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# Automa Website Development Based on Artificial Intelligence to Organize and Optimize Student Time Management

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## ABSTRACT

**Purpose** – This study addresses the common problem of students' difficulty in managing time due to multiple academic and non-academic activities, which often leads to decreased productivity and delayed academic achievement. The purpose of this research is to develop an AI-based website platform, Automa, that assists students in automating time management and achieving their academic targets efficiently.

**Methods** – This research employs the Research and Development (R&D) method using an Agile software development model. The system was designed as a web-based platform integrated with Artificial Intelligence, enabling features such as automated scheduling, conflict detection, and academic planning. System evaluation was conducted based on the ISO 25010 quality standard, including functional suitability, portability, performance efficiency, and usability.

**Findings** – The results show that Automa successfully meets the ISO 25010 criteria with an "Excellent" rating. The platform achieved a GTMetrix performance score of 92% with an average access speed of 1.5 seconds. User evaluations indicate that the system is "Feasible" for implementation and effectively supports students in organizing schedules and achieving semester-based academic goals.

**Research implications** – This study is limited by its testing scope, which involves a specific group of student users. Despite this limitation, the system demonstrates strong potential for practical application in academic time management. Future development may include integration with messaging platforms such as WhatsApp and collaborative features.

**Originality** – The originality of this research lies in integrating AI into a web-based academic time management system that provides adaptive, automated solutions tailored to students' needs, offering a more efficient and intelligent approach compared to conventional scheduling tools.

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## INTRODUCTION

One common problem in education is the constant flow of assignments, making it difficult for students to organize their learning activities. A lack of effective time management results in assignments not being completed optimally [1]. Students also often experience poor concentration and memory, as well as difficulty managing study time [2]. Poor time management leads to stress, decreased productivity, and delayed assignment completion [3], [4]. Time management challenges faced by modern humans can be addressed by utilizing technology-based approaches [5].

Initial observations of 31 students showed that 58% of those active in organizations or working had low levels of time management, and 40% of students who focused solely on their studies also experienced similar issues. This highlights the need for innovative solutions to help students manage their time effectively. With the advancement of technology, various digital tools have been developed to facilitate more systematic time management. Task management applications and digital calendars allow individuals to plan schedules, provide reminders for tasks to be completed, and measure their daily productivity. Various aspects of human life have been transformed by technology in today's digital era, including the way we interact through web platforms. One recent innovation that is gaining popularity is Artificial Intelligence (AI)-based chatbots. AI chatbots are computer programs designed to mimic human conversation, either through voice or text. This technology has been implemented in various applications, such as virtual assistants, customer service, and sales support tools [6].

Based on this, this research developed an AI-based AUTOMA (Automatic Manager) website aimed at helping students plan and manage their time automatically. This system provides schedule recommendations, task reminders, and academic achievement strategies. It is hoped that AUTOMA can improve students' efficiency, productivity, and balance between academic activities and personal life.

## METHOD

This study uses the Research and Development (R&D) method, which aims to create or develop a viable product and evaluate its effectiveness [7]. The software development model uses the Agile Development Model, which allows the AI-based website development process to be carried out iteratively, flexibly, and collaboratively [8]. The main stages of this model include analyzing user needs and key features such as automatic scheduling, academic targets, and progress tracking; designing the AI-based system interface and workflow through the creation of use case diagrams, flowcharts, and UI/UX designs; developing the system using Laravel on the backend and React on the frontend in stages through sprints; and testing using the ISO 25010 standard with aspects of functional suitability, usability, portability, and performance efficiency [9], [10]. After the system is declared functional, the deployment phase is carried out to launch it to the server for user access, and the maintenance phase is carried out to fix bugs and improve performance based on user feedback.

