

Library apps to improve the digitization of Sekolah Penggerak Program

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Abstract: Education is a planned means for human development and progress, especially in Indonesia. Education programs in Indonesia have changed from year to year. The first programs were the Rencana Pelajaran Curriculum in 1947, Pendidikan Curriculum in 1975, the Competency-Based Curriculum in 2004, the 2013 Curriculum, and the Merdeka Curriculum 2022 until now. Sekolah Penggerak Program is one of the curriculum implementations that play a role in making operations that suit the learning needs of students at school. One of the interventions in Sekolah Penggerak Program is digitizing schools using various platforms to support student learning and creativity. There are still many Sekolah Penggerak that have not maximized the use of digitalization, one of which is Pelita Kasih Kindergarten. Pelita Kasih Kindergarten is one of the Sekolah Penggerak in Buleleng Regency. Pelita Kasih Kindergarten still uses manual recording to record borrowing books borrowed by students or parents of students. These problems can hamper the learning process and are considered less efficient. Therefore, a system was developed to assist library management and book lending to minimize errors and human errors that could occur. Library system development in this study using the prototype method. The prototype method is used to allow interaction between system developers and system users, it can overcome discrepancies that may occur between developers and users. The results of information system testing using the black box method show that 91% of the functionality is appropriate and it is an indicator of the success of the designed information system.

Keywords: merdeka curriculum, Sekolah Penggerak, prototype, digitalization, black box

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Introduction

Education is a means to advance all areas of human life, both in the social, economic, technological, welfare, cultural, and national progress [1]. In Indonesia, education is a top priority in every government program. This statement is evidenced by the highest state budget (APBN) budget for education amounting to 20% of the APBN according to the mandate of the Constitution UUD 1945 pasal 31 ayat (4) and UU No. 20 of 2003 concerning the National Education System pasal 49 ayat (1) [2].

Various educational programs have been implemented in Indonesia starting from the 1947 Rencana Pelajaran Curriculum, 2013 curriculum improvements, full-day school in 2018, and the 2022 Merdeka belajar curriculum to date [3]. The education program continues to develop and experience improvements to improve the quality of human resources starting from early childhood education. The Minister of Education of Indonesia, Nadiem Anwar Makarim, in 2021 has implemented a new program, namely Sekolah Penggerak Program. Sekolah Penggerak Program is a catalyst for realizing Indonesia's educational vision which focuses on developing student learning outcomes holistically by realizing Pancasila Student Profile [4]. Sekolah Penggerak Program is an effort to realize the vision of Indonesian Education in realizing an advanced Indonesia that is sovereign, independent, and has personality through the creation of Pancasila Students [5].

Sekolah Penggerak Program focuses on developing student learning outcomes in a holistic manner which includes competence (literacy and numeracy) as well as character, starting with advanced human resources (principals teachers) [6]. This program is a refinement of the previous school transformation program. The Mobilization School Program will accelerate schools in all conditions to move 1-2 stages further. The program is carried out in stages and

integrated with the ecosystem so that all schools in Indonesia become the Sekolah Penggerak Program [7]. This is of course a joint commitment in efforts to improve the quality of education in Indonesia.

Sekolah Penggerak program consists of five interventions from the Ministry of Education and Culture in Indonesia that can assist curriculum implementation and are interrelated. The five interventions are as follows [8]:

1. Consultative and Asymmetric Assistance
The Ministry of Education and Culture through units in each Province as well as Districts/Cities provides assistance and also facilities in carrying out socialization and finding solutions if there are problems during implementation in the field.
2. Strengthening Human Resources in Schools
The strengthening of human resources carried out by the Ministry of Education and Culture to support the success of the prototype curriculum is by providing intensive assistance (coaching) with expert trainers who have been provided one to one.
3. Learning with a New Paradigm
In learning with a new paradigm the focus of the Sekolah Penggerak program is to design learning that is differentiated according to the stage of its development.
4. Data-driven planning
In this intervention, the Ministry of Education and Culture packaged a school-based management system whose planning was based on the results of self-reflection from schools through portrait reports of school quality conditions.
5. Digitizing Schools
There are lots of digital platforms provided by the Ministry of Education and Culture that can be accessed by teachers, school principals, or various related parties that can be used as references to reduce the occurrence of problems.

One of the interventions is school digitalization by using various platforms to support the Sekolah Penggerak program. In this case, Pelita Kasih Singaraja Kindergarten still uses manual recording to record borrowed books borrowed by students or parents of students. Pelita Kasih Singaraja Kindergarten is one of the PAUD schools registered as the first generation of Sekolah Penggerak Program.

In addition, the school does not yet have a database of the list of books in the Pelita Kasih Kindergarten library. These problems can more or less hamper the learning process and are considered less efficient. Therefore, an information system was developed to assist library management and book lending to minimize human error that could occur. Information systems are organized ways to collect, enter, process, store data, process, and report information in such a way that it becomes valuable information [9]. Library digitization is needed to record all book lending transactions so that the learning process can be fast and efficient. The library program is created using PHP Laravel framework and MySQL database. Laravel is used because this framework emphasizes simplicity and flexibility in its design [10]. The MySQL database is used because MySQL is a popular open-source SQL database management system that is being developed and developers will not infringe on copyright when using a license from MySQL [11]. The digital library is designed to be accessed through websites and mobile phones because of the dynamic design of each gadget.

