Design and Implementation of Digital Library System

Akinwalere John Oluwaseun
Department of Software
Engineering
Federal University of
Technology
Akure, Ondo State, Nigeria
Email: akinwalere52@gmail.com

ABSTRACT

Library is a collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. Thus the process of handling a library manually is very troublesome and clumsy. The advancement of technology and the rapid implementation of advanced technology have made many physical walls and boundaries of insignificant effect. Digital Library is a wall breaking and boundaries cutting technology that allows users to have access to information resources electronically and conduct research anywhere they are and want without actually stepping into a library using the internet service. Its key functionalities include viewing and searching for books, reading books online , downloading books and addition ,edit and removal by the admin .This applies rapidly advancing data processing technology as well as networking technology with an expectation to be highly convenient.Digital Library System is Mobile-Based; Flutter and Dart are used for the frontend and firebase was used for its backend.

Keywords: Library, Flutter, Firebase, Digital

1. INTRODUCTION

The design and implementation of a Digital library system is a significant endeavor in the field of library and information science. With the advancement of technology, libraries are transitioning from traditional physical spaces to digital platforms, providing users with access to a wide range of electronic resources and services. The evolution of Digital library systems has revolutionized the way information is stored, managed, and disseminated, enabling users to conveniently access resources from anywhere and at any time (Tanikawa et al., 2009). This paradigm shift has been driven by the increasing demand for efficient and user-friendly library services, as well as the need to adapt to the digital age (Beard & Dale, 2010).

One crucial aspect of designing a Digital library system is the consideration of user needs and preferences. Understanding the information-seeking behavior of library users is essential for designing a system that caters to their requirements (Williams-Ilemobola et al., 2022). Disabled students, for example, may have unique challenges and requirements when accessing library resources. Therefore, it is crucial to ensure that the Digital library system is accessible and inclusive, providing features such as screen readers, text-to-speech capabilities, and alternative formats for visually impaired users (Williams-Ilemobola et al., 2022). By incorporating inclusive design principles, Digital library systems can enhance accessibility and foster equal opportunities for all users.

The design and implementation of a Digital library system also involve considerations of information security and privacy. Libraries are entrusted with sensitive user data, including personal information and borrowing history. Therefore, it is crucial to ensure the confidentiality, integrity, and availability of the data through appropriate security measures (Beard & Dale, 2010). Encryption, access controls, and regular security audits are essential components of a secure Digital library system.

2. RELATED WORKS

In this section, a number of works of literature will be reviewed stressing their motivations, objectives, methodologies, contributions to knowledge and limitations A number of related works exist in literature on the developement of digital library .This section presents a review of some of the literature papers.

In 2019, three authors came up with a digital library solution for the Niger Delta University in Bayelsa State,this paper focuses on the design and implementation of a Digital Library Management System. The case study centers on the Niger Delta University in Bayelsa State, recognizing the need for a

technologically advanced solution to streamline library operations and enhance accessibility to scholarly materials.

This project contributes to the body of knowledge by providing a case study on the design and implementation of a Digital Library Management System tailored for a specific academic institution. The insights gained from addressing the unique challenges faced by the Niger Delta University offer valuable lessons for other educational institutions seeking to modernize their library systems. The project stands as a testament to the transformative impact of technology on academic resource management, contributing to the discourse on digital library systems in the context of Nigerian higher education.

3. METHODOLOGY

The model that will be adopted in developing this system server- client. Server will host database where data will be saved. When the information is requested by the user the server will process the request then display the results. This whole process will be implemented using Flutter SDK and Dart Language for building the intuitive user interface and Firebase Cloud Hosting Platform for the Backend.

4. IMPLEMENTATION AND RESULTS

This section consists of the program modules, showing what they represent, and how the system can be deployed. The Digital Library System functions in such a way that when the app is opened it shows the welcome page in (figure 1) which contains three buttons where the user can either register with their email accout, or create a new account and the admin can login clicking on the admin Login button.Figure 2 shows the registration page where the user can input their names, email, date of birth and password to register in order to have access to the books on the app.figure 3 shows the admin panel where the admin can add , edit or delete books from the books archive. Figure 4 shows how the admin adds a new book to the books collection and to different categories.