## RESULTS AND DISCUSSION

The research results show that the development of the AI-based Automa website successfully produced a system capable of helping students organize and optimize their time management automatically. This system is designed to organize schedules optimally, provide recommendations based on activity patterns, and remind students of important tasks and academic achievement targets, thereby increasing efficiency, productivity, and reducing procrastination. This website was developed using JavaScript, HTML, and CSS, with Firebase as the database, and implementing an Agile development model that includes the stages of analysis, design, development, testing, deployment, and maintenance.

## Analysis

Based on preliminary data, 58% of students with extracurricular activities have poor time management skills, so system development focused on improving time management skills. This website has four main features: Plans to record and display activities, Tasks to monitor and prioritize work, Productivity to evaluate activity effectiveness, and Academic Strategy to assist with long-term academic planning. AI integration is applied to the Academic Plans and Strategy features to provide interactive academic recommendations related to academic targets and problem-solving.

## Design

The design stage is a stage in designing the system to be developed. The form of the design that has been made can be seen in the following image.

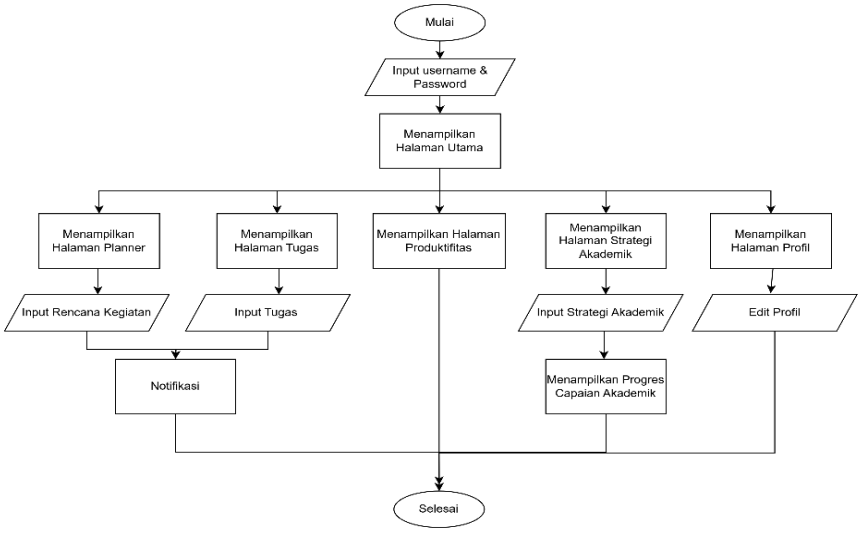



**Figure 1**. AUTOMA *Flowchart*

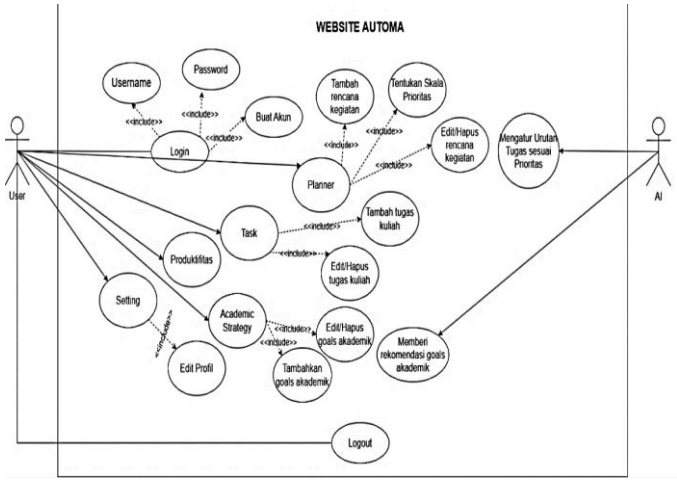



