Web-based student master book information system in vocational school of Muhammadiyah Banyuresmi

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Abstract. The main student book information system is a web-based application that comes as a form of modernization from a manual student main book that can streamline the time in importing, searching, etc. This application is made as simple as possible so that it is easy to use by the user, in terms of interfaces and interactions in the application so even for novice users it will be easy to understand, but even though simple, this application can contribute a lot of reasons, the Student Parent Book is the most important book in school administration. Especially data management of students, the Student Parent Book Information System Application is based on localhost (local network), meaning that when you want to access it does not need to be connected to the internet, just connect to the local network and can only be accessed by users who are connected with the admin, or recorded by admin as someone who has access rights.

1. Introduction
The student master book is a book used to record all student data since the beginning of an educational institution. In the past, the way to fill student master books was still done manually, by writing student data on the book [1]. Even today many educational institutions are still using the manual method to fill student master books.

Muhammadiyah Banyuresmi Vocational School is one of the Vocational Secondary Education institutions in Banyuresmi which is quite a large number of students in the institution. Since the first time, it was established until 2018 more than 500 students have been recorded in the student master book and this number can be ascertained to continue to grow along with the increasing number of residents around the institution.

Based on the description above, it will be very difficult if the main book filling method is still done manually because this method has several disadvantages, among others, filling in student data requires a lot of time and energy, the book is easily damaged if it is stored too long, requires special storage, and requires long enough time to find and match data. Therefore, the authors conducted a study by means of observation with the title of web-based student main book information system design at Muhammadiyah Banyuresmi Vocational School.

2. Methods
The product to be produced is a website-based application. This application can be used as a medium for registering prospective new students. In this study the author will use the Waterfall model. Waterfall is a sequential research method starting from Analysis, Design, Code (Encoding), and Testing [2]. This
method has several advantages, one of which is this method is sequentially regular and the stages are easy to understand [3]. Figure 1 describe about waterfall model [4].

![Figure 1. Linear sequential model](image)

Software development method with a systematic and sequential approach to software development that starts at the level and progress of the system in all analysis, design, code, testing, and maintenance. This model covers activities:

1.1. **System/information engineering and modelling**

Because software is part of a larger system, work starts from the formation of needs for all system elements and then separates which ones for software development. This is important when the software must communicate with hardware, people and databases

1.2. **Analysis of software requirements**

Collection of needs with a focus on software, which includes: Information domains, functions needed, performance/performance and interface. The results must be documented and reviewed to the customer. It is quite justified to state that requirements engineering is a critical success factor in systems development [5]. Analysis consisted of functional and non-functional. A functional requirement specifies, what a system must do. A non-functional requirement represents constrains on the services offered by a system [6].

1.3. **Design**

There are 4 attributes for the program, namely: Data Structure, Software Architecture, Detailed Procedures, and Interface Characteristics. The design process transforms need into a form of character that the software understands before program writing begins. This design must be well documented and become part of the software configuration.

1.4. **Code generation**

Design translation into a form that can be understood by the machine, using a programming language.

1.5. **Testing**

After the program code is finished testing can be done. Testing focuses on the internal logic of the software, external functions and looking for all possible errors and checking whether it matches the desired results.

1.6. **Maintenance**

Is the last part of the development cycle and is done after the software is used. Maintenance of software applies again Every phase of the previous program and does not create a new one.
3. Result and Discussion

3.1. Analysis
After conducting research and direct study at Muhammadiyah Vocational School, Banyuresmi, it turns out that in writing the master book students still use manual methods, causing lags in providing information that is considered very ineffective and inefficient, besides being prone to recording errors due to human limitations. Therefore, to simplify the system, we tried to create a Web-based Student Main Book application to support and assist in the data collection process verification and student validation to the master book.

3.2. Design
Application design aims to provide an overview to the user. The design of this application is the identification of the components of the existing information system [7]. The stages of the design of this application are the depiction, planning, and sketching using Flowchart, DFD (Data Flow Diagram), ERD (Entity Relationship Diagram) and the design of application forms that will be used to develop the Student Master Book Application in Muhammadiyah Vocational Schools Banyuresmi [8]

3.3. System Flowchart
This flowchart system is a chart that shows the flow of work from the entire application in Muhammadiyah Banyuresmi Vocational School [9]. Here's the flowchart:

![Flowchart](image)

**Figure 2.** Flowchart.

3.4. Context Diagram
A context diagram is the first time the system is outlined (top level) and broken into detailed sections. A context diagram contains only one process, context diagram for processing student application data as below.
3.5. ERD (Entity Relationship Diagram)

The next step is to determine the pattern of relationships between entities that make up the Student Main Book Application in the ERD-Diagram Form, for that systematic drawing is needed to facilitate implementation in the form of data tables [10,11]. In making ER-Diagram, you will be able to understand the relationship of many to one, one-to-one, one-to-many so that there is a clear understanding of the entity. The following is a picture of ERD Student Parent Book Application.

**Figure 3.** DFD Level 1 from DFD Level O

**Figure 4.** DFD Level 1 Student Data and Parent Data.
3.6. Implementation

3.6.1. Menu Admin Login and Students. On this login page, is a user who can set all menu options starting from input and printing.

Figure 6. First appearance of localhost when called
3.6.2. Main Menu / Admin Home. On the main page form, there are several menus like homepage, student data, account settings, and log out.

![Image](image1.png)

**Figure 7.** Appearance of “Buku Induk Siswa”

3.6.3. Display of Main Student / Home Main / Home Menu. Similarly, the admin homepage is only here where students only have access to see their own data.

![Image](image2.png)

**Figure 8.** Display of Main Student Menu.
### 3.7. Results

Test results from the main Book system can be seen in the following table 1.

| Test Case | Procedures performed | Achievement | Result |
|-----------|----------------------|-------------|--------|
| Login     | Admin enters username and password then enter each student's data | Admin enters admin page | Success |
| Input data student | Click the Add Data menu | Student data add | Success |
| Change data student | Select the Edit menu then click Edit and make changes to student data | Student data changes | Success |
| Erase data student | Select the student data menu then search or select the data that appears then click Delete | Student data is erased | Success |
| Print     | Open the student menu then press Ctrl + P on the keyboard then press Print or click the print button | Data printed on paper | Success |
| Logout    | Click the Exit menu | Admin exits admin page | Success |

### 4. Conclusion

The student's master book application comes with the background of the student manual book form (physical book) which means that the input method of students still uses manual methods in the Muhammadiyah Banyuresmi Vocational School in the form of thick books so that they are vulnerable to damage. more students. And because of the thickness of the student's parent book and the amount of student data stored in it, it will make it difficult for students to search for data. Then the results of this observation found problems regarding how to design the application of the student's book information system in Muhammadiyah Banyuresmi Vocational School in an information system that meets these criteria. In order to store, search, validate and verify data and print it in document form easily and quickly in Muhammadiyah Banyuresmi Vocational High School, the researcher makes an information system that is expected to be a means to convey student data information that meets these criteria.

The point is the result of this observation is the creation of a student master book information system application in the web-based Muhammadiyah Banyuresmi Vocational School which aims to be used in storing, searching and printing student data as validation and verification of student data easily and quickly.

We hope that this application can be used by schools in order to improve student service at their school. We hope that constructive suggestions and criticisms, for our subsequent journals, especially we also recognize the shortcomings in making this journal, both in writing and in the information published, we say sorry, and thank you for your attention.

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