

# Web-based Library Information System at SMK PGRI Sukodadi Lamongan

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## Abstract.

The purpose of school library as a place to read is now less and less desirable by students to read books and search for scientific literature, this is because it is defeated by information media such as the internet which is easier to use in searching for various kinds of knowledge and reading sources. The impact of the information media is also experienced by the SMK PGRI Sukodadi Library which has a large collection of books that should be used by students to support learning activities but students are less interested in reading and borrowing books from the library in addition to having certain assignments from the teacher that require students to borrow books from the library. Seeing the problems above, a website-based library information system design is made and the development of a library management information system at SMK PGRI Sukodadi Lamongan.

## 1. Introduction

The library is an organizational work unit, agency or institution. These work units can stand alone, but can also be part of a larger above organization. Stand-alone libraries such as public libraries, library Technical Implementation Units at universities, and national libraries. Meanwhile, libraries that are part of a larger organization such as special or official libraries, and school libraries [7]

The current processes are still manual, this causes slow data retrieval and circulation services. To fulfill good and efficient service to its members, libraries need an information system that can assist members in finding information/references about the required book data. Information is data that is processed into a form that is more useful and more meaningful for who receive it [2]. Information System is a system within an organization that brings together the daily transaction processing needs with the strategic activities of the organization and provides reports to certain parties [3]. A library also needs a system to collect data, process data, store data, review data and distribute good information, one of which is having high data accuracy. To meet these needs, the effort that must be done by the library is the use of information technology such as computers and other application programs in addition to increasing human resources and improving systems. This is expected to increase the number of members. It can also assist librarian in processing data quickly and accurately. Starting from building a system that can be used by staff and members of the library, adding a login feature so that users (officers or library members) can enter the system and use the system. The web-base system will use CSS or Cascading Style Sheet. CSS is currently a language that works with HTML to define the way in which the content of a web page is displayed or presented [5].

## 2. Literature Review

### 2.1 Waterfall Model

The waterfall method is often called the classic life cycle, the name of this model is actually the "Linear Sequential Model", where it describes a systematic and sequential approach to software development, starting with the requirements specification. The user then continues through the stages of planning (planning), modeling (modelling), construction (construction), and handing over the system to users (deployment), which ends with support for the complete software produced [4]. The waterfall model was first introduced by Winston Royce in 1970.

This model belongs to the generic model of software engineering and was first introduced by Winston Royce around 1970 so that it is often considered ancient, but is the most widely used model in Software

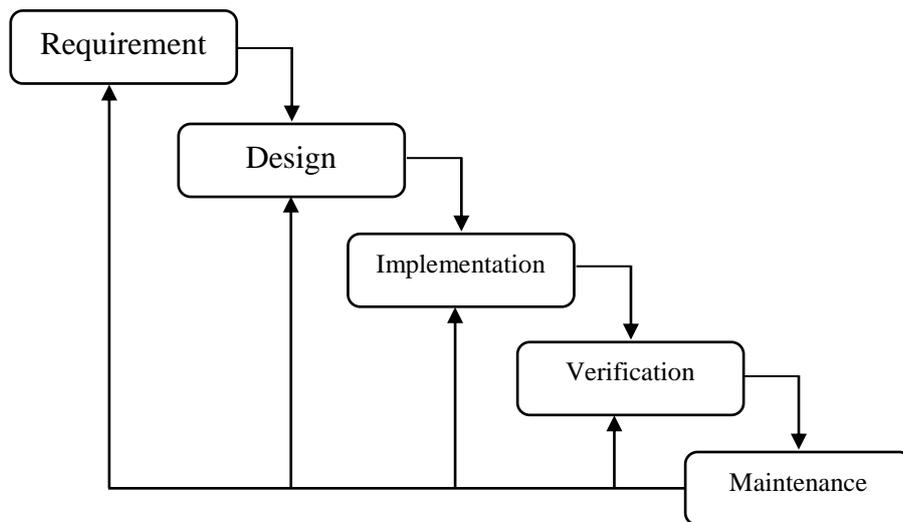
Engineering (SE). This model takes a systematic and sequential approach. It is called a waterfall because the stages that are passed must wait for the completion of the previous stage and run sequentially.

## 2.2 Data Flow Diagram (DFD)

Data Flow Diagrams or DFD are structured analysis and design tools that allow systems analysts to visually understand systems and subsystems as a series of interrelated data flows. Consists of entities, processes, data flows and data stores.

- Entities are usually named with nouns.
- Data flow is the movement of data from one point to another (depicted by means of arrow heads pointing to the destination of the data).
- The process usually always shows a data change and the data transformation process occurs.
- Data storage (data store) is named with a noun, according to the data stored in it.

## 3. Methodology



**Figure 1.** The phases in the Waterfall Model according to Pressman's reference

The stages that will be carried out in designing a website-based library information system according to the phases in the Waterfall model are as follows:

### 1. Requirements Analysis

At this stage, system designers need to communicate to understand the software users expect and their limitations. This information can usually be obtained through interviews, discussions, or questions. Analyze information to get the data needed.

### 2. System Design

In this phase, the requirements specifications of the previous phase are studied and the system design is prepared. System design helps to define the hardware and system requirements and to define the overall system architecture.

### 3. Implementation

At this stage, the system is first developed in the form of small programs called modules and then integrated at a later stage. Each module is developed and tested for a function called unit testing.

### 4. Integration & Testing

All blocks developed during the implementation phase are integrated into the system through tests performed on each block. After integration, the entire system is tested for defects or errors.

### 5. Operation & Maintenance

The final step in the waterfall model, software that has been completed, executed, and maintained. Maintenance includes fixing errors not found in previous steps. Improve the implementation of system devices and improve system services in accordance with new requirements.