**Figure 2**. *Use Case* AUTOMA

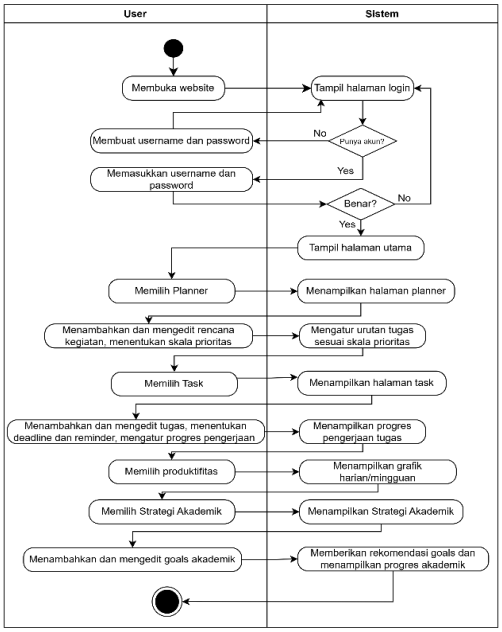



**Figure 3**. AUTOMA Activity Diagram

## Development

After completing the design phase, the researchers proceeded to the development phase. In this phase, the researchers built the Automa website in Visual Studio Code using JavaScript, HTML, CSS, and the Firebase SDK, based on the design developed in the previous phase. The following is the resulting website interface:

Home Page

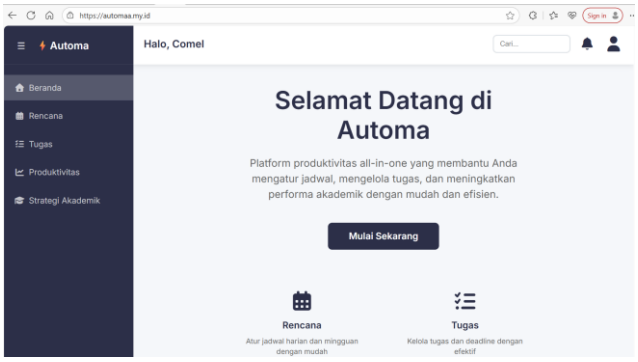
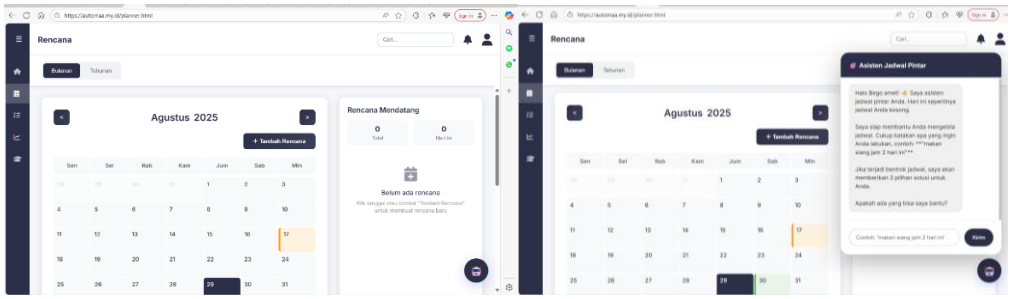



**Figure 4**. AUTOMA Home Page

Figure 4 is the main page that appears when the user operates the system. On this page there is also *a header* containing a notification icon that directs the user to the notification page and also a profile icon that directs the user to the login/create account page, the change profile page and the exit button from the account.

Plan Page

The plan page is the page that appears when the user presses the Plan button on the sidebar . This page contains a display of plans created by the user which are displayed in the Future Plans section.




(a) (b)

**Figure 5**. (a) Plan Page and (b) Plan Page AI Chatbot

Figure 5 (b) is a display of the chatbot on the plan page which can add plans automatically if given a command by the user, with this feature the user no longer needs to fill out a form to create a new plan.

Assignment Page

The task page is the page that appears when the user presses the Task button on the sidebar . This page contains a display of tasks created by the user.

