. Selection of prospective students
 - 2D. Generate PMB Letter
 - 2E. Re-registration payment verification
3. Admin Page
 - 3A. Login
 - 3B. Managing user accounts
 - 3C. Managing entrance exam questions
 - 3D. Verification of prospective student registration
 - 3E. Selection of prospective students
 - 3F. Generate PMB Letter
 - 3G. Re-registration payment verification
 - 3H. Managing new student admission reports

Use Case Diagram

Use case diagrams is a diagram used to explain how the system benefits from the perspective of users who are outside the system or are usually called actors (Rohmanto and Setiawan 2022). The use case diagram of the STMIK Mercusuar new student admissions information system can be described based on each actor, as in Figures 2, 3, and 4:

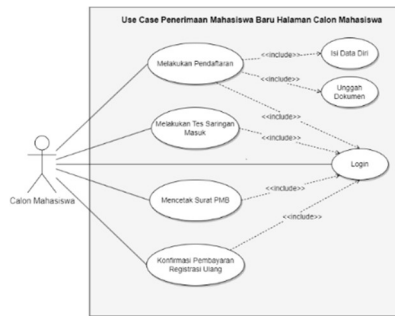


Figure 2. Use Case Diagram Prospective Student Page

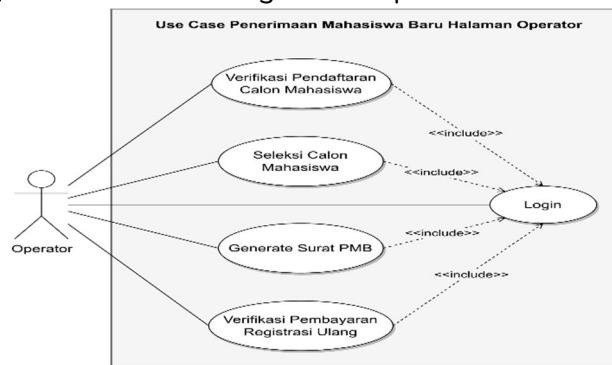


Figure 3. Use Case Diagram Operator Page



Figure 4. Use Case Diagram Admin Page

Activity Diagram

Activity Diagram is a flow diagram that describes all activities from start to finish that are run by the system. This diagram identifies the path and steps that need to be taken to move from one activity to another (Ergashev 2022). The main activity of accepting new students begins with prospective students registering by filling out a personal data form and uploading registration documents as shown in Figure 5.

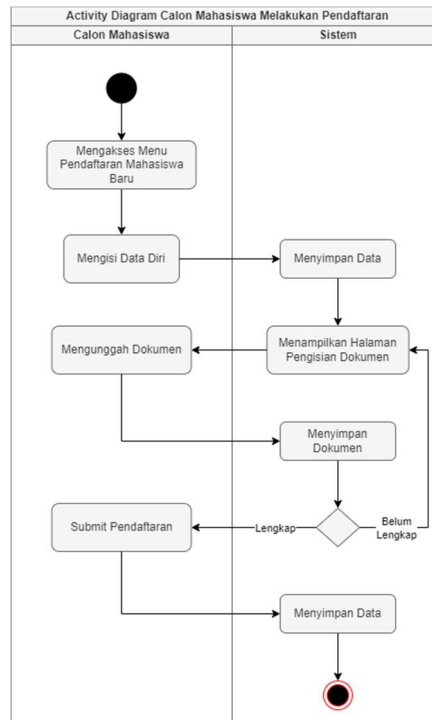


Figure 5. Activity Diagram of Prospective Students Registering

After prospective students have registered, the operator can verify the registration by checking the validity of the personal data and documents that have been uploaded by the prospective student as shown in Figure 6.

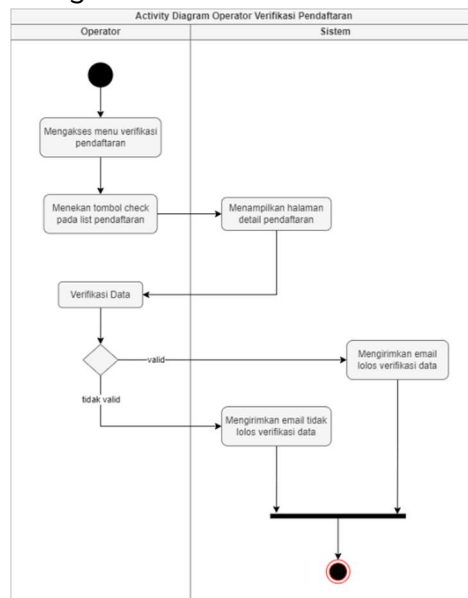


Figure 6. Registration Verification Operator Activity Diagram

Prospective students who pass the data verification stage will then be selected by the operator regarding the scheduling of the entrance screening test as shown in Figure 7.

