

Extracurricular Management Information System at SMPN 1 Umbu Ratu Nggay Central Sumba Regency

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Abstract

Extracurricular activities play an important role in developing students' interests, talents, and non-academic skills. At SMP Negeri 1 Umbu Ratu Nggay, extracurricular data management is still carried out using Microsoft Word and Microsoft Excel. Although these applications assist teachers in recording and storing data, several challenges remain, including time-consuming data retrieval, non-centralized information storage, and limited accessibility. This study aims to develop a web-based Extracurricular Management Information System (SIME) to support the management of extracurricular data in a more structured, efficient, and accessible manner. The system is designed to complement, rather than replace, the use of Microsoft Word and Microsoft Excel by providing a centralized platform for storing and managing information. The development process follows the Waterfall methodology and utilizes UML for system modeling. The system is implemented using PHP and MySQL. The results are expected to improve the efficiency of extracurricular administration, facilitate data management, and provide easier access to information for students and school staff. By integrating extracurricular data into a web-based system, information can be managed more effectively and accessed more quickly when needed.

Keywords: Information Systems, Extracurricular, Website, Waterfall

1. Introduction

Education serves as a means of advancing various aspects of human life, including technology, economics, safety, social skills, peace, national development, and culture. Continuous development and improvement are necessary to achieve optimal educational outcomes. In academic settings, students are taught scientific knowledge and theoretical concepts. However, academic learning alone is insufficient to produce the best educational results. Students' skills and abilities should also be developed through non-academic activities that align with their interests and talents [1]. Therefore, both academic and non-academic education must be continuously enhanced.

At SMP Negeri 1 Umbu Ratu Nggay, there are three extracurricular activities: Scouting, Traditional Dance, and Drum Band. Based on an interview with the Vice Principal for Student Affairs, information regarding activity schedules, implementation, student assessments, and instructors is communicated through announcements from the school and extracurricular advisors. Administrative management of extracurricular activities is still carried out using Microsoft Word and Microsoft Excel. Several challenges have been identified, including difficulties in searching and updating member data, fragmented information management, and the absence of an integrated information system. As a result, access to extracurricular information remains limited.

In addition, each extracurricular activity has its own advisor. Scouting activities are supervised by Mrs. Dian, Drum Band activities by Mrs. Maria, and Dance activities by Mrs. Elsi, while Mr. Umbu Katanga serves as the Head of Extracurricular Activities. These advisors play an important role in guiding, training, and mentoring students according to the activities they participate in.

Extracurricular activities are not conducted daily but are scheduled according to specific needs and events. For example, during August, which is associated with Indonesia's Independence Day celebrations, Scouting and Drum Band activities are conducted more intensively and require structured training schedules. Meanwhile, Dance activities are more flexible and are organized when performance requests arise, such as welcoming guests or participating in school and community events.

To address these challenges, the researcher proposes the development of a web-based Extracurricular Management Information System (SIME). The system is expected to facilitate the management of extracurricular activities, provide comprehensive information regarding all elements involved, and improve administrative processes. Relationship Flow Diagrams (RFD), Data Flow Diagrams (DFD), and database design are utilized to model the system and minimize data redundancy. The system is developed using PHP and MySQL as the primary technologies.

2. Previous Research

2.1. System

Managerial functions, namely organizing, directing, controlling, and planning, are essentially decision-making processes. Information is required to perform each of these functions. A Management Information System (MIS) provides managers with the information they need. Organizations use this information as a basis for monitoring and evaluating their performance. A Management Information System can be defined as a formal approach to providing management with accurate and timely information needed for decision-making and for carrying out planning, control, and operational functions efficiently within an organization [2].

2.2. Information

Etymologically, the term information originates from the French word *informacion*, which means concept, idea, or outline. Information is a noun that refers to communicated knowledge. Information is a collection of data or facts that have been processed into something useful for the recipient. Generally, information undergoes processing to make it easier for recipients to understand. In simple terms, information is data that has been transformed into a meaningful and valuable form. Employees within organizations use information technology to accomplish various tasks, including transferring information that facilitates decision-making, improving customer service, and supporting other organizational activities [3].

2.3. Management Information System

A Management Information System (MIS) is a planning system that forms part of an organization's internal control structure. It involves documents, people, technology, and procedures related to management accounting. According to the book *Human Resource Management Information Systems*, a Management Information System is a collection of management systems that provide information to support managerial operations and decision-making within an organization [4].

