System Requirements Specifications

For

<FridgeHub Assist>

Prepared by
Group name: ColourPanda

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Course : TSE 2451 Software Requirements Engineering
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1.0 Introduction

1.1 System Purpose

The purpose of this document is to provide the details about the requirements needed to complete the Fridgehub Assist, for the benefit of the project management, stakeholder, and development team. This document provide the description and functional of the project, performance requirements, interface, usage scenarios, attributes and use case diagrams of the application.

1.2 System Scope

The scope pertains to the ColorPanda for making FridgeHub Assist. This focus on the company itself, stakeholders and development team. This System Requirement Specifications aims at specifying the requirement of the system to be developed and to assist the development team.

The team start this project on 25 November 2019, for identifying and documenting functional, performance, interface and other requirements for the FridgeHub Assist system. In this period of time, the team conclude the discussion and come to an agreement that Fridgehub Assist shall facilitate mainly the following operations:

1. Scan the grocery item
2. Update the item inside the fridge
3. Order the selected item

1.3 System Overview

The FridgeHub Assist is intended to provide an easier way in handling grocery shopping, especially for a housewife and people who tends to finds it is difficult to do grocery shopping. The remaining sections of this document provide the overall description, system function, user characteristics, references, functional requirements, quality requirements, and logical database requirement. Section 1 consist of purpose, scope, overview, context, function and user characteristics. Meanwhile Section 2 consist references. Section 3 consist of functional requirement, logical database requirements and quality requirements.

1.3.1 System Context

FridgeHub Assist allows the user to handle their grocery items in an efficient way. This system is suitable for a housewife and also people who find it difficult to buy grocery items by walk in due to time constraints. Firstly, user will placed their items inside the fridge, which consists of scanner that can scan image using deep neural networks. The scanner will scan the image of the item and update the grocery item list inside the mobile app. Then, the user can update the list with how many items they wish to have inside the fridge. After that, the system will allow the user to automatically order the selected item that low in stock.

Table 1.3.1 System Context FridgeHub Assists

Subject Facet	Usage Facet	IT System Facet
-User database -Product List	-Housewife -Student -Worker -Supermarket staff -Delivery Guy -System Administrator	-Internet connection -Cloud Server -Administration-server -Mobile Phone

