

DEVELOPMENT OF DIRTINESS LEVEL DETECTION APPLICATION AND TYPES OF TREATMENT RECOMMENDATION FOR SHOE LAUNDRY

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ABSTRACT

Shoes are one of the complementary tools to support one's appearance, as time goes by shoes become a very important aspect to be noticed, the development of the times makes the shoe industry compete in innovations in terms of design or color. Consumers are currently very concerned with the cleanliness of shoes, especially shoes that have a dominant white color. Shoes with bright colors are very susceptible to dirty, therefore it is necessary to have information about the level of dirtiness of the shoes, in addition to needing information to measure the level of dirtiness of the shoes, it is also necessary to clean the shoes to suit the level of dirtiness of the shoes. detect the level of dirtiness of shoes and treatment to clean shoes according to the level of dirtiness. This study aims to create an application that can provide information to the public in addition to presenting information on the level of dirtiness of the application is also equipped with displaying the nearest laundry place, the method used is observation and interview methods. Accuracy of success in providing information on the nearest level of dirtiness, treatment and laundry after using this stepklin application is 93%.

Kata kunci : Sepatu, Laundry, Kotor, rekomendasi

1. INTRODUCTION

Shoes today are not only used for everyday purposes, because most people now consider that shoes are an important icon in their lives. In fact, not a few people make shoes as part of their lifestyle and often determine their own prestige for their users. Now most people buy shoes with

a price range of up to millions of rupiah, of course this indicates that most people now consider that shoes are very important objects. Of course, with shoes that are expensive, users will not necessarily take care of the shoes carelessly. But, the problem is not everyone knows what treatment should be done so that the shoes are not damaged quickly. Usually people consider the way to wash shoes is the same as washing clothes, that is by just washing normally. In fact, caring for the shoes can not only be washed and then brushed with soap because the shoes are made of various types of materials that each material is certainly different treatment. If there is a laundry service for clothes that is a service that helps people to wash their clothes, but there are also many laundry shoes that have sprung up around us, but not a few people don't know it, because most people only know that laundry is only for clothes.

The problem that occurs is that people still lack understanding in determining the level of dirtiness in their shoes, because the level of dirtiness in the shoes varies. Different levels of dirtiness and different types of materials in the shoes are of course different as well as how to care. Therefore, the researchers hope that with the construction of this application it can certainly make it easier for shoe users to detect the level of dirtiness and after detecting the dirtiness the user will be immediately told how to properly care for the shoe so that it does not cause the shoe to break easily. In addition, due to the lack of shoes users who are not aware of the existence of laundry shoes, the recommended treatment features contained in this application feature are expected to help parties from shoe laundry service companies to be better known and known by users and can notify from the user himself that there is a shop that provides washing and maintenance services for shoe users.

In the city of Bandung, there are already a number of laundry shoes, but after a questionnaire survey, 73% of the community did not know about the existence of laundry shoes and they only washed their own shoes and after the same questionnaire survey stated that more than 60% of the people were interested to use the application to be created. So the author hopes that with the construction of this application, it is expected to help people, especially users and shoe lovers, to be able to use applications that can help them in detecting the level of dirtiness and can determine the appropriate treatment type for their shoes so that they are not easily damaged.

The purpose of this research is to build a dirty level detection application on shoes and appropriate treatment type recommendations using Carifai API, Template matching and Google Maps API technology.

a. Provides ease to the user in determining the appropriate type of treatment for his shoes to be maintained and not quickly damaged.

2. CONTENTS OF RESEARCH

2.1 Landasan Teori

Landasan teori ini menjelaskan konsep-konsep yang telah dirangkai secara sistematis yang digunakan untuk mendukung pada penelitian ini.

2.1.1 Clarifai API

Merupakan alat pengenalan untuk gambar dan video yang secara otomatis melakukan tag kepada objek dan kategori yang hanya mengambil pixel sebagai input. sistem ini didasarkan pada algoritma jaringan syaraf tiruan[9].

