

## Software Development of Food Combining Guidelines Using Smartphone-Based On Android In Bandung

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### Abstract

*Food application is a portion of food combining guide application using API Food2Fork, Clarifai API, and API Nutritionix based on Android. Food Combining is an example to address the issues of supplements and energy required by the body. This application's execution is necessary to assist the general population by deciding the menu of food consolidating. Giving wholesome data and plans to help provide data. To get formula suggestions, the client initially chooses a photograph from the camera or exhibition. At that point, the framework will send the picture to clarify to get the label name of the material, acquiring the framework's reputation to send the material to the nutritionist to get the materials gathering. After the consequences are developed, the framework shows the aftereffects of labels and gatherings of materials in the application. After the ingredients are selected, the system sends the name of the component to Food2Fork to get a recipe. The recipe will be translated before displaying it to the system. Based on the results of testing using the BlackBox method and beta testing, it can be concluded that applications can help people to do food combining.*

*Keywords: Android, Food Combining, Clarifai, Nutritionix, Food2Fork*

### Abstrak

Aplikasi pangan merupakan bagian dari aplikasi panduan food combining menggunakan API Food2Fork, Clarifai API, dan API Nutritionix berbasis Android. Food Combining adalah contoh untuk mengatasi masalah suplemen dan energi yang dibutuhkan oleh tubuh. Pengerjaan aplikasi ini diperlukan untuk membantu masyarakat umum dengan menentukan menu konsolidasi pangan. Memberikan data yang sehat dan rencana untuk membantu menyediakan data. Untuk mendapatkan saran formula, klien awalnya memilih foto dari kamera atau pameran. Kemudian kerangka kerja akan mengirimkan gambar untuk mengklarifikasi untuk mendapatkan nama label bahan, memperoleh reputasi kerangka untuk mengirim bahan ke ahli gizi untuk mengumpulkan bahan. Setelah konsekuensi dikembangkan, kerangka kerja menunjukkan efek samping dari label dan pengumpulan bahan dalam aplikasi. Setelah bahan dipilih, sistem mengirimkan nama komponen ke Food2Fork untuk mendapatkan resep. Resep akan diterjemahkan sebelum ditampilkan ke sistem. Berdasarkan hasil pengujian dengan menggunakan metode blackbox dan pengujian beta maka dapat disimpulkan bahwa aplikasi dapat membantu masyarakat dalam melakukan food combining.).

Kata kunci: Android, Food Combining, Clarifai, Nutritionix, Food2Fork

### 1. Introduction

Numerous individuals burn-through unpredictable and didn't focus on the container of the food that has been devoured. The propensities can affect the strength of the body itself. Sporadic dietary patterns and don't focus on nourishment can prompt the rise of different illnesses. Notwithstanding the increase of various infections, sporadic equilibrium supplements can restrain day-by-day exercises because of energy and energy balance. Required adjusted nourishment should contain substances, such as sugars, fats, proteins, nutrients, minerals, and water [1], [2].

Food Combining is a dietary arrangement that can meet the nutrients and energy needed by the human body. This is expected to provide beneficial results for the body and digestive system. Another thing that needs to be considered is to set a regular diet and maintain a balanced diet. Food that has been mixed according to rules based on nutritional intake and expiration time. Due to an irregular diet and balanced nutrition, many health problems are found. Currently, there are still many people who don't know food consolidating and what kind the food is combining [3], [4].

There are tens or even hundreds of diverse assortment of menus dependent on essential materials, handling techniques, and tastes. In view of the aftereffects of surveys that circulated by the quantity were 106 individuals appeared as much as 86.8% of the respondents complex to decide the menu of food consolidating. An aggregate of 89.6% of the respondents it hard to realize the nourishing contain of every menu of food combining. As much as 89.6% of respondents said the trouble of knowing the formula menu of food combining [5].