1.3.2 System Functions

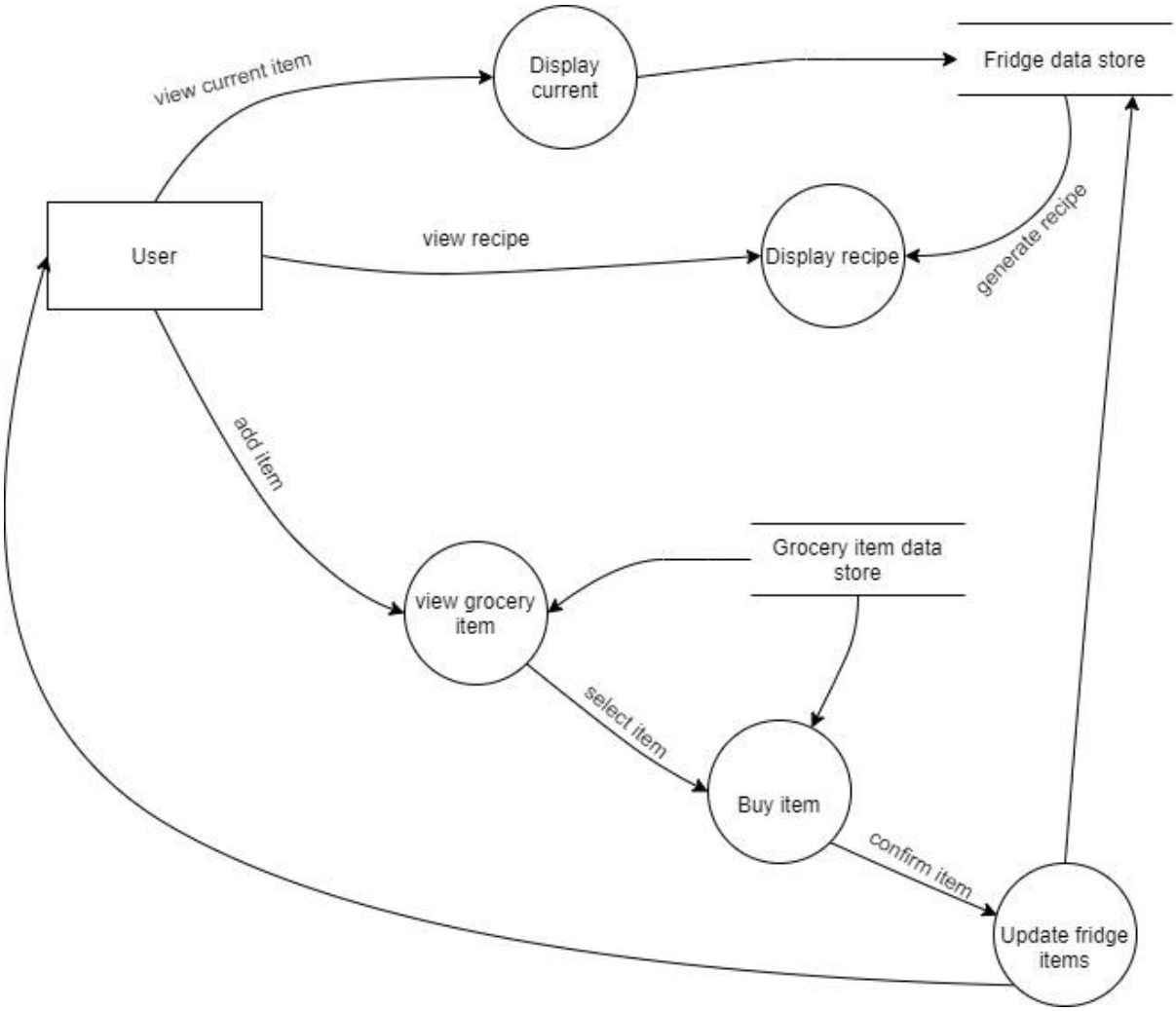

Figure 1.3.2.1 Data Flow Diagram for User

The figure above shows the data flow diagram for the user. In each flow:

1. User able to display the current item inside the fridge
2. User able to display the recipe such as recommended recipe or search desired recipe
3. User able to view grocery item the current item inside the fridge
4. User able to buy grocery item from their choice of grocery vendor

1.3.3 User Characteristics

There are four roles targeted by FridgeHub Assists. It is including system administrator, student, housewife, worker, supermarket staff, and delivery guy. The following table shows the expected level of knowledge for each role.

Table 1.3.3 FridgeHub User Characteristics

Role	Description	Required Knowledge
System Administrator	The developer who performs maintenance activities on FridgeHub Assists.	Basic knowledge on FridgeHub Assist maintenance skills and managing user accounts.
Housewife	General individual who use FridgeHub Assists.	Basic knowledge on how to register, login and update, and order the product inside the system.
Worker	General individual who use FridgeHub. Assists.	Basic knowledge on how to register, login and update, and order the product inside the system.
Student	General individual who use FridgeHub. Assists.	Basic knowledge on how to register, login, update, and order the product inside the system.
Supermarket Staff	Individual who works in the supermarket and use FridgeHub Assist.	Basic knowledge on how to manage the order from customer.
Delivery Guy	Individual who works in the supermarket as a delivery guy and use FridgeHub Assists.	Basic knowledge on how to deliver the order to the customer.

1.4 Definitions

Employee	An employee is a person employed for wages or salary.
Student	A student is a person who is studying at a university or other place of higher education.
System Administrator	A system administrator is a personnel responsible for the maintenance activities of the system.
Housewife	A housewife is a married woman whose main occupation is caring for her family, managing household affairs, and doing housework.
Grocery store	A grocery store or grocer's shop is a retail shop that primarily sells food, either fresh or preserved.
Online grocery shopping	An online grocer is either a brick-and-mortar supermarket or grocery store that allows online ordering, or a standalone e-commerce service that includes grocery items. There is usually a delivery charge for this service.
Expiry date	An expiration date or expiry date is a previously determined date after which something should no longer be used, either by operation of law or by exceeding the anticipated shelf life for perishable goods.
Meal	any of the regular occasions in a day when a reasonably large amount of food is eaten.
Ingredient	An ingredient is a substance that forms part of a mixture (in a general sense).

