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Development of Mobile Library Application Based on Android in Universitas Ahmad Dahlan

Yana Hendriana

Lecturer, Department of Informatics, Faculty of Industrial Technology, Universitas Ahmad Dahlan Yogyakarta, Indonesia

ABSTRACT:Library is one of the facilities which assist in the provision of resources in the educational process, to expedite the process of finding and borrowing services by members of the library has been used web-based Digital Library, where its application is still not available for online borrowing services and therefore required a system that allows the members of the library to access library services, especially the process of borrowing books online using mobile library application based on android.

These reasons make the research necessary to prepare a library that can be accessed by users using Android Smartphone. The method used in this research is the First to define the problem and to analyze of user requirements. Second, to design and system design using UML (Unified Model Language). Third, develop a mobile application using android technology, JSON (Java Script Object Notation) as a connector to the database and MySQL as databseserver, Fourth perform application testing and fault finding before this application is implemented.

The system will be developed in the research is the application can be used as an alternative media library catalog search form, search Books, Magazines, CDs, TA / Thesis, Journal, Proceedings, also borrowing services online, so after doing the online borrowing member libraries can come to the library to pick up the book without to wait and queue.

KEYWORDS:Android Smartphone, Mobile Library, Opensource, Library.

I. INTRODUCTION

Library of Universitas Ahmad Dahlanis place with various collections of books, magazines, CDs, TA / Thesis, Journal, Proceedings. As an institution of higher education is fully committed to developing science. Collections owned by library of Universitas Ahmad Dahlan are generally classified into two types which are used to support the daily lectures in the form of books college textbooks and reference books for students and reference books both in Indonesian and foreign language that is used with the aim of advancing the science and technology.

One part in college, libraries need an information system that is accurate and fast. Library is a means source of knowledge from different disciplines. Libraries usually enabled by visitors as a medium to looking for references and obtain information [1].

Library is one of the facilities which assist in the provision of resources in the educational process, because the library provides borrowing facilities without any charge [3]. To expedite the process of search services and borrowing by the borrower to the library, we need a system that allows the members of the library to access library services, especially the process of borrowing books online using mobile librarybased on android application. This application will also provide facilities to assist in the search book performed by members of the library. The system will tell whether the book is available to be borrowed or not, and its status is being borrowed or not. The system also provides convenience in search of books, books can be searched with the option by title, author, type or publisher.
Android which Google released as an open-source mobile phone operating system is a Linux-based platform; it consists of the operating system, middleware, and user interface and application software[8]. The success and development of

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the current android capable of occupying the highest position gadgets and computer market, it is certainly due to the sophistication of technology systems and applications that are on it are currently a trend among mobile phone users because it can help all areas of work so that it becomes easier [7]. The advantages of android is the open source license so it is possible for anyone with an android programming ability to create or develop applications to run on Android-based gadgets [4].

II. RELATED WORK

A. Overview of Previous Research

Designing a system that is used to build applications STMIK AMIKOM Yogyakarta Library Catalog using Mobile Android (ALICSAM) is by using UML (Unified Modeling Language). UML is a standard language used to describe and visualize artifacts of the process of object-oriented analysis and design. UML allows developers perform visual modeling, namely the emphasis on the depiction [5]. Visual modeling helps to capture the structure and behavior of objects, simplify the depiction of the interaction between the elements in the system, and maintain consistency between the design and implementation of programming [2].

With the development of smart phone many traditional PC applications are being deployed to phone as clients.Based on Android and smart phone,mobile library system implements communication between client and server to provide users' query and request.This article designs the system architecture and functional module,describes how to implement communication between server and client,and lists algorithms of key modules[9].

Libraries should be exploring mobile devices as a way to connect with patrons. Creating a library application (“app”) or mobile Web site that allows patrons to access library hours, view their library account or even search databases is easier than most people think. The resources below should help libraries begin to plan and implement their own unique mobile presence.Resources were chosen based on relevancy, accuracy, and content. Due to current economic considerations, free mobile applications were chosen over similar paid applications[10].