Android is a working framework created by Google that sudden spikes in demand for versatile cell phones (Widiyanto, Ranny, Thejowahyono, and Handoyo, 2020). Based on the survey's consequences, Android clients as much as 95.3%, iOS 17%, java as much as 0.9%. Notwithstanding correspondence, respondents use to look

for data, listening to music, mess around, notes, web-based media, online shop, watch recordings, read the Qur'an, and photography [6], [7].

Based on the above, it would require an application that can help solve existing problems with the help of an Android application on your phone and take advantage of the technology Clarifai API, Food2Fork API, and Nutritionix API. These applications can give suggestions dependent on food consolidating menus accessible food fixings, plans dependent on the substance of supplements required, and the client journal to track the chosen menu and formula consistently [8], [9].

## 2. Literature Review

### 2.1 Food Combining

Food Combining *was* already introduced in Palestine 2000 years ago. At the beginning of the 20th-century food, Food Combining is a strategy to change your eating regimen to get the energy and supplement admission are adjusted for the necessities of one heart-to-day exercise. Food joining diet sets start time or when food is eaten and any mix of good food. Food consolidating can accomplish ideal body conditions in which all the capacities work impeccably. A pointer of the body's equilibrium to see the corrosive and soluble body or unbiased pH conditions (7.35 to 7.45). To keep away from harm to organs and the appearance of different infections, it takes the body balance [10]–[12],

### 2.2 Clarifai API

Clarifai is the support of distinguishing pictures and video that consequently gives expectations about what is in the image or video just as the measure of likelihood. The model utilized in this investigation is the food model. Food models can perceive more than 1000 suppers in the picture and can perceive up to a degree of staples. The idea of Clarifai work can be seen in [13].

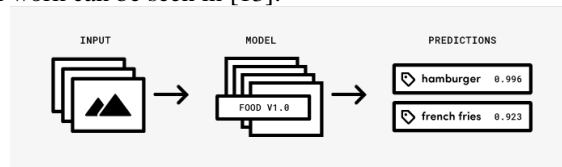


Fig. 1 Work concept Clarifai API

### 2.3 Nutritionix API

Nutritionix API is web services for any nutritional information and food ingredients. 6 features are on fire Nutritionix, including [14]:

- Natural Language, change the text into the proper nutritional analysis with state of the art.
- Autocomplete Search* can predict the input text typed in the search field.
- Common Foods starts by registering to the United States Department of Agriculture (USDA) and managed to fill the standards for the collection of food and recipes. Apart from the USDA Nutritionix also collected thousands of types of food and international recipes.
- Branded Foods has the largest food database by having 568,000 groceries with a bar code and the food in the restaurant as much as 146,000.
- Dietitian Verified has a dietitian to verify the data and API's procedures to ensure the data nutrients' accuracy.

Restaurant Geolocation, there is 202.495 restaurants that can be used to view the location based on the data available nutrients.

### 2.4 Food2Fork API

Food2fork API is a site that provides recipes from around the world that continue to add databases every day by having features that are easy to use by the user. Food2fork has a search feature-based material and a ranking system based on social media popularity [15].

### 2.5 System Android

Android is a working framework and programming stage created by Google for cell phones and other cell phones (for example, tablets). Android can run on a variety of devices from many different manufacturers. Android includes a software development kit for writing native code and assembling software modules to build apps for Android users [16], [17]. Android also provides a market for distributing applications. Overall, Android states an ecosystem for mobile applications [18] [19].

## 3. Analysis System

### 3.1 Problem analysis

Because of the poll's aftereffects to the individuals who made it online in September 2018 [20]–[22]. The survey was led to test 106 individuals from different circles of work, age and from the poll for the locals found a few issues, to be specific :

1. Society is brutal in determining the menu of food combining.
2. Society is challenging to know the nutritional content of each menu food combining. Society difficult to learning the recipes based on food combining

### 3.2 Analysis of Food Combining

Following the analysis of food combining:

1. Within one week of food combining is not to be done every day. Food combining can be done for five days and two days free of food combining called cheating. Better do cheating at lunch and dinner. Fruit on breakfast should still be done.
2. There is no food portion in the Food Combining; the quantity of food is determined by the respective body when the meal is a full stop because each person has a different amount.
3. On any menu meals (lunch and dinner) vegetables should be more than protein or starch..
4. The composition of the menu in one day as follows:
  - a. 1 menu protein + vegetables,
  - b. 1 menu starch + vegetables,
  - c. 1 menu fruits.

