

## IMPLEMENTATION OF THE SMART SCHOOL APPLICATION WEB-BASED USING A PROTOTYPE MODEL

**Reni Haerani<sup>1\*</sup>, Pradya Adi Nugroho<sup>2</sup>, Ahmad Sofan Ansor<sup>1</sup>**

<sup>1</sup>Department of Informatics Management, Politeknik PGRI Banten

<sup>2</sup>Department of Electrical Engineering, Politeknik PGRI Banten

email: [renihaerani@politeknikpgribanten.ac.id](mailto:renihaerani@politeknikpgribanten.ac.id)

**Abstract:** The advances in information technology have substantially affected the world of education. One of these impacts is the emergence of the concept of innovative schools. The Smart School application is a solution to increase the effectiveness and efficiency of managing the educational procedures in schools. This research intends to design a Smart School application using the Web-based Prototype method. The prototype method allows developers to design and develop application prototypes that can be tested by users (teachers, students, and parents) before implementing the actual application. This will help identify user needs, collect feedback and ensure that the resulting Smart School application meets the expectations and needs of all stakeholders. The Smart School application has many features, such as student data management, lesson schedules, homework and test management, communication between teachers, students and parents, and tracking student learning progress. This application is designed with a web interface like computers, tablets and smartphones. The resulting Smart School application using the Prototype approach will be better able to meet changing user needs and help improve the quality of education in schools. Apart from that, web technology will make it easier to access and use applications by all stakeholders in the world of education.

**Keywords:** Smart School Application; Prototype; Website

**Abstrak:** Kemajuan teknologi informasi sudah meninggalkan efek yang substansial terhadap dunia pendidikan. Salah satu dampak tersebut adalah munculnya konsep sekolah cerdas. Aplikasi Smart School merupakan solusi untuk meningkatkan efektivitas dan efisiensi pengelolaan prosedur pendidikan di sekolah. Riset ini bermaksud untuk merancang aplikasi Smart School dengan menggunakan metode Prototype berbasis Web. Metode Prototipe memungkinkan pengembang merancang dan mengembangkan prototipe aplikasi yang dapat diuji oleh pengguna (guru, siswa, dan orang tua) sebelum menerapkan aplikasi sebenarnya. Hal ini akan membantu mengidentifikasi kebutuhan pengguna, mengumpulkan umpan balik dan memastikan bahwa aplikasi Smart School yang dihasilkan memenuhi harapan dan kebutuhan seluruh pemangku kepentingan. Aplikasi Smart School dirancang dengan banyak fitur yang beragam seperti pengelolaan data siswa, jadwal pelajaran, pengelolaan pekerjaan rumah dan ulangan, komunikasi antara guru, siswa dan orangtua, serta pelacakan kemajuan perkembangan pembelajaran siswa. Aplikasi ini dirancang dengan antarmuka web seperti komputer, tablet, dan smartphone. Dengan menggunakan pendekatan Prototype, diharapkan aplikasi Smart School yang dihasilkan akan lebih mampu memenuhi perubahan kebutuhan pengguna dan dapat membantu meningkatkan kualitas pendidikan di sekolah. Selain itu, pemanfaatan teknologi web akan memudahkan akses dan penggunaan aplikasi oleh seluruh pemangku kepentingan di dunia pendidikan.

**Kata kunci:** Aplikasi Smart School; Prototype; Website

## INTRODUCTION

The development of information and communication technology has had a significant impact on various fields, including education. Education is an essential issue in a country's development. With the development of technology, especially the internet and web-based devices, many schools and educational institutions are starting to adopt technology to increase the efficiency and effectiveness of the learning process. Web-based Smart School is a system that integrates ICT into various educational directions in schools. Thanks to this, students, teachers and administrative staff can access information in real time, communicate efficiently and take advantage of multiple features to improve the quality of education.

SDIT Mandiri in registering new students and entering data into the entry is always done manually by handwriting in a notebook. This will of course be very troublesome when searching for data and making reports because you have to search on by one, so the data is often redundant and the errors are very large.

This research aims to design a prototype Smart School web application system to increase efficiency, effectiveness and transparency of education management in schools, as well as facilitate the schools implementation process.

By designing an integrated and comprehensive Smart School web application system, education in schools can adapt, respond more quickly and be more effective in facing future confrontations.

