Application Design for Food and Beverage Online Delivery System Based of Android Framework

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Abstract— **Providing good services and satisfaction to customer is main concern on online business. As technology is developed rapidly, many online restaurants has sought user-friendly platform to serve their customer. The purpose of this research is to build an Android-based online order application for online delivery restaurant. We added features of outlets distribution and product promos. We also developed a more user-friendly interface as new design. Through Waterfall development method, we design the application which based of android APP Inventor framework. Based on the assessment result of four aspect (e.g., software engineering defect, learning design, visual communication), we got average scores of 2.45, 3.40, 3.35 and 3.07. The assessment results showed that our application design is eligible to be implemented for real situation with fairly eligible score. It is recommended that the application is implemented with partial improvement especially on the software engineering debugging to get a more decent score.**

Keywords: Android, APP Inventor, Pizza Delivery

I. INTRODUCTION

Rapid technological developments in various fields including telecommunications, allow humans to communicate with each other anytime and anywhere, even if separated at great distances [1]. In globalization era, there are several transmission media used in the field of telecommunications, namely by using cables, as well as wireless (wireless) [2]. One of them is a cellphone which is a telecommunications device that is very widely used by people to communicate long distances [3]. In food and beverage ordering restaurant, many outlets have to manage their ordering distribution to achieve sales target and provide user-friendly service by delivering the food and drinks directly to buyers. The products offered by online ordering restaurant sometimes missing the feature of user-friendly especially for the food and drinks that can be purchased directly from the outlets through online order [4]. In addition, much confusion is still occurred when the customer must order the take away and sent to their home (delivery) [5].

In terms of ordering, when customers take away their order, there is sometimes, occurred long queues, jostling, traffic jams, less price updates and unneeded promos along with a lack of information on a product composition. Along with the development of these technologies, there is a need in providing application with adequate information on the availability of food and beverage menus in fulfilling customer's needs. In addition, the speed in serving food information is one of the elements of service level that the application must provide.

By utilizing the Android-based framework, this paper tries to build an application to help customers make orders easily, on time and accurately. Observations were made at the Online Delivery Outlet in Ciputat.

Application software according to Porter et al.,[4] is a subclass of computer software that utilizes the ability of the computer directly to perform a task that the user or user wants. Usually system software can integrate various computer capabilities, but does not directly apply these capabilities to do a task that benefits the user. The main examples of application software are word processors, worksheets, and media players and so on [6].

Some applications that are combined together into a package are sometimes referred to as a package or application suite (application suite). Examples are Microsoft Office and OpenOffice.org, which combine a word processing application, worksheet, and several other applications. Applications in a package usually have a user interface that has similarities, making it easier for users to learn and use each application [7]. Often, these applications have the ability to interact with each other so that it benefits the user. For example, a worksheet can be embedded in a word processing

document even if it is made on a separate worksheet application.

Understanding the application according to Senyurt & Calıskan [8] is a program that people use to do things on a computer system. Mobile can be interpreted as an easy transfer from one place to another, for example a mobile telephone means that a telephone terminal can move easily from one place to another without the termination or interruption of communication [2]. A mobile application system is an application that can be used even if the user moves easily from one place to another without the termination or communication interruption [5]. This application can be accessed via wireless devices such as pagers, such as cellular phones and PDAs. The characteristics of mobile devices are:

A. *Small size: Mobile devices have a small size. Consumers want the smallest device for their comfort and mobility.*

B. *Limited memory: Mobile devices also have small memory, namely primary (RAM) and secondary (disk).*

C. *Limited processing power: Mobile systems are not as strong as their desktop counterparts.*

D. *Low power consumption: Mobile devices consume less power than desktop machines*

E. *Strong and reliable: Because mobile devices are always carried anywhere, they must be strong enough to deal with collisions, movements, and occasional drops of water.*

F. *Limited connectivity: Mobile devices have low bandwidth; some of them aren't even connected.*

G. *Short life span: These consumer devices are lit up in seconds, most of them are always on.*

Discussion of Android and the tools used in making the application will be explained in the following sections:

1) Definition of Android. According to Armando et al., [9]. Android is an operating system on mobile phones that is open and based on the Linux operating system. Android can be used by anyone who wants to use it on their device [10]. Android provides an open platform for developers to create their own applications that will be used for various mobile devices [3].