Or,

  - a. 2 menu starch + vegetables,
  - b. 1 menu fruits.

Or,

  - a. 1 menu protein + vegetables
  - b. 2 menu fruits

Or,

  - a. 1 menu starch + vegetables
  - b. 2 menu fruits.
5. The ideal combination of dinner and lunch is
  - a. protein and vegetables
  - b. starch and vegetables

### 3.3 Analysis of Technology

A few innovations are used to construct this application to deal with food menu proposals just for lunch and supper. The aftereffects of the ID tag of Clarifai, Nutritionix, and food2fork Indonesian translate into using Google Translate API. Here's an explanation of the results obtained from the technology.

1. The identification process using Clarifai API.
  - a. First, take pictures of food from the camera or gallery.



Fig. 1 Input Sample Image

Once an image is selected, and then uploaded to Clarifai to identify the material name tag.

- b. Results tag of Clarifai API:

TABLE 1. Results Clarifai Tag API

No	Material
1	broccoli
2	kale
3	egg
4	broccolini
5	spinach
6	vegetable
7	cabbage
8	parsley
9	chicken

10	garlic
11	herb
12	cauliflower
13	sauce
14	mushroom
15	basil
16	ginger
17	butter
18	pesto

Once the tag material obtained, the next step is to determine the group of each ingredient by using the API Nutritionix

TABLE 2. Results of Nutritionix API

No	Material	Group
1	broccoli	Vegetable
2	kale	Vegetable
3	egg	Protein
4	broccolini	Vegetable
5	spinach	Vegetable
6	vegetable	Vegetable
7	cabbage	Vegetable
8	parsley	Vegetable
9	chicken	Protein
10	garlic	Vegetable
11	herb	
12	cauliflower	Vegetable
13	sauce	
14	mushroom	Vegetable
15	basil	
16	ginger	
17	butter	
18	pesto	

c. Once the name tag of the material was translated from English to Indonesian Cloud, use google translation.

TABLE 3. Results Translation

No	Material	Group
1	Brokoli	Sayuran
2	kubis	Sayuran
3	telur	Protein
4	brokolini	Sayuran
5	bayam	Sayuran
6	sayuran	Sayuran
7	kubis	Sayuran
8	peterseli	Sayuran
9	ayam	Protein
10	Bawang putih	Sayuran
11	herba	
12	kol bunga	Sayuran
13	saus	
14	jamur	Sayuran
15	kemangi	
16	Jahe	
17	mentega	
18	pesto	

d. Tag results from Clarifai identification and classification of materials will be displayed in the application, then choose a tag that will be resolved based on the material selected menu. Here are

examples of tags that have been users.

TABLE 4. Election Results

No	Material
1	brokoli
2	telur

e. Once the material is selected, the system performs a combination determination based on food combining rules. The system checks for each material group to match with other groups. Here are the results of a combination of materials according to the laws of food combining.

TABLE 5. Results Determination Combinations

No	Material 1	Material 2	Information
1	Egg	broccoli	Protein and Vegetables

### 3.4 System Architecture Analysis

Analysis of system architecture aims to identify the architecture to be built. The system architecture can be seen in.

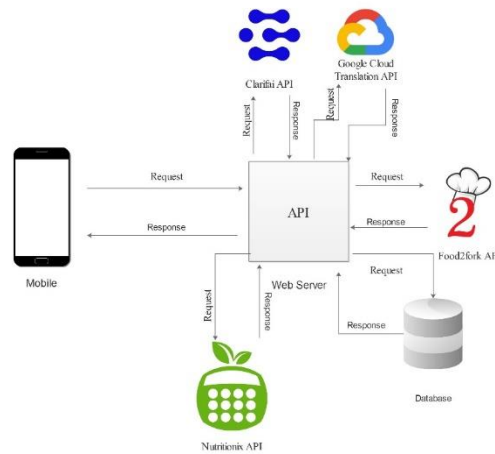


Fig. 2 System Architecture

### 3.5 Use Case Diagram

Use Case is a construction diagram to describe the relationships between actors with the system's activities. From the existing applications analysis, that use case diagram can be seen on a mobile platform.