## 4. Result and Discussion

### 4.1 Context Diagram

Context Diagram is a system design tool that can display all processes contained in a particular application or website in a clear and structured manner. The context diagram is part of data flow diagram that functions to map the environmental model, which is presented with a single circle representing the whole system [8].

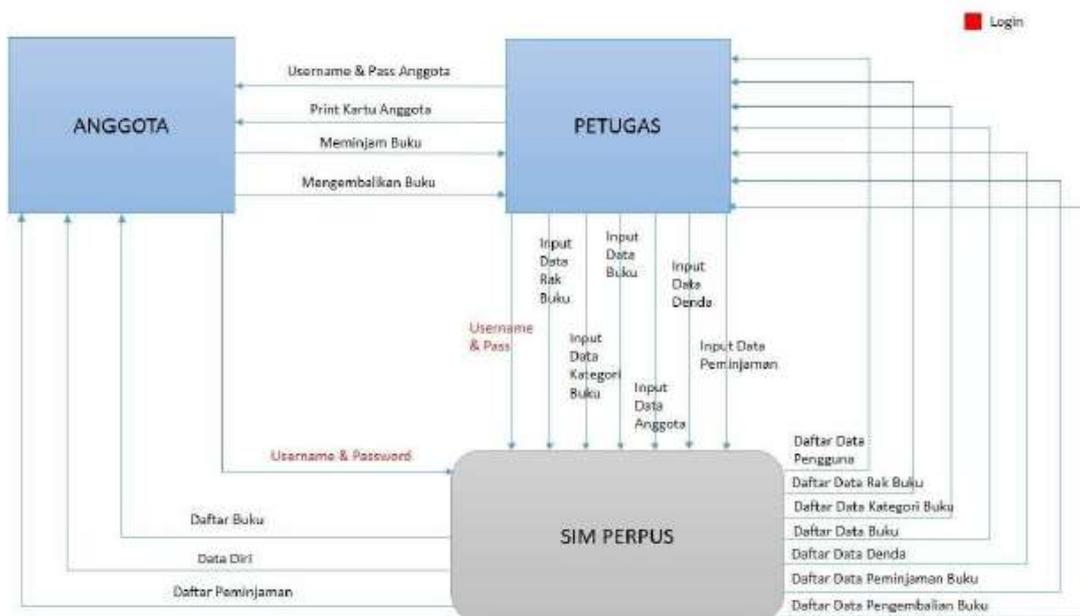


Figure 2. Context Diagram

#### 4.2 Use Case

The use case diagram is a depiction of the system from the point of view of the system user, so that making use cases is more focused on the existing functionality in the system, and not based on the flow or sequence of events.

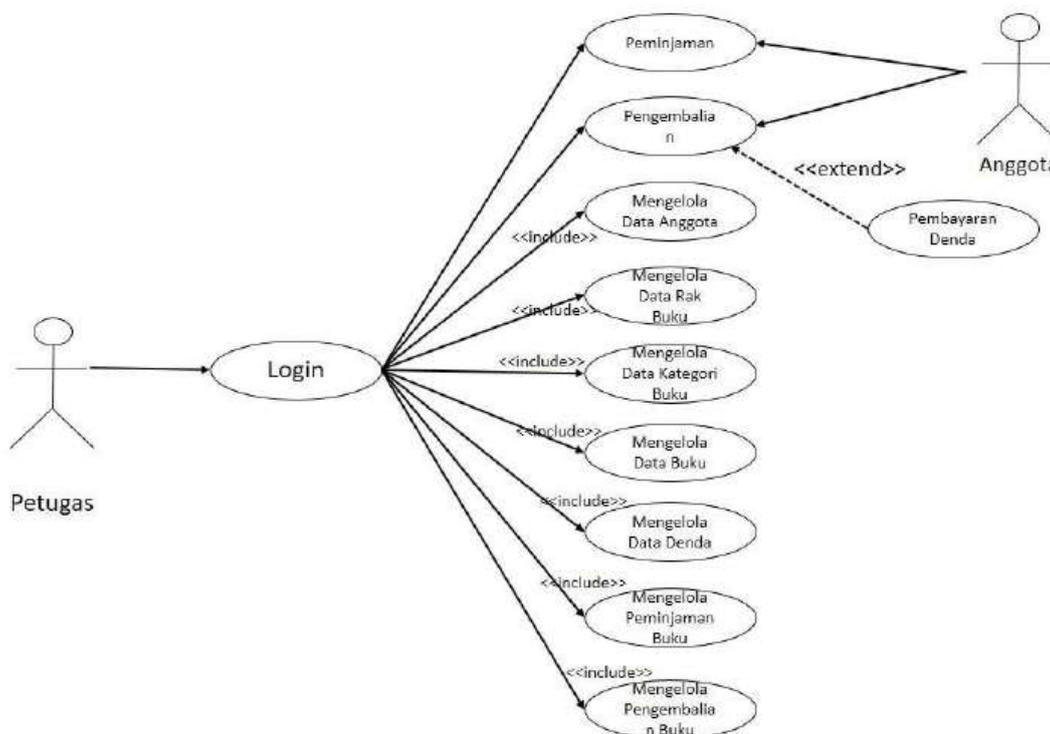


Figure 3. Use Case Library Information System

#### 4.3 Database

The database shows the tables and relationships that exist in other tables. There are seven tables which are presented in Figure 5 below:





**Figure 6.** Library Information System Dashboard

## 5. Conclusion

Conclusions that can be drawn during practical work at SMK PGRI Sukodadi Lamongan are:

The information system that has been created will be added to a menu that displays the data graphically. Library information system graphical display in the form of the number of books currently available and the number of users who make loans and returns

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