2.4. Extracurricular Activities

Extracurricular activities are activities conducted both inside and outside the designated school environment. Through activities based on students' interests and hobbies, their skills and creativity can be developed. To maximize outcomes, specialized training tailored to each extracurricular activity is designed to enhance students' talents and abilities. The benefits of extracurricular activities include improving students' understanding of how to apply knowledge and skills in various contexts, including arts and sports. Extracurricular activities also provide opportunities for students to reach their full potential and develop skills that may not be acquired through classroom learning alone [5].

2.5. Waterfall Method

The Waterfall Method is one of the software development models characterized by a linear and sequential process, where each phase must be completed before proceeding to the next. This model is also known as the linear sequential model because its workflow progresses downward like a waterfall, from the initial stage to the final stage [6].

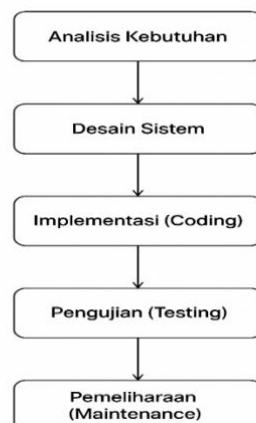


Fig. 1: Waterfall Method

The Waterfall Method consists of several sequential stages, where each phase must be completed before moving to the next.

1. **Requirement Analysis**
This initial stage involves gathering information from users or clients to identify system requirements. The result is a system requirements specification document that outlines the system's functions, features, and constraints. A proper requirements analysis helps ensure that the developed system meets user needs effectively.
2. **System Design**
At this stage, the system architecture is designed based on the identified requirements. The design includes database structures, user interface (UI) layouts, data flow diagrams, and program logic. This process provides a clear blueprint for system development.
3. **Implementation (Coding)**
During implementation, the system design is translated into source code using appropriate programming languages. Individual modules are developed and integrated into a complete system that functions according to the design specifications.

4. **Testing**
Testing is conducted to verify that the system operates correctly and meets the specified requirements. This stage aims to identify and correct errors while ensuring that all system functions perform as expected.
5. **Maintenance**
Maintenance is the final stage and takes place after the system is deployed. It includes fixing errors, updating features, and improving system performance to ensure that the system remains effective, efficient, and aligned with evolving organizational needs and technological developments.

2.6. Black Box Testing

Black Box Testing is a software testing method that treats a software application or program as a "black box." This approach evaluates the software solely based on its outputs or outcomes. The internal structure of the program and its source code are not considered during the testing process. The advantages of this testing method are its simplicity and low cost. However, it cannot identify inefficiencies within the program's code. The test data are executed on the software, and the results are then examined to determine whether they meet the expected outcomes [7].

3. Results And Discussion

This research was conducted at SMP Negeri 1 Umbu Ratu Nggay, a public junior high school located in Umbu Ratu Nggay District, Central Sumba Regency, East Nusa Tenggara, Indonesia. The school was established on March 7, 1991, under the authority of the Ministry of Education and Culture. Currently, SMP Negeri 1 Umbu Ratu Nggay serves 141 students and is supported by 19 qualified teachers who contribute to the teaching and learning process. The school is led by Frederingko Umbu Tibu, S.H., while Suparjon, S.Pd. serves as the school operator responsible for administrative and information management activities.

The data collection method used in this study is a qualitative research approach. This approach was employed to obtain an in-depth understanding of the existing extracurricular management process and to identify the system requirements. The research focuses on data collected through interviews and direct observations.

1. **Interview**
At this stage, the researcher conducted interviews with representatives of SMP Negeri 1 Umbu Ratu Nggay to obtain the data and information required for the study. The interviews were aimed at identifying the problems encountered in managing extracurricular activities, understanding user needs, and gathering requirements for the development of the proposed system.
2. **Observation**
At this stage, the researcher conducted direct observations at SMP Negeri 1 Umbu Ratu Nggay to examine the school's conditions and gather additional information regarding the extracurricular activities conducted at the school. Through observation, the researcher was able to understand the existing administrative procedures, data management practices, and challenges faced in the extracurricular management process.

4. Implementation and Testing

The result of this study is a web-based Extracurricular Management Information System (SIME) implemented at SMP Negeri 1 Umbu Ratu Nggay. The system was developed using the PHP programming language and a MySQL database to support the management of extracurricular data in a more effective, efficient, and well-structured manner.