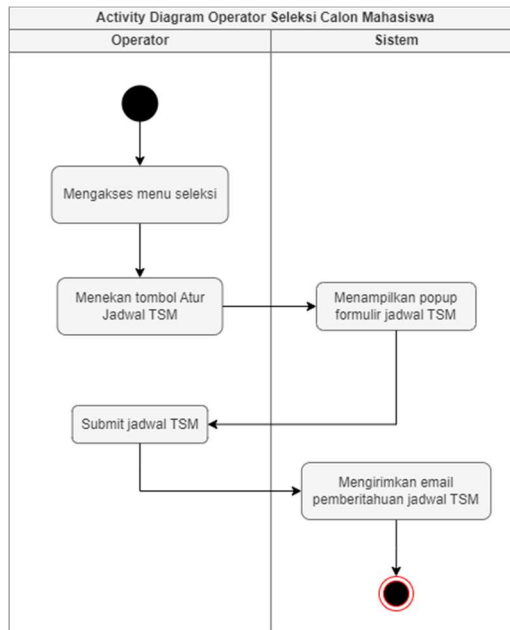


Figure 7. Student Candidate Selection Operator Activity Diagram

Prospective students will receive an email notification regarding the schedule for the entrance screening test. On the day of the entrance screening test, prospective students can answer the questions that appear based on the time given as depicted in Figure 8.

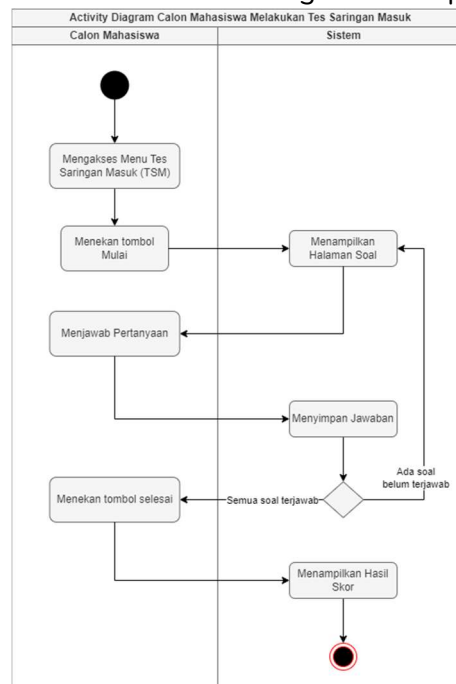


Figure 8. Activity Diagram Prospective Students Taking Entrance Screening Test

Next, the operator can generate a PMB letter to prospective students who have taken the entrance screening test. The operator can fill in the Student Registration Number as in Figure 9.

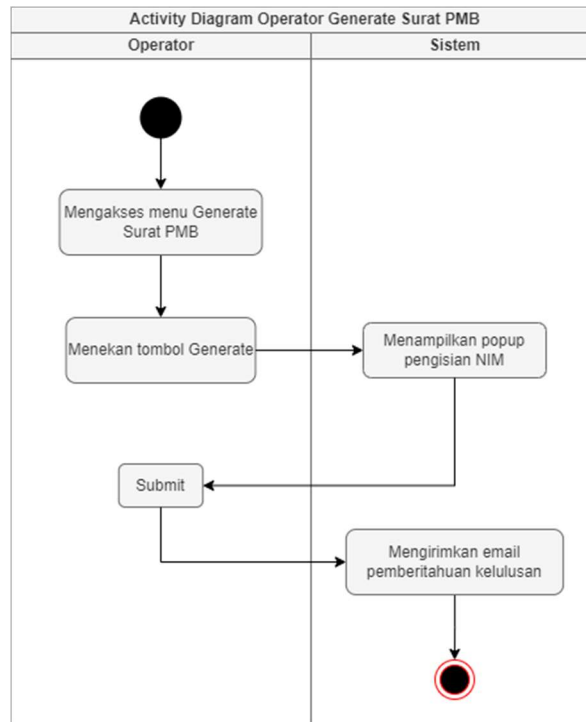


Figure 9. Activity Diagram Operator Generate PMB Letter

After that, prospective students can print the PMB Letter which can be downloaded on the main page as shown in Figure 10. The contents of the PMB letter are a statement letter of acceptance as a student at STMIK Mercusuar.

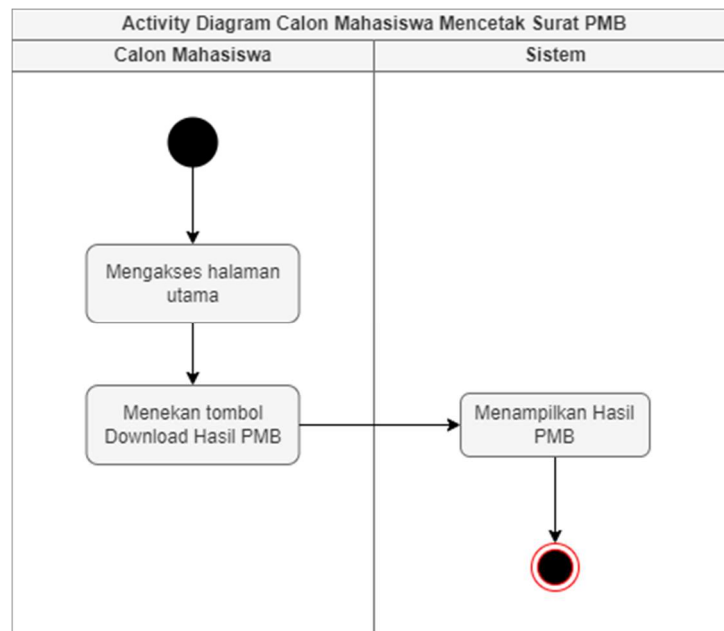


Figure 10. Activity Diagram Prospective Students Print PMB Letters

After being accepted as a STMIK Mercusuar student, students can confirm re-registration by uploading proof of tuition payment as shown in Figure 11.