2.1.2 Google Maps API

Merupakan teknologi yang banyak digunakan untuk mencari tempat terdekat, dalam aplikasi ini *Google API* dimanfaatkan untuk mencari laundry sepatu terdekat.

2.1.3 Template Maching

Template matching adalah sebuah teknik dalam pengolahan citra digital untuk menemukan bagian-bagian kecil dari gambar yang cocok dengan template gambar.

Template matching merupakan salah satu ide yang digunakan untuk menjelaskan bagaimana otak kita mengenali kembali bentuk-bentuk atau pola-pola[1].

2.2 METHOD

Research methods are needed to solve a problem in research, which requires data to carry out a study. This research uses descriptive method, because it is generally carried out with the main objective, namely to describe systematically and accurately the characteristics

of the object under study [6]. Based on the results of direct observation in the field, the stages are as follows:

Data collection methods used in this study are as follows:

a. Studi Literatur

Data collection techniques were carried out by collecting, studying and researching various literature sourced from scientific journals, papers, internet sites and readings related to the research title.

b. Kuesioner

The questionnaire was conducted on the community as a validation data collection to prove how needed this application was built based on the results of the questionnaire.

In making this application using the waterfall model as the stage of software development. The process includes: *Requirement analysis and definition*

a. Requirement analysis and definition stage is the stage where the needs collection has been fully defined then analyzed and defined needs that must be fulfilled by the program to be built. This phase must be completed in full to produce a complete design. *System and software design*

a. The system and software design stage is the stage of designing software that is done after complete needs are collected in full.

b. *Implementation and unit testing*

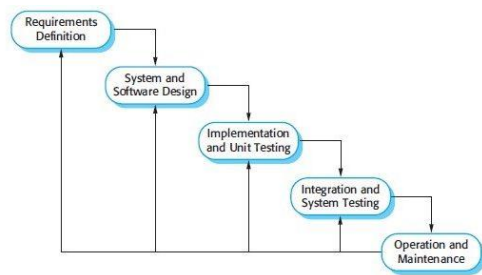
c. Requirement analysis and definition stage is the stage of program design results translated into codes using a predetermined programming language. The program built is directly tested based on the units.

d. *Integration and system testing*

The level of integration and system testing is the stage of unification of the program units then the system is tested as a whole.

e. *Operation and maintenance*

The operation and maintenance phase is the stage of operating the program in its environment and carrying out maintenance, such as adjustments or changes due to adaptation to the actual situation. Of the various stages, for more details can be seen the waterfall model in Figure.



Picture 1. Waterfall

2.3 Analisis and desain

System analysis can be defined as the decomposition of a complete system into its component parts with a view to identifying and evaluating the problems that occur and the expected needs so that improvements can be proposed. Analysis can be interpreted as research on an existing system with the aim of designing a new or updated system. In the process of making an absolute system, research and analysis of the system to be built is carried out.

2.2.3 problem of analisis

Problem analysis is the stage of elaborating problems that exist before the application is built and aims to build this multimedia application. Analysis of existing problems includes the following:

How to make an application that can tell the public to do the appropriate treatment on their shoes.

a) How to make applications that can help people in recommending shoes laundry services located around the community.

b) How can this application be used as a medium of promotion for the place of laundry shoes services to be better known by the public.

2.2.4 Analisis Metode

2. Cara kerja metode *Clarifai* adalah sebagai berikut :

1. There is one user shoe object in white color and black logo

2. then the color detection into the shoe will be carried out, after the detection is done and the resulting color is dominant in black, but there is another color that is brown.

3. Because it is known the initial color of the shoe is white and the shoe logo is black, then after the color detection turns out to be brown, according to the data in the table, the detection results show that the shoes are dirty.

2. Metode Profile Matching

Dalam metode ini digunakan 3 langkah yaitu :

1. Menentukan variable data yang dibutuhkan.
2. Menentukan aspek-aspek yang digunakan untuk penilaian.
3. Pemetaan *Gap Profil*.