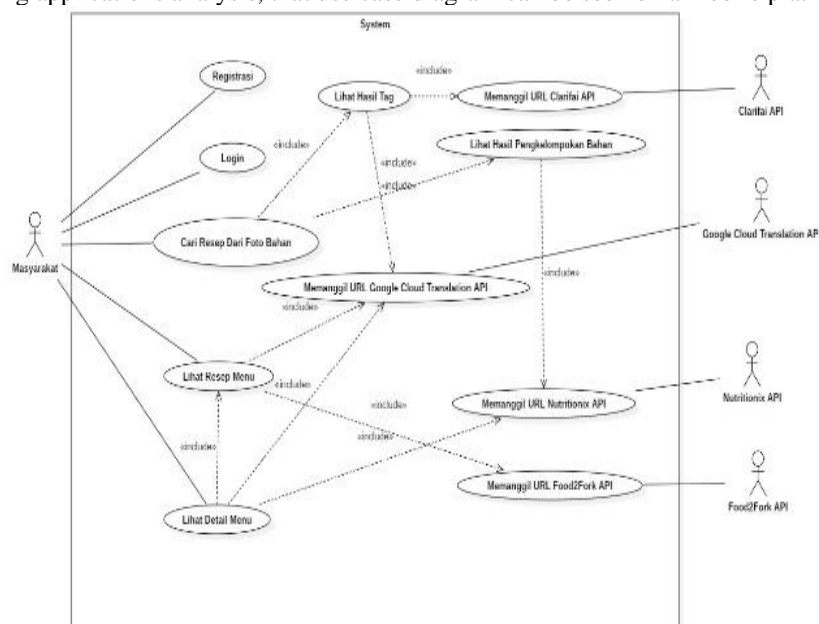


Fig. 3 Use Case Diagram

### 3.6 Relation scheme

Following the relation scheme of the software will be built as shown in.

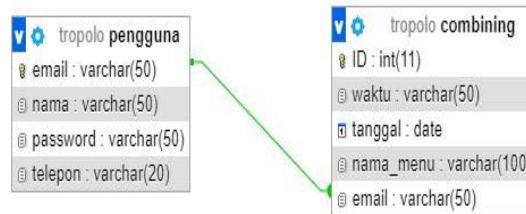


Fig. 4 Schema Relationships

### 4. Result

This stage is the process after analysis and system design. Implementation of the system is the stage of laying the system so that it can be operated. The performance aims to confirm the creation of the modules so that the system user can provide input to the system's development.

TABLE 6. Results Recipes from Food2Fork

No	Recipe	Material
1	Baked Potatoes with Broccoli, Cheddar, and Egg	Idaho potatoes, broccoli, cheddar cheese, eggs, butter, salt, pepper
2	Broccoli & eggs	olive oil, red chilies, garlic, sherry or red wine vinegar, broccoli, eggs
3	Green Salad	Lettuce, broccoli, avocado, balsamic tarragon vinaigrette, grilled pistachios
4	Thai Spicy Coconut Quinoa Recipe	cilantro, roasted peanuts, hot sauce Sriracha, grated lime peel, lime juice, sesame oil, brown sugar, garlic, salt, quinoa, coconut milk, vegetable stock, carrots, broccoli, green onion, vegetable oil, coriander, peanuts raw
5	Mini Egg Frittatas with Broccoli, Cheddar Cheese & Chipotle Pepper Recipe	broccoli, eggs, water, chipotle pepper powder, salt, green onions, Cheddar cheese

The next step is to compare the material with each recipe and count the same number to search for a match percentage. The formula to find the presentation material compatibility

$$\frac{\text{material of the same}}{\text{total material}} \times 100$$

Here is a table of the results of the matching process materials can be viewed in Table 7.