Initially, Google Inc. buys Android Inc., a newcomer who makes software for cellphones. Then to develop Android, the Open Handset Alliance was formed, a consortium of 34 hardware, software and telecommunications companies, including Google,

HTC, Intel, Motorola, Qualcomm, T-Mobile, and Nvidia.

At the time of the inaugural release of Android, November 5, 2007, Android together with the Open Handset Alliance said it supported the development of open standards on mobile devices. On the other hand, Google releases Android codes under the Apache license, a software license and open standards for mobile devices.

2) History and Development of Android. At first there were various kinds of operating systems on mobile devices, (Programming of Android 2012: 79 smartphone and tablet PC mobile applications), e.g., Symbian operating system, Microsoft Windows Mobile, Mobile Linux, and iPhone. However, among the operating systems those have not supported the standards and publishing APIs that can be utilized as a whole and at a low cost. Then Google is involved in it with the Android platform, which promises openness, affordability, open source and quality frameworks.

In 2005, Google acquired the Android Inc. Company. To start the development of the Android platform, the programmers are Andy Rubin, Rich Miner, Nick Sears, and Chris White. In mid-2007 a group of industry leaders jointly formed an analysis of an open cellular alliance, the Open Handset Alliance (OHA). Part of the goal of this alliance is to innovate quickly and respond better to consumer needs, with the initial product being the Android platform. Where Android is designed to serve the needs of telecom operators, handset manufacturing, and application development, OHA is committed to making Android open source with the Apache Version 2.0 license.

II. METHOD

Research and development are research methods used to produce certain products, and test the effectiveness of these products [11]. Research and development was chosen because the researchers aimed to produce a new product in the design Application design of online delivery based on android using APP Inventor, therefore the researchers also wanted to test the feasibility of the products that have been produced.

A. System Analysis

The system to be built is a mobile application that can run on the Android operating system. This application aims to create a design for application design of online delivery based on android. System analysis that can be applied to identify this application is the analysis of functional requirements analysis, and non-functional needs analysis [12].

Functional Requirements Analysis:

1) Analysis of the functional requirements of the system to be developed are as follows:

2) The application provides features on how to order clothes online which are expected to make it easier for consumers to shop online.

3) Displays information about procedures for ordering online delivery to help consumers online shopping.

4) Provides information about applications and application usage guidelines.

B. Analysis of Non-Functional Requirements

Non-functional requirements that support the creation of this application system include:

1) *The system can provide several choices.*

2) *The system is equipped with images that make it easier for consumers to find their needs.*

C. System Composition

System design is carried out with the aim to provide an overview of how business processes are contained in the system and the display interface of the system to be built [6].

D. Process Design

The design process describes the process that will be built on the system that will be created. The modeling used for designing this system is the Unified Modeling Language (UML). Some of the diagrams used include:

1) *Use Case Diagram.* The use case is a description of the scenario of interactions between users and the system. A use case diagram describes the relationship between the actor and the activities he can do with the application. Use case diagram in application design based on android can be seen in Figure 1 below.

2) *Proposed System Design.* To analyze the system that was created and which was intended to be proposed in this study, the Visual Paradigm 6.4 Enterprise Edition program was used to describe Use case Diagrams and Activity Diagrams.

In Figure 1, it contains Use Case Diagram for the Smartphone Application online order consisting of 3 (three) actors, including: customer, admin, and shop head. As well as having 4 (four) behaviors or habits including:

1) One system which is the design of the proposed system process at the customer.

2) One actor, the customer who can carry out activities, namely the process of looking at the main page, then ordering for delivery or taking the place.

3) One actor, namely the admin in charge of receiving customer order results.