Pada langkah pertama mencari variabel data yang dibutuhkan, dimana data variabel yang dibutuhkan yaitu :

- 1) Sepatu
- 2) Warna dominan
- 3) Warna Template

Selanjutnya langkah ke 2 yaitu menentukan aspek aspek yang digunakan untuk penilaian, aspek yang digunakan untuk penilaian adalah :

- 1) Warna Dominan
- 2) Warna *Template*

Dan langkah yang terakhir yaitu pemetaan GAP dalam pemetaan ini terdapat 2 tabel yaitu :

Berikut ini merupakan penjabaran dari langkah – langkah dalam tabel perbandingan diantaranya :

1. Enter the minimum data into the database.
2. Make comparisons between the minimal data contained in the database with the user's test data.
3. Example in the comparison data table column one where compared whether the test data for shoes with the NIKE brand is the same as the initial database, if the same then proceed to the dominant color, if the dominant color is the same then continue to the template color, if the same then detect another color if in the results of the test data there are other colors, it is concluded that the shoes are dirty.
4. Examples in the comparison data table column two where compared whether the test data, shoes with the adidas brand are the same as the initial database, if the same then continue to the dominant color, if the dominant color is different then the

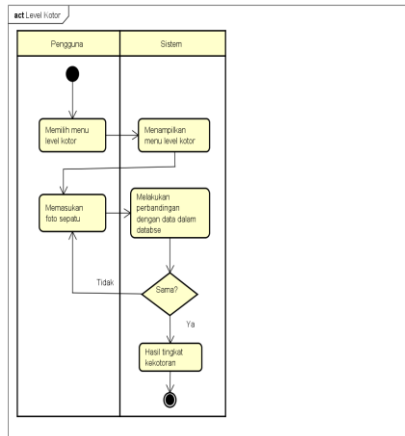
comparison is considered complete with the conclusion shoes cannot be detected level to the dirt.

- Examples in the comparison data table of the third column compare whether the asiccs brand shoes test data is the same as the initial database if the same then continue to the dominant color if the same then continue to the template color if the same then it will detect other colors if there are no other colors then It can be concluded that shoes are not dirty.

2.2.5 Analisis Sistem Yang Dibangun

Analisis sistem yang dibangun merupakan gambaran lengkap dari sistem yang akan di bangun. Adapun proses-proses pada sistem yang dibangun adalah sebagai berikut :

- Proses Deteksi Warna Kotor

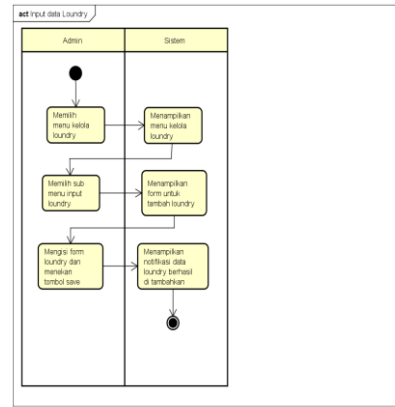


Picture 2. Alur Sistem Yang Dibangun Proses 1

Berikut adalah deskripsi dari alur diagram diatas :

- User memotret sepatu yang akan dideteksi oleh sistem.
- Sistem menyimpan data dan dikirimkan kembali ke *clarifai* untuk dicari merk, logo dan warna dominan yang terdapat dalam sepatu.
- Sistem melakukan perbandingan antara data uji yang diinputkan oleh user dengan data minimal yang terdapat pada database.
- Jika hasil perbandingan menunjukkan hasil data sama maka dianggap tidak kotor.
- Jika hasil perbandingan menunjukkan hasil data yang berbeda maka data uji akan dianggap kotor.