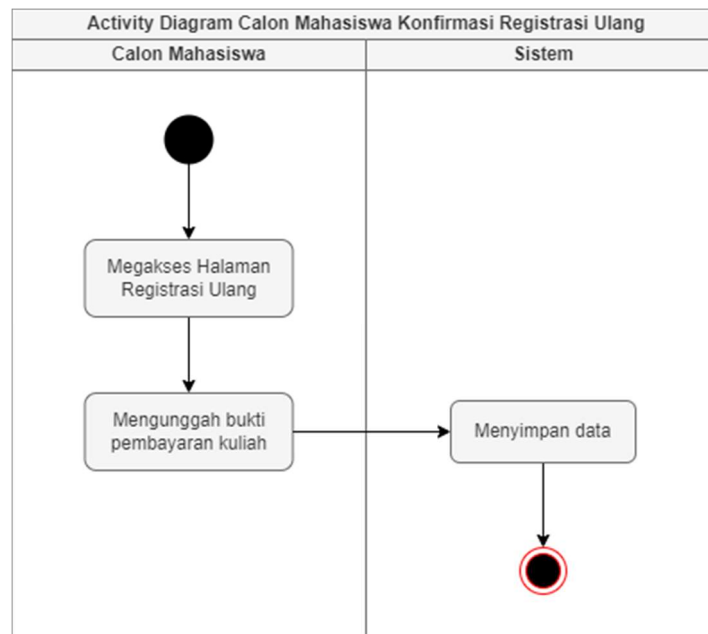


Figure 11. Activity Diagram Prospective Students Confirm Re-Registration

Operators can verify re-registration payments by checking the validity of the documents uploaded by students as shown in Figure 12.

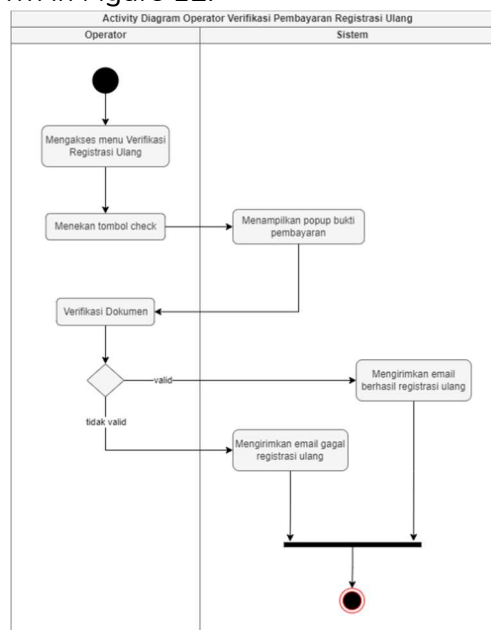


Figure 12. Activity Diagram Operator Verification Payment Re-registration

After the new student admission stage has been passed. The results of the new student admission report can be managed by the admin. The admin can filter the data based on the wave and then export the data to excel as in figure 13.

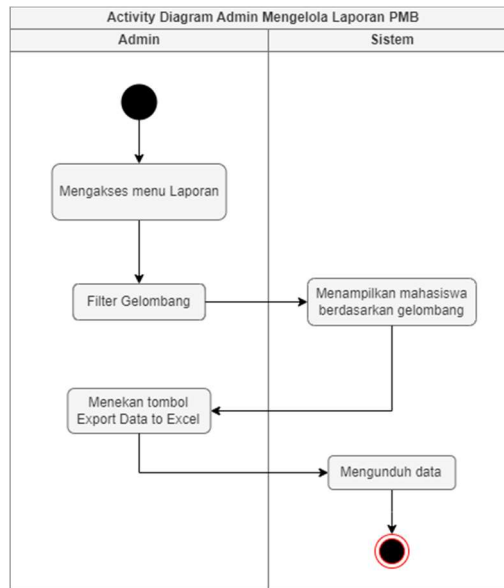


Figure 13. Activity Diagram Admin Manage PMB Reports

Information System Implementation

The STMIK Mercusuar new student admissions information system can be accessed via a browser at the address admissi.mercusuar.ac.id. The implementation of this information system produces 4 page sections consisting of the authentication page, prospective student page, operator page, and admin page.

1. Authentication Page

The authentication page consists of a login page and a register page. The login page can be used by all actors, while the register page can only be used by prospective students. The login page contains a form in the form of an email and password which will later be filled in by the user.