- a. **Admin Page**
 1. **System Login Page**

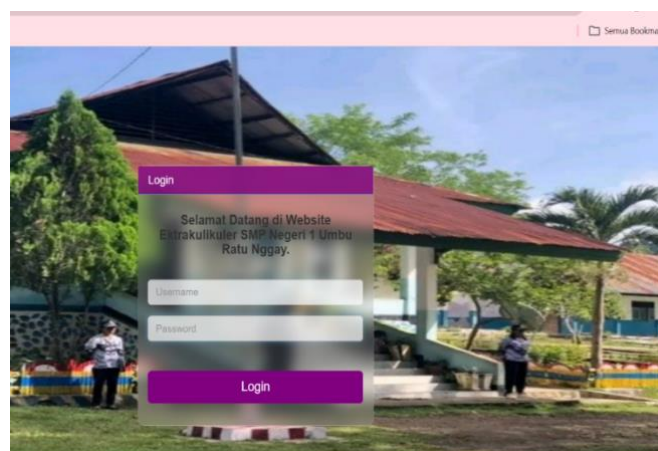


Fig. 2: System Login Page

The Login Page serves as the initial interface for accessing the Extracurricular Information System. On this page, users are required to enter their username and password for authentication purposes. Once the login credentials have been successfully verified, users are redirected to the system's main page according to their assigned access rights. The page design incorporates a school-themed background to provide institutional identity and enhance the visual appearance of the system.

2. Admin Dashboard

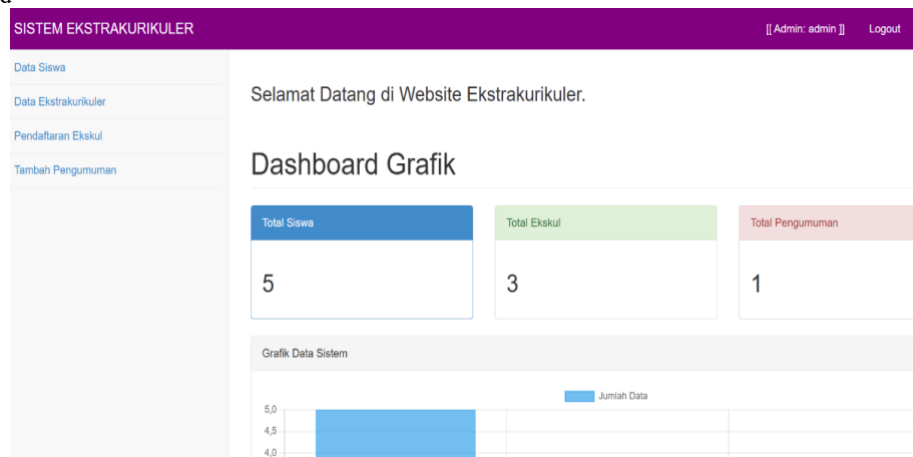


Fig. 3: Admin Dashboard

The Admin Dashboard serves as the main page used by administrators to manage the Extracurricular Information System. This page displays a summary of data, including the total number of students, extracurricular activities, and announcements available in the system. In addition, graphical visualizations are provided to present information in a more intuitive manner, enabling administrators to monitor the status and development of extracurricular activities effectively. The available navigation menu also allows administrators to manage student data, extracurricular activity data, extracurricular registrations, and announcements through an integrated system.

3. Student Data Page

No	NIS	Nama	JK	Alamat	No HP	Aksi
1	1739	Aben	L	langgaliu	09876543	Edit Hapus
2	1740	Agnes	P	praibakul	0865432	Edit Hapus
3	1741	Agus	L	sonu	87665443	Edit Hapus
4	1742	Amel	P	maharang	0865432	Edit Hapus
5	1743	Alex	L	langgaliu	09876543	Edit Hapus

Fig. 4: Student Data Page

The Student Data Page is used by administrators to manage all student records registered in the extracurricular system. This page displays student information such as student identification number, name, gender, address, and phone number. Administrators can add new student records, update existing information, and delete unnecessary data. In addition, a report generation feature is available, allowing administrators to export student data in PDF format, thereby facilitating documentation and reporting processes in a quick and organized manner.

