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Application of the Object-Oriented Analysis Method and Design Web Profile at MA Darussalam Pangkal Pinang

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ABSTRACT

Web profile is one of the effective media for disseminating information in introducing the institution to the wider community. This is what is used by many government and private agencies, one of which is an educational institution or school. MA (Madrasah Aliyah) Darussalam Pangkalpinang is one of the education institutions under the auspices of the Ministry of Religion of the Republic of Indonesia. MA Darussalam Pangkalpinang does not currently have a Web Profile as a means of disseminating information to the public at large. This research has the objective of helping MA Darussalam Pangkalpinang to have a medium for disseminating information that can be accessed by the wider community easily, effectively, and efficiently. In making the Web Profile in this study, the Object-Oriented Analysis and Design (OOAD) method was used which has several work stages that can optimize web performance to be optimal. Based on the OOAD method in this study, there are 5 diagrams used, including Use Case, Activity, Collaboration, Sequence, and Class Diagrams. The result of applying the OOAD method is a website-based school profile application that contains useful information belonging to the school, especially MA Darussalam Pangkalpinang which can be accessed by students and the wider community. With this web profile, it is hoped that it will help MA Darussalam in promoting their school more broadly and building a better school branding.

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1. INTRODUCTION

Information Technology is increasingly embedded in human life as a medium for obtaining effective and efficient information, as well as in making decisions that have a major impact on the human future [1]. Many agencies have implemented Information Technology as a medium for disseminating information, one of which is an institution in the education sector [2]. However, there are still schools that have not implemented Information Technology as a medium for disseminating information [3]. Based on Law Number 20 of 2003 concerning national education standards, schools with national standards endeavored to have a medium for disseminating information. [4].

Web Profile is one of the media solutions for disseminating information that is widely used by government and private agencies to better introduce their agencies to the wider community [5]. This

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will increase the trust and branding of an agency. Web Profiles can contain text, images, video, and sound, even a combination of all of them, which are static or dynamic [5, 6].

MA (Madrasah Aliyah) Darussalam Pangkalpinang is one of the private education institutions under the auspices of the Ministry of Religion of the Republic of Indonesia. Currently, the school does not yet have information dissemination media such as the school's Web Profile, so it is difficult for the community to find important information, as well as the school's activity agenda [8].

Based on these problems, it is known that the role of information dissemination by applying Information Technology is very important, especially for the education sector, especially at MA Darussalam Pangkalpinang. Therefore, this research entitled "Application of the Object-Oriented Analysis Method and Design Web Profile in Darussalam Pangkalpinang Islamic Senior High School" has the aim of helping Pangkalpinang Darussalam Islamic Senior High School to have a medium for disseminating information that can be accessed by the wider community easily, effectively, and efficiently.

In developing the system, this research will use the Object-Oriented Analysis and Design (OOAD) method. The object-oriented analysis method has several stages of work as follows: (1) Prioritizing the needs of system users. (2) Identify system use cases. (3) Selection of classes and objects using requirements as a guide. (4) Identify the attributes and operations on each object class. (5) Identify class hierarchy and structure. (6) Create a class and object relationship model [9]. Meanwhile, object-oriented design also has several diagrams, namely, use case diagrams, activity diagrams, sequence diagrams, collaboration diagrams, class diagrams, and several other diagrams.

The software development method used to create the Darussalam MA school's web profile is Web Engineering which has several stages, namely: Customer Communication, Planning, Modeling, Construction, and Deployment. While the programming language used is PHP language which has open-source properties and can be used on various types of operating system platforms. Meanwhile, the database is used to store data in MySQL. MySQL is a database server that is widely used in PHP programming.

2. RESEARCH METHOD

The stages in this research method are related to research literature studies, data collection, system development using the Object-Oriented Analysis and Design method, system coding, system testing, system evaluation, and system use. **Figure 1** is a flowchart of the research to be carried out.