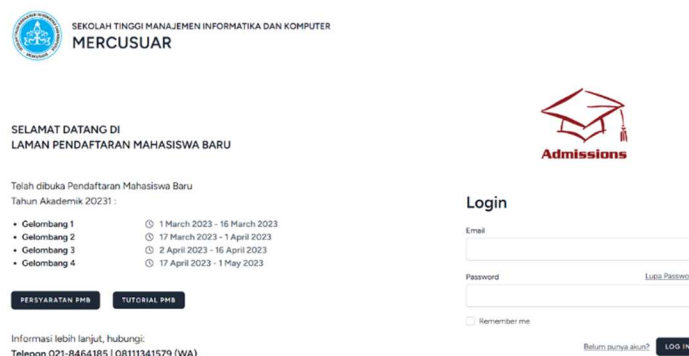


Figure 14. Login Page

Meanwhile, the registration page contains a form in the form of Full Name, Email, Mobile Number, Password, and Repeat Password.

SELAMAT DATANG DI
 LAMAN PENDAFTARAN MAHASISWA BARU

Telah dibuka Pendaftaran Mahasiswa Baru
 Tahun Akademik 20231 :

- Gelombang 1 ⌚ 1 March 2023 - 16 March 2023
- Gelombang 2 ⌚ 17 March 2023 - 1 April 2023
- Gelombang 3 ⌚ 2 April 2023 - 16 April 2023
- Gelombang 4 ⌚ 17 April 2023 - 1 May 2023

[PERSYARATAN PMB](#) [TUTORIAL PMB](#)

Informasi lebih lanjut, hubungi:
 Telepon 021-8464185 | 08111341579 (WA)

Daftar Akun

Nama Lengkap

Email

Nomor Handphone

Password

Ulangi Password

Sudah punya akun? [DAFTAR](#)

Figure 15. Register Page

2. Prospective Student Page

The prospective student page consists of the front page, registration page, entrance test page, and re-registration page. The front page contains information on registration status, entrance test schedule, and final PMB status.

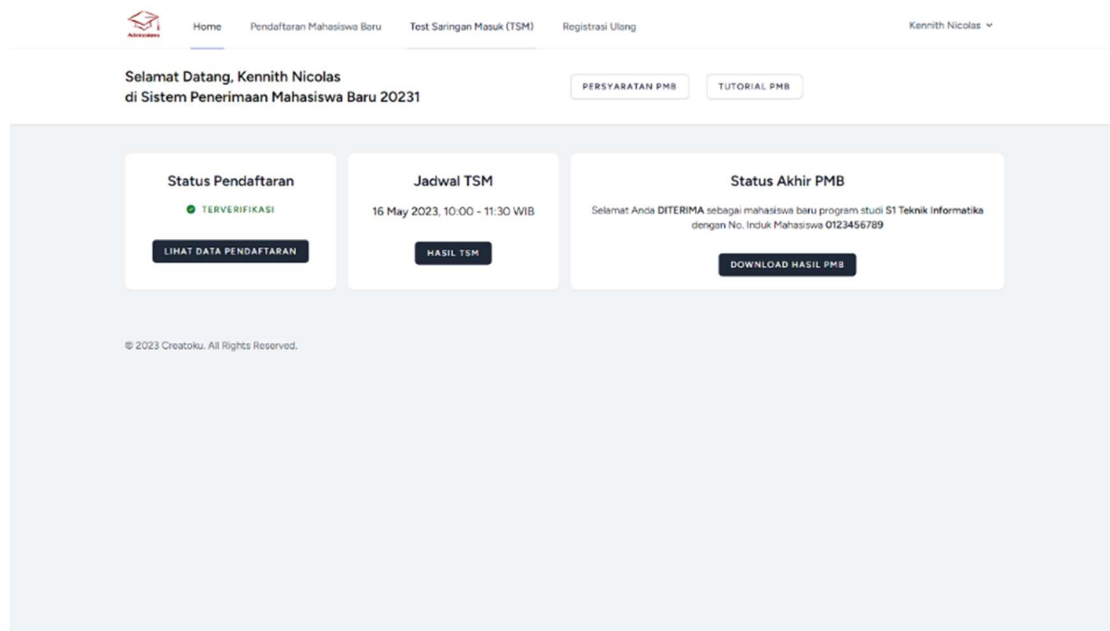
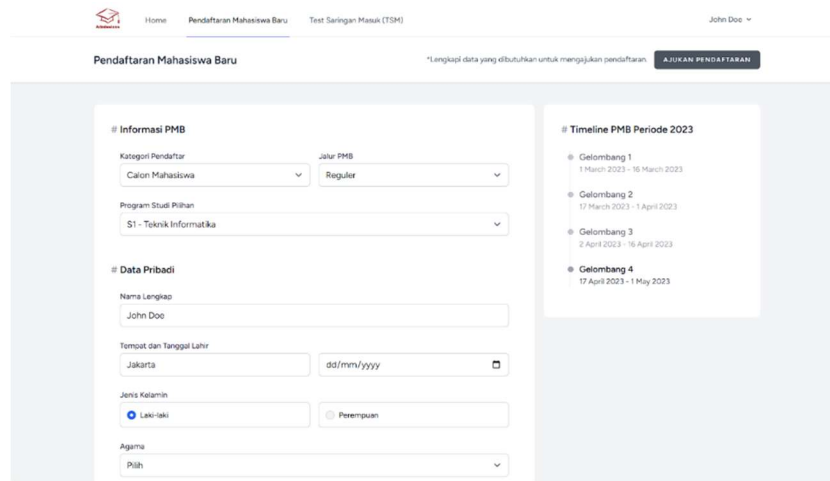