4) One actor, namely the head of the shop in charge of receiving reports on the results of sales and delivery.
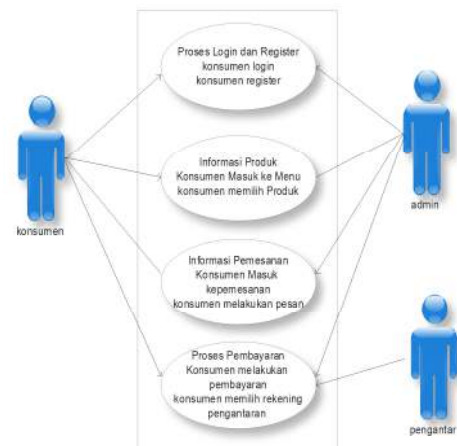
Figure 1. Use case process of the online delivery

III. RESULTS AND DISCUSSION

Activity Diagram is illustrated in the figure below. We divide the Application tasks into four activities (Figure 2).
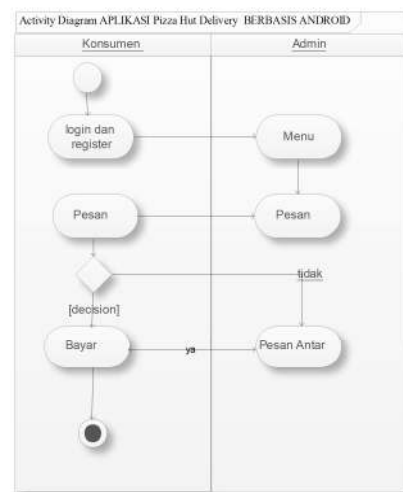
Figure 2. Activity diagram

In Figure 2, it is illustrated the activity diagram of android-based application. Activity system diagram for product ordering procedures performed by customers as below.

A. One initial node as the starting object.

B. Six activity as a state of the system that reflects the execution of an action including:

1) Customers see the product menu that is connected to the admin.

2) Customers order products that are connected to the admin.

3) Customers choose messages on the spot.

4) Customers choose messages between.

5) Admin receives orders from customers.

6) Customers make payments after the order has been received.

7) Initial final node which is the final activity of the activity.

C. Implementation

The results of the system information interface implementation can be seen as in the following in Figure 3 to Figure 7.
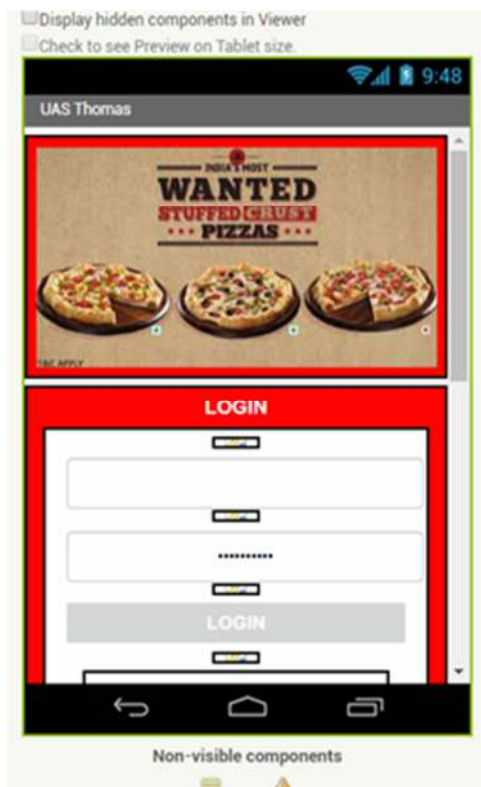
Figure 3. Login display. In this Login menu, the user enters the main menu. If the customer does not have an account then they must register in the next menu.

Figure 4. Registration display. In this form, the customer registers by filling in the full name, cellphone number, user name, and password.

Figure 5. Menu display

Figure 6. Order display

Figure 7. Payment display

In Figure 3-4 this product menu displays order details in the form of order names, types of pizzas, types of drinks, prices, addresses and shipping costs, after that if the customer has done it then the customer touches the message, then the order is successful for ordering.

D. Application Design Interface (App Inventor)

We develop four blocks of code which arranged with App Inventor tool. The illustration of the blocks of code is given in Figure 8 to Figure 11.

Figure 8. Block login

Figure 9. Block menu

Figure 10. Block order

Figure 11. Block payment

E. Implementation Phase

The implementation phase of this product was tested in 2 classes, each class containing 22 students, but at the time of implementation there were students who were not present because they were participating in activities outside the university. At this stage the product was tested twice, first for Android-based applications and the second for Desktop-based applications on the same research subject. The trial of Android-based products will be carried out with an Android Smartphone owned by each student, while Desktop-based products will use computers in the Computer Lab owned by the university. Before the media is used, students are asked to install the media on their accounting lab and smartphone computers. The spread of media on the computer is done by copying the software on the server computer which will automatically appear on the client computer.