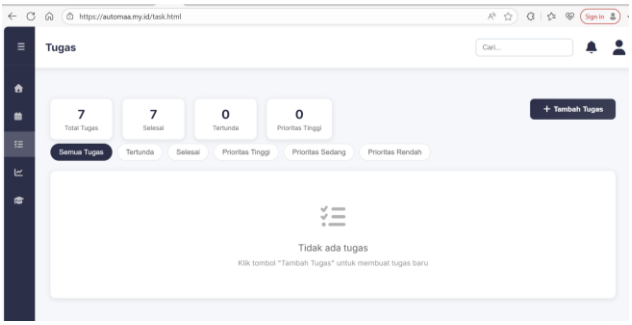
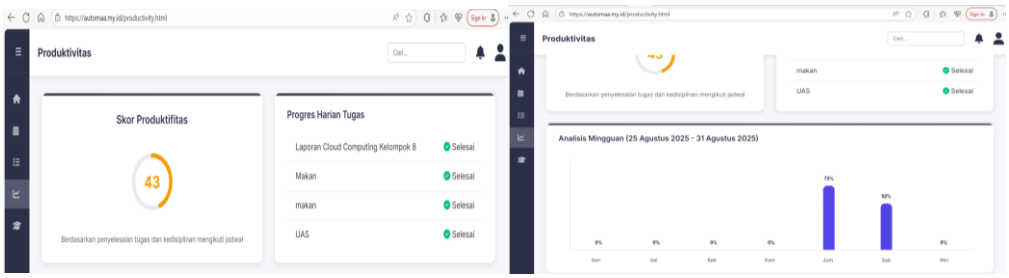



**Figure 6**. AUTOMA Task Page

Productivity Page

The productivity page is the page that appears when the user presses the Productivity button on the sidebar. This page contains a comprehensive overview of the user's productivity level.



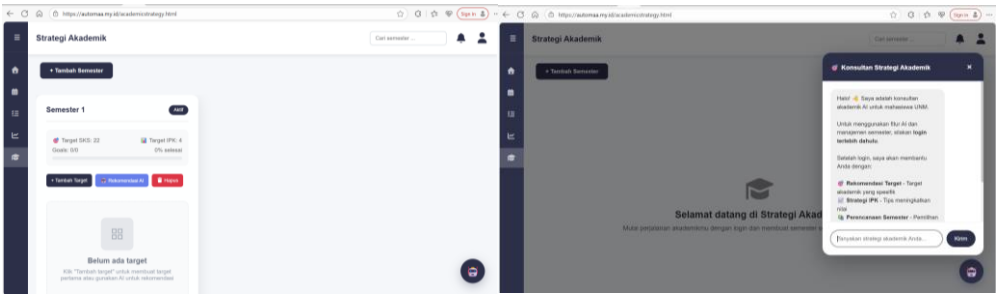

(a) (b)

**Figure 7**. (a) Daily Productivity Page and (b) Weekly Productivity Page

Figure 7 (a) displays the productivity score as measured by the completion rate , which is the percentage ratio between the number of plans or tasks completed and the total number of plans created. Figure 7 (b) displays the weekly analysis in chart form. This feature presents the accumulation of plans and tasks completed each day for a full week, allowing for more comprehensive identification of productivity patterns.

Academic Strategy Page

The academic strategy page is a page that appears when the user presses the Academic Strategy button on the sidebar . This page contains information about the long-term targets that the user wants to achieve each semester.




(a) (b)

**Figure 8**. (a) AUTOMA Academic Strategy Page and (b) AUTOMA Academic Strategy AI Chatbot

Figure 8 (a) is a display of the academic strategy feature, when a user adds a new semester, then in each semester there will be a feature to add their own targets and also a recommendation feature from AI, when the user uses the AI recommendation feature an automatic message will appear in the chatbot box . Figure 8 (b) is a display of the chatbot on the academic strategy page that can add strategies automatically if given a command by the user, with this feature AI can help users in determining long-term targets that they want to achieve in each semester.