Various studies regarding the development of library systems have been carried out. Research conducted by Supriyanto Wahyu with the title "Digital Library Service System Development". This study discusses the importance of implementing information technology in library networks because of the many conveniences provided to users to access digital information in libraries [12]. Subsequent research was conducted by Athanasia Octaviani Puspita Dewi with the title "Use of Mobile Libraries for Digital Libraries". This research develops a mobile-based digital library with several features such as member registration, circulation, member management, and digital collections. With the several conveniences that can be obtained from using this mobile library, it is hoped that the library can consider switching to a digital library for the progress of the library itself and user satisfaction [13].

Research on other library digitization by B. Gavit entitled "Web-Based Library Services". The author explains that the first and foremost function of the library is to provide quality information service to satisfy its users with the right information at the right time. With the help of a library webpage, the library can easily propagate its services and facilities to the academic community worldwide. According to the author, here are some advantages of having a web-based library application: it saves the precious time of the users, a large number of users can be helped simultaneously by using web-based library services, less dependent on the library staff for getting the required information, no need of library staff in large numbers to carry out library works and services, fulfill information requirements instantly, operating costs are minimal, saves considerable storage space and fast publication [14].

Based on this background, a library information system is proposed for Pelita Kasih schools. The information system will help digitize schools to achieve the goals of Sekolah Penggerak program. In addition, the information system will also facilitate the process of borrowing and recording books in schools. In the future, this information system will continue to be developed so that it can reach all Sekolah Penggerak at the national level.

Methodology

The method used in this study is the prototype method. The prototype method is a way of developing the initial device by first designing the initial appearance [15]. The purpose of using the prototype method is to increase interaction between developers and users so that applications can run as expected by users [16]. In addition, if there is an error in the system, the developer can immediately find out and fix the error.

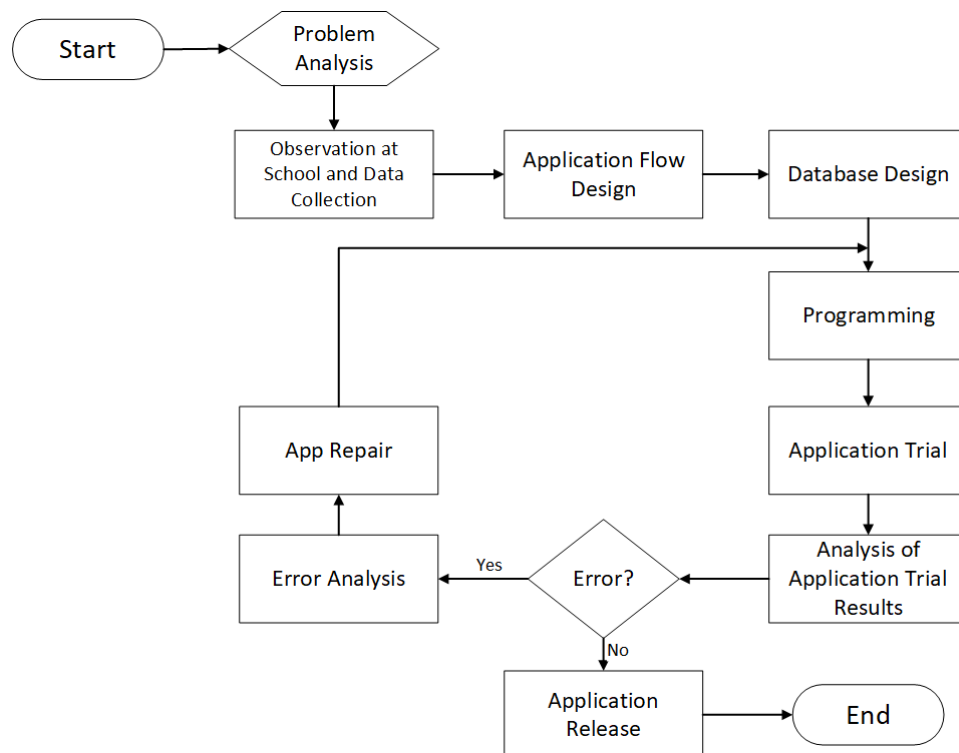


Figure 1. Library app prototype model

Figure 1 is the research process that has been used with the prototype model. The purpose of designing this system is to improve accessibility to library resources and streamline library management. The initial stage of analyzing the problems encountered was then conducting direct observations at the school, namely Pelita Kasih Singaraja Kindergarten. Identify the needs of library information systems by understanding the needs of kindergarten schools, librarians, teachers, and students. Gather information about desired features such as cataloging books, managing borrowing processes, tracking user accounts, and providing an easy-to-use interface.

