
DESIGNING A COUNTERFEIT-PRODUCT-CHECK APPLICATION USING ANDROID BASED BARCODE SCANNER IN COSMETICS PRODUCTS

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Abstract

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In this day and age, all information can be searched and obtained from technological developments. The more users of technology such as smartphones/androids among the wider community, the more information that can be obtained. Currently, there are many cases of violations of cosmetic circulation in Indonesia. Such as the circulation of products without a registration code from the BPOM (Food and Drug Supervisory Agency) which is faked by irresponsible parties. Of the many cases of cosmetic violations, along with changes in people's lifestyles such as changes in consumption patterns (users). At this time, public knowledge is still minimal about choosing and using safe cosmetic products. The application of cosmetic safety check applications is an option for consumers because with this application they can check for themselves whether the products to be used are genuine or fake. The method used in this study is to use qualitative methods and the waterfall method. This application is expected to help the public before buying a cosmetic product, simply by checking the barcode and scanning using a smartphone/android, consumers can quickly find out whether a cosmetic product is genuine or not before using it..

Keywords: *Barcode, QR Code, Android*

1. Introduction

The development of technology is currently growing rapidly, especially smartphones/android. a smartphone is a cellular phone that is easy to carry and use anytime and anywhere, which has more capabilities, ranging from resolution, features, to computing including the mobile operating system in it. The presence of this smartphone is indeed able to provide various benefits and conveniences for its users, and almost all over the world, humans can use smartphones. Such as the development of QR Code generator applications and QR Code Readers from data in the form of images (M. Pasca Nugraha, 2011)

Even now smartphones/androids have become a necessity for every human being, with the current smartphone, of course, we can very easily communicate with other people, and thanks to the internet today we can find or get information quickly and precisely.

Currently, the use of cosmetics is getting higher and has a very important role in everyday life for most women. Because the presence of cosmetics can beautify and beautify the face so that women are much more confident, therefore cosmetics have become a primary need for some women. Cosmetics are not only for applying make-up but cosmetics can also be used for body care or commonly called body care.

Cosmetics are also widely used by many groups such as adults and children, therefore we must pay attention to cosmetic products that are safe to use or which are not safe to use. Covert Communication via the Qr Code Image by a Data Hiding Technique Based on Module Shape Adjustments (M. Pasca Nugraha., & Dr. Ir. Rinaldi Munir M. T. 2011)

Nowadays, many consumers or cosmetic users lack knowledge about the authenticity of a cosmetic product they use in detail. In general, we can see from the packaging of the cosmetic product, if the packaging of the cosmetic product is damaged, it is better not to use the cosmetic. However, the packaging does not guarantee that the product is genuine or fake, because nowadays many original packaging can be easily imitated by fake distributors so that fake cosmetic products are very similar to the original cosmetic products. Therefore, it is necessary for us as consumers to be more careful in choosing the cosmetic products to be used. Before buying cosmetics, it's a good idea to check the safety of the cosmetic product first. And often cosmetic users do not want to check the products they use manually, because they are too complicated and take a long time. The product checking application with Barcode is a solution that utilizes mobile information technology that can handle problems during the product checking process so that the product checking process can be carried out quickly and accurately[1]. The system on the smartphone will act as input and analyze the accuracy of barcode recognition for each cosmetic product[2].

With advances in the field of technology today, so that can make it easier to do work, especially in the advancement of the information field. Technological advances are expected to be able to solve problems in various fields. Based on the above, the writer is interested in researching with the title "Cosmetic Application Design Using Android-Based Barcode Scanner".

2. Research Method

In this study, researchers used the waterfall method which is a software development model that is carried out sequentially and very systematically. The framework can be seen in Figure 1 below.