Notification Page

The notification page is the page that appears when the user presses the Notification button in the header. This page contains notifications regarding task schedules and plans that are approaching the deadline.

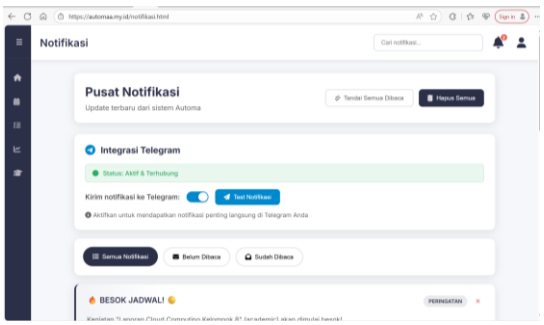



**Figure 9**. AUTOMA Notification Center Page

Figure 9 is a notification display that contains several features where users can integrate notifications with Telegram, so that website notifications will not only appear on the website when it is opened.

## Testing

Testing phase is the stage where the website is tested using the established standards. Researchers used the ISO 25010 standard to test the Automa Website, which encompasses several aspects: Functional Suitability, Usability, Portability, and Performance Efficiency. The following are the results of the Automa Website testing:

Functional Suitability

Functional Suitability testing refers to a test case instrument containing 42 statements regarding the system's operation and functionality on the developed website . The Functional Suitability instrument has been validated by two system experts, who then provide a score.

**Table 1**. Functional Suitability Test Scores

| Answer | Expert Validator Score | | Total Max | Total Score | X |
|---|---|---|---|---|---|
| | Validator 1 | Validator 2 | | | |
| Yes | 42 | 42 | 84 | 84 | 1 |
| No | - | - | - | - | - |

Based on the expert validation frequency distribution table, the percentage results can be calculated using the following formula:

$$x = \frac{\mathrm{I}}{\mathrm{P}}$$

$$x = \frac{84}{84}$$

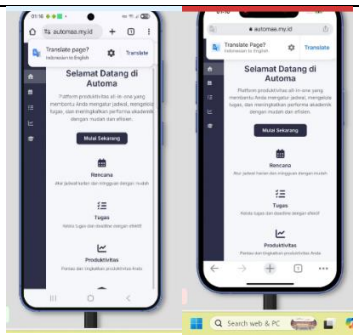
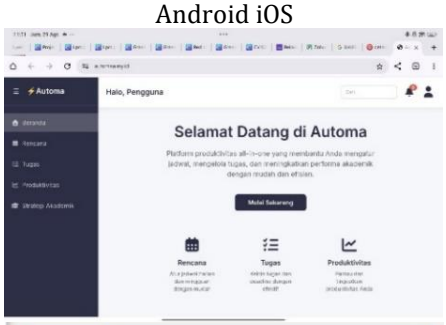
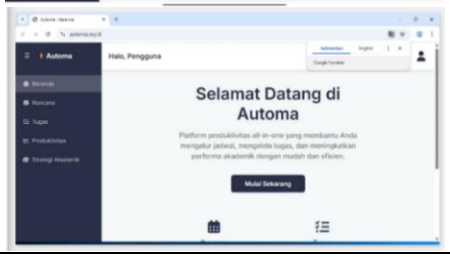
$$x = 1$$

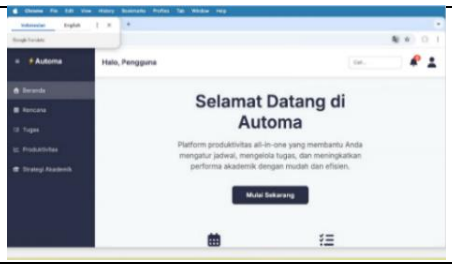
The data analysis results show the results of the Functional Suitability test conducted by two system experts. Based on calculations using the *feature completeness matrix formula* , this test obtained a score of one. With an interpretation score of 0.5 ≤ x ≤ 1, it falls into the "Good" category.