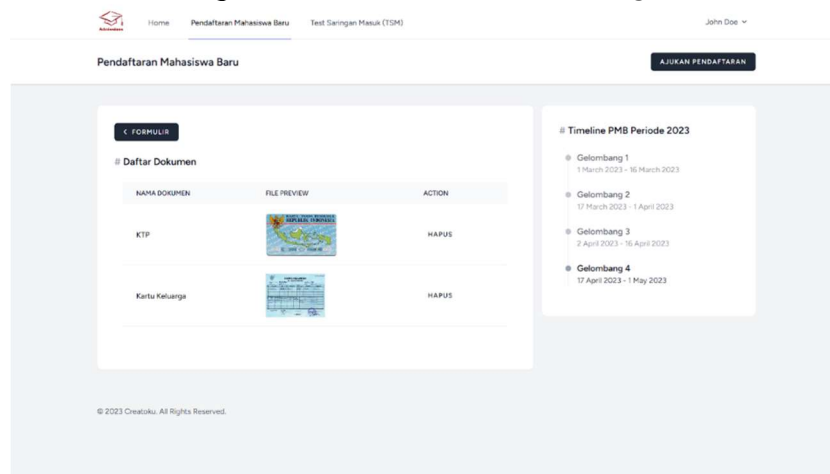
Figure 16. Front page

Next is the New Student Registration Page. This page contains a personal data form and a document upload form for registration carried out by prospective students as in pictures 17 and 18.



The screenshot shows a web form titled "Pendaftaran Mahasiswa Baru" (New Student Registration). It includes sections for "Informasi PMB" (PMB Information) with dropdowns for "Calon Mahasiswa" and "Jalur PMB", a "Program Studi Pilihan" dropdown, and "Data Pribadi" (Personal Data) with fields for "Nama Lengkap", "Tempat dan Tanggal Lahir", "Jenis Kelamin", and "Agama". A "Timeline PMB Periode 2023" sidebar lists four waves of registration with their respective dates.

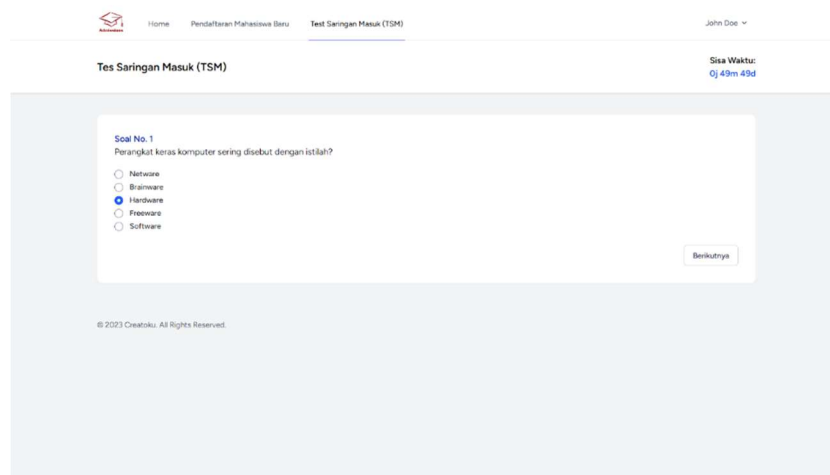
Figure 17. Personal Data Form Page



The screenshot shows the "Daftar Dokumen" (Document List) section of the registration page. It features a table with columns for "NAMA DOKUMEN", "FILE PREVIEW", and "ACTION". Two documents are listed: "KTP" and "Kartu Keluarga", each with a preview image and a "HAPUS" (Delete) button. A "Timeline PMB Periode 2023" sidebar is also visible on the right.

Figure 18. Upload Registration Documents Page

Next is the entrance screening test page. This page contains a number of questions that must be answered by prospective students and displays the test score results as in figures 19 and 20.



The screenshot shows a multiple-choice question titled "Soal No. 1" with the text "Perangkat keras komputer sering disebut dengan istilah?". The options are "Network", "Brainware", "Hardware", "Firmware", and "Software". The "Hardware" option is selected. A "Berikutnya" (Next) button is located at the bottom right of the question area.