After observation, it turns out that the process of reporting student learning outcomes and library management still uses manual recording and uses hardcopy reports. Therefore, a digital library application was developed to support the digitization of Sekolah Penggerak program starting from designing the application flow and designing the database design.

After designing the application flow and database, followed by designing a prototype design. Based on the requirements collected, design the structure, interface, and functionality of the library information system prototype, a prototype design was carried out with the following considerations.

1. User Interface Design.
Designing visually appealing and intuitive interfaces suitable for young children. Use child-friendly colors, icons and fonts and ensure the interface is easy to navigate and understand.
2. Cataloging and Search Functions.
Designing a system that allows librarians to catalog books based on title, author, genre, and other relevant attributes. Implemented a search function that allows users to easily find books based on different criteria, such as age group or topic.
3. User Accounts and Loan Management.
Develop mechanisms to create user accounts for students and teachers, enabling them to borrow books. Added features such as book reservations, due date reminders, and tracking borrowed books.
4. Reporting and Analytics.
Combines features that allow librarians and administrators to create reports on book circulation, popular books, or user preferences. This report can assist in making decisions about resource allocation and library improvement.

The next stage is testing the digital library application. If an error or error occurs during the trial, then the database repair and programming of the application are carried out. The trial process was carried out with the principal of the teaching teacher, and parents of students at Pelita Kasih Singaraja Kindergarten. Testing and evaluation activities need to be carried out to assess the effectiveness of the prototype and gather feedback. Testing involves kindergarten school librarians, teachers, and even children in the testing process. Based on the test, feedback will be obtained about the usability of the system, functionality, and the overall user experience, and then record problems.

The next stage is identifying areas that require further refinement or development. Based on the analysis, repeat the prototyping process by making necessary adjustments and improvements. The final stage is the release of the digital library application which has been started to be used in Pelita Kasih Singaraja Kindergarten. After conducting various trials and improvements to the application, the digital library application can be used by Pelita Kasih Singaraja Kindergarten, one of the school movers in Buleleng Regency.

Results and Discussions

The research phase begins with problem analysis. there are several problems in the Pelita Kasih Singaraja Kindergarten library so it requires an information system. Pelita Kasih Kindergarten is one of the school movers initiated by the Indonesian Minister of Education which is obliged to digitize the process of borrowing books in the library and student study reports. Furthermore, there are quite a lot of books owned by Pelita Kasih Kindergarten, making it difficult for library staff to search for books. Then the process of borrowing books by students is still doing notebooks which if the notebook is lost then the entire history of borrowing books is also lost.

The next stage was conducting interviews with the school principal to find out the flow of borrowing books at Pelita Kasih Kindergarten and looking directly at the transaction book for borrowing books. The results of these observations serve as the basis for designing a library information system according to the needs of Pelita Kasih Kindergarten.

[Figure 2](#) describes the flow of digital library applications that can be accessed via a browser on a computer or smartphone. There is a library admin entity that can manage book data, school profile data, student data, lists of book loans, and book borrowing history. Admins can add

usernames and passwords for each student so parents can log into the system and borrow books. Library administrators can be 1 or more and are appointed directly by the school principal.

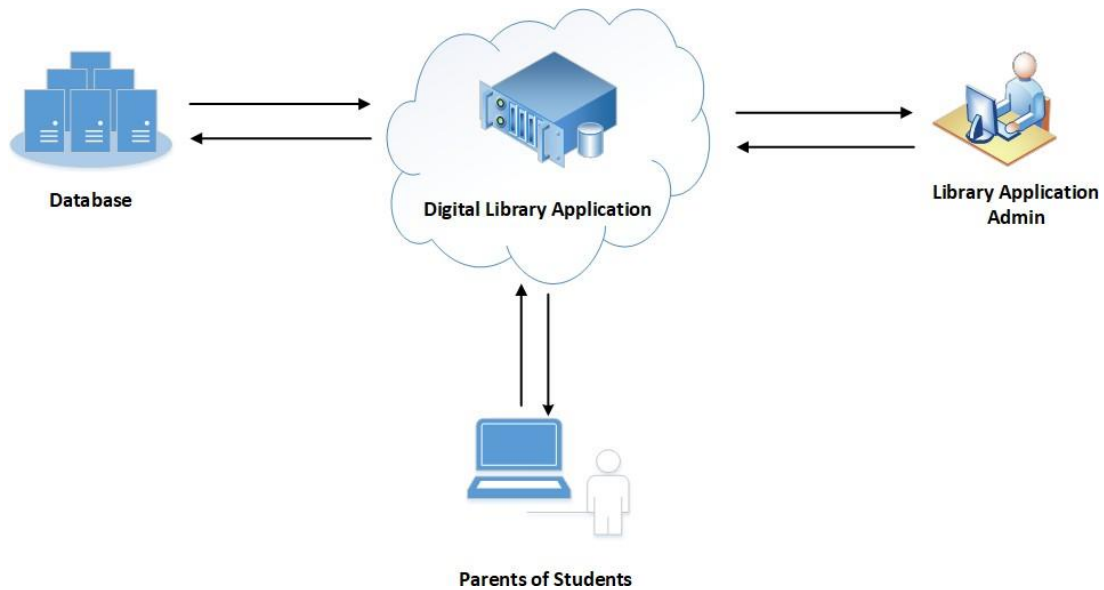


Figure 2. Overview of digital library applications

The student's parent entity displays a list of books that can be borrowed. Parents of students who are logged in can borrow books as needed and return books which will later be updated by the library admin. All transaction processes carried out by the admin and parents of students will enter the system database.