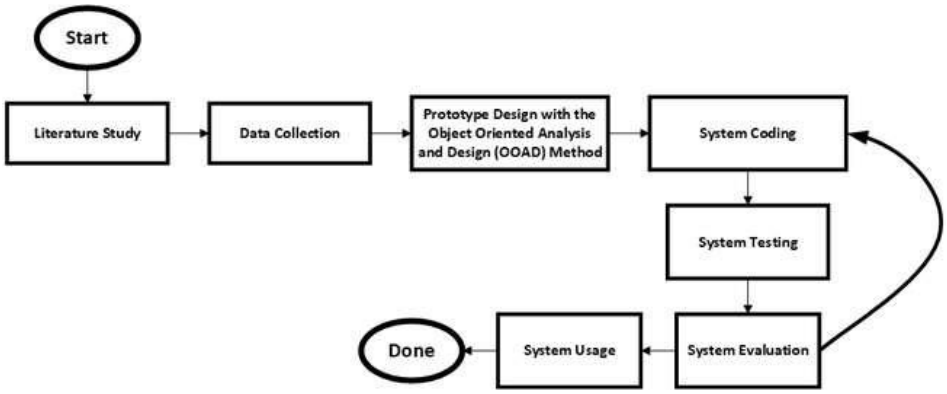

Figure 1. Research Flowchart

2.1 Studi of Literature

The first stage in this research is a literature study, to find and scientifically examine previous studies that are relevant to this research.

2.2 Data retrieval

The data collection method in this study was carried out in three ways, namely: The first method was to conduct interviews with the school. The second method is to observe the manual business processes that occur in the school environment. Meanwhile, the third method is to find, study, and understand various literature studies that can support this research.

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2.3 System Development Method

The system development method used in this study is Web Engineering which has the following work stages:

1. Customer Communication is the stage for finding solutions to problem-solving.
2. Planning is the stage for planning activities in making a website.
3. Modeling is the stage of analyzing and designing object-oriented systems.
4. Construction is the stage for building a website.
5. Deployment is the en-user stage and conducts regular evaluations on the website created.

3. RESULTS AND DISCUSSION

The application of object-oriented design and analysis methods in this study is described as follows:

3.1 Object Oriented Analysis

1. Prioritizing System User Needs

The first stage in object-oriented analysis is to prioritize the needs of system users. At this stage, all the needs of the user for the system to be built are described. The workflow image of the system to be built is shown in

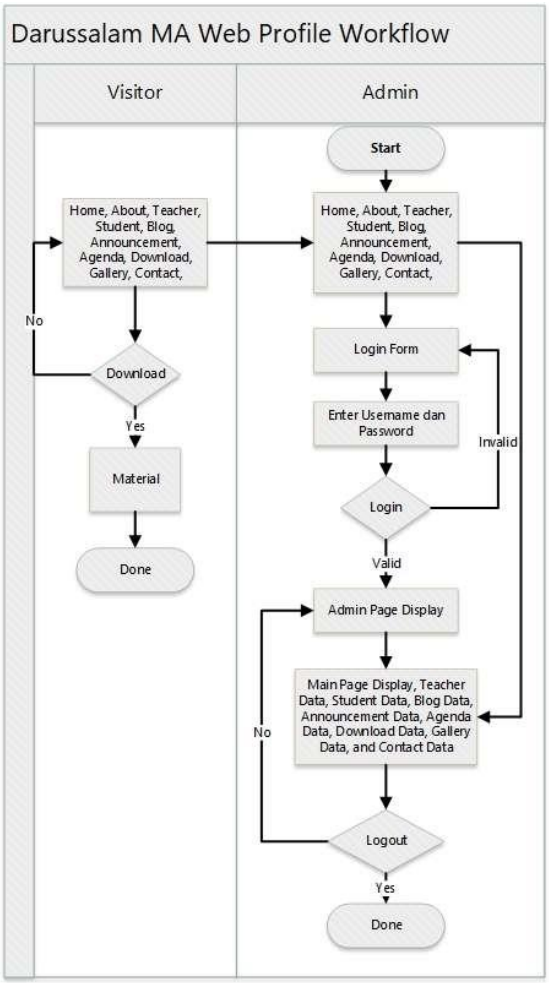

Figure 2. Workflow Sistem Web Profile

In Figure 2 shows that there are two activities in the system, namely admin activities and visitors who have their respective tasks. In this workflow, visitors can view announcements, news, agendas, downloads, and galleries. Admin can add, change, and delete teacher data, student data, gallery data, download data, agenda data, announcement data, and news data.

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2. Identify System Use Cases

The second stage in the object-oriented analysis method is to create a system use case scenario. In this study, there are 10 scenarios including logging in to the admin menu, managing admin data, adding admin data, managing announcement data, downloads, galleries, student data, teacher data, managing inboxes, and managing comments.

3. Selection of Classes and Objects

This stage aims to select classes and objects from the system scenarios that have been created. In this study, there are twelve objects, namely: admin, announcements, materials, files, agenda, galleries, students, teachers, activity logs, and writing. Meanwhile, in this study, there were nine classes: admin, announcements, materials, files, agendas, galleries, students, teachers, and activity logs.