4. Extracurricular Data Page

No	Nama	Pembina	Hari	Jam	Lokasi	Aksi
1	pramuka	ibu Dian	jumad	15:00	lapangan sekolah	Edit Hapus
2	drumband	ibu Maria	kamis dan sabtu	15:00	lapangan sekolah	Edit Hapus
3	Bola voly	Pak Yermias dan pak Wilhelmus	kamis dan sabtu	15:00	lapangan bola voli	Edit Hapus

Fig. 5: Extracurricular Data Page

The Extracurricular Data Page is used by administrators to manage all extracurricular activities available at the school. This page provides information regarding the extracurricular activity name, supervisor, schedule, activity time, and location. Administrators can add new extracurricular activities, modify existing records, and remove activities that are no longer needed. Furthermore, the system provides a PDF report generation feature that supports effective and well-structured documentation and reporting of extracurricular activity data.

5. Extracurricular Registration Data Page

No	Nama Siswa	Ekskul	Tanggal Daftar	Status	Aksi
1	Aben	pramuka	2026-06-03	diterima	Selesai
2	Aben	drumband	2026-06-03	diterima	Selesai
3	Agnes	pramuka	2026-06-03	diterima	Selesai
4	Agus	pramuka	2026-06-03	ditolak	Selesai
5	Agus	drumband	2026-06-03	diterima	Selesai
6	Amel	pramuka	2026-06-03	ditolak	Selesai
7	Amel	drumband	2026-06-03	diterima	Selesai
8	Alex	pramuka	2026-06-03	diterima	Selesai
9	Alex	drumband	2026-06-03	ditolak	Selesai

Fig. 6: Extracurricular Registration Data Page

The Extracurricular Registration Data Page is part of the administrative panel that functions to monitor, record, and manage extracurricular activity registration submissions made by students. The page layout remains consistent with other modules, featuring a purple top navigation bar that displays the system name, information about the currently active administrator account, and a logout button. On the left side of the page, a vertical navigation menu highlights the Extracurricular Registration option, indicating the administrator's current working section. Through this page, administrators can review and manage student registration data efficiently, ensuring that the registration process is organized and well documented within the system.

6. Add Announcement Page

No	Judul	Isi	Tanggal	Aksi
1	jadwal latihan	syalom rekan-rekan dan anak-anak kami yang terkasih, ijinkan saya menyampaikan informasi bahwa dalam minggu depan kita tidak ada jadwal kegiatan ekskul. terimakasih	2026-06-21	Edit Hapus

Fig. 7: Add Announcement Page

In the main content area, a prominent heading labeled "Announcement Data" clearly identifies the active workspace. Directly below the heading, administrators are provided with a green interactive button labeled "+ Add Announcement", which is used to open a form for creating and publishing new announcements within the system. The most prominent component on this page is a structured table containing a list of announcements that have been created. The table consists of five main columns: No, Title, Content, Date, and Action. At the time of observation, the table contained a single announcement titled "Training Schedule", which informed students that no extracurricular activities would be held during the following week. The announcement was recorded as being published on June 21, 2026. In the rightmost column, namely the Action column, the system provides two operational control buttons to facilitate announcement management by administrators. The first is a blue "Edit" button, which allows administrators to modify the title or revise the content of an existing announcement. The second is a red "Delete" button, which enables administrators to permanently remove an announcement from the system when the information is no longer relevant. These features support efficient maintenance and management of announcement data within the Extracurricular Information System.