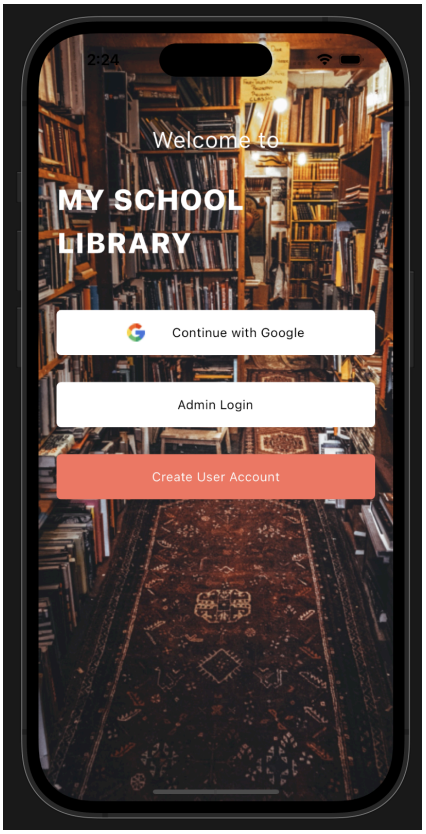

Figure 1. Welcome Page

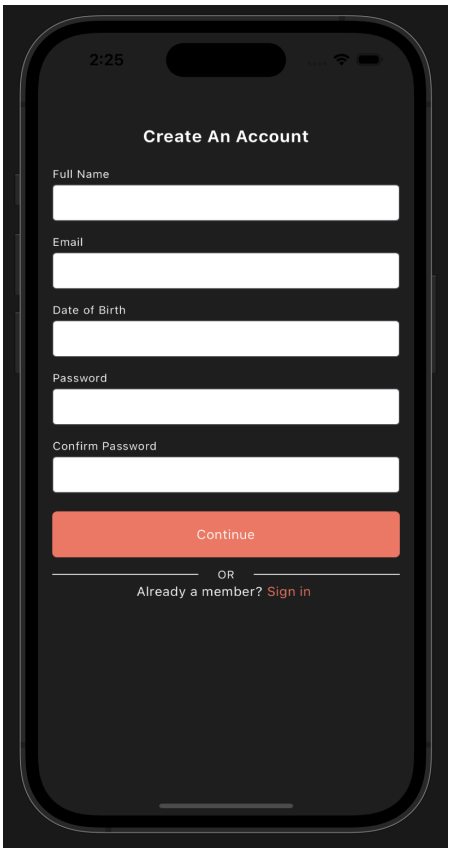

Figure 2. Registration Page

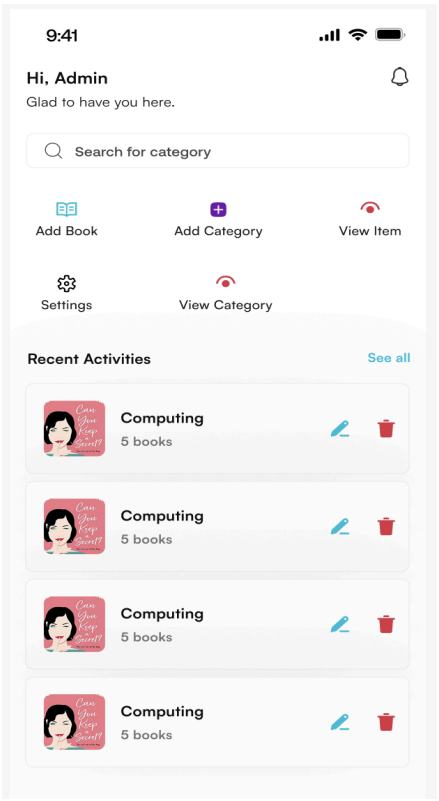

Figure 3. Admin Panel

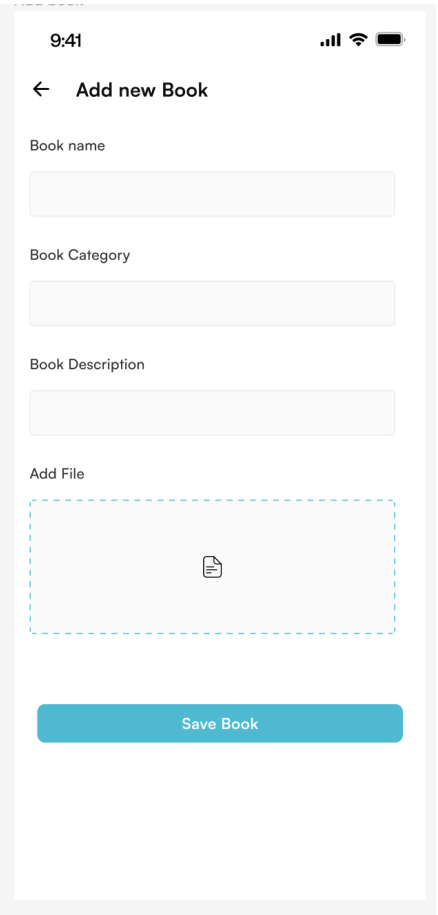

Figure 4. Adding Books

5. CONCLUSION

When automated systems are placed side by side with traditional/manual systems, the former always has proved to be more successful with far more unique advantages when compared.Digital library has redefined and added value to the way knowledge resources are being accessed and taken from the traditional library. This has help to promote the speedy access of materials and the multiple accesses of the same. The constant availability of resources on the system is also a goal against the manual library system. Conclusively, digital libraries are the best option against traditional libraries in the aspect of resources especially

when speed, coverage and preservation is concerned.

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