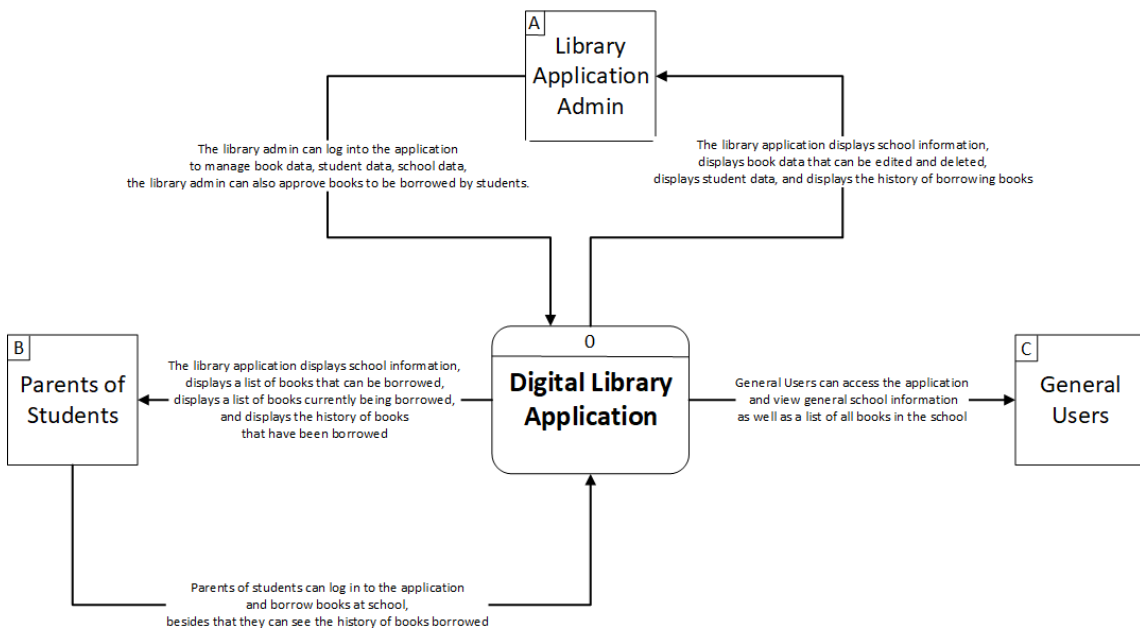


Figure 3. Data flow diagrams

Data flow diagrams (DFD) for digital library applications explain the relationship between entities that can access the system. Data flow diagrams can be seen in [Figure 3](#). In this library application, there are 3 entities namely library admin, parents and general users.

1. The library admin can manage school data such as school profile data, book data, student data, and book loan transactions. School profile data and book data inputted by the admin will appear on the school home page.

2. Parents of students can access the application by logging in first. After logging in, parents of students can borrow books and can read books that are available online.
3. General users can only access the home page of the provided library application. There is some information on the school's home page such as the school's vision and mission, address, social media, and a list of books in Pelita Kasih Singaraja Kindergarten.