This demonstration will showcase a prototype Mobile application we built for accessing the library catalog at the University of Texas. The demonstration complements our corresponding short paper, “Mobile Phone Search for Library Catalogs”, also appearing at ASIS&T 2010. In particular, we will provide attendees a hands-on experience seeing and using our interface, as well as an opportunity to discuss design alternatives and tradeoffs with us in person. We will show how MUT can provide library patrons with a faster and easier access via a customized mobile application[11].

B. The Library

The library is one of the units that form a place to gather, store, manage, and organize a collection of library materials to be used systematically by users as a source of information as well as a fun learning tool [3].

C. Integration System

Integration is a relationship of mutual linkages between sub-systems so that data from one system on a regular basis can be passed, to or taken by one or more other systems. The integration of information systems is one of the key concepts of the Management Information System. Various systems can be interconnected to one another in various ways according to its requirements [6].

III. METHODOLOGY AND DISCUSSION

A. Design System

The design of the system in the development of software used in this research, include :

1. Defining System Requirements

Defining the system requirements which determine the specifications of the system design library android based mobile applications. System requirements include member libraries data, the data in the respective Unit campus library, a library of data collection category and flow of library information systems existing.

2. System and Software Design

After the system specification is obtained, then the next step of designing an application that will be developed. The process of designing includes designing menus, interfaces and databases.

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3. Implementation

Design of systems and devices all the design that was created using Eclipse and the Android SDK tools. The draft implementation begins with the development of an existing database to add some tables to suit the needs of mobile systems, to make it look as well as providing programming language.

4. Testing

After the application is ready for use, the next step is to test or tests that aim to optimize the performance of the software. Tests using black box method and the alpha test. Black box testing is done by trial and error, that is by trying some input at the time the application is run. This testing process conducted by lecturers. While testing the alpha test is done by the students to try to use the program to use the device / android smartphone.

B. Flowchart of UAD Library Services

Standards of service to users or members in the library of Universitas Ahmad Dahlan based service process flow as shown in Fig. 1.

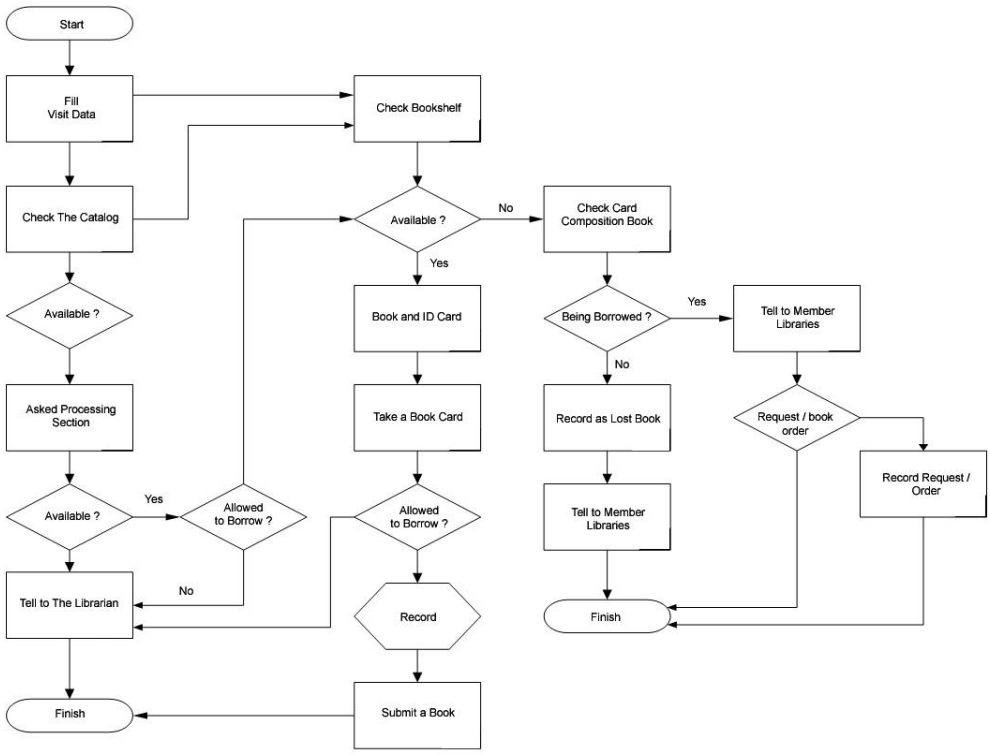

Fig. 1 Flowchart of UAD Library Services

Fig. 1 shows the Standard User or Member Services at the Library of Universitas Ahmad Dahlan:

