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Task Monitoring Information System: Case Study of Task Minder Implementation in PTIK A Class Students Class 2022 Makassar State University

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ABSTRACT

In the digital age, students face increasing demands to manage various academic assignments and deadlines effectively. Manual task management often leads to missed deadlines, irregularities, and reduced productivity. Therefore, a structured, easy-to-use task monitoring system is needed to support learning efficiency. This research explores Task Minder, a task monitoring system that helps individuals and organizations manage tasks in a structured manner. With user-friendly features such as account creation, task editing, status tracking, and automatic reminders, Task Minder aims to increase productivity and efficiency. A descriptive method is used to describe and analyze this system, through a whitebox approach in the creation of Software Requirements Specification (SRS) documents. Data was collected through interviews, observations, and documentation, then analyzed qualitatively using thematic analysis methods. The results show an increase in user productivity, but also identify some limitations that need to be considered for effective use. Overall, Task Minder makes a real contribution as a digital solution in academic task management, helping students organize work more efficiently, responsively, and integrated with learning needs.

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INTRODUCTION

In the rapidly evolving digital era, the need for an efficient and effective information system is becoming increasingly important [1]. One application that can meet this need is Task Minder, a task monitoring system designed to help individuals and organizations manage and organize their tasks in a structured manner [2]. Good task management not only helps in increasing productivity, but also simplifies the process of tracking and completing tasks, thus reducing the likelihood of errors or omissions [3].

Task Minder aims to provide a comprehensive solution in task management through user-friendly and intuitive features [4]. Key features provided by Task Minder include creating user accounts, adding and editing tasks, tracking task status, as well as automatic reminders for tasks that are approaching deadlines [5]. With an easy-to-use interface, this application is expected to be accessible to various groups, ranging from students, professionals, to organizations that need help in project management [6].

The preparation of the Software Requirements Specification (SRS) document for Task Minder aims to provide clear and detailed guidance on the software needs that must be developed [7]. This document not only serves as a reference for the development team in the implementation process, but also as an important communication tool between the development team, clients, and other stakeholders [8]. With this document, it is hoped that it can minimize the risk of

misunderstandings and ensure that the final product is in accordance with the needs and expectations of users [9].

In this study, we will discuss the structure of the Task Minder application and how these features interact to help users. We will also discuss the non-functional and security needs that the application must meet in order for it to function properly and safely. Non-functional needs such as page load times, responsiveness, scalability, and availability are critical in ensuring the app can function properly and meet user needs. In addition, application security is also essential to protect user data and avoid hacking attacks. In this study, we will use the structure and function analysis method to understand how the Task Minder application functions and how these features interact. We will also use testing methods to ensure that the app can function properly and meet the needs of users.

However, the development of Task Minder is inseparable from several limitations that need to be considered. One of the main limitations is the system's inability to integrate with external calendars such as Google Calendar or Outlook Calendar, which requires users to manually enter task information. In addition, Task Minder is designed to manage tasks with a moderate level of complexity, so it may be less than optimal for highly complex project management. Understanding these limitations is important to ensure realistic expectations and effective use of the app.

METHOD

Research Methods, Subjects, and Procedures

Research Methods

The research method used in this study is descriptive research [10], with the aim of describing and analyzing the Task Minder information system and the features associated with the system. This research will use a whitebox approach in the creation of SRS documents, taking into account the details of the internal implementation of the system, as well as non-functional requirements such as performance and security [11].

Research Subject

The subject of this research is the Task Minder information system and the features associated with the system, including integration with external calendars, more complex project management, a standalone mobile app, and more flexible notifications. This subject will be analyzed to find out how the system can help increase the productivity and efficiency of users in completing their tasks.

Research Procedure

This research procedure consists of several stages, namely:

1. Data Collection: Data will be collected from relevant sources, including SRS documents, flowcharts, and login page syntax images.
2. Data Analysis: The data collected will be analyzed to find out how the Task Minder information system and related features can help improve user productivity and efficiency.
3. SRS Document Creation: SRS Document will be created based on data analysis to explain the system specifications, including features, integrations, and non-functional requirements.
4. Presentation of Results: The results of the research are then presented in the form of a report containing information about the Task Minder information system developed, as well as its implications for users.

Data Collection and Analysis Techniques

Interview

Conduct interviews with system users, both project managers, developers, and end users. This interview aims to gain in-depth insights into the user experience, needs, and obstacles encountered during the use of the system [12].

Observation

The use of observation as an additional technique can provide a more complete understanding of user interaction with tourism information systems. Direct observation of users while using the system can provide insight into usage patterns, difficulties encountered, and responses to specific features in the system [13].

Documentation

Collect and review documentation [14] related to the development and implementation of the Task Minder Information System, including system specification documents, user manuals, and test reports. This documentation helps to understand the technical and functional context of the system being researched [15].

Qualitative analysis

Qualitative data from interviews were analyzed using thematic analysis methods [12]. This process involves coding the data, identifying key themes, and drawing conclusions based on the themes that emerge [16]. This analysis aims to deeply understand the user's experience and views of the system [13].

Table 1. Task Minder Research Method (Task Monitoring Information System)

Research Stages	Description
Research Methods	Qualitative with a descriptive-analytical approach.
Research Subject	Tourism users who are interested in visiting destinations tourism in Bulukumba Regency.
Research Procedure	1. Data Collection: Structured interviews through video conferencing platforms. 2. Data Analysis: Using qualitative analysis to identify themes and patterns. 3. Data Validation: Ensure the accuracy and reliability of research results. 4. Presentation of Results: Presented in the report.
Research Materials	Structured interviews and qualitative analysis.
Data Collection Techniques	Structured interviews with the research subject.
Amount of Data	10 Research Subjects

RESULTS AND DISCUSSION

Planning Stage

At the planning stage, there are needs or features needed to create a task monitoring information system that will be used in the PTIK A class Class of 2022 at Makassar State University. Here are the desired features in the Task Minder system:

a. Registration Features
b. Login Features
c. Add Task Features
d. Task Status Features
e. Calendar Features
f. Profile Features
g. Settings Features
h. Unification Feature