2.0 References

This document is prepared in reference of the following:

[1] IEEE 29148:2011 International Standard – Systems and Software Engineering – Life Cycle
Processes – Requirements Engineering.

[2] R. R. N. V. P. P. R. D. D. Mukesh P. Mahajan, "Smart Refrigerator Using IOT," International Journal of Latest Engineering Research and Applications (IJLERA) ISSN: 2455-7137, vol. 02, no. 03, pp. 86-91, 2017.

[3] Ridden, Paul. “LG launches first Smart-Grid appliance: the Smart Fridge.” gizmag. N.p., 27 Apr 2011. Web. 29 Jan 2012. <http://www.gizmag.com/lg-smart-fridge/18502/>.

[4] Suhuai Luo, Jesse S. Jin, and Jiaming Li, “A Smart Fridge with an Ability to Enhance Health and Enable BetterNutrition” published in International Journal of Multimedia and Ubiquitous EngineeringVol. 4, No. 2, April, 2009

3.0 System Requirements

3.1 Functional Requirements

Requirement ID	F001
Description	FridgeHub Assist shall allow user to login and start the system.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F002
Description	FridgeHub Assist scanner shall scan the product inside the fridge.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F003
Description	FridgeHub Assist shall update the product details in the database system.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F004
Description	FridgeHub Assist shall let the user to set the default quantity of their desired product.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F005
Description	FridgeHub Assist shall display all the product list on the user mobile app.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F006
Description	FridgeHub Assist shall let the user to view and select the recipe relates to item the user have.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F007
Description	FridgeHub Assist shall display the delivery status of the product on their mobile app.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	F008
Description	FridgeHub Assist shall let the user select their supplier.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

3.2 Logical Database Requirements

For this proposed system, a database is required to design and needs to be implemented. The purpose of applying this database is to store and organize data in the system. This includes the users' identifications, the items purchased, users' location(address) and contact information, delivery information and etc.

In this system, we have designed our database by using the Entity-Relationship Model. The entities included are: User, Order, Supplier, Items, Delivery and Recipe. Each entity has its own identity (ID), along with its necessary attributes.

The following figure represents the ER diagram of the system:

