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Mobile Library Application Modeling for Strengthening Digital-Based Student's Reading Writing Interest

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Abstract: Digital literacy is very important at this time. Proficiency in using technology is a must in order to compete nationally and internationally. One way to improve literacy patterns is to obtain a lot of information and reading materials through the library. Technological devel-opments make libraries have to innovate so that conventional libraries become digital li-braries. At the library of the State Islamic University of North Sumatra (UINSU) Medan itself, the literacy pattern has utilized the digital library. It just needs better innovation by creating responsive mobile applications. This application model will focus on providing digital books so that they can be accessed from anywhere without having to visit the li-brary. The development of this application model uses the Research and Development (R&D) method and is designed using the UML model and with various tools and various programming languages such as Android Studio, HTML, CSS, and PHP which will later produce a responsive web view. There are 3 access rights in the mobile library application, namely Administrators, Library Members and Library Visitors who have their own access rights. This application model is only intended for the Android platform, not for the iOS platform. This model runs well on the Android platform which is relevant to today and makes it easy for users because it can be accessed anywhere and anytime and has online read, borrow and return features.

Keywords: mobile library; android; digital literacy;research and development

INTRODUCTION

The current digital generation spends more time accessing entertainment media such as games, movies, viral videos than accessing self-development information. The press council noted that the development of information-presenting media in Indonesia reached 43,400 but the official media recorded only 0.04 percent(Merdeka.com, 2018). Therefore, the public easily obtains information from sharing media related to whether or not the news is or is often called a hoax. This indication shows a decline in public interest in reading. UNESCO applies the concept of digital literacy which can be a foundation for understanding technology, information and communication tools (Perpustakaan BSN(Badan Standardisasi Nasional), 2021). Digital literacy with conceptual and operational approaches. Cognitive, social and emotional development is the focus of the conceptual approach, while technical ability is the operational approach, namely how to use information media.

The development to create a literacy pattern that can be reached by the wider community in the current digital era has undergone many changes. The most frequently visited literacy resource is the library. The challenges of libraries in the digital era are increasing, we no longer often see shelves or piles of book collections. This shift is deemed necessary so that the library still exists and becomes an interesting source of literacy. This development makes conventional libraries into digital libraries. Digital library is a library whose application uses Information Technology (IT) (Wibowo, Riyanto, & Rakhmah, 2017). Digital library is a library that has a collection that is mostly in digital form, and can be accessed with laptops, PC computers, and mobile phones (Patriawati & Hanum, 2020). In 2017 the development of the digital world in Indonesia recorded as many as 132 internet users, growing 51 percent from 2016 of around 88.1 million (Wicaksono, Rakhmawati, & Suryandari, 2019). Therefore it is necessary to create a library that can be implemented into a digital library application that can be used mobile.

At the library of the State Islamic University of North Sumatra (UINSU) Medan itself, the literacy pattern has utilized a digital library so that it can be accessed anywhere. However, the UINSU Medan library

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must make better innovations that are in accordance with the current situation. Universities must disrupt themselves. Universities need to develop new innovations in the educational process, one of which is creating responsive mobile applications. Universities must be able to produce mobile applications that are responsive to market needs for education (Suratno, 2022).

This research will develop a digital library application at UINSU Medan which is already running into a mobile library application that is more responsive but only focuses on digital books because it is more practical and can be published in digital form and can be viewed and read through various platforms such as computers, smartphones, tablets and so on (Mentari, Sumpono, & Ruyani, 2018). This research will also only focus on using the Android platform, not the iOS platform.

LITERATURE REVIEW

Digital library is a library whose application uses Information Technology (IT) (Wibowo et al., 2017). Digital library is a library that has a collection that is mostly in digital form, and can be accessed with laptops, PC computers, and mobile phones (Patriawati & Hanum, 2020). Digital libraries are one of the solution options to solve problems against the constraints of traditional library theory (Atningsih & Sugiarto, 2017).

Mobile applications are a term to describe applications on devices that are small, portable, wireless and also support communication. Mobile technology has become a part of everyday life and almost all people have cellphones or the like which they use as a medium to communicate via voice, check email and also others (Prakarsya, 2019). The word mobile itself is the meaning of moving. So, mobile application is a term for applications that run on devices that can move or move. With the mobile application, various activities such as browsing, studying, entertainment, selling and other activities can be done easily (Prakarsya, 2019).