Before these features are implemented, a feasibility study was conducted to measure whether the PTIK A class of 2022 at the State University of Makassar is feasible to run this task monitoring information system. This feasibility study includes two main aspects, namely feasibility from a technical point of view and feasibility from an organizational perspective. The following are the results of the feasibility study conducted:

1. Technical Feasibility

   The Task Minder Information System Information System is technically feasible, although it has some risks as follows:

   a. Risks Associated with Familiarity with Applications: Medium Risk
      - The User Division does not have extensive experience in using similar applications.
      - The IT division has a good understanding of web application development, but does not necessarily master all the features that will be implemented in Task Minder.
   b. Risks Associated with Familiarity with Technology: Low Risk
      - The IT division has adequate expertise in web application development and the use of related technologies
      - The use of commonly used technologies such as JavaScript frameworks and SQL databases minimizes the risk of familiarity.
   c. Risks Associated with Project Size: Low Risk
      - The company has enough development teams to handle this project.
      - Realistic estimate of time to complete the project, with adequate resource allocation.
   d. Compatibility with Existing Systems and Infrastructure: Low Risk
      - The system will be developed using standard web technology and proven to be compatible with existing infrastructure.
      - Integration with existing systems and infrastructure will be relatively easy.

2. Organizational Eligibility
   a. Product User/Owner: Department of Informatics and Computer Engineering, State University of Makassar
   b. Project Manager: Mr. Majid
   c. Developers: Fauziah, Miftakhul Jannah and Amanda Putri Lestari

d. Integration with the Vision and Mission of the Department of Informatics and Computer Engineering, State University of Makassar? Yes.

The Task Minder Information System is designed to support the company's vision and mission in improving productivity and work efficiency.

e. Clear Development Goals? Yes.

The main goal of the development of the Task Minder Information System is to increase productivity and work efficiency throughout the organization. This is in line with the company's KPIs related to improving the quality and quantity of work output.

f. Good Developer Team Organization? Yes.

The Task Minder Information System will automate most of the business processes related to task management and project supervision in the organization. This will help reduce manual workload and improve accuracy and consistency in the execution of daily tasks.

g. Project work estimate:

The estimated time to work on the Task Minder information system is 17 months which is carried out by a team of 3 people.

Stages of Analysis

1. System Description

Task Minder is an innovative task management application that is very useful for individuals who want to increase their productivity and efficiency in organizing their work. With its user-friendly interface and intuitive features, Task Minder allows users to easily create to-do lists, set priorities, and organize their schedules. One of the outstanding features of Task Minder is its ability to send customizable reminders, so users won't miss important deadlines or urgent tasks. In addition, the app also integrates with a calendar, allowing users to easily view and manage all of their activities in one place. Task Minder also provides a space to store notes, attachments, and task-related information, so users can access all the information they need quickly and easily. With Task Minder, users can increase their productivity, reduce stress, and achieve their goals more effectively.

2. Functional Requirements

The actors who will run this information system, namely students or students who have a strict study schedule, have many tasks, projects, and exams that need to be managed and managed properly as well as being the admin of the Task Minder information system. The admin roles are:

- Register and manage user accounts in the system.
- Assign specific tasks to users or groups.
- Monitor user activity, including task completion and system usage time.
- Respond to questions, issues, or requests for help from users regarding the use of the system.

a. Use Case Diagram

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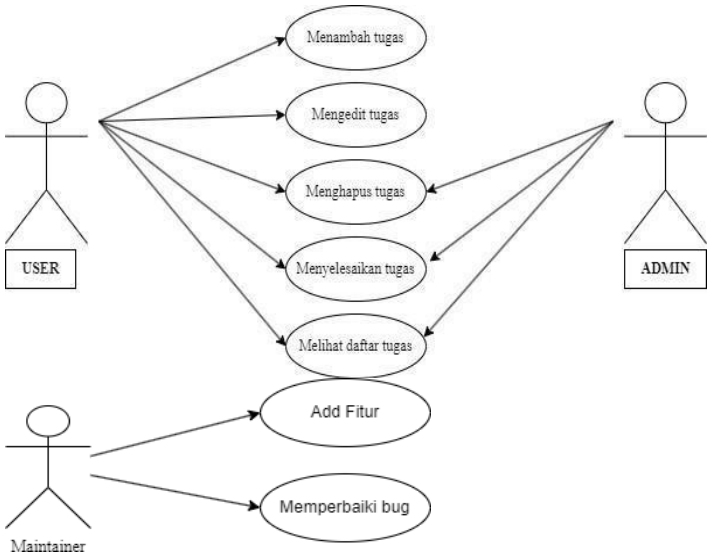