The full results of student assessment can be seen in the Appendix. The following are the results of student assessment of aspects of software engineering, design aspects, aspects of Visual Communication (Table 1).

TABLE I
STUDENT ASSESSMENT RESULTS IN THE INFORMATICS ENGINEERING DEPARTMENT STMIK SWADARMA

No	Assessment Aspect	Total score	Average Score	Category
1	Software Engineering debugging	85.75	2.45	Fairly Eligible
2	Learning Design	119	3.40	Eligible
3	Visual Communication	117.25	3.35	Eligible
4	Total	322	3.07	Eligible

Based on Table 1 regarding the survey results of the assessment of the customer from college engineering students at STMIK Swadarma obtained an average score of 3.07 which entered into the range X>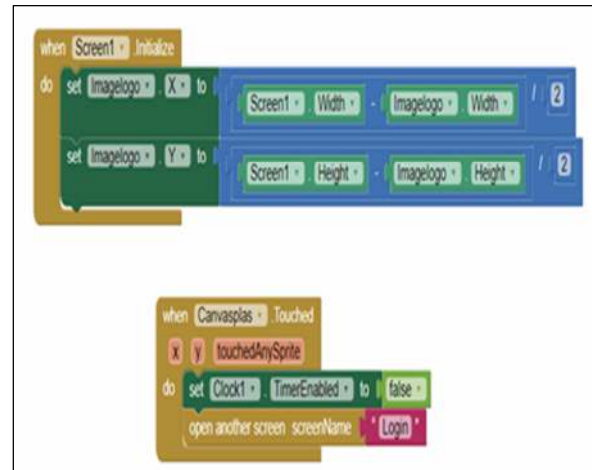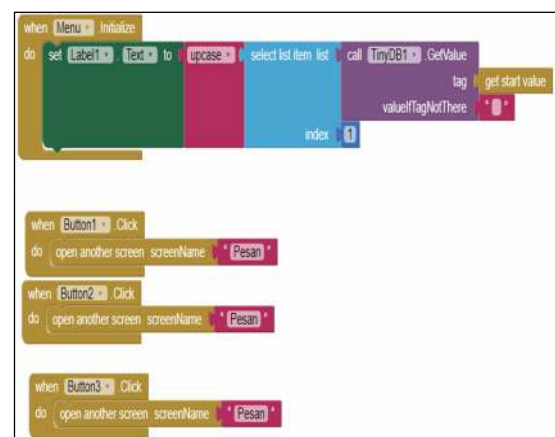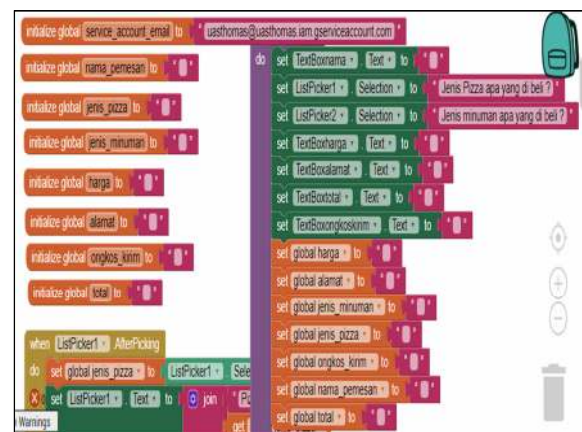 2.8 with a decent category. The survey result provides the level of feasibility of the Online Delivery application is in the category of Eligible to descent scores.

IV. CONCLUSION

The system that runs on android based online delivery application has not been able to provide accurate and efficient data, because the system implemented is still by telephone and comes directly to find out the latest product menu information, besides the sales run by android-based applications still need to be improved with other features such as locational maps and route tracing orders in real time to improve customer comfort. Such feature will beneficial and improve the order process. From the survey result, we get eligible to descent score which means that the feasibility of the application is adequate to be implemented in real setting.

Further development of this application can be added other features such as, route ordering maps, tracking delivery and order time. In addition, this application still uses the tinyDb data base so that further development needs to be created with a more secure MySQL database.

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