# **Idea Proposal** (Team 2)

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## 1. Subject Application

- **'Fridge Bridge'**
- A refrigerator assistance system in collaboration with an optimized smart refrigerator that can help and manage food ingredients and the refrigerator itself

## 2. Application Summary

### A. Target Domain

- The category of the application is 'Food & Drink', 'House & Home', and 'Lifestyle'.

### B. Expected Users

- The expected user for the application is an individual or business operator who directly purchases and manages ingredients.
- The expected user base is sensitive to the freshness and expiration date of the ingredients, such as restaurants.

### C. Description

- It is not easy to manage a refrigerator; in most cases, refrigerators end up being stuffed with ingredients that will never be used again. Managing the refrigerator and the ingredients inside have become a labour-intensive chore in most households.
- The expiration dates of the food ingredients are various depending on the category of ingredients and are difficult to manage food expiration without any assistance.
- In order to solve the problems stated above, a smart assistance system for managing the refrigerator is needed. 'Fridge Bridge' can recommend individual locations of new ingredients, control customized temperature per location, provide a list of stored ingredients and expiration date information, and recommend food ingredient purchases when they are near expiration, which makes it the optimal solution for refrigerator management.

## 3. Functional Requirements

### A. Account Registration / Access

- The system requires a function that enables users to create their own accounts.
- The system requires a function to authenticate the users when creating an account.

- The system requires a function that allows users to modify the information in their accounts optionally.
- The system requires a function that allows users to sign in and sign out of their accounts.

**B. Ingredient Management**

- The system requires a function to store and display the ingredients in the user's refrigerator.
- The system requires a function to keep track of the expiration dates of the stored ingredients, in reference to the type of the ingredient.
- When a certain ingredient is near expiration, the system requires a function to notify the user about the expiration and recommend similar products.
- The system requires a function to recommend recipes that can handle the ingredients in the refrigerator by including ingredients that are nearing their expiration date first.
- The system requires a function that enables the users to add, remove, and modify the stored information of the ingredients.
- The system requires a function to scan receipts and automatically create a list of newly added ingredients by recognizing characters on receipts. It should allow the user to manually input expiration dates and photos for chosen ingredients.

**C. Refrigerator Monitoring**

- The system requires a function to receive the status of the refrigerator by connecting to the (temperature, humidity) sensors in the refrigerator.
- The system requires a function to display the status of the refrigerator to the user and notify the user if some signals are considered abnormal. (e.g., temperature not being maintained)
- The system requires a function to connect the manufacturer service centre at the user's request.
- The system requires a function to keep track of the period for cleaning the refrigerator and notify the user when the scheduled cleaning date is near.

**D. Refrigerator Management**

- The system requires a function to set the temperature of the refrigerator cell by cell if possible.
- The system requires a function to keep track of the ingredients stored in each cell and check if the temperature of the cell matches the optimal temperature of the ingredient.
- The system requires a function to recommend the cell storage with the optimal temperature of new ingredients based on the temperature of each cell.

## 4. Nonfunctional Requirements

### A. User Interface

- The user interface of the application should satisfy high readability and be designed aesthetically while being practical so that it can be easily used by anyone and also be attractive to the users.
- Users should learn and be familiar with the connection interface between the application and the refrigerator in order to use the full functionality of the application.

### B. User Device

- The system should be available on mobile devices on the Android platform with API Level no less than 14(Android 4.0, ICE_CREAM_SANDWICH).
- The device is proposed to have at least 40Mb of free space.
- In order to perform operations accompanying the function of the refrigerator, the device must be connected to the refrigerator through a network.
- The device's camera should be able to fully recognize the text on the receipt.
- The device should be able to respond to the information transfer within 2 seconds.

### C. Refrigerator Performance

- The refrigerator should be able to set its temperature in reference to the temperature range set by the user. A better cooling function can satisfy a narrower temperature range.
- The refrigerator should be sufficiently large to set the temperature of the individual cells differently.
- The refrigerator must be connected to the network in order to automatically set the appropriate temperature and expiration date of the input ingredient.
- The thermometer that measures the temperature of the interior of the refrigerator should be sufficiently sensitive. The more sensitive thermometer can recognize small temperature changes so that it recovers faster when the refrigerator deviates from the set temperature condition.

### D. Exception Handling

- The system should check the input for a correct(expected) type and output an error message for improper input.
- The system should notify the user if the internet connection is lost.
- The system should check that information is conveyed accurately.
- The system should record and send logs when either the refrigerator or the device undergoes unexpected errors.