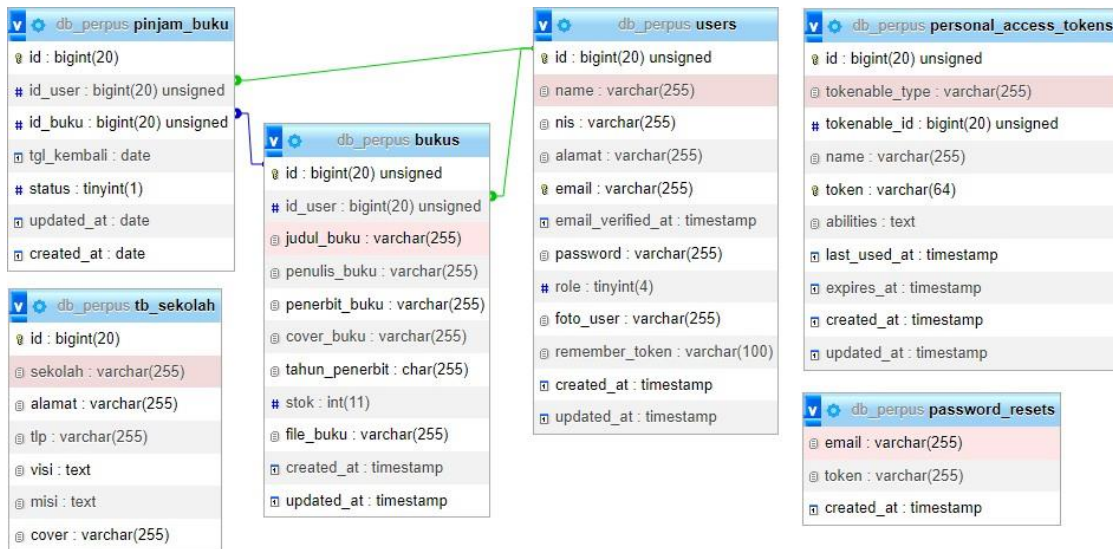


Figure 4. Library apps database

Figure 4 is a library application database schema. There are several tables to store transactions made. The tb_sekolah table contains school data such as address, telephone, vision, mission, and school logo. The users table contains student data, identification number, address, email, photo, username, and password. The bukus table contains book data, title, author, publisher, year of publication, stock, book files, and cover photos. The pinjam_buku table contains transaction data for borrowing books, book return dates, and book status.

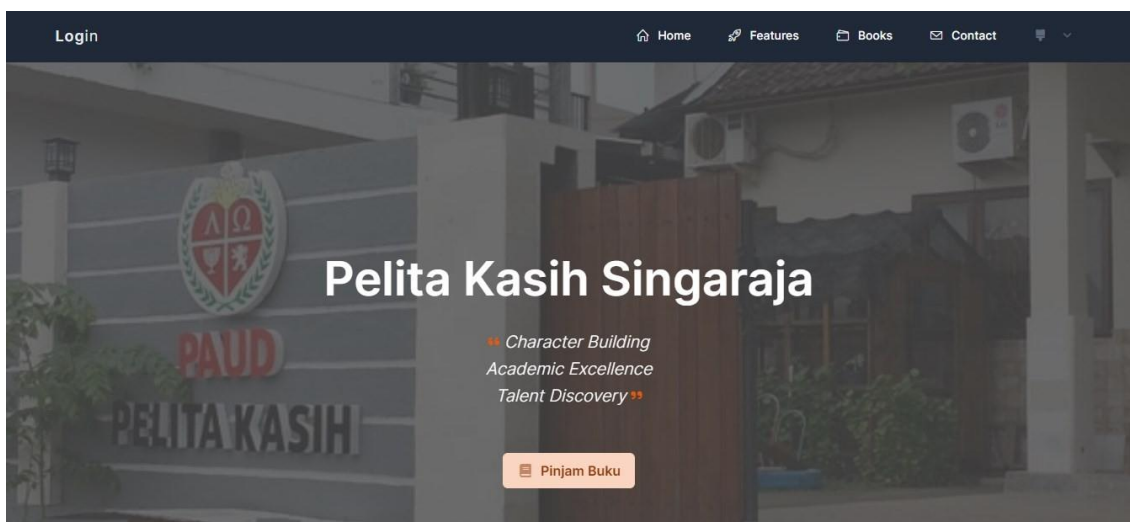


Figure 5. Library app home page

Figure 5 is the initial page of the library application for the Sekolah Penggerak Program (PSP). Users can immediately see a list of books that have been inputted by the library admin and can log into the system.

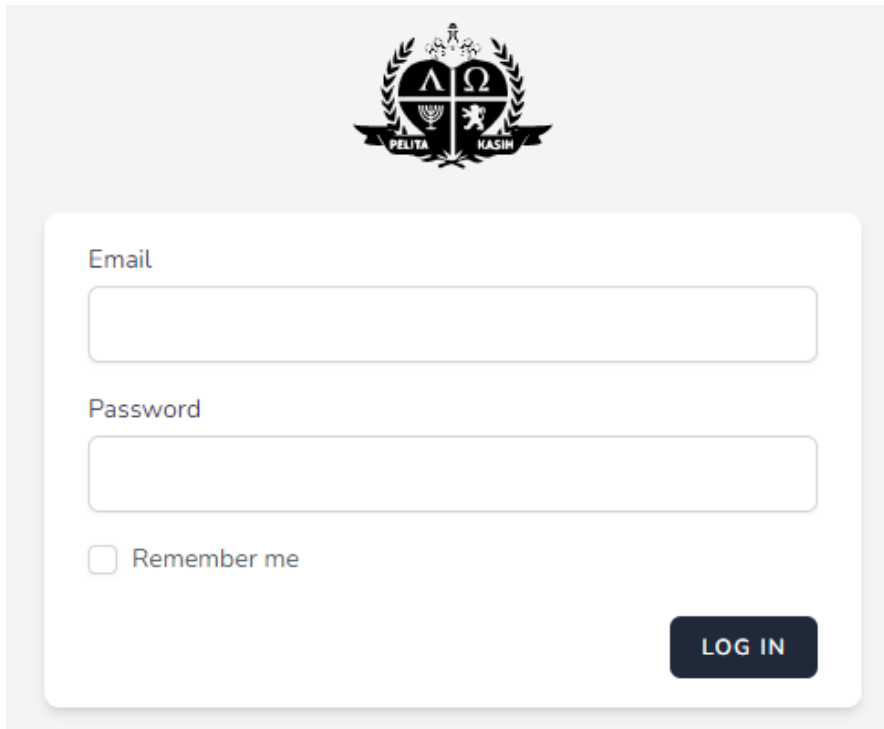


Figure 6. Login page

[Figure 6](#) is the login page to enter the digital library application. Two entities can log in, namely the library admin from the school and parents of students to be able to borrow books.