Figure 1. Use Case Diagram

b. Activity Diagram

Figure 2. Activity Diagram

c. Class Diagram

Figure 3. Class Diagram

d. Sequence Diagram

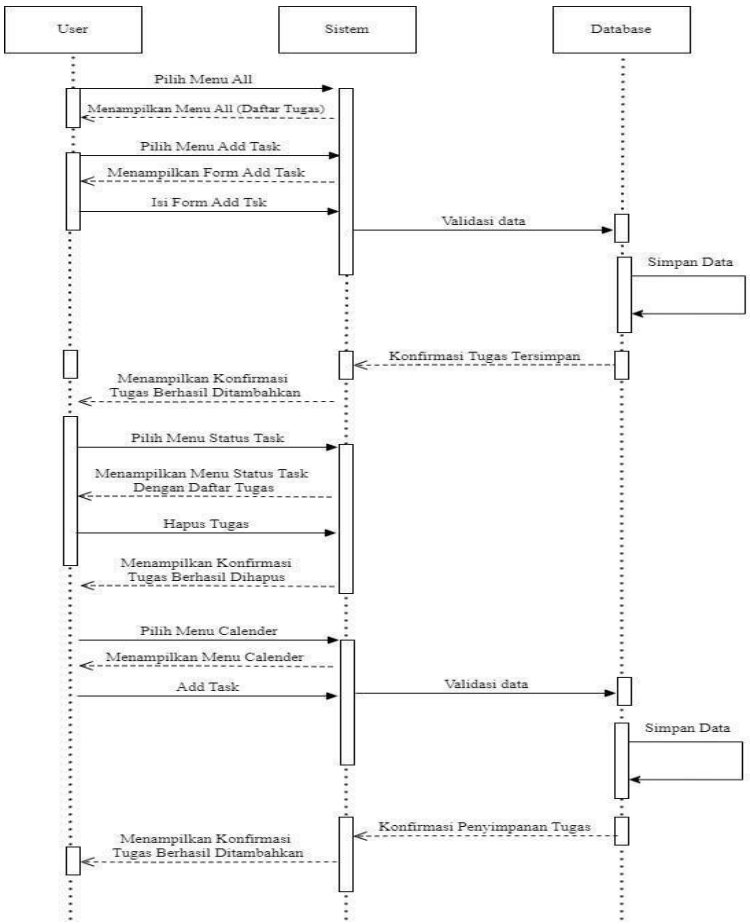

Figure 4. Sequence Diagram

3. Non-functional requirements

Functional requirements are specifications that define what an information system must do to meet the needs of users and achieve the goals that have been set. These requirements describe the functions or features that the system must have, how the system will interact with users, and how data will be processed and presented [17]. Functional requirements generally include the operation, inputs, outputs, and behavior of the system in certain scenarios [18]. In this study, relevant non-functional needs will be identified. The following are the Non-Functional requirements of this study:

Table 2. Non-Functional Requirements

Parameters	Requirements
Performance Requirement	The website is designed to provide an optimal user experience by ensuring fast page load times, high responsiveness, and good scalability.
Safety Requirement	The website is designed to be secure, protects user data, is resistant to hacking and DDoS attacks, and complies with regulations. Additionally, it must have a disaster recovery plan, regular updates, a clear privacy policy, and a security reporting system.
Security Requirement	Websites should implement user data encryption, XSS prevention, strong password management, proper access authorization, and use HTTPS. Brute force prevention measures, active security monitoring, regular security updates, data deletion is not required, and data leak reporting procedures.
Software Quality Attributes	The task minder application must be easy to use, reliable, responsive, and secure. Additionally, the application must be capable of handling workload increases, be easy to update and fix, and be accessible across multiple platforms.
Development Platform	Development platforms for task minder apps include web platforms that use HTML, CSS, JavaScript, and PHP, as well as mobile platforms for Android that use Java and Kotlin.

Design Stage

In this design stage, we discuss the devices that will be used in the Task Minder information system, where the devices that will be discussed start from the hardware interface, software interface and the initial design or provisional image as the initial benchmark for designing the system display. Task Minder Information System.

1. Hardware Interface

The hardware interface on the Task Minder information system is required to display the system display. A hardware interface may also be required to perform data entry or other tasks. Furthermore, the hardware used in the Task Minder information:

a. PC or Laptop: users can access the web interface through a desktop or laptop computer and of course it functions as I/O

Figure 5. Laptop

b. Mouse and Keyboard: Mouse functions to move the cursor on laptops and PCs, while keyboards are one of the hardware that functions to input data into laptops or PCs.

Figure 6. Keyboard

Figure 7. Mouse

c. Internet Connection: the web interface should be able to operate properly under different network conditions, including slow or unstable internet connections. And the use of optimized images and efficient processing needs to be taken into account to keep page load times fast.

Figure 8. Router

2. Software Interface

The user interface in the task minder information system plays an important role in ensuring that users can interact effectively with various system features and components. The goal is to provide a seamless and intuitive user experience, allowing users to easily add, edit, and delete tasks, as well as access relevant information.

3. Temporary Design

In the temporary design of the task minder information system, the Figma design application is used to produce an interface design that can be an initial reference in system development. Here is an example of a temporary interface design that has been created using the Figma application:

a. Login Page

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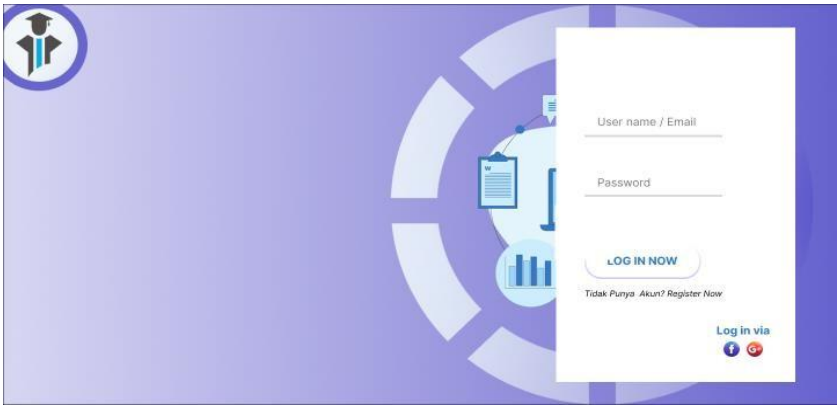