1. Procedure based on Standard Operating Procedures (SOP) :

a. User / Member Libraries utilize library materials required before registration to write a Guestbook on Computer Facilities Digital library. If University student or lecturer want to be an active participant library membership required to register in accordance with the requirements set.

b. Implementing library services (Librarian) processing an application for membership participated in the library after received complete and correct requirements of a membership card.

c. Head section of the library to research the requirements and give initial approval on a library card if it has complied with and if not returned to the applicant.

d. Librarians do print Library Membership Card.

e.Librarians do laminating on or after the library membership card signed by members of the library.

f. Member Libraries who already have a membership card can borrow a book with the amount in accordance with the provisions of the management of the library and before the book was brought out for the requested evidence borrow.

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g. Librarians register borrowing in circulation book facility and after the record is complete, the book delivered to members..
h. Members must return the book on time and in case of late fines in accordance with the provisions of UAD library.
i. Librarians make bills if the borrower does not return within the prescribed time limit in order to book can be returned immediately by members.
j. Returns a book by the borrower or members to be registered in the return circulation of library services by librarians.
2. Standard Operating Procedure of the above, there are several things that should be known by the users of the library are as follows :
a. Rules borrow the collection
b. Time Library Service
c. Membership
d. Sanctions

C. Analysis of System Development
Based on the testing that has been done by the input data and the selection of each menu, the system analyzes the results obtained, among others,:
Library of Universitas Ahmad Dahlan has been implemented Library Information System and Digital Library, but the system is still limited to standard application library services, where members still have to find their own library collections available in the rack of books, and book ordering service is not available in online and unavailability of facilities reminder that informs the return date must book libraries and information fines if books borrowed book return deadline passes. Apart from these two systems, it is still required an Mobile Library based on Android Application, for the research is designed to integrate mobile applications with the Library Information System is used in the Library of Universitas Ahmad Dahlan. This application also provides facilities that help in the search book performed by members of the library. The system will tell whether the book is available to be borrowed or not, and its status is being borrowed or not. The system also provides convenience in search of books, books can be searched with the option by title, author, type or publisher, so that after making the online borrowmember libraries can come to the library to pick up the book without to wait and queue.

IV. EXPERIMENTAL RESULTS

A. System Design
1. System Architecture
The system architecture for application integration and database libraries Mobile Library UAD built is as follows:

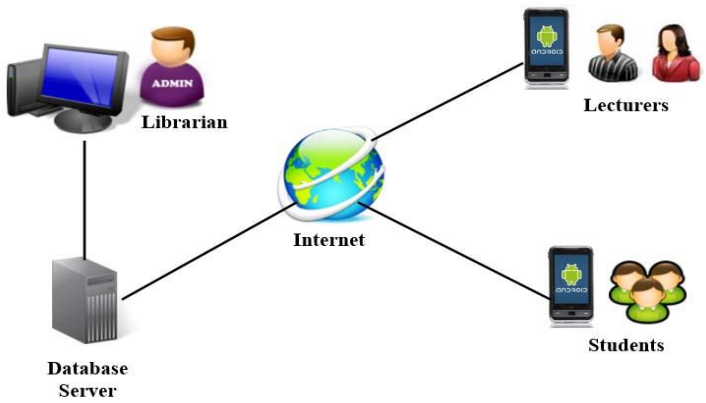

Fig. 2System Architecture of Mobile Library

In Fig. 2. indicates that all data stored on the server information. Administrator or librarian can manage data information that will happen in the library service. While lecturers and students can receive information through mobile library applications.

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B. System Functional Specifications

System functional specifications in this research, among others,:

1.Through android smartphone, library members can see the information of collection contained in library.

2.As a facility to borrow books online.