Figure 19. Entry Screening Test Page

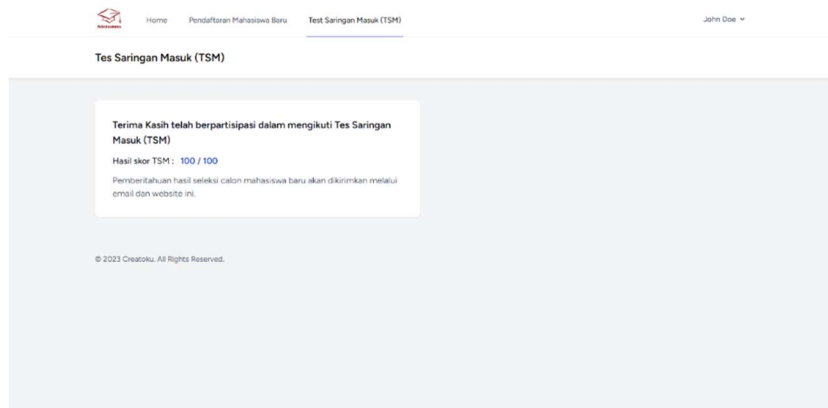


Figure 20. Entrance Screening Test Score Results Page

Lastly is the registration page. The re-registration page contains a form of proof of tuition payment documents uploaded by prospective students.

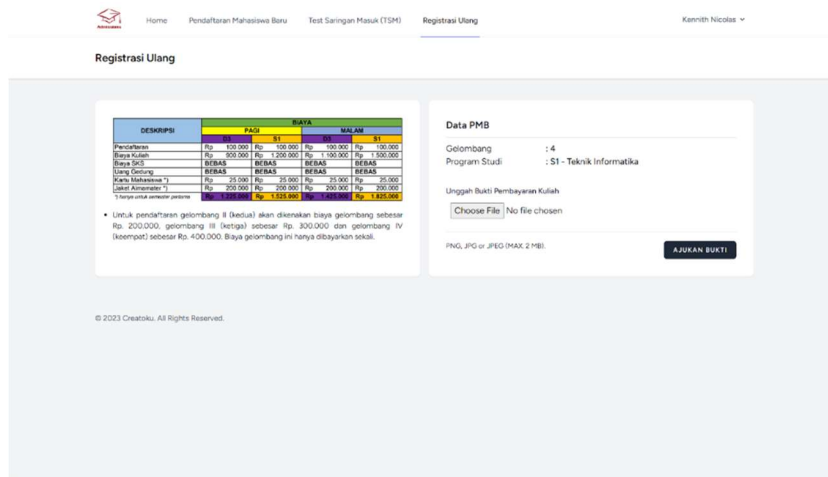


Figure 21. Re-registration Page

3. Operator Page

The operator page consists of a registration verification page, a selection page, a PMB letter generation page, and a re-registration verification page. The registration verification page contains a list and details of prospective students who have registered as shown in Figure 22. On this page, the operator can verify data based on the validity of the personal data form and documents that have been uploaded by prospective students.

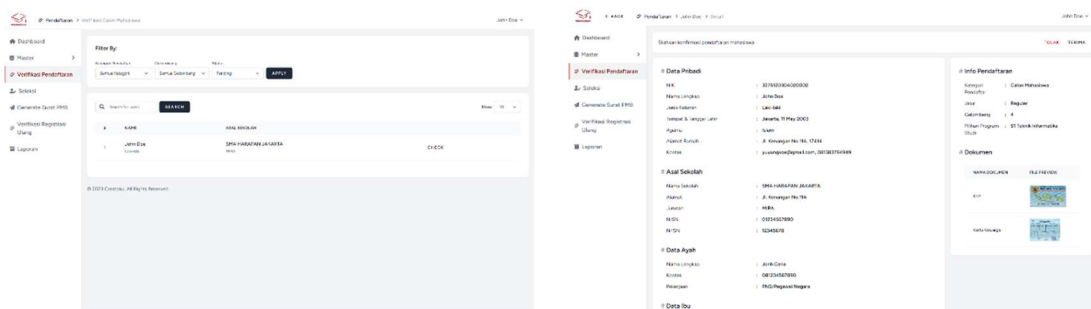


Figure 22. Registration Verification Page

Next is the selection page, this page contains a list of prospective students who have successfully passed the registration verification. The operator can set the entrance test schedule for each prospective student.

