Abstract—SMK Gandasari is one of the vocational high schools in Tangerang City. The purpose of the school authority is to improve student discipline related to increasing student discipline at school, namely by attendance in class or in attendance calls. Parents are still very concerned about the condition of the children at school, whether they really behave well or not, and parents cannot do direct monitoring but have to wait when the report cards are distributed. In monitoring violations, Gandasari Vocational School students still use paper media, namely by being recorded in a book, this makes information about student behavior slow to reach parents. To overcome this, a student monitoring information system is needed at the Gandasari Vocational School to communicate information to parents of students that are directly related to the condition of their students at school through computerized data processing using a web-based system. To analyze the problem data and the needs of a student monitoring information system using the waterfall method, with stages of needs analysis, design, code generation, system design with Unified Modeling Language (UML) Diagrams, programs and testing. The waterfall method has the main stages of the waterfall model that reflect basic development activities. There are 5 (five) stages in the Waterfall method, namely requirements analysis and definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance. The result of this research is a website for student violation information systems as a solution to existing problems.

Keywords: Information System; Website; Violation Monitoring; Waterfall

1. INTRODUCTION

In the current era, the role of information technology is very important and is applied to the field of education both academically and non-academically. In the academic field, from elementary school to university education, information technology has now been used to support educational progress. Information technology develops with various kinds of information delivery systems in the form of a Website or Android. This application facilitates data processing and delivery to its users. The use of the Website on the educational information application can be used for the delivery of complete, efficient and updated student data information. Gandasari Vocational School participates in realizing quality education and shaping the soul of the younger generation who has a balance between science and technology with noble character.

At SMK Gandasari Tangerang, data processing of student violations against educational activities is still managed manually. The data is still recorded in a book. Parents who want to know or control student activities and violations must wait during the report card distribution process. This makes the student monitoring system less effective because it is not monitored optimally by teachers and parents, but so far supervision of students is mostly only carried out by the school, especially the high level of parental activity, parents do not monitor the development of their children. her child at school.

In previous research, the Application of the Student Violation Monitoring Web Application System at SMKN 2 Tangerang, can help the work of counseling teachers in recording student violation data, calculating total points for violations, giving sanctions to students and making reports to be given to the school principal become easier and faster in a computerized manner [1].

Based on some of the problems above, the author built a website for student violation information systems as a solution to existing problems with the title "Design of Web-Based Student Violation Monitoring Information System in Gandasari Vocational School".

2. RESEARCH METHODOLOGY

The type of research used in this writing process is Case Study Research, which is a series of scientific activities carried out intensively, in detail, and in depth about a program, event, and activity, either at the individual level, a group of people, institutions, or organizations. organization to gain in-depth knowledge of the event over a period of time and collect data from multiple sources. The stages of the research are observation, documents, reports, and interviews

2.1 System

According to [2] [3], the system is a series consisting of two or more components that are interconnected and interact with each other to achieve a goal where the system is usually divided into smaller sub-systems that support a larger system. According to [4], the system is a set of interrelated elements or elements that influence each other in carrying out joint activities to achieve a goal. From some of these definitions, researchers can conclude that system design is to create or develop a system that can overcome problems in the previous system that has been previously analyzed.
2.2 Information

According to [4] Information is data that has been classified or interpreted for use in the decision-making process. According to Taufiq (2013) defines that: "Information is data that is processed so that it has added value and is useful for users". According to [5] the function of information is to increase knowledge and reduce the uncertainty of information users. The function of information is not to direct decision-making about what to do, but to reduce the diversity and uncertainty that causes a good decision to be made.

2.3 Monitoring

According to [6] monitoring is monitoring which can be explained as awareness of what one wants to know, high level monitoring is carried out in order to make measurements through time that indicate the movement of the destination or away from it.

According to [7] Monitoring is a continuous assessment of the function of project activities in the context of implementation schedules and of the use of project inputs by the target group in the context of design expectations. Based on the two definitions of monitoring, it can be concluded that monitoring is supervision or monitoring of an activity so as to produce useful information. The resulting information can make it easier to make decisions about future activities.