- b. Student Pages
 1. Student Dashboard

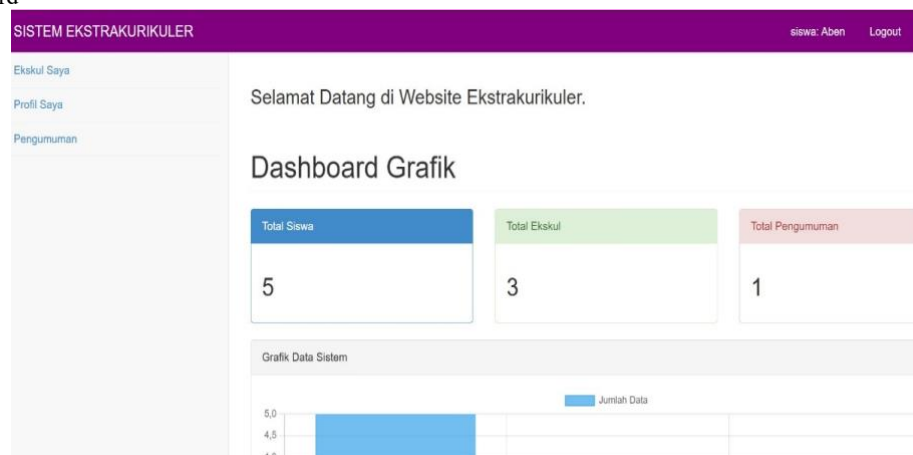


Fig. 8: Student Dashboard

The webpage shown in the figure above is the login page of the Extracurricular Website of SMP Negeri 1 Umbu Ratu Nggay, which is designed in a simple and attractive manner. The page uses a photograph of the school environment as its background, creating a realistic impression while reinforcing the school's identity. In the center of the page, there is a transparent login form that serves as the main focus for users. At the top of the form, a purple header labeled "Login" indicates the user authentication page. Below the header, a welcome message provides information about the website being accessed. The login form consists of username and password fields used by users to access the system. The password is masked with dot symbols to ensure data security. At the bottom of the form, a purple "Login" button is provided to process user credentials. Overall, the website interface appears neat, easy to understand, and user-friendly due to its centralized layout and simple yet modern design.

2. Student Schedule Page

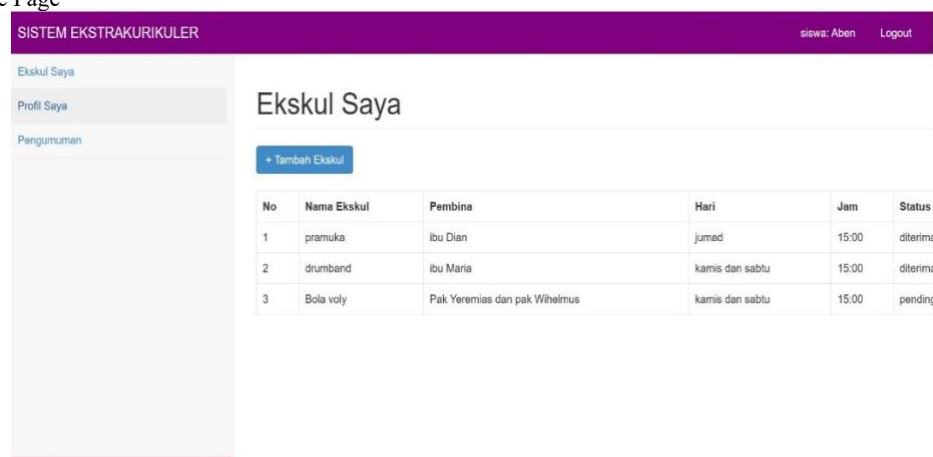


Fig. 9: Student Schedule Page

The My Extracurricular Activities page, which displays student schedule information, is part of the student user interface belonging to a student named Aben. The page layout is consistent with the overall system design, maintaining a purple navigation bar at the top that displays the application name, the active student's name, and a logout option on the right side. On the left side of the page, a navigation menu provides quick access to several features that allow students to manage their data and view information. In the main content area, the title "My Extracurricular Activities" identifies the active page. Directly below the title, a blue "+ Add Extracurricular Activity" button allows students to register for additional extracurricular activities offered by the school. The central section of the page contains a structured schedule table displaying the student's extracurricular participation history and registration status. The table consists of six columns: No, Extracurricular Activity Name, Supervisor, Day, Time, and Status. Based on the displayed data, the student Aben is registered for three activities: Scouting, supervised by Mrs. Dian on Fridays at 3:00 PM with an Accepted status; Drum Band, supervised by Mrs. Maria on Thursdays and Saturdays at 3:00 PM with an Accepted status; and Volleyball, supervised by Mr. Yeremias and Mr. Wihelmus on Thursdays and Saturdays at 3:00 PM. The Status column provides important registration information for students. The Accepted status indicates that the student has officially joined the activity and may participate in its scheduled sessions, while the Pending status for Volleyball indicates that the registration request is still under review and awaiting approval from the system administrator.