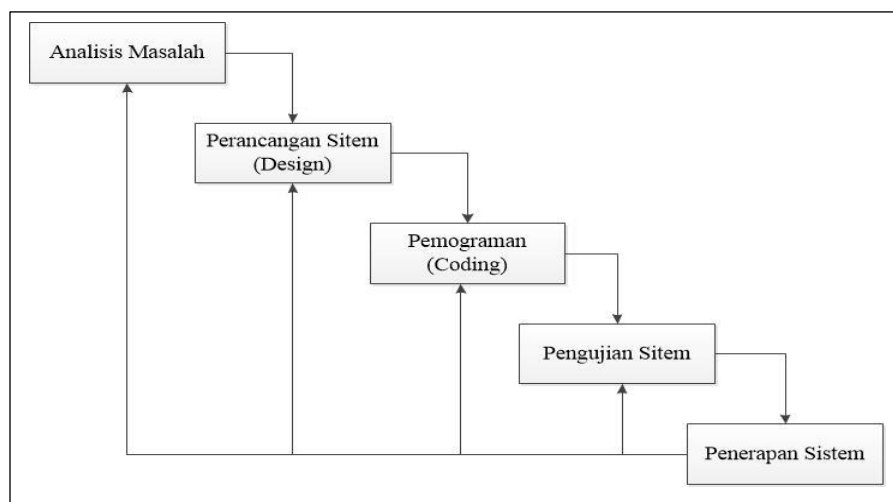


Figure 1. Illustration of the Waterfall Model

2.1 Unified Modelling Language (UML)

Unified Modeling Language is a visual language for modeling and communicating about a system using diagrams and supporting tests. UML emerged because of the need for visual modeling to detail, describe, construct, and document software systems. UML only serves to do modeling, so the use of UML is not limited to a particular methodology, although UML is most widely used in object-oriented methodologies.

3. System Analisis and Design

3.1. Barcode Scanner

Barcodes have a long history and their development was driven by the fundamental need to speed up the purchasing process and inventory tracking. Barcodes as seen in Figure 2, are a collection of black and white lines of different widths to store special data such as production code, expiration date, identification number, etc. So that the computer system can easily identify the information encoded in the barcode. Barcode has several types of barcodes, namely 1D linear barcode (1 dimension) which is a collection of lines with different thicknesses and is rectangular. And the type of 2D (2-dimensional) matrix barcode is that the data is represented by symbols in the form of squares, dots, hexagons, and other geometric shapes. After the barcode is scanned with a barcode scanner, the code is automatically connected to the product data that has been stored in the database [3].



Figure 2. Barcode

Based on its use, there are 5 categories of barcode uses, namely:

1. Barcodes for retail purposes, usually used for products sold in supermarkets.
2. Barcode for packaging, usually used for shipping goods.
3. Barcode for publishing purposes, often used in publishing a product, for example, a barcode indicating the ISSN of a book.
4. Barcodes for pharmaceutical purposes are usually used to identify a drug product.
5. Barcodes for non-retail purposes, for example, barcodes for labeling books in the library.

The advantages of using barcodes are:

1. The data input process is faster because the barcode scanner can read / record data faster than manually inputting data.
2. The data input process is more precise because barcode technology has high accuracy in data retrieval.
3. The search for data information is more accurate because barcode technology has very high accuracy and precision.
4. Save costs, because it can avoid losses from data recording errors and reduce repetitive manual work.
5. Improved management performance, because with faster, precise, and accurate data, management's decision-making will be much better and more precise, which will be very influential in determining company policies.
6. Having a higher bargaining value and the ability to compete with rivals will be better maintained.

3.2 QR Code (Quick Response Code)

QR Code is a type of barcode in the form of 2 dimensions that can store information horizontally and vertically and can store alphanumeric text, symbols, numbers, and control codes [4]. To open this QR Code, you also need a scan or scanning tool using a smartphone.



Figure 3. QR Code

3.3 Java

Java is a pure object-oriented programming (OOP) language. With this concept, programming in terms of designing, creating, developing, and determining errors in a program based on Java, can be done easily, quickly, and precisely.