According to [8] broadly speaking, the stages in a monitoring system are divided into three major processes as shown in the following figure.

![Figure 1. Monitoring Process](image1)

The processes that occur in a monitoring system start from collecting data such as data from network traffic, hardware information, and others which are then analyzed in the data analysis process and in the end the data will be displayed [8].

2.4 Waterfall Model

The waterfall model according to [9] is a process of activities from specification, development, validation, and evolution and represents them as separate processes such as requirements specification, software design, implementation, testing, and so on. The waterfall method has the main stages of the waterfall model that reflect basic development activities. There are 5 (five) stages in the Waterfall method, namely requirements analysis and definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance.

![Figure 2. Waterfall Model](image2)

2.4 Unified Modeling Language (UML)

According to [10]. Unified Modeling Language (UML) is a modeling language for systems or software with an object-oriented paradigm. Modeling is actually used to simplify complex problems in such a way that they are easier to learn and understand. A diagram in the form of a graph showing the elements of a model arranged to illustrate a particular part or aspect of the system. A diagram is part of a particular view and when drawn is usually allocated to a particular view. The types of diagrams include:

2.4.1 Use Case Diagram

According to [10], "use case is a modeling for the behavior (behavior) of the information system to be made. Use cases describe an interaction between one or more actors and the information system that will be created. Roughly speaking, use cases are used to find out what functions are in an information system and who has the right to use those functions."
2.4.2 Statechart Diagram
Describing transitions and state changes (from one state to another) of an object in the system as a result of the stimuli received. In general, statechart diagrams describe certain classes (one class can have more than one statechart diagram).

2.4.3 Activity Diagram
According to [10], "Activity Diagrams describe the workflow or activities of a system or business process or menu that is in the software". The thing to note here is that Activity diagrams describe system activities not what actors do, so activities that can be performed by the system.

2.4.4 Sequence Diagram
According to [10], "Sequence Diagrams describe objects in use cases by describing the life time of objects and messages sent and received between objects". Sequence Diagram shows the sequence of events occurring at a time. The Sequence Diagram component consists of an object written in a rectangular box named message represented by a line with an arrow and a time indicated by a vertical progress.

3. RESULT AND DISCUSSION
The Waterfall method is a system development method where one phase to another is carried out sequentially. In the process of implementing this Waterfall method, a step will be completed first starting from the first stage before proceeding to the next stage. The advantage of using this waterfall method is that requirements must be defined more deeply before the coding process is carried out, besides that the implementation process is carried out in stages from the first stage to the last stage in sequence. Besides that, the Waterfall method also allows as few changes as possible for the project to take place.

3.1 Current System Analysis
System analysis is one way or technique to describe problems and look for an overview of the system that is running which is then processed so as to produce an expected requirement so that it leads to a solution to the problems that exist in the system. This analysis process is very important to do as a basis for designing a new system and as a comparison material between the current system and the system to be developed. Procedure for the occurrence of violations
A. Students come to school to take part in teaching and learning activities, if students violate it will be recorded by the BK teacher.
B. The counseling teacher records student violations in the BK book, if the violation is minor, the student will be given a warning and if the violation is severe and repeated, a warning letter will be given.
C. Data on the results of student violations are then recapitulated and given to the homeroom teacher
D. The homeroom teacher notifies the homeroom teacher the results of the student violation data

3.1.1 Requirement Analysis and Definition
A. Functional Needs
This type of requirement contains what processes will be carried out by the system. Functional requirements also contain information that must exist and be generated by the system. The needs analysis consists of:
1. There is a login facility
2. There is a search facility
3. Admin can manage users
4. Admin can manage majors
5. Admin can manage violations
6. Admin can manage achievements
7. Admin can input student achievement
8. Admin can input student violations
9. Admin can manage reports
10. Users can find out the results of student achievements and violations

B. Non-Functional Needs
1. The system is easy to understand by the user
2. The system can be done in all types of browsers
3. Simple layout
4. Attractive appearance
3.2 Implementation of System Design

A. Use Case Diagram

![Use Case Diagram Main Page](image)

Figure 3. Use Case Diagram Main Page

This use case is used to verify entry into the student achievement monitoring information system. Admin is in charge and has access rights to perform user account management operations, user data, manage violation data, and reports. Homeroom and homeroom teachers do login the application and view student violation data.