Mobile library is the integrity between the mobile device and the library. Mobile devices act as library assistants by sending information and allowing users to access certain services within the library. Your mobile device must be connected to the internet to use the mobile library. M-Library or M-Libraries comes from the word Mobile Devices, abbreviated M for library. Therefore, user access via mobile technology can be used anywhere (Mutiara, 2021).

Digital books, also known as e-books, are publications in the form of text, images, or sound that are published in digital form and can be viewed and read through computers or other electronic devices such as smartphones, androids or tablets (Mentari et al., 2018). E-books contain digital information in the form of text or images, while printed books contain a collection of paper containing text or images (Makdis, 2020).

Android is a Linux-based operating system using open source code under the APACHE 2.0 license, designed for various devices. Android, Inc. was founded in Palo Alto, California in October 2003 by Andy Rubin, Rich Miner, Nick Sears, and Chris White. The initial goal of developing Android was to create an advanced operating system for digital cameras, but later it was discovered that the market for such devices was not large enough and Android development was abandoned. Move to the smartphone market to compete with Symbian and Windows Phones. (Apple's iPhone didn't exist at the time) (Hardiansyah & Suryono, 2020).

METHOD

The research method used in this study is the Research and Development (R&D) method because this study aims to develop products. R&D is the method used in making certain products and testing the effectiveness of these products. In order for this research to be carried out in a targeted manner, a research framework is needed. The framework in this research uses Waterfall or System Development Life Cycle (SDLC).

Data Collection

Data collection is done in the following way:

1. Observation, in this study the researchers made direct observations at the Library of UINSU Medan.
2. Interviews, At this stage, the researcher conducted direct interviews with the library manager of UINSU Medan about the current system. This is intended so that researchers understand what development is needed for the existing system in the UINSU Medan Library.
3. Literature Study, at this stage the researcher looks for literature studies related to research that will be used as a theoretical basis and relevant previous studies. This is so that researchers can deepen their understanding as well as broaden the knowledge of both researchers and readers of the research they are doing.

Requirement Analysis

At this stage, the researcher conducts a functional requirements analysis which explains the number of access rights, what can be accessed by each user in using the mobile library application.

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System Design

After knowing the functional requirements that have been obtained in the previous stage, the next stage is to design the system according to the needs using the UML model.

System Build

At this stage, a digital-based mobile library application is made according to the system design stages using various tools and programming languages such as Android Studio, HTML, CSS, PHP and MySQL.

System Testing

At this stage, the model is tested by inputting 10 digital book titles with different categories. Then read digital books using 3 different users and make borrowing transactions as well as returning digital books.

System Development

At this stage, system development is carried out if the resulting system is not in accordance with what has been planned.

System Socialization

The stage where the application that has been completed will be socialized to users who will run the system.

