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DEVELOPMENT OF ANDROID-BASED IN-APPS APPLICATION USING WATERFALL SDLC METHOD

Linggar Maretva Cendani*[1]
Johanadi Santoso[2]
Hanif Ramadhani[3]
Bimanto Bayu Bintoro[4]
Ganis Grahandika[5]
Siti Khabibah, M.Sc[6]
*[1,2,3] Informatic Department, Diponegoro University, Semarang, Indonesia
[4,5,6] Mathematics Department, Diponegoro University, Semarang, Indonesia

ABSTRACT
The many needs and jobs of the community, especially students, must be completed. As well as many who want their work to be resolved quickly and instantly. Therefore, in the company we make applications in the application as a solution for those interests, the application provides services ranging from rental of event equipment, message design, the printing of all needs, and installing the software. The development of this system is done by the Waterfall SDLC method using the JAVA programming language. Through this application, it is expected to be useful for many parties. For the community, the benefits are obtained and the practicality in completing a job. For partners who work together, can help us and increase partner income. For students or the general public, get a place to channel creative work through design services.

Keywords:
In Apps, SDLC, Waterfall

INTRODUCTION

The diversity of student needs is always the prey of entrepreneurs in creating business opportunities. So that students become one of the best markets for creating a business with a sustainable income. Based on our survey in Semarang, some of the most needed service needs of students are design, rental and printing services (for small and large event organizers). Then the os laptop installation services (for final year students and gaming students), and among these service businesses are still separate and scattered in various shop houses in Semarang. However, most students in Semarang tend to be less consumptive and more passive in seeking needs. Semarang students tend to choose social awareness trends in life, in the sense of "higher laziness" and have been proven to have harmed many shop shoppers around Semarang. A service in Semarang will be in demand and generate sustainable income if it is always needed by following the times. The current era should be an era of instantaneous, including ordering a service that is fast and on target. Because as long as feeling lazy always stays in the student, then it is a source of money for us, perpetrators of application-based services. Besides that, digital start-up business has skyrocketed in the current era. So from that from the background above we (In-Corporation) have innovations to create In-Apps applications. In-Apps will deliver complete services ranging from event rental equipment, message design, the printing of all needs, and Install OS and applications that are collected in one smartphone application base.

METHODOLOGY

The method used in making this application is the System Development Life Cycle (SDLC) method. Penggunaan SDLC akan lebih optimal jika dilengkapi dengan berbagai teknik pengembangan system[5]. according to [2] Software development life cycle or SDLC is a methodology for designing, building, and maintaining information and industrial systems. There are many SDLC models, the SDLC model that we use is Waterfall. The Waterfall Model is the oldest and the most well-known SDLC model, This model is widely used in government projects and in many major companies. The special feature of this model is its sequential steps, It goes downward through the phases of requirements analysis, design, coding, testing, and maintenance[2]. The Waterfall defines several consecutive models phases that must be completed one after the other and moving phase is the next phase only when the phase is completely done. For this reason, the Waterfall model is recursive in each

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phase can be endlessly repeated until it is perfected [3].

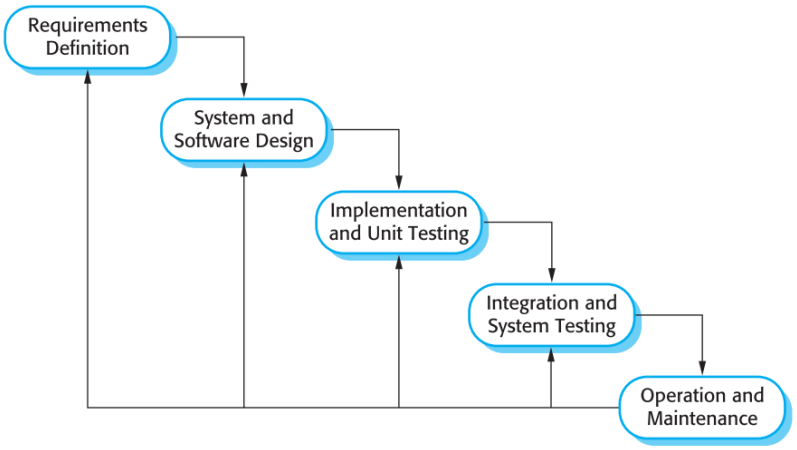

Fig. 1: Model Waterfall [1]