Figure 9. Login Page

b. Registration Page

Figure 10. Registration Page

c. Home Page

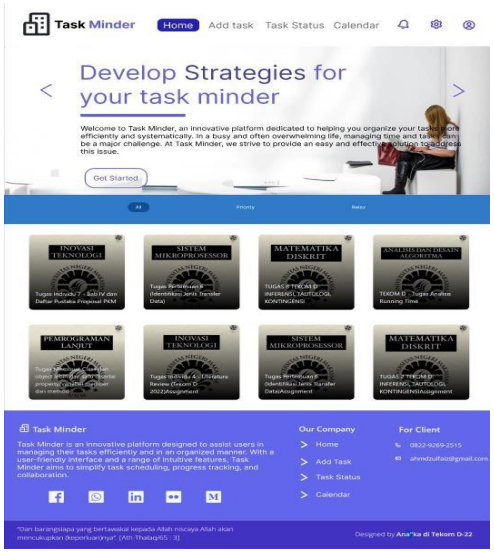


Figure 11. Home Page

d. Add Task Page

Figure 12. Halaman Add Task

e. Task Status Page

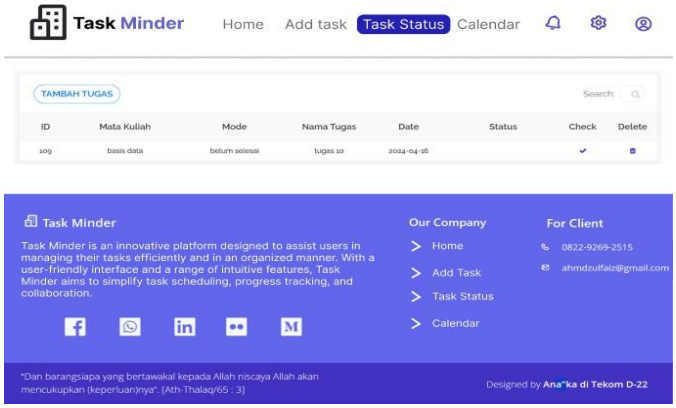


Figure 13. Task Status Page

f. Calendar Page

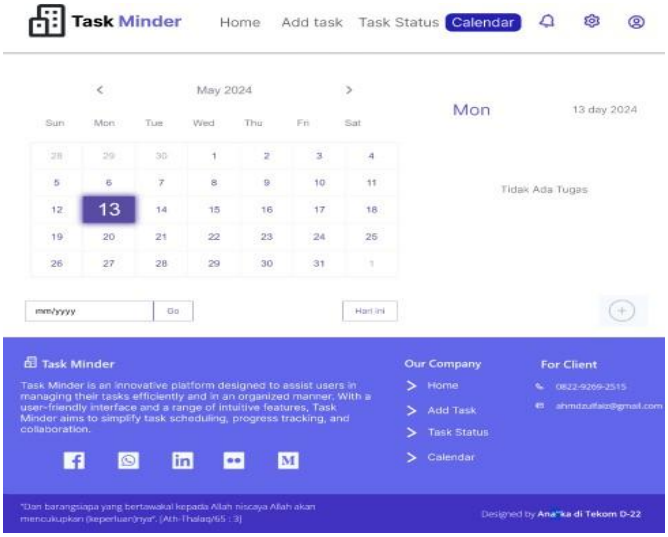


Figure 14. Halaman Calender

4. Testing Stage

After the design stage of the task minder information system, the next step is to conduct tests to ensure that the system meets the needs of users. The test is carried out using two methods, namely White Box testing and Black Box testing. White Box involves a direct examination of the internal structure of the system, while Black Box testing focuses on testing the functionality of the system from the user's point of view, without paying attention to the details of the internal implementation. The purpose of this test is to identify potential issues and ensure that the system is functioning properly before it is fully implemented. Thus, testing gives developers and stakeholders confidence that the task minder information system is ready to be used smoothly and according to expectations.

a. White Box Testing
   - Login Page

Table 3. White Box Testing on the Login Page

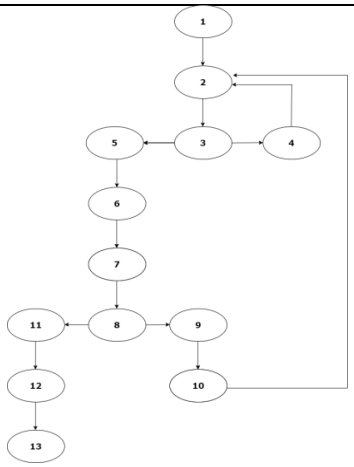
Flowchart	Flowgraph
	

Figure 15. Flowchart Halaman Login

Figure 16. Flowgraph Halaman Login

Flowchart Lines	Cyclomatic Complexity
Track 1 : 1 - 2 - 3 - 5 - 7 - 12 - 13 Track 2 : 1 - 2 - 3 - 5 - 12 - 8 - 12 – 13 Track 3 : 1 - 2 - 3 - 5 - 10 Track 4 : 1 - 2 - 3 - 5 – 6 Track 5 : 1 - 2 - 3 - 5 - 9 - 10 - 11	E = 7 N = 4 So V(G) = E - N + 2 V(G) = 7 - 4 + 2 V(G) = 5

- Add Task Page

Table 4. White Box Testing on Add Task Pages

Flowchart	Flowgraph

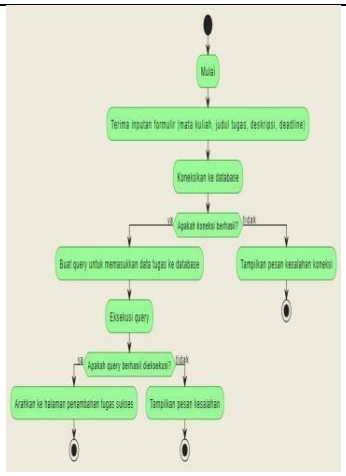
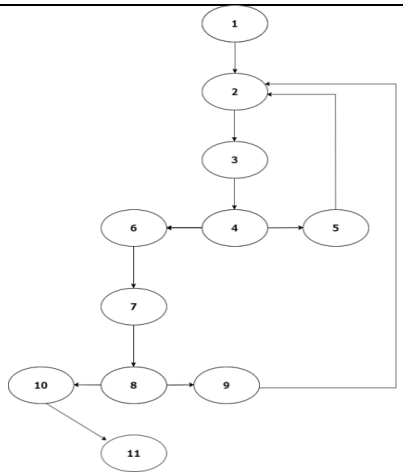

	

Figure 17. Flowchart Halaman Add Task	**Figure 18.** Flowgraph Halaman Add Task

Flowchart Lines	Cyclomatic Complexity
Line 1 : 1-2-3-4 Line 2 : 1-2-3-5-6-7-8-10-11 Line 3 : 1-2-3-5-6-7-8-9 Line 4 : 1-2-3-4-5-6-7	E = 6 N = 4 So V(G) = E - N + 2 V(G) = 6 – 4 + 2 V(G) = 4