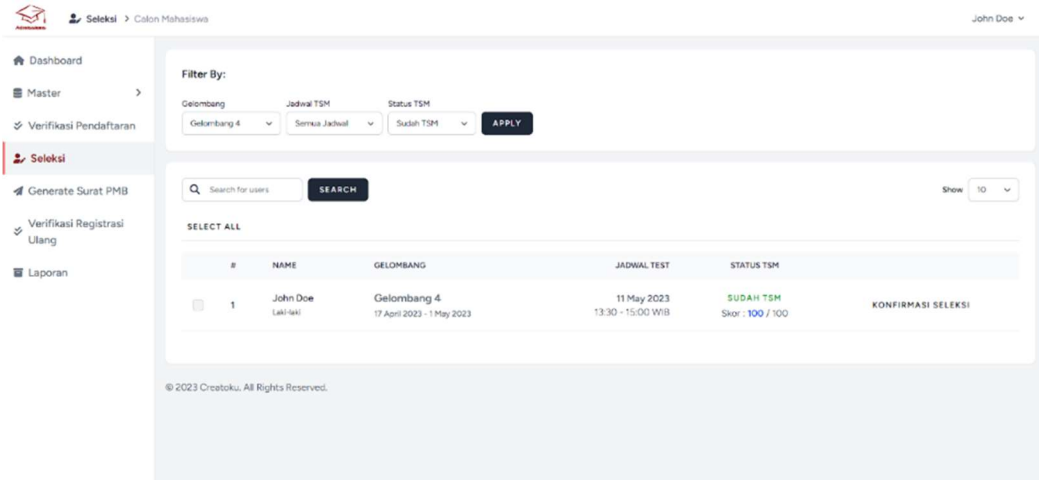


Figure 23. Selection Page

The next page is the Generate PMB letter page. This page contains prospective students who have taken the entrance screening test. The operator can generate by filling in the Student Registration Number for each prospective student.

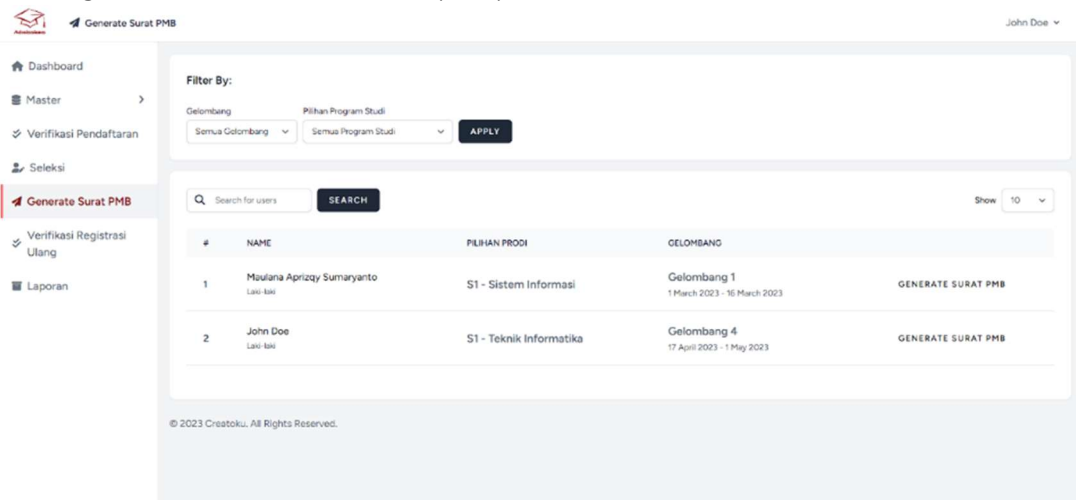


Figure 24. PMB Letter Generate Page

The last is the re-registration verification page, here the operator can verify the data based on the validity of the proof of tuition payment documents uploaded by the student.

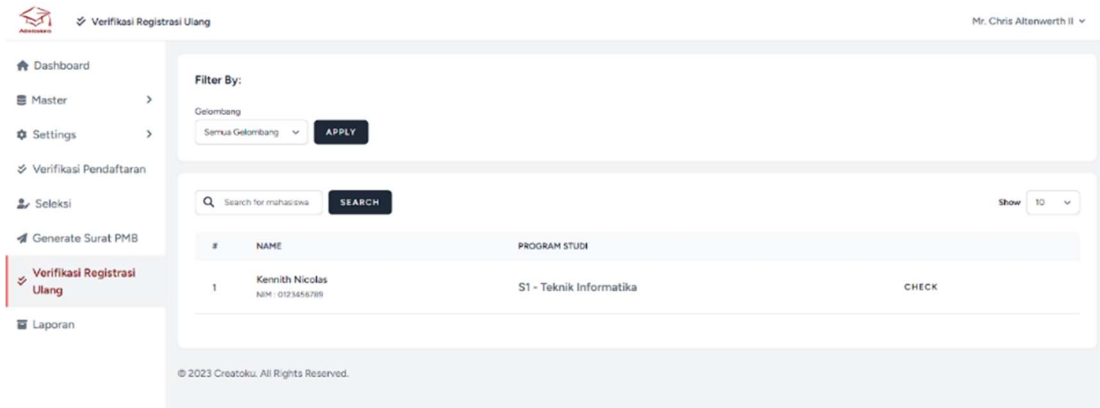


Figure 25. Re-registration Verification Page

4. Admin Page

The main admin page consists of the user account management page, the entrance test management page, and the new student admission report management page. Admin can access the pages that can be accessed by the Operator. The manage user account page contains a list of all users with operator and prospective student actors. On this page, the admin can add, change, and delete data.