4. Identify Attributes and Operations on Each Object Class

The next stage is to determine the attributes and operations of the classes that have been created. In this study the first class is the admin class which has the attributes: id_admin, admin_name username, password, jenkel_admin, email, no_hp, photo) and its operations are (browser, edit, save, send, view, delete). The second class is an announcement that has attributes namely announcement id, announcement_title, announcement_date, announcement_content, and publisher_name. The operations in the announcement class are edit, save, and delete.

The third class is agenda_activity which has the attributes id_agenda, agenda_name, agenda_date, description, agenda_noble, agenda_finished, place, time, description and publisher_name. Operations in the agenda_activity class are edited, save and delete. Next, the fourth class is a gallery which has id_gallery, title, date, image, id_album, and id_user attributes. Operations in the gallery_foto class are edited, save, and delete. The next class is the student class which has the attributes id_siswa, NIS_siswa, jenkel_siswa, id_class, and foto_student. Operations on student classes are browsers and material downloads. The seventh class is the teacher class which has the attributes id_guru, NIP_guru, name, address, contact number, id_materi_pelahan, and id_class. The teacher class has edit, delete, and save operations. The last class is uploaded material that has the attributes title material, date, nama_guru. While the operations are edit, save, delete, and send.

5. Identify Class Structure and Hierarchy in the System

In this study, the class structure is divided into three, namely the main class, the system display class, and the description of the system use case scenario. The main class in this study is the website of the MA Darussalam Pangkal Pinang school. Furthermore, the system display class will consist of admin login classes, admin menus, announcements, activity agendas, galleries, students, teachers, downloads, and contacts. Meanwhile, for class descriptions of system use case scenarios, there are admin classes, announcements, materials, agendas, galleries, students, teachers, and files.

The class hierarchy is a description of the class structure, where the main class is placed at the top, the next class is placed by the class that handles the system display, and the last class is the description of the system's use case scenario.

6. Create Class and Object Relationships

The final stage in the object-oriented analysis method is to create relationships or relationships between classes. The following are the relationships between classes that have been described in stage five: 1) The writing class will relate to the agenda class. 2) The album class will be related to the gallery class. 3) Material classes will relate to classes. 4) The admin class will be related to the agenda class. 5) Class material will relate to the teacher's class. 6) The material class will be related to the admin class. 7) The teacher class will be related to the admin class. 8) The admin class will be related to the gallery class. 9) The admin class will be related to the writing class. 10). The announcement class will be related to the writing class. 11) The announcement class will be related to the admin class. 12) Class students will relate to class classes.

3.2 Object Oriented Design

In this study, there are five diagrams created to support the object-oriented system design process. The following is an object-oriented diagram design:

1. Use Case Diagram

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A use case diagram is a diagram that connects actors and use cases in the system [10]. This designed website profile system has 2 actors, namely Admin, and Visitors. Use case diagrams can be seen in Figure 3.

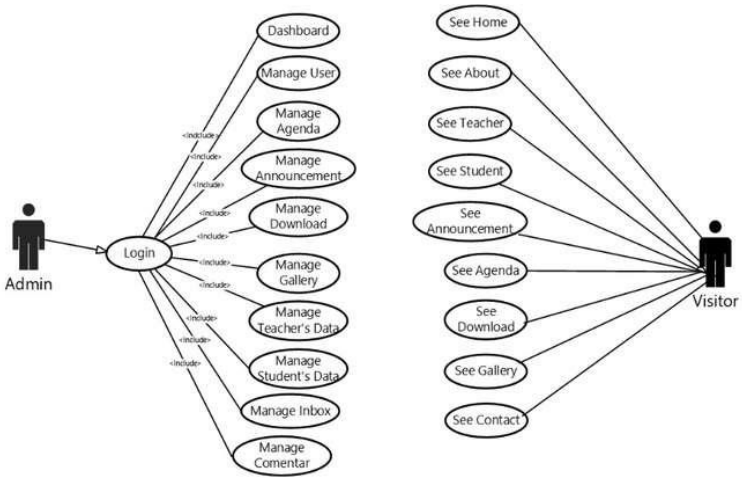

Figure 3. Use Case Diagram

2. Activity Diagram

An activity diagram is a diagram that will define the sequence of activities in the system [11]. The activity diagram can be seen in Figure 4.