- Task Status Page

Table 5. White Box Testing on Task Status Page

Flowchart	Flowgraph

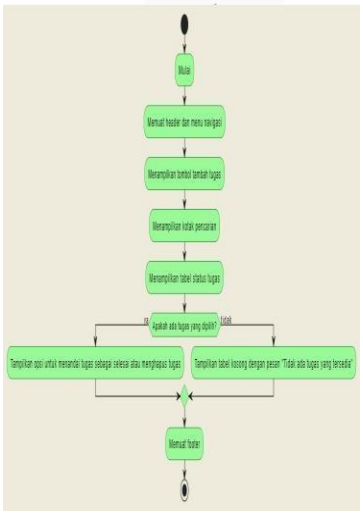
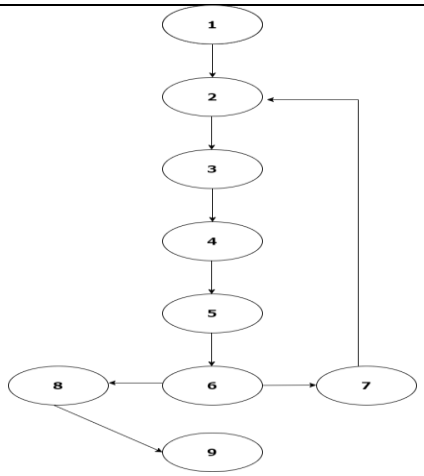

	

Figure 19. Flowchart Halaman Task Status	**Figure 20.** Flowgraph Halaman Task Status

Flowchart Lines	Cyclomatic Complexity
Line 1 : 1-2-3-4-5-6-8-9	E = 7
Line 2 : 1-2-3-4-5-6-7	N = 2
Line 3 : 1-2-3-4-5-6-7-9	So
Line 4 : 1-2-3-4	V(G) = E - N + 2
Line 5 : 1-2-3-4-7	V(G) = 7 - 2 + 2
Line 6 : 1-2-3-4-5-6-7-8	V(G) = 7
Line 7 : 1-2-3-4-5-6	

b. Black Box Testing

Table 6. Black Box Testing

Activity Testing	Expected Relationships	Test Results	Status
Registration	Users can register by filling out the registration form with valid information.	Successfully created New account	Succeed
		Failed to create an account New (email already in use)	Fail
		Failed to create a new account (password not met requirements)	Fail
Login	Users can log in to the account using the correct email and password	Successfully log in with a valid account	Succeed
		Failed to log in with the wrong email	Fail
		Failed to log in with the wrong password	Fail
Task Addition	Users can add new tasks with a valid title, description, and due date	Successfully added new tasks	Succeed
Task Editing	Users can edit the details of existing tasks	Successfully edit task details	Succeed
Task Removal	Users can delete unnecessary tasks	Successfully delete a task	Succeed
Task Status Tagging	Users can mark the status of a task as complete or incomplete	Successfully mark the status of the task	Succeed

Implementation

This implementation stage involves building a pre-designed user interface into a live usable application. This process is done using the main web technologies, namely HTML, CSS, and JavaScript. HTML is used to organize the structure and content of the page, CSS is used to set the

visual appearance and style of the page, while JavaScript is used to add dynamic interaction and functionality to the interface. Task minder information systems use PHP as the programming language for backend logic, Visual Studio Code as the code editor, and MySQL as the database. This combination provides the system with reliability and efficiency in its development.

By combining PHP, HTML, CSS, and JavaScript, developers can implement pre-designed interface designs more easily. HTML is used to build the basic structure of a page, CSS is used to set the look and visual style of the page to match the design, while JavaScript is used to add dynamic interaction and functionality to the interface. Through this implementation process, the task minder information system can generate a responsive and interactive interface, allowing users to easily manage their tasks efficiently.

1. Registration Page

   Here, new users can create a new account by filling out a registration form that asks for information such as name, email address, and password.

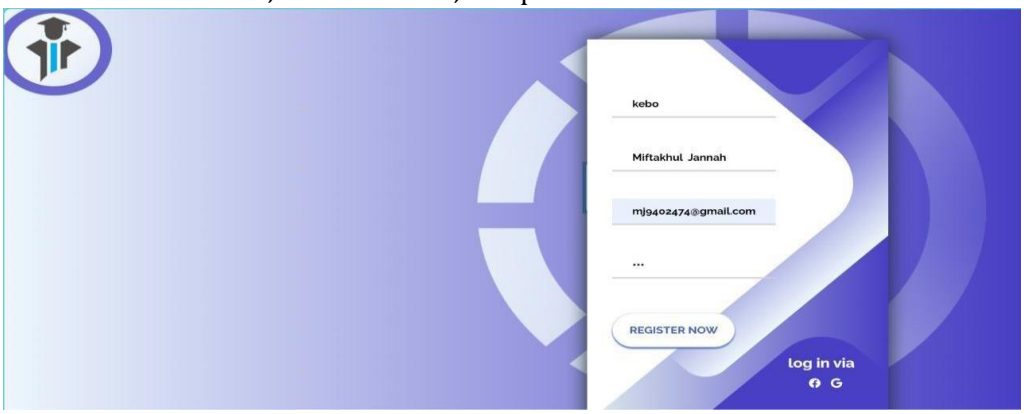


Figure 21. Login Page View

2. Login Page

   This page allows users to log in to their account by entering login information such as email address and password.