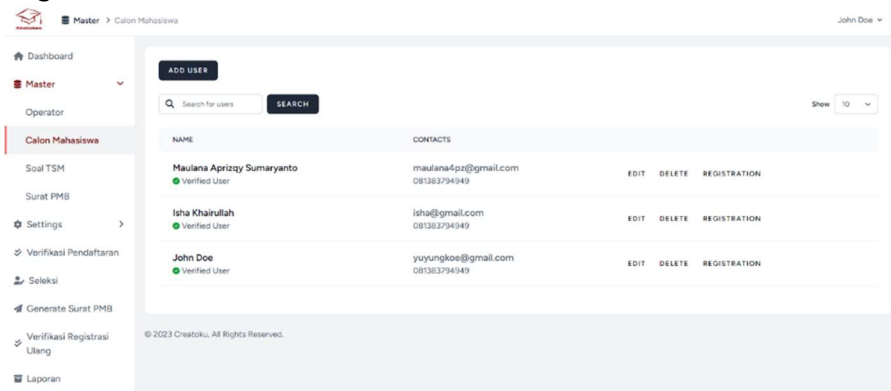


Figure 26. Main Admin Page

Next is the manage entrance test page, this page contains a list of all questions and answers on the entrance test. On this page, the admin can add, change, and delete questions and answers on the entrance test.

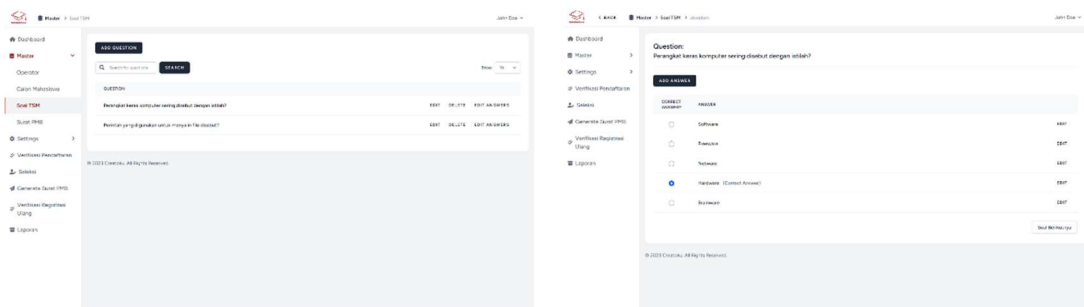


Figure 27. Manage Entry Screening Test Page

Lastly, is the PMB report management page. This page contains data on prospective students who have successfully become STMIK Mercusuar students. Admin can view and export data to excel for new student admission reports based on waves.

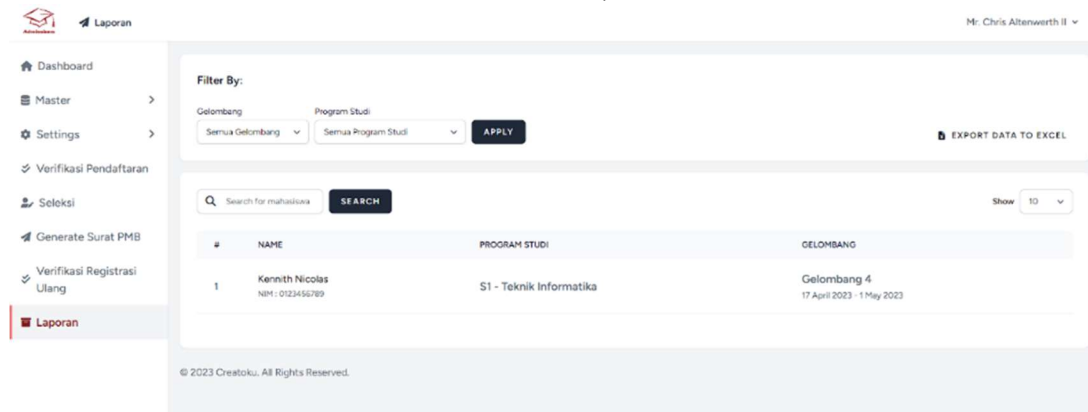


Figure 28. Manage PMB Reports Page

CONCLUSION

Based on the research conducted, the implementation of Scrum and Laravel in the New Student Admission Information System at STMIK Mercusuar has several advantages and disadvantages. The advantages of this information system lie in its improved efficiency and flexibility in processing prospective student registration data. By using the Laravel framework, this system can produce a reliable, secure, and well-structured system. The use of the Scrum methodology in the development of this information system also offers significant benefits, such as providing flexibility and efficiency in the system development process. Additionally, this information system facilitates access to information for prospective students, simplifies the registration process, document verification, student selection, and re-registration payment confirmation. With this information system, the PMB committee can work more efficiently in managing prospective student registration data. However, alongside the many advantages, this information system also has some drawbacks that need to be considered. First, system users need to understand and receive training to maximize its use. Second, this system also requires regular maintenance and updates to remain relevant and adaptable to technological advancements and the needs of the institution. By considering the aforementioned advantages and disadvantages, it is hoped that the designed new student admission information system will provide significant benefits to prospective students, the PMB committee, and the institution in improving the efficiency and quality of the student admission process.

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