3. Student Profile Page

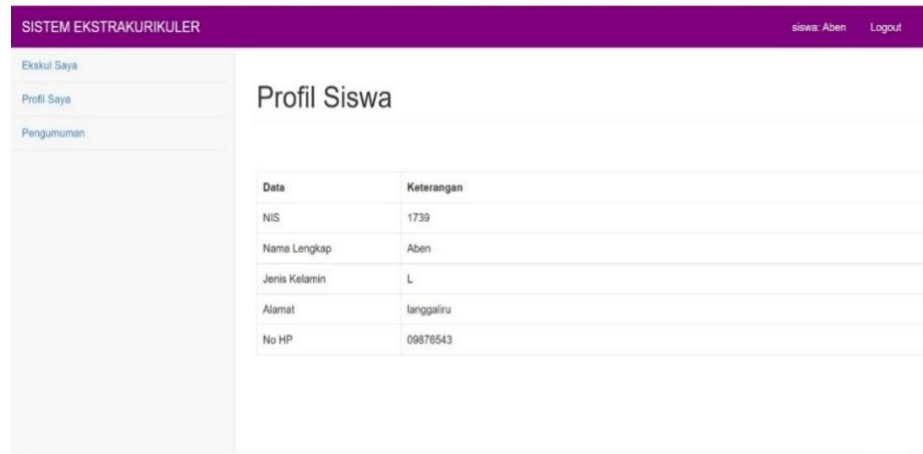


Fig. 10: Student Profile Page

The My Profile page, also referred to as the student profile page, is a dedicated section that allows students to view and manage their personal information stored within the Extracurricular Information System. Based on the navigation structure shown on the left side of the interface, the My Profile menu is located directly below the My Extracurricular Activities menu. When a student selects this menu, the main content area changes from the extracurricular information page to a form or table displaying the student's personal details, which in this case belong to a student named Aben. This page typically presents important personal information in detail, including the Student Identification Number (NIS), full name, gender, residential address, and active phone number. The primary purpose of this page is to ensure the accuracy of student data stored in the school's database. Through this feature, students can verify whether their personal information has been recorded correctly. In addition, the page is generally equipped with edit or update functions that allow students to modify their information whenever necessary, such as when changing their address or phone number.

4. Announcement Page

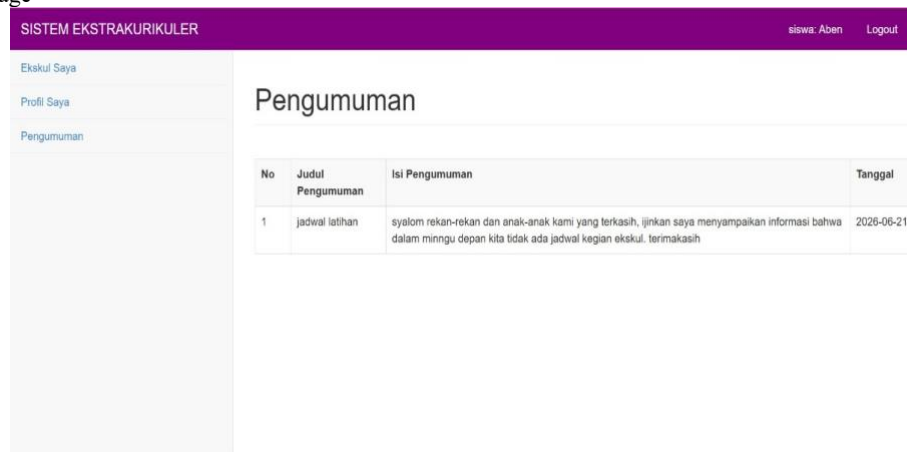


Fig. 11: Announcement Page

This page is part of the information system called Extracurricular Information System. The current user is logged in using a student account belonging to Aben, whose name is displayed in the upper-right corner alongside the Logout button. On the left side of the page, there is a navigation menu containing several options, namely My Extracurricular Activities, My Profile, and Announcements. The currently active menu is Announcements. The main content area displays an announcement table containing important information for students. The table currently includes an announcement regarding the training schedule. The content of the announcement informs students that no extracurricular activities will be conducted during the following week. At the end of the table, the publication date of the announcement is also displayed, namely June 21, 2026. This page enables students to stay informed about the latest extracurricular updates and announcements provided by the school administration.

c. Black Box Testing

Black-box testing was conducted to evaluate the functionality of each module in the Extracurricular Information System. The testing scenarios and results are presented in Table 1.