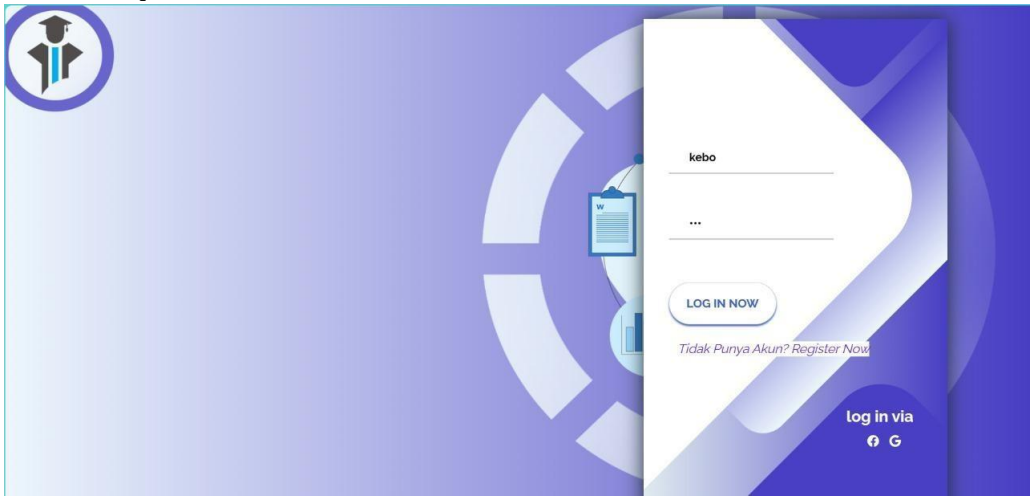


Figure 21. Login Page View

3. Home Page

   This is the main page that is displayed after the user successfully logs in. This page contains a summary of uncompleted tasks, completed tasks, and may also be notifications or updates related to the application.

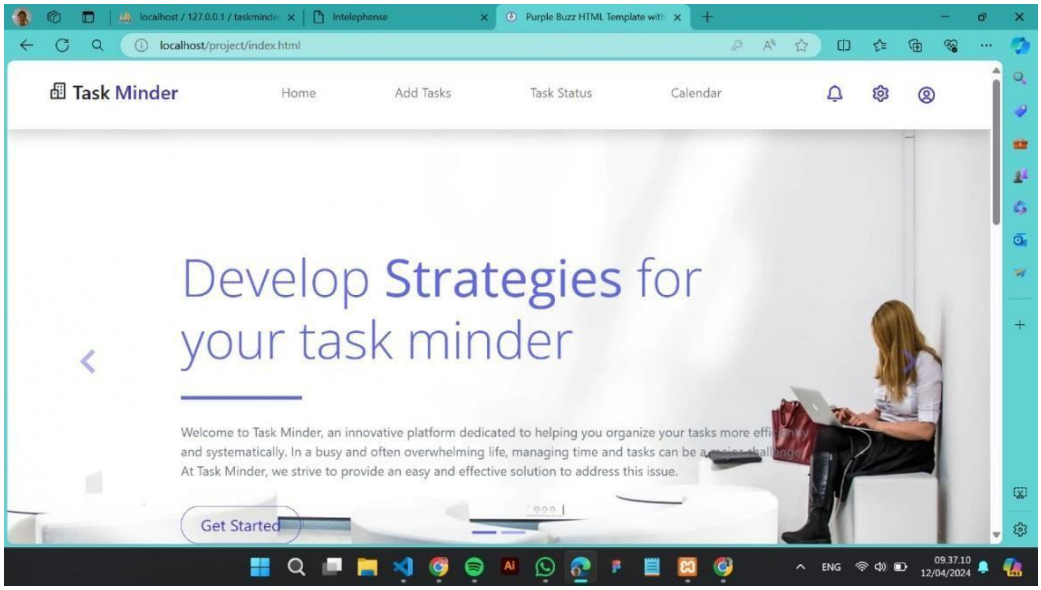


Figure 22. Home Page Display

4. Profile Page

   This page allows users to view and manage their profile information, such as name, profile picture, account settings, and performance statistics such as the number of tasks completed.

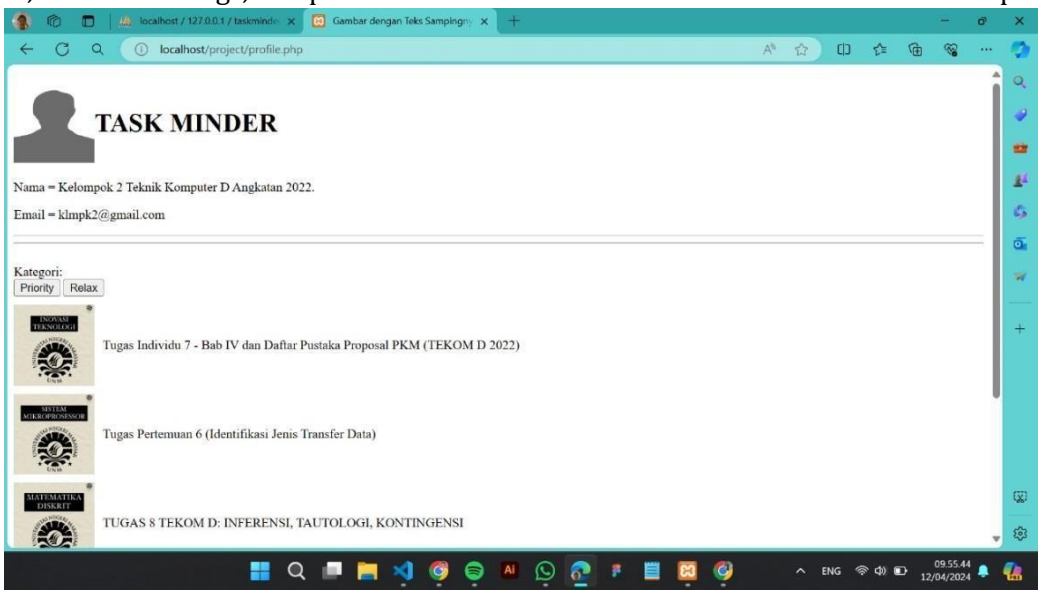


Figure 23. Profile Page View

5. Task Storage Page

   This page is where all the tasks that have been created or assigned are saved. Users can view a full list of tasks that have been created, view task details, edit task information, mark tasks as complete, or delete tasks that are completed or no longer relevant.