B. Activity Diagram

![Data of Violation Activity Diagram](image)

Figure 4. Data of Violation Activity Diagram

The Activity Diagram above illustrates the management of breach data. Admin can add violation data and input data for students who commit violations.
C. Display Login Page

![Login Page](image)

**Figure 5. Display Login Page**

This page displays the username and password fields. If the data entered is correct, it will go to the main system page (dashboard).

D. Display of Main Page

![Dashboard](image)

**Figure 6. Display of Main Page (Dashboard)**

Displays the main administrator page and menus that can be accessed by admins.

E. Data Users Page Display

![User Management](image)

**Figure 7. User Management Page Display**

On this page displays the data access settings of each user. Admin can manage the access rights of each user such as parents, students and teachers.
F. Violation Page View

![Violations Page View](image)

**Figure 8. Violations Page View**

This page displays the data settings for student violations that have been inputted, such as students arriving late, not wearing socks and so on. Admin can manage the breach data such as adding and deleting data.

G. Report of Violation Data View

![Report Page View](image)

**Figure 9. Report Page View**

On this page displays the overall data report of students who have committed violations. From this violation data report, the teacher can find out which students often commit violations. So that actions can be taken such as reducing grades or calling parents and guardians of students to school. Admin can manage the data report to be submitted to the Principal.

H. Blackbox Testing

<table>
<thead>
<tr>
<th>No</th>
<th>Skenario Pengujian</th>
<th>Hasil Pengujian</th>
<th>Hasil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pengujian “Login” menggunakan No.Induk dan Password</td>
<td>Sistem dapat melakukan “login” dengan memasukkan No.induk dan Password, lalu muncul tampilan halaman utama</td>
<td>Berhasil</td>
</tr>
<tr>
<td>2</td>
<td>Pengujian menu kelola data user akses dengan menambah data, lalu mengisi form yang ada</td>
<td>Sistem akan memproses dan menyimpan datauser akses yang baru</td>
<td>Berhasil</td>
</tr>
<tr>
<td>3</td>
<td>Pengujian menu kelola data guru dengan menambah data, lalu mengisi form yang ada</td>
<td>Sistem akan memproses dan menyimpan data guru yang telah diinput</td>
<td>Berhasil</td>
</tr>
<tr>
<td>4</td>
<td>Pengujian menu kelola data murid dengan menambah data, lalu mengisi form yang ada</td>
<td>Sistem akan memproses dan menyimpan data murid yang telah di input</td>
<td>Berhasil</td>
</tr>
<tr>
<td>5</td>
<td>Pengujian menu Kelola Data Kelas</td>
<td>Sistem akan mengedit data murid yang telah input</td>
<td>Berhasil</td>
</tr>
</tbody>
</table>

**Table 1. Blackbox Testing Login**
4. CONCLUSION

Based on the research that has been carried out regarding the design of a web-based student achievement monitoring information system, the following conclusions can be drawn is the student violation monitoring information system can make the existing supervision or monitoring process in schools more effective than before. Every violation committed by students will be inputted into the application, making it easier for teachers to evaluate the process of teaching activities in schools, as well as evaluating reports to be given to schools and information to parents of students becomes easier and faster and more accurate, so that able to monitor the discipline of their children at school.

Designing an information system for monitoring student violations using the PHP programming language and using the Laravel Framework, with this system it is easier to store data in the form of a database can reduce space.

REFERENCES