Several related studies regarding prototype design have been carried out previously and are relevant according to

the survey. Based on research conducted by [1] using the Smart School application, whose primary function is to facilitate the work process in schools, using R&D development methods and using the K-Means algorithm as an identification systems, and class division for students who are advancing to grade.

Further research by [2] designed a web-based school inventory information system using the prototyping method, making it easier to record school supplies by recording reports. According to [3], web-based information systems provide an alternative to the problems faced when using manual methods. In addition, it minimizes the possibility of errors and makes it easier to find the necessary data. According to [4], school websites receive high attention and response in education and from various parties, including education staff, students and the community. Different school information and news can be presented more quickly and accurately using the Smart School web application.

Additionally, according to [5], the learning model using the Smart School application can create a learning environment full of power, achieving competency and completeness of learning material. According to [6] it is hoped that the Smart School application will create an online learning system model so that interaction between teachers and students can be carried out anytime and anywhere to improve the quality of education and speed up the delivery of information to students and parents about the development and achievements of each student. According to [7] the Smart School application functionally produces results that meet expectations.

Research by [8] explains that implementing the Smart School application can increase the effectiveness and efficiency of student academic management, both more effectively in terms of distance and time and more efficiently reducing paper use. In other research [9], the object of study is the application of Smart School learning through in-house training (IHT) and increasing teachers abilities in Smart School learning through in house training (IHT). The learning approach uses information technology and electronic media so that the teaching process can occur place well [10].

The Smart School application can create an application that not only aims to provide information to users (students and parents) but can also help administrators do many things that would take a lot of time if done manually. This web-based Smart School application can increase the schools visibility in the community, attracting many prospective new students to join SDIT Mandiri.

## METHOD

### Research Framework

In line with the context described in this study, a structure can be created and implemented using a prototype approach. This research stage includes literature review, data accumulation, problem and needs analysis, software design, implementation, testing and analysis, and drawing conclusions and recommendations. These steps are illustrated in Image 1.



Image 1. Research Stages

### Development Method

The development method used is the prototyping model, [11] argues that the prototyping process begins by gathering customer needs for creating the software. Next, a prototype program is designed so that customers can better visualize what they want; then it is evaluated by the customer or user until details are found that are in sync with the customers wishes. Prototyping method steps:

### System Planning

In this stage, the system developer designs the system interface to be built. This step is crucial for understanding customer interests in the system. At this stage, the Smart School application design is implemented from the website that will be built.

### Needs Analysis

At this stage, an analysis of what is needed to expand the information system is carried out. At this point, there needs to be communication between system users and developers regarding what is required.

### System Evaluation

This step is a negotiation phase between the system developer and the user, to understand whether the function carried out by the developer is by the users wishes or not. At this stage, the developer must understand and know the users needs for the system.

### Cryptographic Systems

After knowing the needs and functionality of the Smart School application, the next step is to implement it in code form until it becomes a mandatory system. This system uses a MySQL database.

Here is the proto-type model cycle:

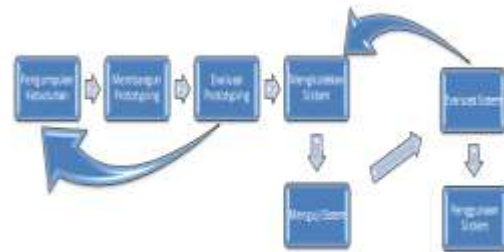


Image 2. Prototyping Model Cycle

### Data Collection Techniques

#### Maintenance

Interview data collection is a method of collecting data through direct interviews with related people in the academic department. Interviews were conducted by sources in the management environment so that valid data was obtained [12].

#### Observe

Data collection by observation is a way of collecting data through direct observation and recording. Learn everything about the current system. Observe directly the existing Smart School process system.

#### Document

It is a method of collecting theoretical data by reading, taking notes, and quoting from books and journals as a basis for research preparation [16].

## RESULTS AND DISCUSSION

This section explains how to produce program results by showing an example form. Deployment is the stage where the system is ready to be activated in reality, so that it can be found that the system has been created to achieve the required

goals. System implementation is based on use case design and system appearance [17].

### Implementation Program

#### 1. Home page

This is an image showing the main page of the SDIT Mandiri Smart School website.



Image 3. Main Page

#### 2. Student Registration Page

Displays a registration page so students can move on to the next page.