TABLE 7. Match Result Ingredients

No	Recipe	Materials of the Same	Total Same	Remaining ingredients
1	Baked Potatoes with Broccoli, Cheddar and Egg	Broccoli, Egg	2	5
2	Broccoli & Egg	Broccoli, Egg	2	4
3	Green Salad	Broccoli	1	4
4	Thai Spicy Coconut Quinoa Recipe	Broccoli	1	17
5	Mini Egg Frittatas with Broccoli, Cheddar Cheese & Chipotle Pepper Recipe	Broccoli, Egg	2	5

Here is the percentage of matching materials can be viewed in Table 8.

TABLE 8. Results Matching Percentage

No	Recipe	Materials of the Same	Total Same	Total Material	Match percentage of materials
1	Baked Potatoes with Broccoli, Cheddar and Egg	Broccoli, Egg	2	7	29%
2	Broccoli & Egg	Broccoli, Egg	2	6	33%
3	Green Salad	Broccoli	1	5	20%
4	Thai Spicy Coconut Quinoa Recipe	Broccoli	1	18	6%
5	Mini Egg Frittatas with Broccoli, Cheddar Cheese & Chipotle Pepper Recipe	Broccoli, Egg	2	7	29%

After the presentation is obtained, then do the sorting of recipes-based presentations, largest to smallest. The following example is based on a percentage compatibility sorting of materials:

- Shown to 1 Recipe No. 2 Broccoli & eggs with a percentage of 33%
- Shown to 2 Recipe No. 1 Baked potato with broccoli, Cheddar and Egg with a percentage of 29%
- Shown to 3 Recipe No. 5 frittatas Mini Eggs with Recipes Broccoli, Cheddar and Chipotle Pepper with a percentage of 29%
- Shown to 4 Green Salad Recipe No. 3 with a percentage of 20%
- Shown to 5 Number 4 Recipes Quinoa Recipes Spicy Thai Coconut with a percentage of 6%

#### 4.1 Beta testing

Beta testing is testing conducted directly by the users who will be using the software [23], [24]. The question is as follows:

- a. Do you agree? Can food application help determine the recipes based on food combining?

#### 4.2 Beta Testing Results

Once the question is given to the public, look for a percentage of any of the answers. To find the percentage used the following formula [25], [26]:

$$Y = P/Q * 100\%$$

Information:

Y: Percentage Value

P: Total Score

Q: Top Scores

Likert scale is used to measure the attitude of app users who have been given a questionnaire. Here are the scores for the answers to the questionnaire.

- b. Do you agree? Can food application help determine the recipes based on food combining?

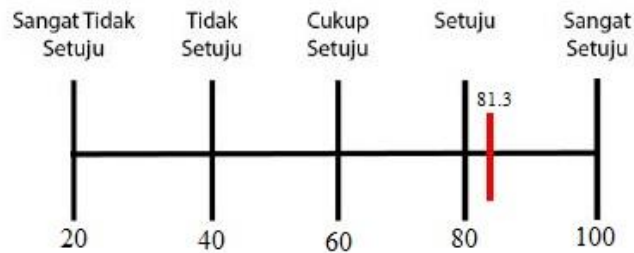


Figure 6. Quissioner Bandung Society

## 5. Kesimpulan

Food combining manage application by utilizing API Food2Fork, Clarifai API, and API Nutritionix based on Android. Food Combining is the case of food to address the issues and balance of enhancements and energy needed by the body. In light of test outcomes and conversation made, it tends to be reasoned that this application can help decide the menu of food consolidating, assisting with giving wholesome data, and giving the formula as per the food Combining. For the future, this framework can be created by joining food menu recommendations understanding with the sickness just as utilize other APIs to acquire better outcomes

## 6. Referensi

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