Table 1: Black Box Testing

No	Module	Test Scenario	Input	Expected Output	Result
1.	Login	Login with valid credentials	Valid username and password	User is redirected to the dashboard	Passed
2.	Login	Login with invalid credentials	Invalid username and password	Error message is displayed	Passed
3.	Login	Empty fields	No input provided	Validation message requiring field completion is displayed	Passed
4.	Student Data	Add student data	Complete student information	Data is successfully saved	Passed

5.	Student Data	Add student data with empty fields	Empty fields	Error message is displayed	Passed
6.	Student Data	Edit student data	Modified student information	Data is successfully updated	Passed
7.	Student Data	Delete student data	Click the delete button	Data is successfully deleted	Passed
8.	Extracurricular Activities	Add extracurricular activity	Activity name, schedule, and supervisor	Data is successfully saved	Passed
9.	Extracurricular Activities	Edit extracurricular activity	Modified activity information	Data is successfully updated	Passed
10.	Extracurricular Activities	Delete extracurricular activity	Click the delete button	Data is successfully deleted	Passed
11.	Extracurricular Activities	Submit empty input	Empty fields	Error message is displayed	Passed
12.	Registration	Register without logging in	Not logged in	User is redirected to the login page	Passed
13.	Registration	Access registration without logging in	Not logged in	User is redirected to the login page	Passed
14.	Registration	Register for a full extracurricular activity	Activity quota is full	Registration failure notification is displayed	Passed
15.	View Extracurricular Activities	View extracurricular activity list	Click the menu	List of extracurricular activities is displayed	Passed
16.	View Extracurricular Activities	View extracurricular activity details	Click an extracurricular activity	Detailed information is displayed	Passed
17.	Attendance	Submit attendance	Select Present/Absent	Attendance data is successfully saved	Passed
18.	Attendance	Submit attendance without input	No attendance selection	Error message is displayed	Passed
19.	Logout	Logout from the system	Click the logout button	User is redirected to the login page	Passed

Based on the testing results shown in Table 1, all tested functionalities produced the expected outputs. Therefore, the Extracurricular Information System can be considered to have met the functional requirements and is ready for implementation.

d. System Usability Scale (SUS)

To evaluate the usability of the Extracurricular Management Information System (SIME), a System Usability Scale (SUS) assessment was conducted involving 10 respondents. The SUS scores obtained from each respondent are presented in Table 2.

Table 2: System Usability Scale (SUS) Test Results

Respondent	SUS Score
R1	80
R2	75
R3	82,5
R4	77,5
R5	85
R6	80
R7	72,5
R8	77,5
R9	82,5
R10	80
Total	792,5

$$\bar{x} = \frac{792,5}{10} = 79,25$$

Based on the calculation results, the average SUS score obtained was 79.25. This score indicates that the Extracurricular Management Information System (SIME) falls into the Good category and is considered acceptable by users. The results demonstrate that the system has achieved a satisfactory level of usability, enabling users to operate the system easily, effectively, and efficiently in managing extracurricular activities at SMP Negeri 1 Umbu Ratu Nggay.

5. Conclusion

The web-based Extracurricular Management Information System (SIME) has been successfully designed and developed for SMP Negeri 1 Umbu Ratu Nggay using the PHP programming language and a MySQL database by applying the Waterfall development method. The implementation of this system has successfully replaced the previous administrative process, which relied on conventional use of Microsoft

Word and Microsoft Excel. Limitations of the previous system, such as slow member data retrieval, fragmented schedule information, and the high risk of data duplication or file loss on local computers, have been effectively addressed through a centralized and integrated data management system. The implemented system provides clear and functional access control for its users. Administrators have full authority to manage student data, user accounts, extracurricular activities and supervisors, as well as publish announcements. Meanwhile, students can conveniently access activity information, register for extracurricular programs independently, monitor the status of their registrations, and update their personal profiles in real time. In addition, administrative processes have become more efficient through the availability of PDF report generation features for student and extracurricular activity data. From the technical evaluation perspective, all application functionalities performed reliably and as expected. Based on the results of Black-Box Testing, which covered nineteen test scenarios—including login processes under various conditions, master data management, registration mechanisms with quota validation, attendance recording, and logout functionality—all test cases produced outputs consistent with the expected system requirements. Therefore, the developed system has been proven to be functionally reliable and ready to support the efficient management of extracurricular activities at SMP Negeri 1 Umu Ratu Nggay.

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