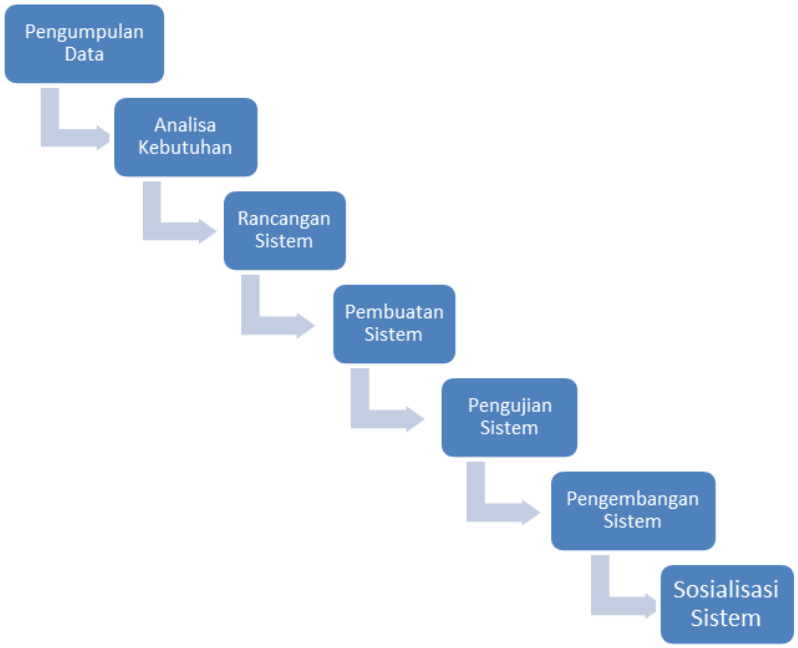

Figure. 1 Research Implementation Stages

RESULT

Process Modeling

Process modeling or business process modeling is a graphical representation of a business process or workflow and the various related activities within it. With process modeling, you can get a diagram that is comprehensive and contains insights about business processes such as; events and activities that occur in the workflow; who is responsible for or initiating each event and activity in the workflow; various decisions and directions that a workflow can take based on its outcomes; various tools used in business processes; timeline of the entire business process as well as every step in it; the level of success and failure of a business process.

From this insight, you can also use the process model for visualize the various processes being brainstormed with the team, find ways to improve the performance of current business processes, designing a new business process and create processes for business functions that are performed iteratively

The application process model in this study, the researchers used a Use Case Diagram can be seen in the following Fig 2.

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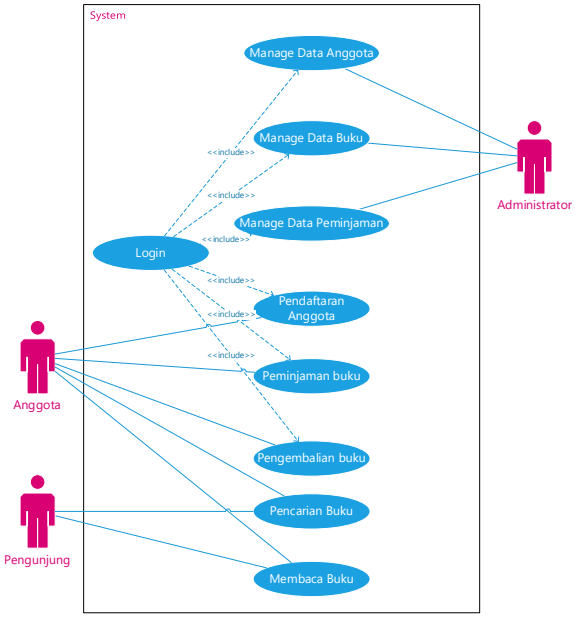

Figure. 2 Mobile Library Application Use Case Diagram

System View

The UINSU Medan mobile library application model is in the form of a file with the extension *.apk which can be installed on Android devices to see how the application looks.

Fig. 3 Mobile Library Application Logo

Figure. 4 Main Page

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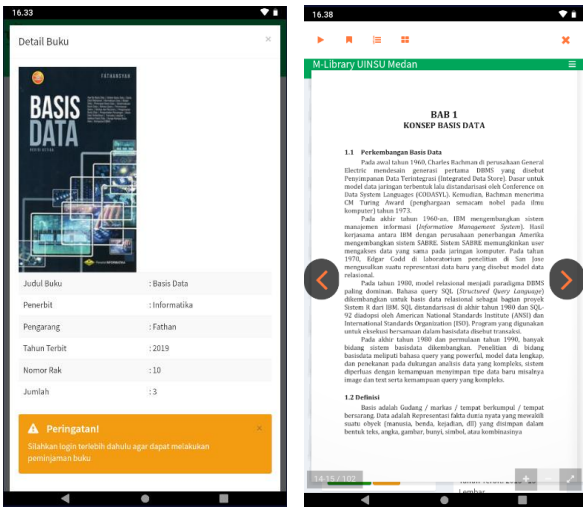