According to [1] The principal stages of the waterfall model directly reflect the fundamental devel-opment activities:

1. Requirements analysis and definition The system's services, constraints, andgoals are established by consultation with system users. They are then definedin detail and serve as a system specification.
2. System and software design The systems design process allocates the require-ments to either hardware or software systems by establishing an overall systemarchitecture. Software design involves identifying and describing the fundamen-tal software system abstractions and their relationships.
3. Implementation and unit testing During this stage, the software design is real-ized as a set of programs or program units. Unit testing involves verifying thateach unit meets its specification.
4. Integration and system testing The individual program units or programsare integrated and tested as a complete system to ensure that the softwarerequirements have been met. After testing, the software system is delivered tothe customer.
5. Operation and maintenance Normally (although not necessarily), this is thelongest life cycle phase. The system is installed and put into practical use.Maintenance involves correcting errors which were not discovered in earlierstages of the life cycle, improving the implementation of system units andenhancing the system's services as new requirements are discovered.

RESULTS AND DISCUSSION

1. Requirements definition

These in-apps are mobile software that function to order In-Corporation services (Design-In Services, Rental-In Services, Cetak-In Services, and Install-In Services). Users can order and cancel orders. The other features of this application include:

a. Design-in
In this feature, the user can order the design, write down the desired design description. Users can choose the design price package.

b. Rental-In
In this feature, users can order items that they want to borrow. The user can choose the loan package, determine loan dates and return dates.

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c. Cetak-in
In this feature, users can upload the file they want to print, determine the number of items to be printed

d. Install-In
In this feature, the user can order the software that wants to install or choose the installation package that is available.

e. The cart
In this feature the user can view all items that have been added to the cart, see the total price to be paid, and the cart can delete items from the cart.

f. Order
In this feature, the user can see orders that have been ordered, processed, and orders that have been completed.

2. System and software design

2.1. Model Use Case

Use case diagram works to show the relationship between actors and use cases. Figure 1 shows the use case diagram of the system to be built.