Portability

Portability testing aims to assess the website's functionality and performance. This testing is conducted by observing the output displayed when the website is run on Android, iOS, laptops, and tablets. The results of the portability testing on the Automa website are as follows:

**Table 2**. Portability Test Results

| No | Device | Version | Appearance | Note |
|---|---|---|---|---|
| 1. | Mobile phone | Android & iOS |  Android iOS | Accessible |
| 2. | Tablet | Android |  | Accessible |
| 3. | Laptop | Windows 11 |  | Accessible |

| No | Device | Version | Appearance | Note |
|---|---|---|---|---|
| 4. | Laptop | Macbook |  | Accessible |



portability testing , conducted through accessibility tests on various devices of various versions, demonstrated satisfactory performance. Therefore, it can be concluded that the Automa website can be used properly on various hardware versions.

Performance efficiency

The performance efficiency aspect is carried out by utilizing the GTMetrix website , then GTMetrix performs an analysis and displays the results in the form of a performance score , structure , and the time the page is opened.

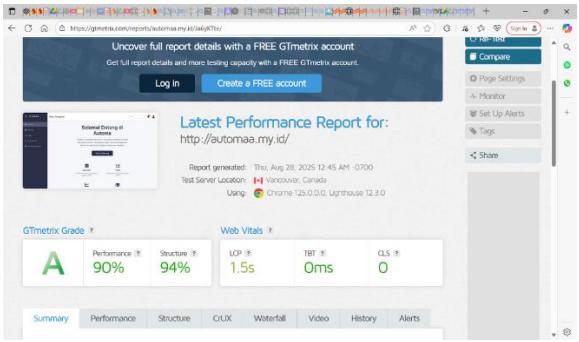




**Figure 10**. Performance Efficiency Test Results

performance efficiency test results using GTMetrix, the website achieved a performance score of 92% and a structure score of 94%, with a Grade A rating . Furthermore, the average website response time was recorded at around 1.5 seconds. Referring to the user satisfaction table, these results are categorized as "Very Satisfied."

Usability

The usability aspect of the AUTOMA website was tested using the USE Questionnaire, which contains 12 statements and is divided into four categories: usefulness , ease of use , ease of learning , and satisfaction . The assessment was carried out using a Likert scale . This instrument was given to 30 students from various departments as respondents and users of the Automa website .

**Table 3**. Usability Test Results

| Respondents | Total Score (a) | Maximum Score (b) | Percentage (%) ( $x = a/b.100\%$) |
|---|---|---|---|
| 32 | 1637 | 1920 | 85.2% |

$$\textbf{Score Percentage} = \frac{\textbf{Total Score}}{\textbf{Maximum Score}} \textbf{x } 100\%$$

$$\textbf{Score Percentage} = \frac{1637}{1920} \textbf{x } 100\%$$

$$\textbf{Score Percentage} = 85,2\%$$

Usability test yielded a score of 85.2%. This score indicates that the quality of the developed website meets established standards, categorizing the usability aspect as "Very Good." This means the system

meets usability criteria well, indicating user satisfaction and the system's ability to effectively support their activities.

## Deployment

Deployment phase was carried out using Rumahweb's hosting service on the automaa.my.id domain. After the entire development and testing process was completed locally, the project files were uploaded to the server via cPanel, placing all files in the public_html directory.