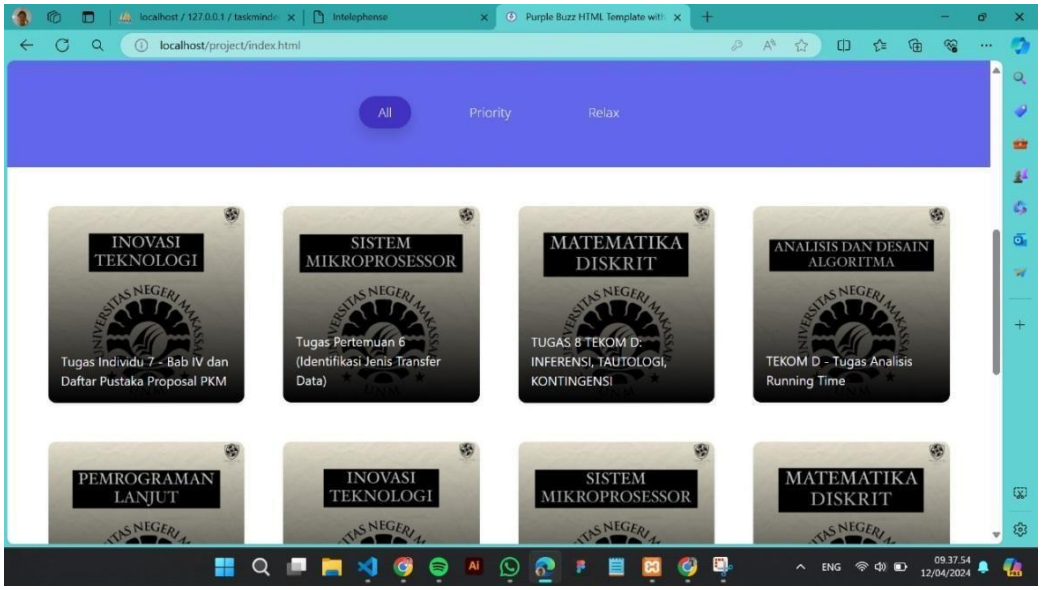


Figure 24. Task Storage Page View

6. Add Task Page

The Add Task page allows users to create new tasks in the system. Users can enter task details such as title, description, due date, priority, and other settings. This is the place where the user initiates the addition of information about the tasks that need to be done.

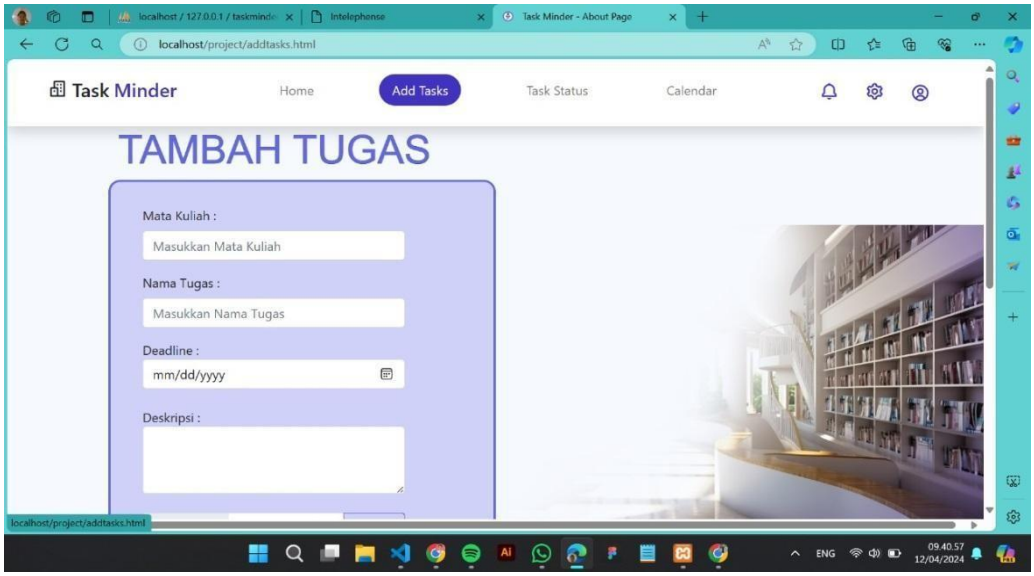


Figure 25. Add Task Page View

7. Task Status Page

This is the view that appears when a user adds a schedule or deadline for a newly created task. Users can select a date, time, and recurrence option (if needed) to set a task schedule. This view allows users to plan and organize when the task should be completed.