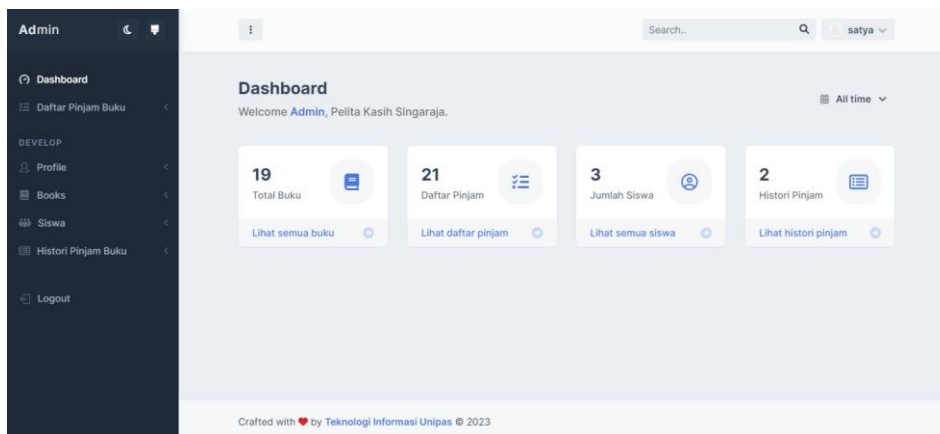


Figure 7. Library admin page

[Figure 7](#) is the display of the digital library admin page. Library administrators can manage various data, namely book data, student data, book borrower data, and book borrowing history. On the dashboard page, the admin can see the amount of each of these data. The admin page is designed with navigation assistance on the left and a search feature on the top right. The design of this feature is to make it easier for admins and librarians to manage all book transactions and prioritize the appearance of the system to ordinary users.



Figure 8. List of book loans on the admin page

Figure 8 is a view of the book borrow list page. Admin can update data on borrowing books borrowed by students. Admin can see the date of borrowing books and the status of borrowing books.

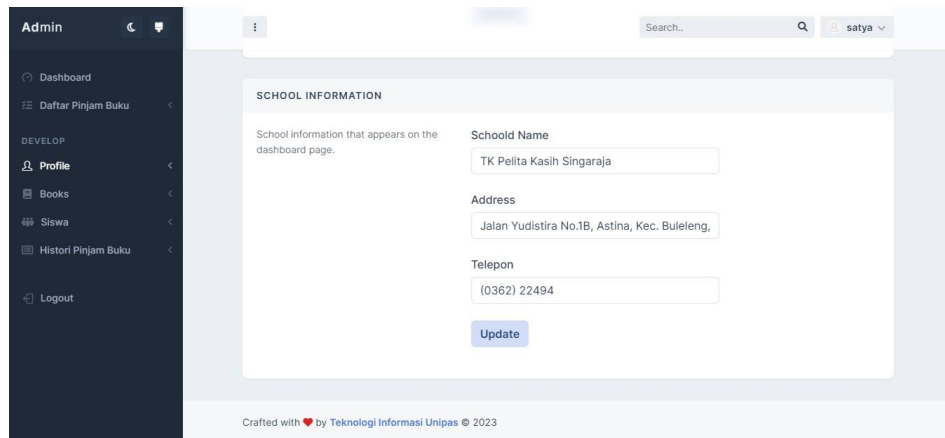


Figure 9. School profile on the admin page

Figure 9 is a school profile page. Admins can manage school profiles such as school name, address, telephone, and school social media.

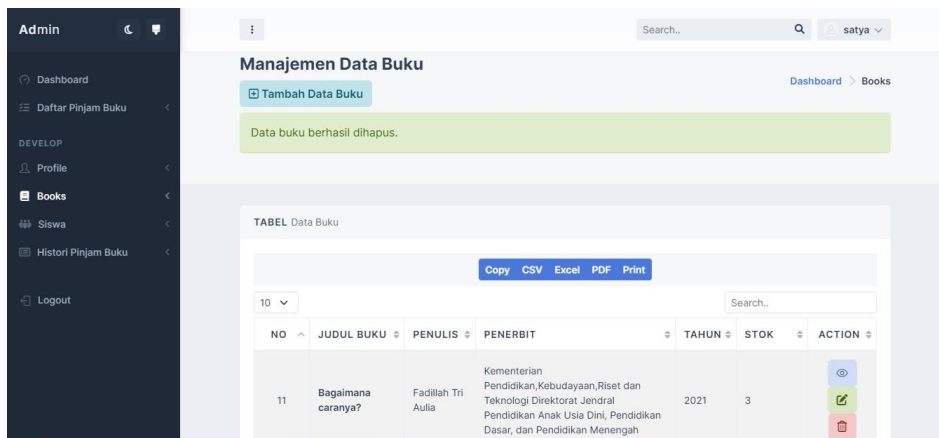


Figure 10. Book data management on the admin page

Figure 10 is a book data page. Admin can manage book data such as adding books, editing book data and deleting books. A list of existing books will appear on the homepage of the digital library application.