3.4 Android

Android is an open-source operating system based on Linux with an open platform for developers to create new applications. Android provides an open platform for developers to create their applications for use by various mobile devices [4]. At first, this operating system was developed by a company called Android, Inc. This is where the name Android came from. Android provides an open platform for developers to create their applications [5].

3.5 Analysis

The analysis aims to gain a more detailed understanding of a matter. This understanding can later be explained to the public. So that the public gets useful information from the analysis. The analysis is the most important stage because errors in this stage will lead to errors in the next stage. The application created is a program to display information about cosmetics used by consumers whether they are suitable for use or not. The application made is an android-based program, which is to make it easier for people to know the details of the cosmetics they use [6]. The application is carried out using a systematic approach, starting from the system requirements stage and then moving on to the analysis, design, coding, testing/verification, and system maintenance stages. The steps that are passed must be completed one by one (cannot jump to the next stage) and run sequentially, therefore it is called a waterfall.

3.6 Problem Analysis

Currently, checking a genuine/fake product, especially cosmetics, is only through the website, making the public lack understanding about the authenticity of a cosmetic product. To make it easier for the public or especially cosmetic users in obtaining information on the authenticity of a cosmetic product used, an Android-based barcode scanner is applied, so that users can easily/practically obtain information on the authenticity or not of a cosmetic they have [7].

3.7 Analysis Method

To find out a method that will be used in the research process, it is necessary to first analyze the method that will be used to support conformity in terms of implementation of the existing problems. In this case, the author tries to analyze the waterfall method that the author uses as a method for barcode detection [8].

3.8 How the Method Works

The initial process starts from the stage of displaying the serial number, barcode, and QR Code interface. At this stage, the user is asked to choose to input the serial number, barcode, or QR Code. After the user chooses to input the serial number, barcode, and QR Code. The next stage is the display of the barcode / QR Code frame, at this stage, the barcode / QR Code frame undergoes a scanning process to produce product information. This stage aims for barcodes and QR Codes to display detailed product descriptions.

3.9 Application of the Method

This study examines the use of the Scan barcode method and the Scan QR Code method, both of these methods are Scanning methods on Android-based systems.

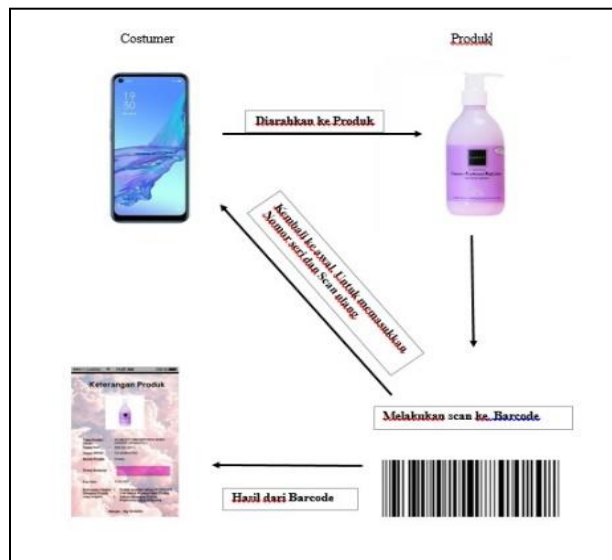


Figure 4. Application of Scan Barcode

The picture above is the result of a smartphone scan against a QR Code or Barcode containing design data that can produce detailed information about the product.

3.10 System Design

3.10.1 Use Case Diagrams

The preparation of a program required a data model in the form of a diagram that can explain the process flow of the system to be built. Then a Use Case diagram is drawn which can be seen in Figure 5.