3.Member libraries can see the status of the book that is being borrowed, whether it is time to return or not.

4.Member librariescan enter criticism or suggestions for the procurement of titles of books that are not available in the library.

C. Design of the system

Design of the system developed in this research is that these applications can be used as an alternative media search the library catalog search form Books, Magazines, CDs, TA / Thesis, Journal, Proceedings, also borrowing services online, so after doing the online borrowing,member libraries can come to the library to pick up the book without to wait and queue.

D. Usecase Diagram

Under the existing system, the picture can be described as the following use case diagrams as shown in Figure 3:

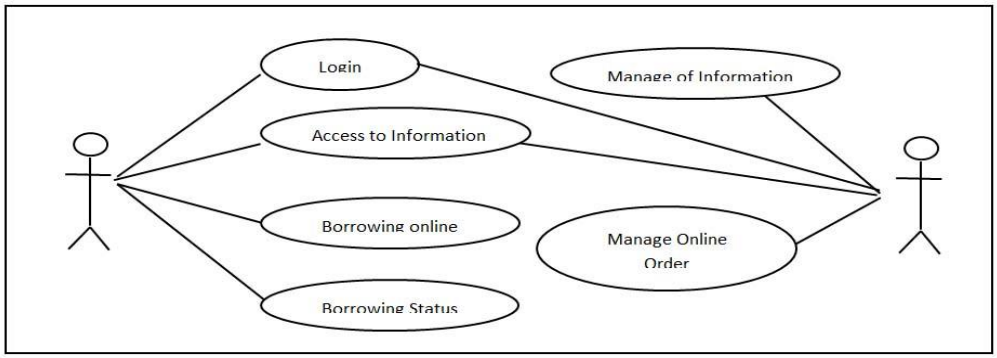

Fig. 3 Use case Diagram of the Mobile Library Services

E. Activity Diagram

Activity diagrams are used to describe the workflow between users of information distribution systems involved to be able to see the information that can be accessed as shown in Figure4.

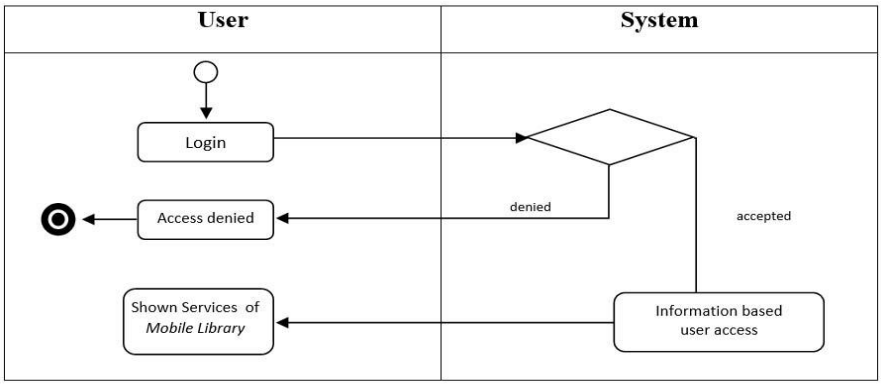

Fig. 4 Activity diagram of the Mobile Library Service

F. Design Implementation System

Implementation of the design of the system created consists of several features, among others :