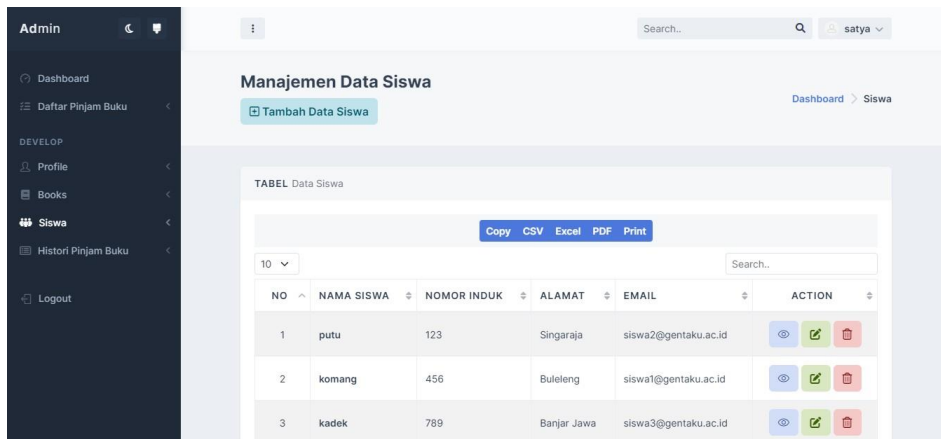


Figure 11. Student data management on the admin page

Figure 11 is a student data page. Admin can manage student data such as adding students, editing student data, and deleting students.



Figure 12. Book borrowing history on the admin page

Figure 12 is the book lending history page. Admin can see students who borrowed books and the total number of books borrowed.

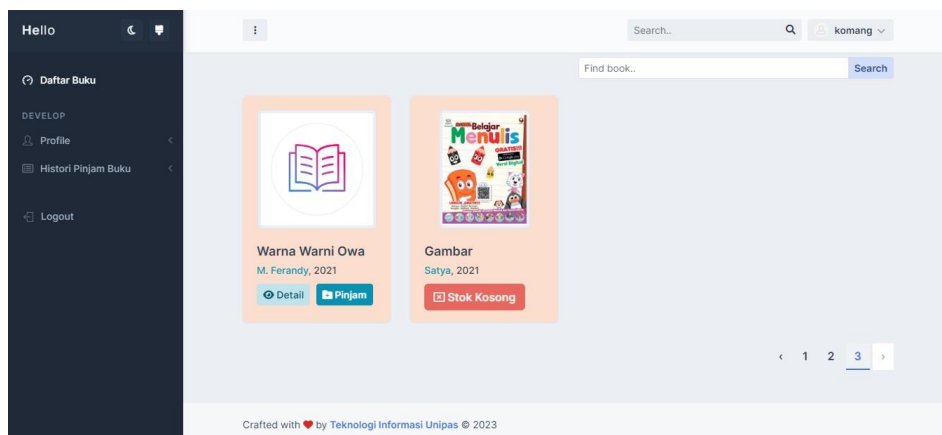


Figure 13. Home page when students log in

Figure 13 is the student's parent page when logging into the digital library application. The student page after logging in displays a list of books that can be borrowed and books that cannot be borrowed because they are out of stock. Students can borrow books by clicking on the Borrow

button. Student pages are visually appealing and child-friendly. This page provides a book search feature to make it easier to find books by title, author, or year of publication.

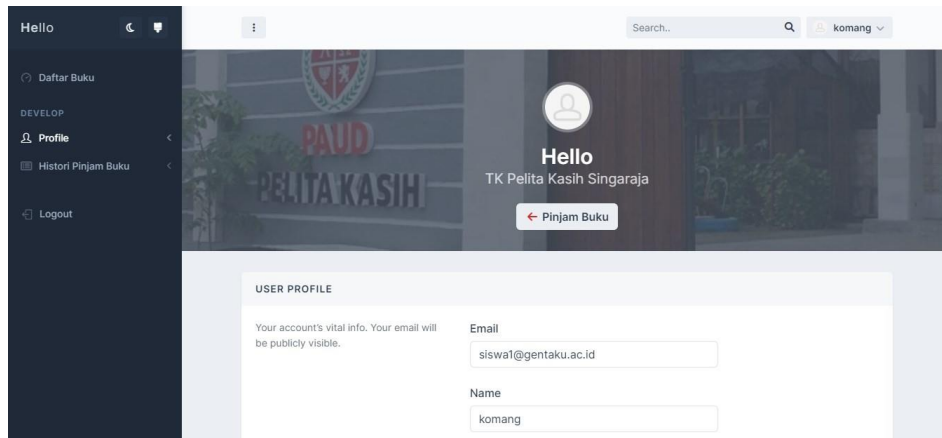


Figure 14. Display profiles on student pages

Figure 14 is a student profile page. On the profile page, students can change data such as name, address, email, and password to log into the application.