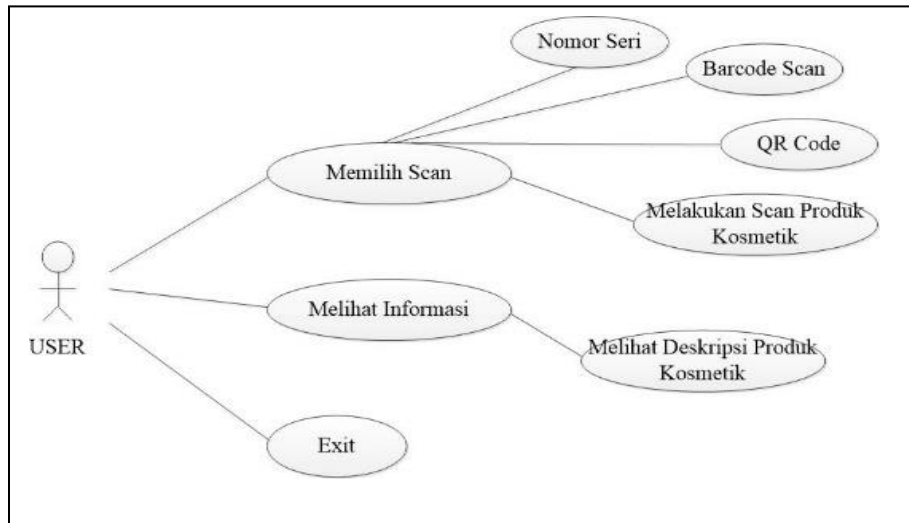


Figure 5. Use the Application Diagram

3.10.2 Activity Diagrams

Describes a series of the flow of activities, used to describe activities that are formed in an operation so that it can also be used for other activities such as use cases or interactions. Can be seen in Figure 6

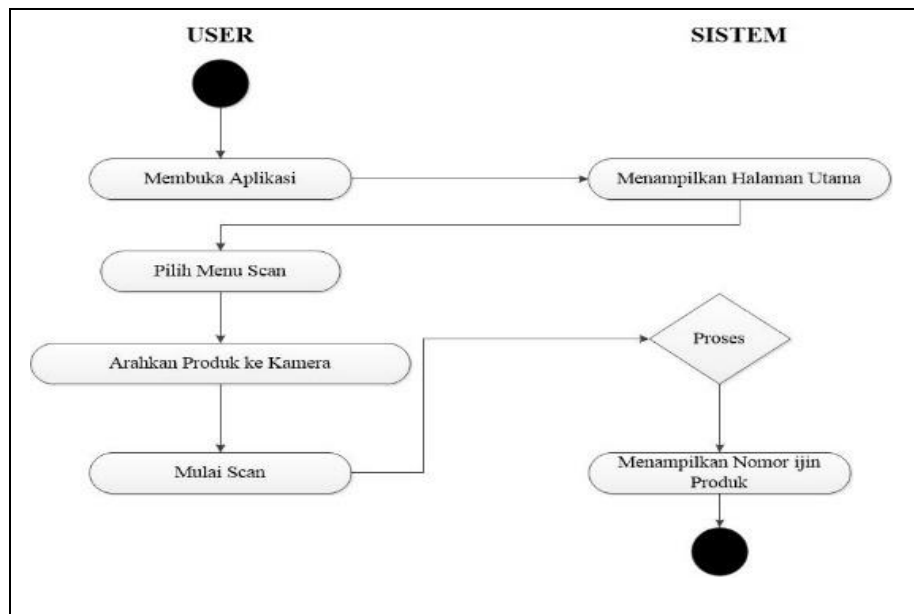


Figure 6. Activity Diagram Scanning Barcode / QR Code

SYSTEM DESIGN

The Draft Form is as follows:

1. Main Menu Form

The customer must first select the scan menu form on the main menu to continue scanning the product. Can be seen in Figure 7.