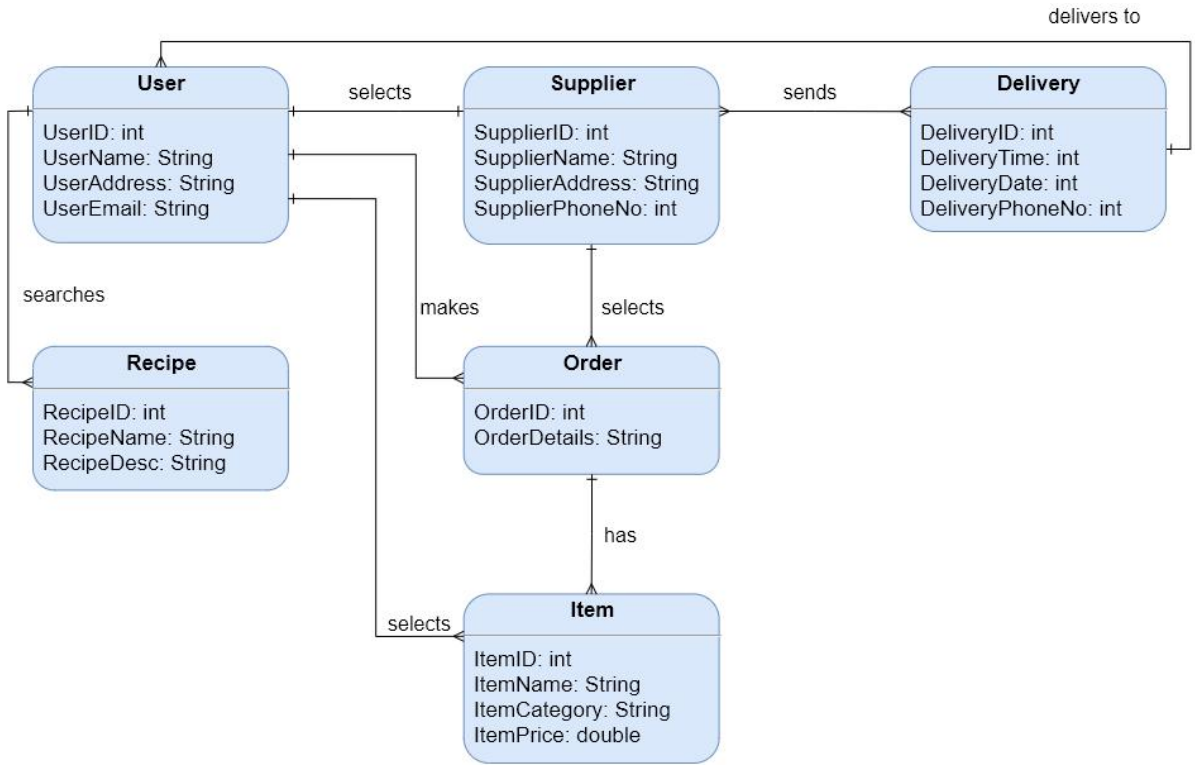

Figure 3.2.1 Entity-Relationship Diagram (ERD) of the system

Below describes the relationships between the entities based on requirements:

1. User can select more than one item to purchase; Each item can only be purchased by one user.
2. User can order more than once; an Order can be done only once by a user.
3. User must choose only one Supplier per purchase; Supplier can only supply to User one at a time.
4. Supplier can provide more than one orders to delivery; delivery can receive many orders from different Suppliers.
5. Delivery can deliver ordered items to many Users; A User can only receive ordered item one at a time.

3.3 Quality Requirements

Requirement ID	Q001
Description	FridgeHub Assists shall login with response time less than 10 seconds.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	Q002
Description	The scanner shall scan the item with response time less than 1 minute.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	Q003
Description	FridgeHub Assist shall allow the user data to be back up in case of system failure.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

Requirement ID	Q004
Description	FridgeHub Assist shall allow updating, ordering item for registered users only.
Version	1.0
Author	Nur Shakina Binti Mohd Hamis