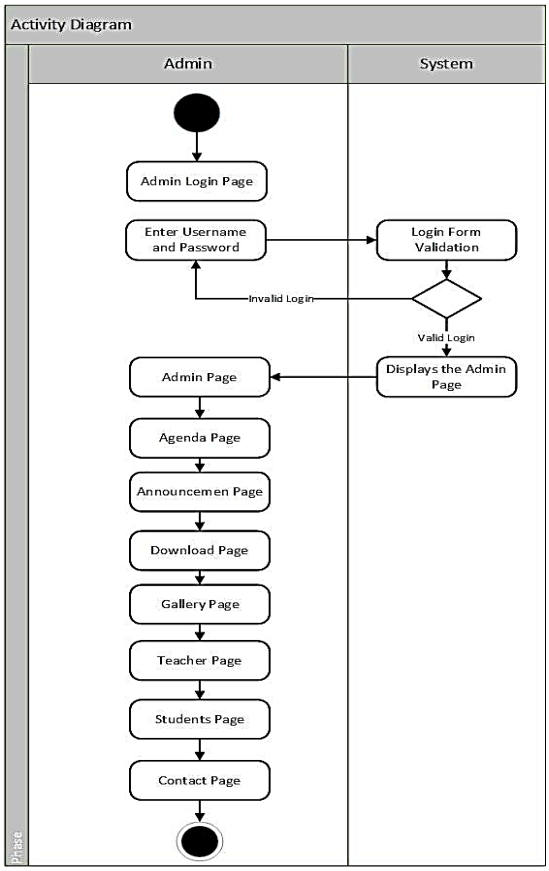

Figure 4. Activity Diagram

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3. Sequence Diagram

A sequence diagram is a diagram that describes the relationship of objects in the system [12]. In this diagram, the object is taken from the object-oriented analysis stage. The sequence of the diagram can be seen in Figure 5.

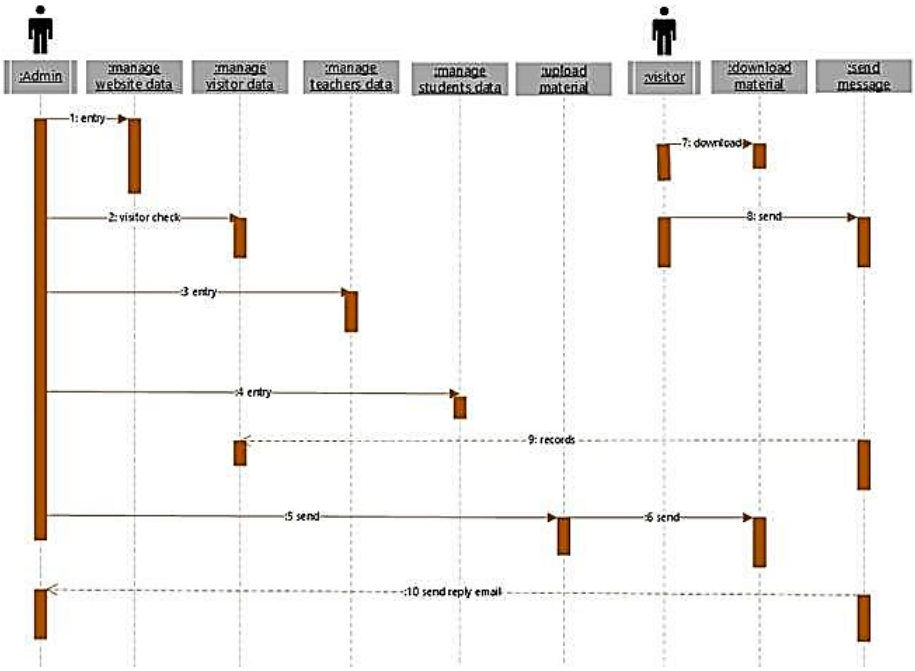

Figure 5. Sequence Diagram

4. Collaboration Diagram

A collaboration diagram is a diagram that is used to describe the collaboration between objects in the system [13]. The collaboration diagram can be seen in Figure 6.