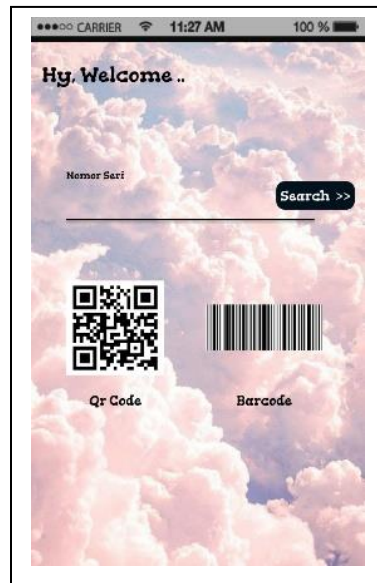


Figure 7. *Scan Menu Form*

2. Scan QR Code Form

If the customer chooses to scan the QR Code, it will appear as shown in Figure 8 below.

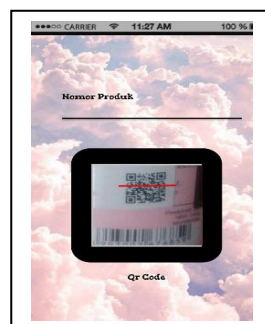


Figure 8. *QR Code Scan Form*

3. Barcode Scan Form

If the customer chooses to scan Barcode, Figure 9 will appear below.

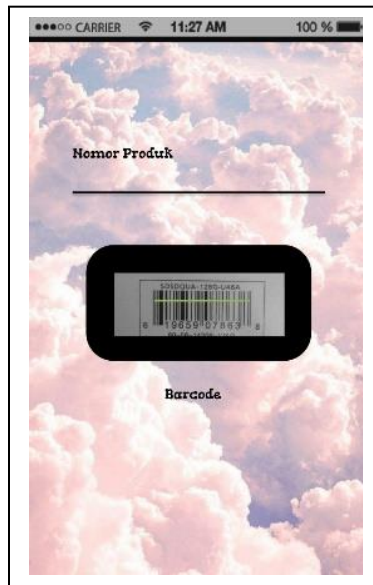


Figure 9. Scan Barcode Form

4. Description Form

After the user has scanned the product, then there are 2 possibilities that the scan results from the barcode / QR Code will appear, namely in the form of a description form / original or fake information from the cosmetic product or that, if it is originally a form will appear as shown on the left image containing Information on scanned cosmetic products, and fake ones will appear on the right-hand side of the image stating that the cosmetic product does not have a registered code.

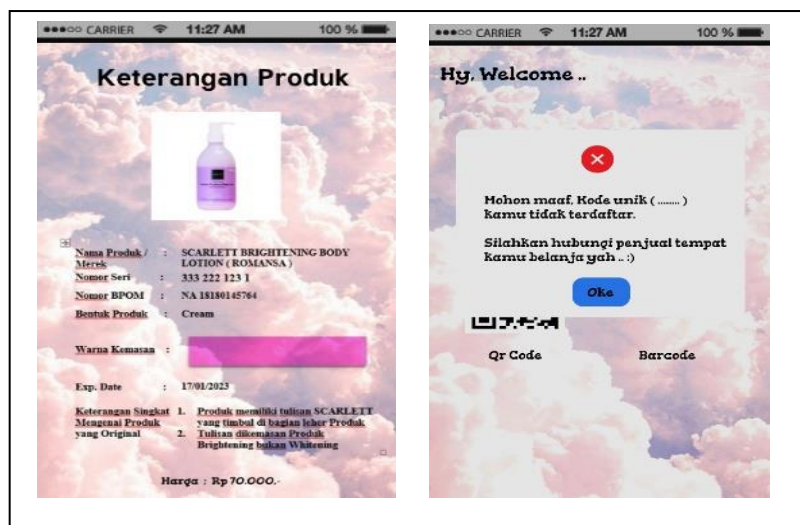


figure 10. Description Form

4. Conclusion

Based on the description and discussion and the results of system testing that have been carried out, it can be concluded that the design of cosmetic applications using an Android-based barcode scanner is an application that can be used by consumers or cosmetic users to make it easier to check the authenticity or obtain accurate and detailed information from a cosmetic product.

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