Figure. 5 Book Details Page and Reading Book Page

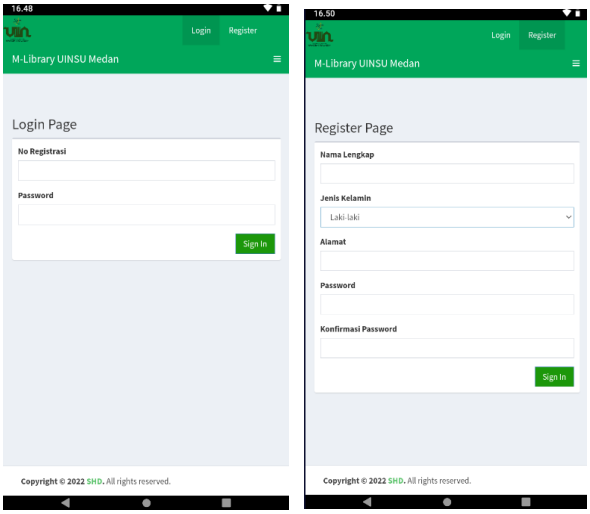

Figure 6. Login Page and Register Page

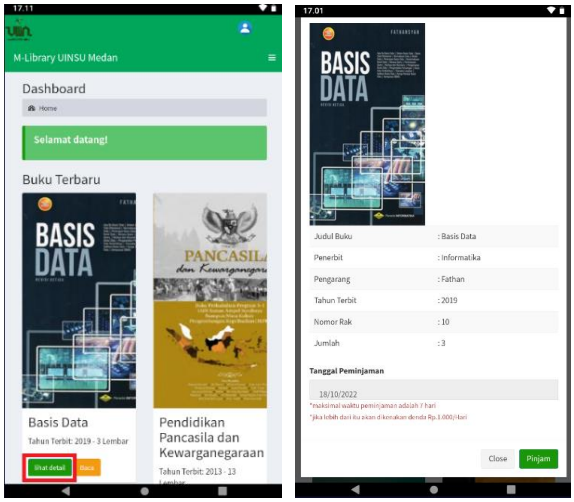

Figure 7. Loans on the Details Page

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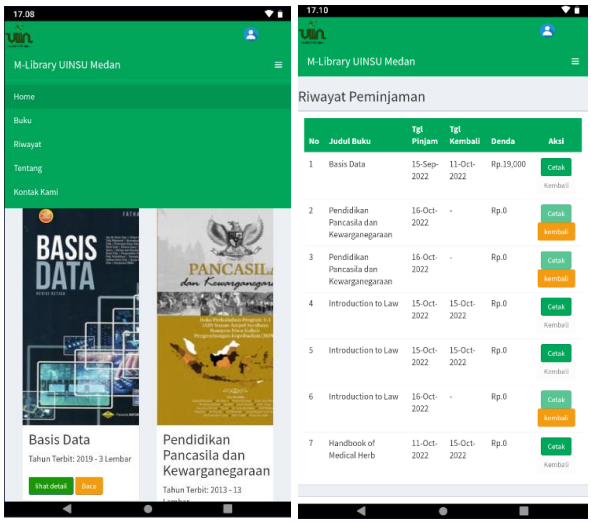

Figure 8. Returns on History Page

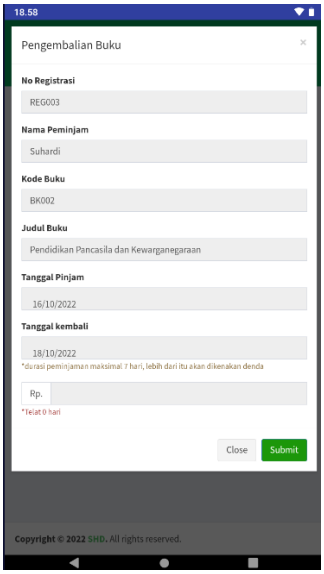

Figure 9. Book Return Page

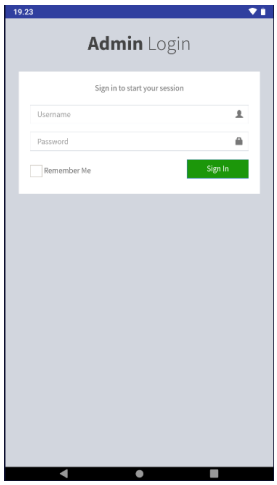

Figure 10. Administrator Login Page

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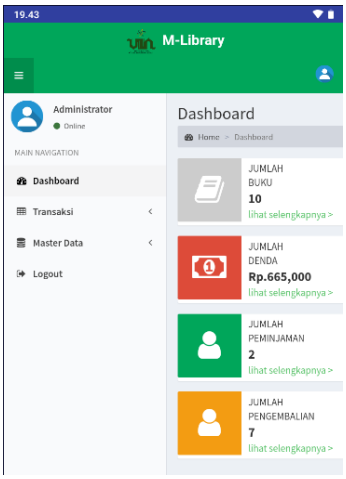