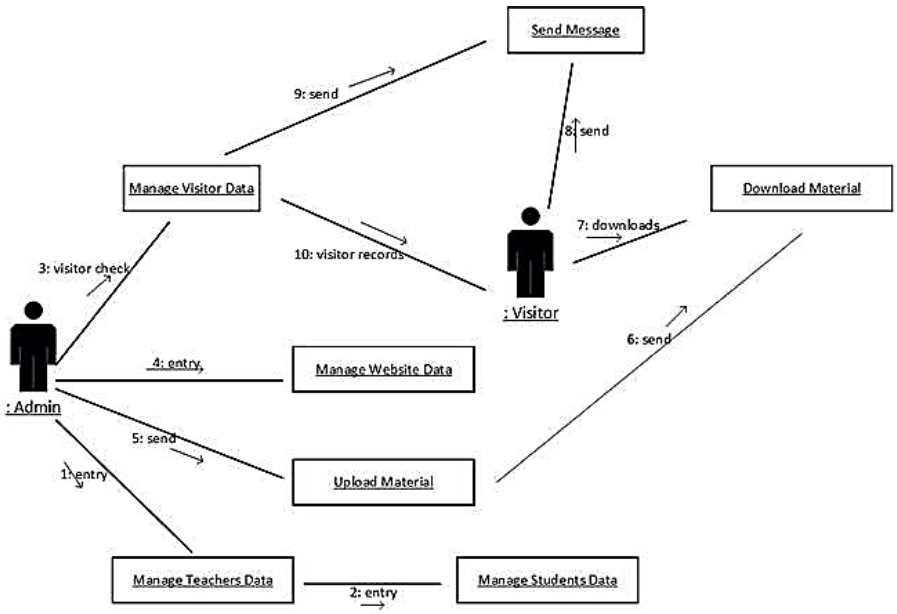

Figure 6. Collaboration Diagram

5. Class Diagram

A class diagram is a diagram that is used to connect class relationships in the system [14]. Class and system relations in this study have been defined in stage 6 of object-oriented analysis. The class diagram can be seen in Figure 7.

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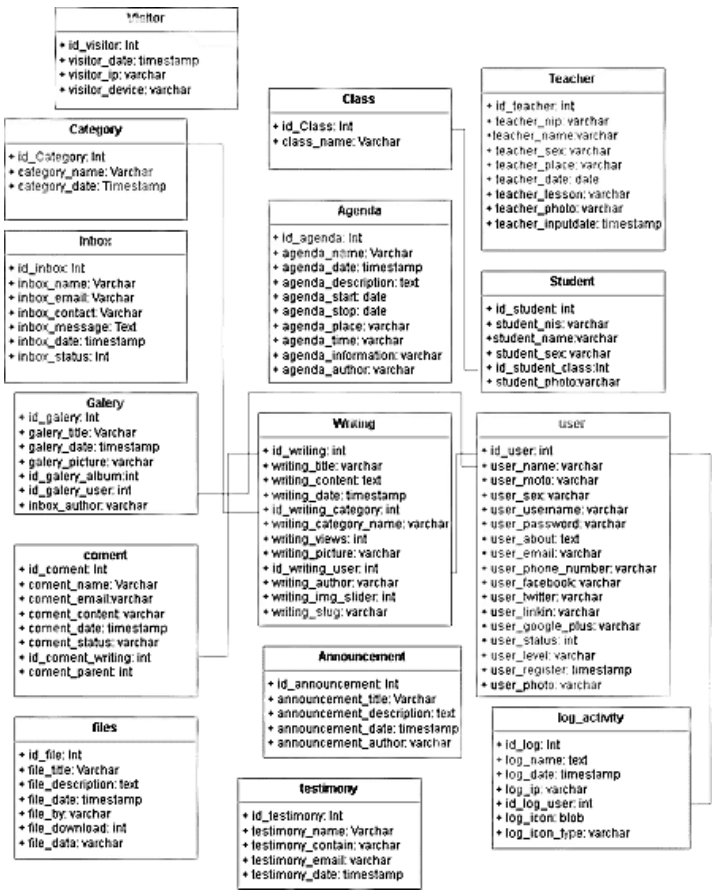

Figure 7. Class Diagram

3.3 System Implementation

1. Main Page

In Figure 8 is the main menu of the Ma Darussalam Pangkalpinang website. It consists of a header, a sidebar at the top and content in the middle, and a footer at the bottom.

Figure 8. Main Page

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2. Announcement Page

The following is the display of the announcement menu on the MA Darussalam Pangkalpinang website, including the contents of the important announcements that will be delivered to students, parents and teachers.