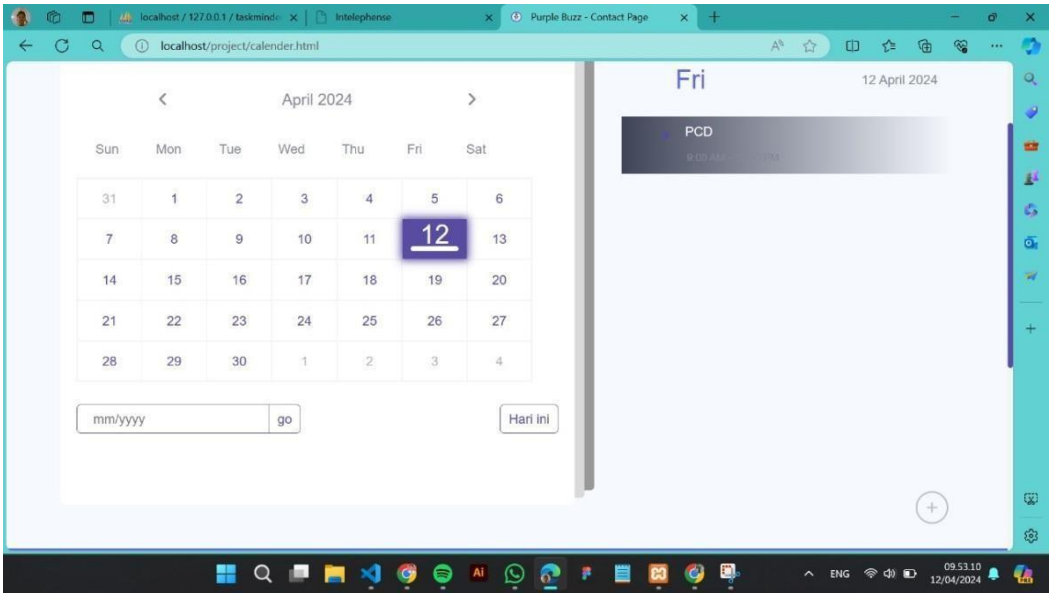


Figure 26. Task Status Page View

CONCLUSIONS

Task Minder Information System is a digital solution that helps users manage their tasks more efficiently. Using a combination of major web technologies such as HTML, CSS, and JavaScript, the system provides a responsive and interactive interface for users. Through the implementation stage that involves the use of PHP as the backend programming language, Visual Studio Code as the code editor, and MySQL as the database, the system offers reliability and efficiency in its development. Users of the task minder information system can easily register, log in, add, edit, and delete their tasks, as well as monitor the status of completion of these tasks. With the notification feature, users can also be reminded of the deadlines for tasks that need to be completed. Thus, the task minder information system makes a significant contribution in increasing the productivity and efficiency of users in managing their daily tasks. With an intuitive and functional interface, the system is a very useful tool for better organizing and tracking the progress of tasks.

REFERENCES

[1] Ana Nurfadilah and Ilham, "The Implementation Of Management Information Systems In The Digital Era: Challenges And Solutions," *JCI*, vol. 4, no. 2, pp. 68–87, Dec. 2024, doi: 10.54066/jci.v4i2.510.

[2] F. R. Dhanias, D. A. Kusumastuti, H. D. Sylvatri, Z. S. Darmawan, and B. Efendi, "Stepping Forward in the Digital Era: The Contribution of Business Information Systems in Responding to Global Entrepreneurship Challenges," *jmp*, vol. 13, no. 1, pp. 366–372, May 2024, doi: 10.33395/jmp.v13i1.13668.

[3] A. Prasetya Nugraha, H. Agus Romi, M. Yudi Wisra, and S. Suriani, "Government Information Systems in the Digitalization Era 4.0 in Increasing the Value of Human Resources.," *SAID IT*, vol. 5, no. 6, pp. 2419–2429, Sept. 2024, doi: 10.38035/dijemss.v5i6.3194.

[4] N. T. Singh, Preeti, R. Kumar, A. Choubey, Suresh, and J. Singh, "An All-Inclusive Daily Task Tracker App for Enhancing College Student Productivity," in *2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, Kamand, India: IEEE, June 2024, pp. 1–5. doi: 10.1109/ICCCNT61001.2024.10724109.

[5] P. Nagalapur and V. Hittalamani, "Complete Task Tracking System For Software Company Using Python," *IRJMETS*, Sept. 2023, doi: 10.56726/IRJMETS44485.

[6] F. A. Nurzi and K. Ab Wahab, "Web-Based Student Task Management System," *EASTJ*, vol. 1, no. 1, pp. 50–56, July 2022, doi: 10.37698/eastj.v1i1.119.

[7] M. Krishna, B. Gaur, A. Verma, and P. Jalote, "Using LLMs in Software Requirements Specifications: An Empirical Evaluation," in *2024 IEEE 32nd International Requirements Engineering Conference (RE)*, June 2024, pp. 475–483. doi: 10.1109/RE59067.2024.00056.

[8] X. Franch, C. Palomares, C. Quer, P. Chatzipetrou, and T. Gorschek, "The state-of-practice in requirements specification: an extended interview study at 12 companies," *Requirements Eng*, vol. 28, no. 3, pp. 377–409, Sept. 2023, doi: 10.1007/s00766-023-00399-7.

[9] H. S. Dar, S. Imtiaz, and M. I. Lali, "Reducing Requirements Ambiguity via Gamification: Comparison with Traditional Techniques," *Computational Intelligence and Neuroscience*, vol. 2022, pp. 1–12, July 2022, doi: 10.1155/2022/3183411.

[10] J. E. Kosie and C. Lew-Williams, "Open science considerations for descriptive research in developmental science," *Infant and Child Development*, vol. 33, no. 1, p. e2377, Jan. 2024, doi: 10.1002/icd.2377.

[11] C. Dongmo, "A Review of Non-Functional Requirements Analysis Throughout the SDLC," *Computers*, vol. 13, no. 12, p. 308, Nov. 2024, doi: 10.3390/computers13120308.

[12] Agri Fina and H. B. Santoso, "Usability Evaluation and Interface Design Improvements Recommendations for Self-Service System of a Help Center in an E-commerce Mobile Application," *ijcs*, vol. 13, no. 4, Aug. 2024, doi: 10.33022/ijcs.v13i4.4258.

[13] A. G. Pradnya Sidhawara, "Evaluation of UAJY Learning Management System's Usability using USE Questionnaire and Eye-tracking," *Indonesian J. of Inf. Syst.*, vol. 4, no. 2, Feb. 2022, doi: 10.24002/ijis.v4i2.5273.

[14] Z. Gao, J. Wang, and M. Wang, "Mapping the Information Journey: Unveiling the Documentation Experience of Software Developers in China," 2023.

[15] A. A. Winecoff and M. Bogen, "Improving governance outcomes through AI documentation: Bridging theory and practice," Dec. 09, 2024, *arXiv*arXiv:2409.08960. doi:10.48550/arXiv.2409.08960.

[16] M. W. Yasykur and Devi Ajeng Efrilianda, "Evaluation of User Interface and User Experience on Solo Destination App using System Usability Scale and Human-centered Design Methods," *J. Adv. Inf. Syst. Tech*, vol. 6, no. 2, pp. 183–199, Jan. 2025, doi: 10.15294/jaist.v6i2.4185.

[17] Z. K. A. Baizal, D. H. Widyantoro, and N. U. Maulidevi, "Factors Influencing User's Adoption of Conversational Recommender System Based on Product Functional Requirements," *TELKOMNIKA*, vol. 14, no. 4, p. 1575, Dec. 2016, doi: 10.12928/telkomnika.v14i4.4234.

[18] N. Hussin and S. F. M. Yatim, "Evaluating the Applicability of the Functional Requirements Developed on the Practices of Records Management System in the Malaysian Court of Appeal," vol. 9, no. 4, 2017.