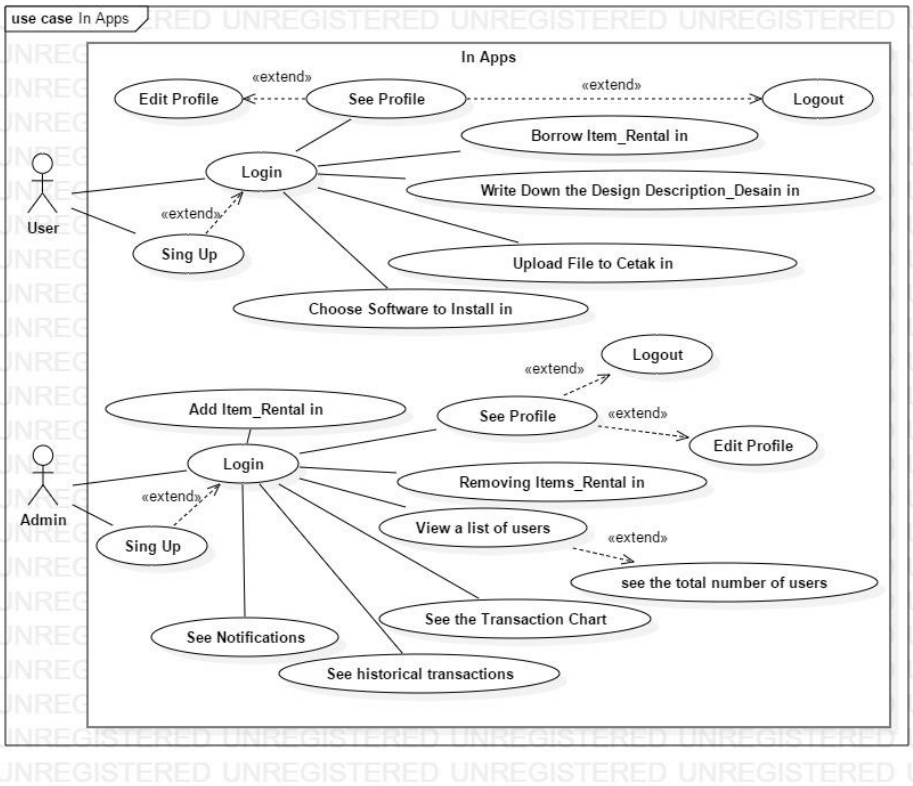

Fig. 2: Use Case Diagram In Apps

Explanation of each use case is explained by the use case detail. Table 1 shows one example of a use case detail.

Tabel 1: Use Case Details of Borrowing Item

Use Case Borrowing Item

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Actors : User
Preconditions : The user opens the In Apps on his cellphone
Flow of Events : 1. Users choose the Rental-In menu 2. The user selects the item to be borrowed. 3. The user fills in the number of items, hours and date of the loan, hour and date of return, the organization represented (if any). 4. Users choose to Add to cart.
Postconditions : Successful handling of goods, the system displays the total price that must be paid.

2.2. Non-functional Needs

Non-functional requirements determine the overall attributes or quality of a system. Non-functional requirements for In Apps development are shown in Table 2.

Tabel 2: Non-Fungsional Needs

No	Parameter	Requirement
1.	Availability	The system is available in 24 hours
2.	Usability	The interface is simple and easy to understand
3.	Reliability	Never fails.
4.	Performance	Has a response time of fewer than 9 seconds.
5.	Security	Data is only changed by the system administrator.

3. Implementasi

Implementation: It refers to the realization of business requirements and design specifications into a concrete executable program, database, website, or software component through programming and deployment. This phase is where the real code is written and compiled into an operational application, and where the database and text files are created. In other words, it is the process of converting the whole requirements and blueprints into a production environment [3]. This implementation is done using hardware and software. The following is a list of hardware specifications and software used for users, namely:

a. Android smartphones with operating system version 8.1 (Oreo).
b. Internet connection.

While the list of hardware and software specifications used are:

a. CPU : Intel Core i5-3337U Processor 1.80 GHz
b. Memory 8 GB
c. Sistem operasi : Microsoft Windows 8.1 Pro
d. Android Studio
e. Android Development Tools (ADT)
f. Android Software Development Kit (SDK)
g. PhpMyAdmin 4.8.5
h. Notepad++
i. JAVA

The interface implementation is shown in Figure 3 to Figure 7.

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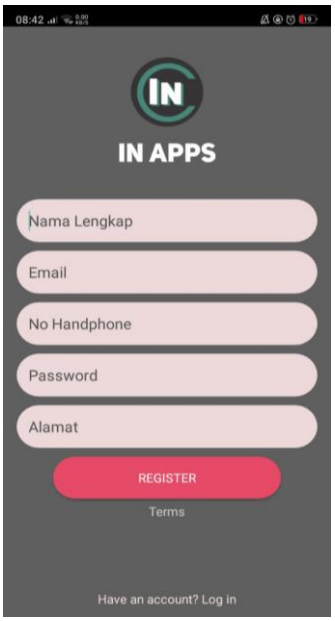