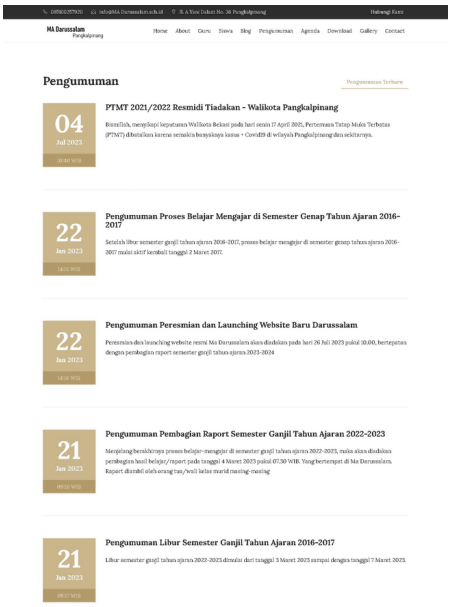

Figure 9. Announcement Page

3. Gallery Page

In Figure 10 is a gallery menu screen containing photos or images of various school facilities and activities.

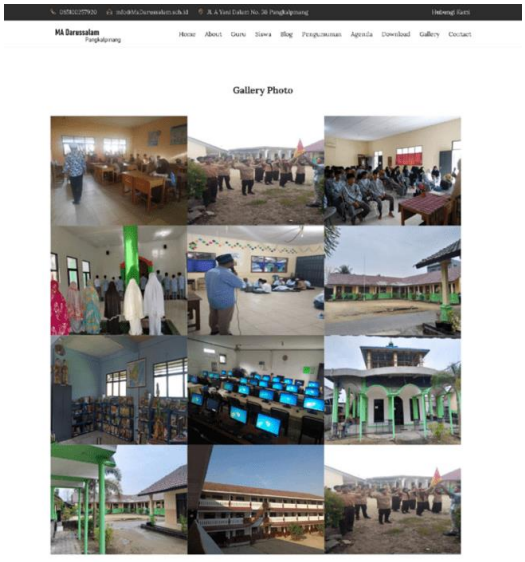

Figure 10. Gallery Page

4. Login Page

At this point, users (school managers, teachers/homeroom teachers) can log in to the application system with different access rights, of course. As shown in Figure 11, connect the following.

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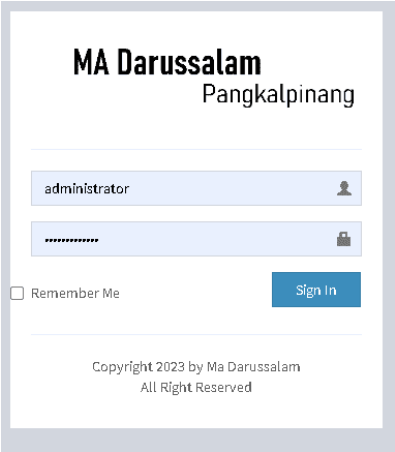

Figure 11. Login Page

5. Dashboard Page

On the dashboard page, here manage academic data managed with full access held by admin/admin. Admin can manage all activities on this school's website system.

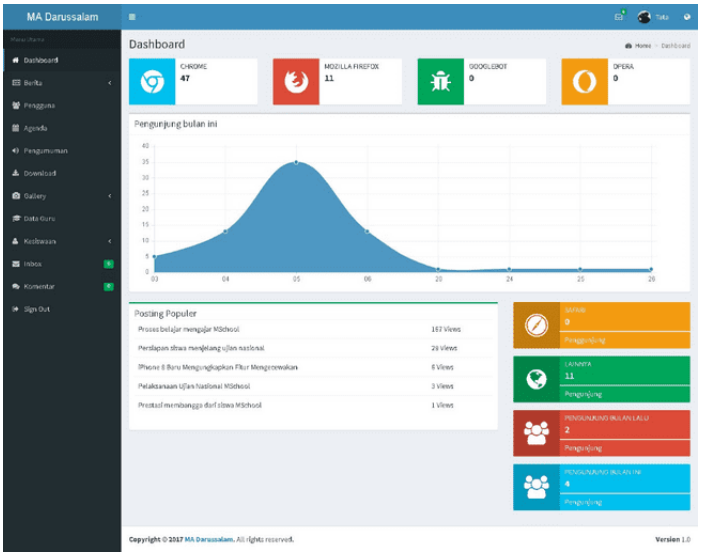

Figure 12. Dashboard Page

4. CONCLUSION

Based on the results of this study, it can be concluded that, firstly, a school profile web design has been produced for MA Darussalam Pangkalpinang using the Object-Oriented Analysis and Design (OOAD) method. Second, after obtaining the web profile design, proceed with creating a web profile. With this web profile, it is hoped that it can assist the MA Darussalam Pangkalpinang in promoting all school activities. So that Darussalam Pangkalpinang MA school can be recognized by the wider community.

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