- Proses Pencarian Laundry Terdekat



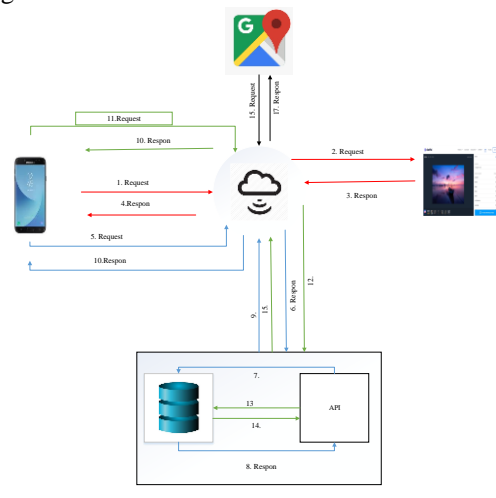
Picture 3. Alur Sistem Yang Dibangun Proses 2

Berikut adalah deskripsi dari alur diagram diatas :

- User memilih menu cari laundry.
- Sistem akan menampilkan menu cari laundry terdekat dengan memanfaatkan teknologi API Google Maps yang terdapat dalam program.
- User akan memilih salah satu laundry yang terdapat pada menu.
- Sistem akan menampilkan detail data laundry yang dipilih oleh user.
- Sistem akan menampilkan rute laundry yang terdekat dengan user itu sendiri dengan pemanfaatan GPS yang terdapat dalam sistem.

2.2.7 Analisis Arsitektur Sistem

System architecture analysis aims to identify the architecture to be built. The following is the overall system architecture in the following Figure:



Gambar 5. Arsitektur Sistem

The following is a description of the system architecture built:

1. Users take pictures of the shoes to be detected.
2. Photos of shoes will be saved stored on mobile.
3. Requesting application to web service to send photo file to Clarifai API using internet network.
4. Clarifai API sends dominant color data contained in the shoe file via the internet.
5. Mobile receives data in the form of dominant colors on shoes.
6. A consistent comparison between test data from the results of clarifai with minimal data contained in the database.
7. The system requests the Google API data for the nearest laundry search
8. The Google API provides the nearest laundry data with the user.

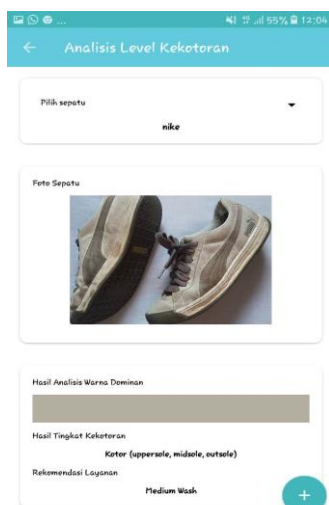
2.2.8 Implementation and Testing

1. Implementasi Tampilan Menu Utama



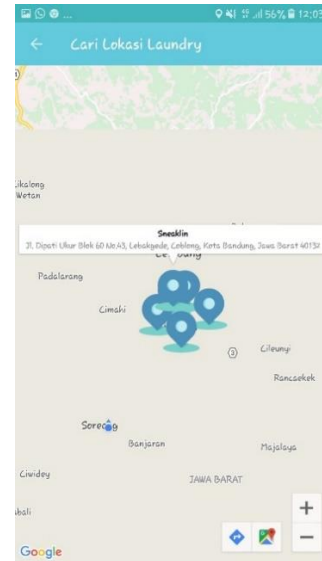
Picture 6. Tampilan menu

2. Implementasi Tampilan Level Kotor



Picture 7. Tampilan Level Kotor

3. Implementasi Tampilan Laundry Terdekat



Picture 8. Tampilan Menu Laundry

4. Conclusion and Suggest

1. Conclusion

This research resulted in an application to detect the level of dirtiness of shoes that can help users detect the level of dirtiness of shoes and provide information on the nearest shoe laundry place, where this application is based on Android by using Clarifai as a tool to determine the level of dirtiness of the shoes and GPS that is petrified in presenting information the nearest laundry place, and help the user in giving treatment to the shoes according to the dirty level of the shoes.

Based on the results of testing on the StepKlin application obtained a success rate of 94.2% where 7 functions were successfully performed, and a success rate of 87.5% for testing data.

2. Suggest

Based on the results of the study there are various suggestions that can be raised are added functions such as laundry price details in every nearby laundry, can detect shoes with a lot of shoes.

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