Figure 11 . Administrator Dashboard Page

Figure 12. Recent Transactions Page

System Testing

Testing of the system is carried out using the black box method by testing the functions and features that exist on the system such as the function of storing data, changing data, deleting data, displaying data and searching for existing data in Book Data, Book Categories, Member Data, Borrowing and Returning Book Transactions. The data tested used 10 digital books in different categories with 3 access rights, Administrator, Library Members and Visitors.

Table 1. Black-box Test Results

Pages	Features	Results
Visitor Main Page	- Showing Latest Books - View Book Details - Read a Book - Registration	Success
Member Login Page	- Verify the data of members who have the right to login	Success

Pages	Features	Results

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Member Main Page	-	Showing Latest Books - View Book Details - Read a Book - Borrowing Book	Success
Borrowing History Page	-	View Borrowing History - Book Return - Print History - Calculate Fines Automatic	Success
Administrator Login Page	-	Verify the administrator's data that has the right to login	Success
Administrator Main Page	-	View Data, Add, Delete Recent Lending and Return Transactions - View the Total Penalty Amount of Transactions - View Number of Books - View Loan Amount - View Refund Amount	Success
Book Data Page	-	View, Add, Change, Delete Data	Success
Category Data Page	-	View, Add, Change, Delete Data	Success
Member Data Page	-	View, Add, Change, Delete Data	Success
Admin Data Page	-	View, Add, Change, Delete Data	Success
Loan Transaction Page	-	View, Add, Change, Delete Data	Success
Return Transaction Page	-	View, Add, Change, Delete Data	Success

DISCUSSIONS

Based on the research results that have been obtained, there are 3 access rights in the mobile library application, namely: Administrator, this user has ac-cess to manage all the main data related to the library such as input, edit and de-lete data; Library member, this user has access to information on books available in the library such as viewing, borrowing and returning books for free. This user must first be registered as a member of the library by registering to the system; Library visitors, this user has limited access, which is only able to view or read books for free.

For library visitors who want to access the application, they can only search and read digital books. If library visitors want to borrow and return books online, they are required to register if they are not registered as a member of the library, but if they have registered before, it is enough just to log in. Visitors who have logged in as members can already make loans via the view details button on the main page and can make returns via the history menu on the options in the form of three lines.

On the main page, you can see book catalogs accompanied by a description of the book's title, year of publication, number of available copies, a detail button that can display complete book information and a read button that functions to read digital books.

Returning books online is one feature that makes it easy for library members. This can be done directly through the application without having to come to the library. Library members will be fined if the return date is more than 7 days from the borrowing date.

Administrator is a user who controls all the main data related to the library such as input, edit and deletion of data. For the application model, it is made separately from the application for visitors and library members so that library data cannot be controlled by unauthorized persons. Administrators are required to login first when starting the application. If the login process is successful, the administrator's main page will appear. On this page the administrator can make arrangements for library member data, book data, category data, borrowing and returning transactions.

On the Administrator Dashboard page, you can find out the number of digital books available, the total amount of fines, the number of ongoing lending transactions, and the number of book returns that have occurred.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that this application model is designed only for the Android platform, not for the iOS platform. This model can also run well on the relevant android platform at the moment. This model can also make it easier for users, both visitors, members and library managers because it is based on Android which can be used anywhere and anytime via the internet network. This

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application model also has features for reading digital books online, borrowing and returning digital books online, which is very useful for visitors and library members because they don't have to visit the library directly. Automatic fine calculation feature, monitoring the latest digital book borrowing and returning transactions which can also make it easier for administrators to manage the library. This model is also an alternative solution to the concept of digital literacy which can increase interest in reading and writing, especially for students because of the online feature that makes it easier for users to access library books in digital form.

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