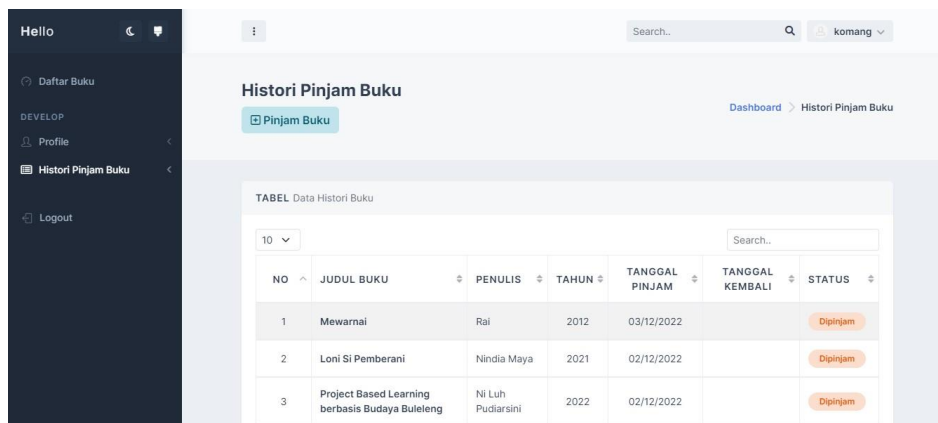


Figure 15. History of borrowing books on the student page

Figure 15 is the history page for borrowing books when students log in. This page displays information on all books that have been borrowed or are being borrowed. If the student has returned the borrowed book, the loan status and return date will be updated automatically.

The test method is done by black box testing. Aspects of testing include system functionality, security, performance, and errors.

Table 1. Testing with black box

| Testing Activity | Expected results | Test result | Conclusion |
|--------------------------------|--|---|-------------|
| Log in to the system | Users point to the dashboard according to roles and access rights | The login process works as expected and the user view matches the permissions | Appropriate |
| Click the add book data button | A book data add form appears which contains the book cover, title, author, year of publication, and book stock | The add book data button works as expected with a modal pop up | Appropriate |

| | | | |
|---|---|--|-----------------|
| Click the edit book data button | The book data detail form appears and the latest book data update appears | The book data edit button works as expected | Appropriate |
| Click the delete book data button | Validation appears before deleting book data | The delete book data button works as expected with validation before the data is deleted | Appropriate |
| Click the book loan status update button | The appearance of the book loan status form will change to the book has been returned | The book loan status update button works as expected | Appropriate |
| Click the search book button | All book data will appear according to keywords | The search book button works as expected with search results according to the database | Appropriate |
| Click the book borrow details button | All book data borrowed by the user appears | The book borrows details button works as expected by displaying all book data that has been borrowed by the user | Appropriate |
| Download data by clicking the Excel button | Excel data is stored on the computer | The download button works as expected | Appropriate |
| Online reading button | A new tab appears to read books online with pdf files | Unable to display book files in a web browser | Not appropriate |
| Access information systems through web devices | The display adjusts to the screen on the computer | The information system prototype display functions as expected in a web browser on a computer | Appropriate |
| Access information systems through mobile devices | The display according to the size of the smartphone screen | The information system prototype display functions as expected on the smartphone screen | Appropriate |

Functional testing is used to ensure that every feature or function in the system can run properly. This test includes login, data input, and the process of borrowing books. Security testing is used to ensure that the library information system is safe from attacks or unauthorized data leakage. This test includes verification that the system has implemented proper access controls and that the system cannot be accessed by unauthorized parties. Performance testing is used to ensure that the information system can handle the workload and can operate efficiently. The system can provide a fast response to the user. Error testing is used to ensure that the information system does not experience errors or bugs that could interfere with the user experience. This test includes verifying that the system can properly identify and handle errors and provide error messages that are clear and easy for users to understand. Black box testing is done with 11 test activities. The information system has not been able to display files in a browser so that users can read books online. Therefore, the black box test gets 91% results with 10 appropriate tests and 1 test that is not appropriate.

Conclusion

Sekolah Penggerak program is a breakthrough that gives students the freedom to be creative and develop according to their interests. The government's intervention in this program is digitizing schools using various digital platforms. The digitization of the school was carried out by Pelita Kasih Singaraja Kindergarten starting from making library applications to data book management and book lending transactions. The designed library information system can help the management process of borrowing books in schools. This system can be accessed via browser on a computer or smartphone, making it easier for users to make book transactions. This information system has

been tested using the black box method, including testing functionality, security, and system performance. Based on the tests that have been carried out with the blackbox, the test was carried out with 11 test activities where 10 tests were appropriate and 1 test was not appropriate. The test results with the black box are more than the expected results.

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