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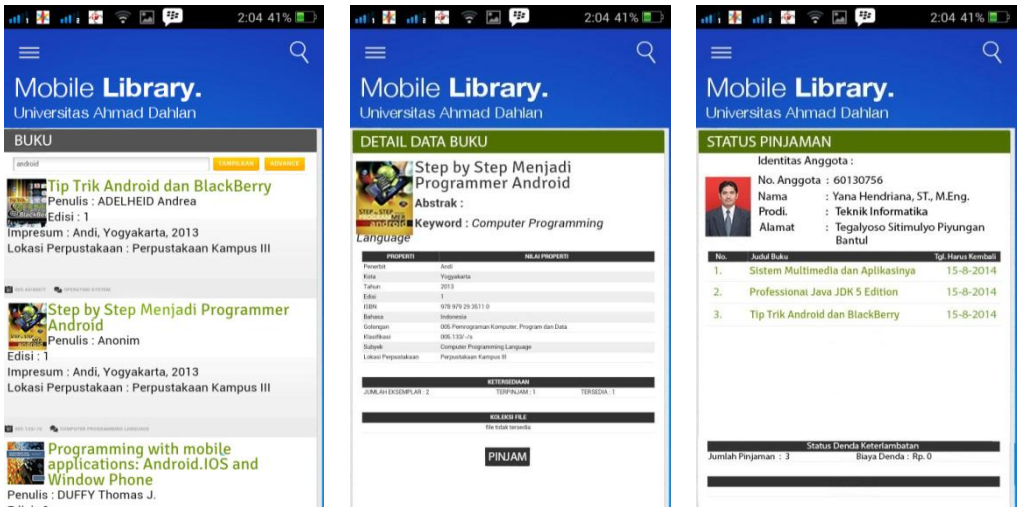
(a) (b) (c)

Fig. 5 Basic Features (a) Splashscreen Page (b) Main Page (c) Login Page

Fig. 5 shows the basic features in this application, splashscreen is the first page that appears when the application is run the Mobile Library. This page is a splash page when the application runs. Splashscreen page consists of View UAD Logo, and 2 pieces TextView. Splashscreen page shown in Figure 5(a).The main page is the page after page splashscreen. On the main page there are 7 menu options that can be selected by the user, namely: Books, Magazines, CDs, TA / Thesis, Journal, Proceedings. Main Page is shown in Figure 5(b).In Mobile Libray Applications contains loginmenu and register as an initial menu. On the Login menu the user can enter into the system. Login page is shown in Figure 5(c).



(d) (e) (f)

Fig. 6Main ServiceFeatures (d) Searching Page (e) Detail of Book Information Page (f) Borrowing Status Page

Fig. 6 shows the Main Service Features which containssearching page that appears when the user selects or click the image collection (ImageButton) search option based on the title of a book, CD, thesis, journal or proceedings and the search for a book on the Mobile Libary application. Searching Page is shown in Figure 6(d).The next display is the

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Detail of Book Information. Once the user selects a book on the list of books list the user will be able to see the book detail data. In the data view book details the user can view detailed information and status of the books are available or being borrowed books. Then the user can borrow on the book with the icon "PINJAM" when the status of the book is available. Detail of Book Information Page is shown in Figure 6(e).Borrowing Status page is a collection of libraries containing detailed information that is being borrowed by users / members of the library and also information should date back. Borrowing Status page is shown in Figure 6(f).

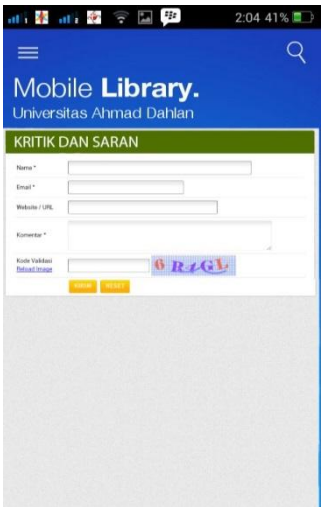

Fig. 7 Criticism and Suggestions Page

In Fig. 7 shows the additional pagethat as Criticism and Suggestions Page, Criticism and Suggestions page is containing Form fields to include criticisms and suggestions and request books or other collections, This feature is also to facilitate the members to provide a critique of the strengths and weaknesses of library services

IV. CONCLUSION

Based on the experimental results it is concluded that :

1. Through *android smartphone*, Member libraries can search for the information that available in Library of Universitas Ahmad Dahlan.
2. This Application can used as a facility for member libraries to borrow books online.
3. This applicationcan also help monitor the status of the borrowing with the deadline date to be return, so it will be minimized as a result of delays in returning books forgot the date of return of the book

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BIOGRAPHY

Name : Yana Hendriana
Affiliation : Lecturer in Department of Informatics, Faculty of Industrial Technology,
Universitas Ahmad Dahlan Yogyakarta, Indonesia
[1] Specialization / Interest Area : Software Engineering, HCI, Multimedia, Networking