Image 4. Registration Page

#### 3. Student and admin login page

Displays the login page that students and administrators use with their username and password so they can access the home page.



Image 5. Student login



Image 6. Admin login

#### 4. Administrator Dashboard Page

The initial form view is the one an application administrator uses to respond to other forms.



Image 7. Admin Dashboard Page

#### 5. Student registration report page

Display the reporting page for those who have registered and completed

the required documents. On this page, administrators and principals can view the document.

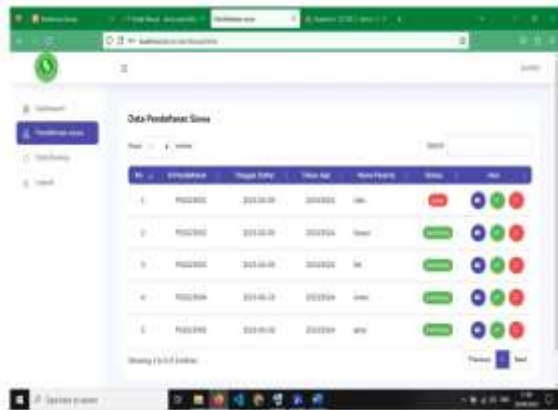


Image 8. Report Page

#### 6. Student Registration Details Page

Display the overall student registration data, which students and admin can see..

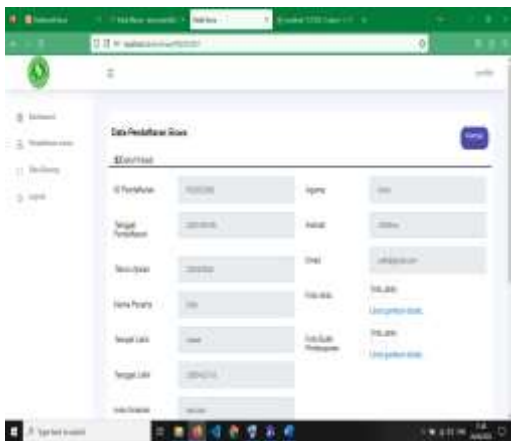


Image 9. Student Registration Details

#### 7. Goods data collection report page

Viewing reports that collect data entered by administrators and school principals allows you to see the results.

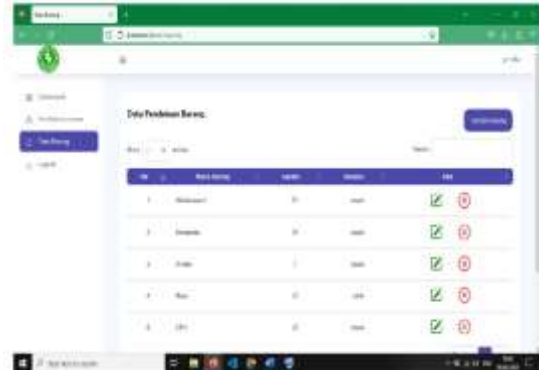


Image 10. Goods Data Collection Page

#### 8. Add item data page

Displays an input page for administrators to enter warehouse data.

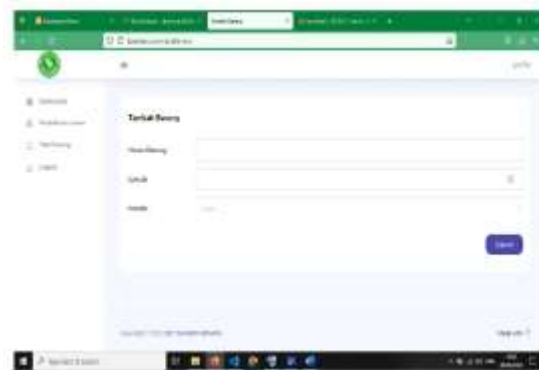


Image 11. Add Item Data Page

## CONCLUSION

Based on the results of the analysis and design, it can be concluded that the implementation of a web-based smart school application using a proto-type model allows rapid adaptation to changing needs and demands of the education system, making it easier for parents to register new students, helping officers collect data, item data more easily, to minimize the possibility of data loss. A prototype model can identify potential problems or errors in advance, saving

time and resources needed for improvements that can help create practical Smart School applications. In this way, the application used can increase efficiency, adaptability, stakeholder involvement and ultimately provide a better educational experience for all parties involved in the education system, especially at SDIT Mandiri.

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