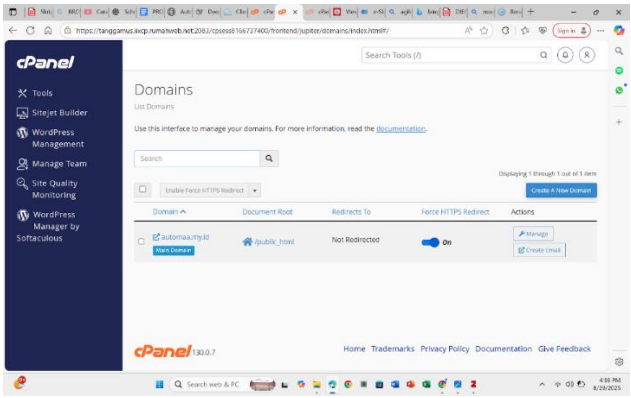



**Figure 11**. RumahWeb cPanel

In this process, the researcher uploaded all the code created in Visual Studio Code. This process ensured that the website files were publicly accessible through the domain. After the upload was complete, the system was tested by accessing the automaa.my.id domain address in a browser. The test results showed that the website ran properly and connected directly to Firebase as designed.

## Maintenance

At this stage, the system is monitored regularly to ensure the website continues to run smoothly and stably. Monitoring is performed through cPanel to assess server performance, storage capacity, and error logs, which can be used to detect system issues. Furthermore, because the website is connected to Firebase, database activity and user authentication are also monitored through the Firebase Console . If errors or bugs are found, fixes are made to the local code and then uploaded back to the public_html directory on the server. To maintain data security, regular backups are also performed.

As a comparison, research conducted by Pratama et al. [11] entitled “PINTARJADWALAI: Web-Based Productivity Application with Task Management and Focus Timer Integration” implemented the Agile model in developing web-based applications, which utilize AI to help students manage time through task management and focus timers. System testing focuses more on usability and direct testing with users. In contrast to Automa which provides more structured testing and complies with ISO 25010 standards which are more effective because they provide assurance that the application meets stricter international standards in terms of performance and portability.

Research conducted by Padang et al. [12] entitled “Designing a Time Management Application to Increase User Productivity” developed the TIMEFLOW application using Flutter for mobile development and MySQL as a database. This application is designed to increase productivity with key features such as task scheduling, time tracking, and reminders. The development method used is Agile , allowing adaptation to user needs through an iterative process. Testing uses Blackbox. Testing focuses more on end-user evaluation of application functionality, without considering internal technical aspects. This also differs from Automa, which uses the ISO 25010 standard, measuring software quality more comprehensively, not just functionality but also performance and portability.

Based on all the steps taken, the AUTOMA system has been successfully developed to meet student needs. Test results show that the system is capable of assisting with planning, task management, productivity monitoring, and academic strategies. Therefore, it can be concluded that this application suitable for use to support student time management more effectively.

## CONCLUSION

Based on the results of the research and the discussion presented, the AUTOMA website was successfully developed using the Agile Development method, which includes analysis, design, development, testing, deployment, and maintenance. The website was built with HTML, CSS, and JavaScript and utilizes Firebase as its database, and the development results demonstrate that the system can assist students in scheduling, managing assignments, and planning academic strategies. Testing based on the ISO/IEC 25010 standard across four aspects shows that the application meets software quality standards. The functional suitability test obtained very good results, with all main functions running as needed. The usability test obtained a percentage of 85.2%, which falls into the "Very Good" category. The performance efficiency test using GTmetrix produced a performance score of 92% and a structure score of 94%, with an average response time of 1.5 seconds, categorized as "Very Satisfied". Finally, the portability test showed that the system can be accessed well on various devices and browser versions.

## ACKNOWLEDGMENT

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## AUTHOR CONTRIBUTION STATEMENT

AS: Conceptualization, Methodology, Software, Investigation, Formal Analysis, Writing - Original Draft. NF: Software, Investigation, Data Curation, Visualization, Writing - Original Draft. AMF: Methodology, Software, Resources, Validation, Writing - Review & Editing. NAM: Investigation, Formal Analysis, Data Curation, Visualization, Writing - Review & Editing. DFS: Validation, Supervision, Project Administration, Writing - Review & Editing.

## AI DISCLOSURE STATEMENT

The author used ChatGPT during the preparation of this work for drafting and writing the manuscript. After using the tool/service, the author thoroughly reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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