Fig. 3: Display of Register Page

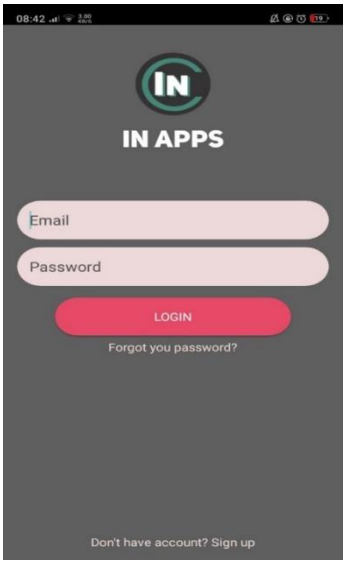

Fig. 4: Display of Login Page

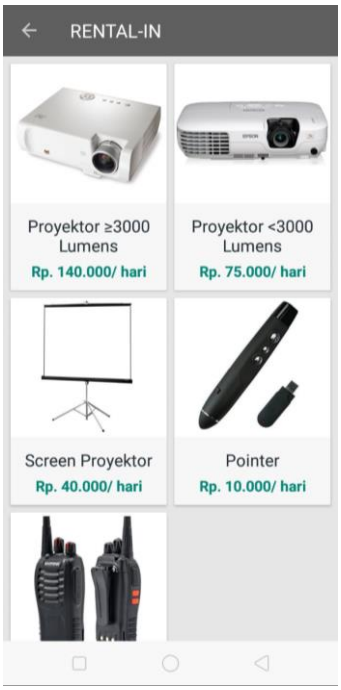

Fig. 5: Display of Rental-in Page

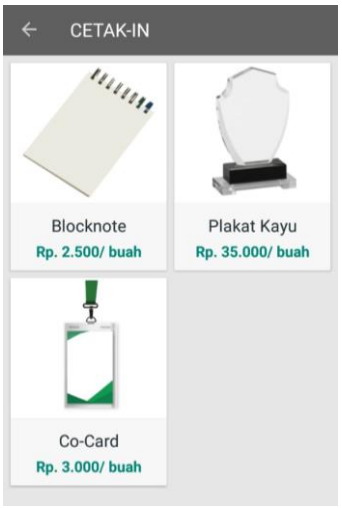

Fig. 6: Display of Cetak-in Page

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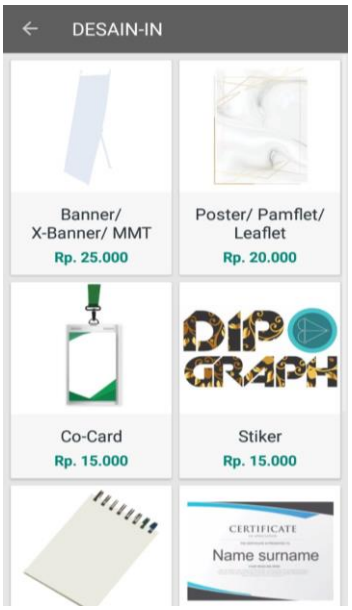

Fig. 7: Display of Desain-in Page

4. Testing

4.1. Black Box Testing

Black box testing is a test carried out only in the form of observations of the results of execution through data testing and functional examination of software [4]. So black box testing only tests the display of output from applications and application functionality, without having to know the source code in detail in getting the results. This test is said to be successful if the existing features are in accordance with the requirements specifications previously made. From the test results, it can be seen that this Application has met for:

a. Login
b. Sing Up
c. Borrowing goods (Ordering rental services)
d. Write down the design description (Ordering design services)
e. Uploading files that will be printed (Order printing services)
f. Choose software to install (Order install services)
g. See profile.
h. Edit profile
i. Logout

Table 3: Testing the login and register pages

Input data	Hope	Observation	Results
Login button	Enter account and display the main page	Successfully entered the account and the home page appears	Appear
Sign up button	Display the register page	The register page appears	Appear

Table 3: Testing Button Navigation

Input data	Hope	Observation	Results
Home button	Display the home page	The home page appears	Appear

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Order button	Display the order page	The order page appears	Appear
Cart button	Display the cart page	The cart page appears	Appear
Chat button	Display the chat page	The chat page appears	Appear
Profile button	Display profile page	A profile page appears	Appear

Table 4: Testing the home page

Input data	Hope	Observation	Results
Rental-in icon button	Display the Rental-in page	The Rental-in page appears	Appear
Desain-in icon button	Displays the Desain-in pagen	The Desain -in page appears	Appear
Cetak-in icon button	Display the Cetak-in page	The Cetak -in page appears	Appear
Install-in icon button	Display the Install-in page	The Install -in page appears	Appear

CONCLUSION

The conclusion that can be drawn is that an Android-based In Apps mobile application is developed using the SDLLC Waterfall method. The application of the Waterfall method will produce a good quality system and an organized system development process. The In Apps application has features to select and order the design, rental, print and install services. display all ordered items, display estimated price information, make payments. This application can be run with minimum specifications of Android 4.4 (KitKat).

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