3.4 System Modes and States

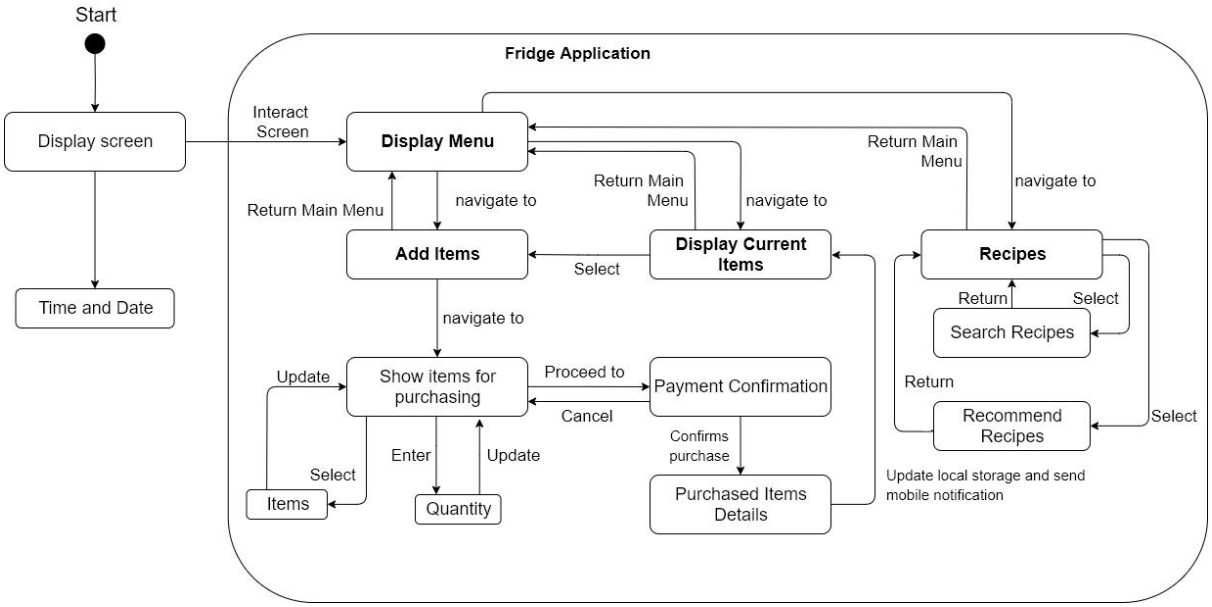

Figure 3.4.1 State Diagram for Fridge Application of the System

The figure above describes the state diagram of the Application designed for the fridge. The application consists of 3 main states: **Display current items; Add items; and Recipes**. The authentication of user is validated on the mobile application, thus does not require any login verification. At initial state, the screen will display the Menu of the system. The user decides one of the main states (functions), depends on users' need. The **Display Current items** state will shows the current available grocery items stored inside the fridge.In **Add Items**, user can purchase grocery items. **Add Items** can be navigated from the Main Menu, or directly when viewing current items. From here it navigates to 'Show Purchase Items' where the system shall display grocery items available in the store, whereas the user will selects the desired Suppliers (such as Tesco), the grocery items, and quantities. Once selected, the system will proceeds to 'Payment Confirmation'. The user can decide to proceed the payment, or cancel the purchase if necessary. If Confirmed, the system will display the newly purchased items list. When user receives the order from the delivery and restore the items, the system will send notification to user's smartphone (through Mobile Application) that the items have been restored.

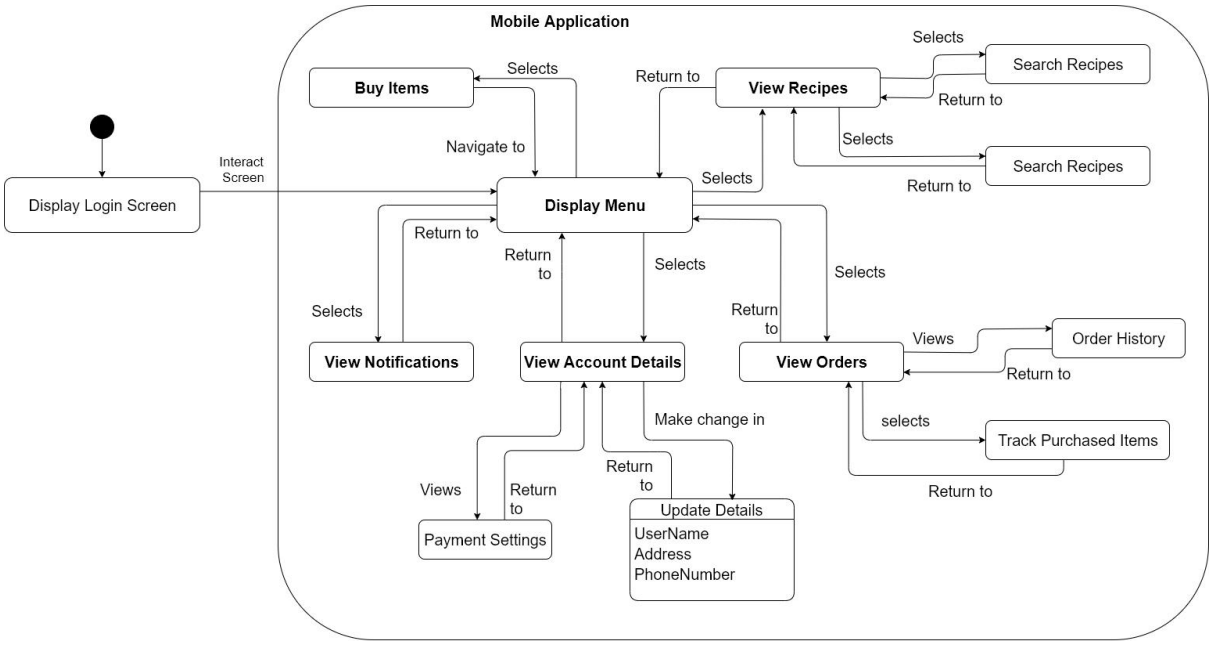

Figure 3.4.2 State Diagram for Mobile Application of the System

The figure above illustrates the state diagram of the Application designed for the mobile (smartphone). The Mobile Application consists of five states: **View Notifications; View Account Details; View Orders; Buy Items; and View Recipes**. Each states can be navigated back and forth to Main Menu for ease of use for the user. Initially, the system requires the user to login only once and does not need to re-login to access the application (unless necessary). In Notification, user can receive messages, including purchased items, orders, deliveries, messages from Fridge Application, and messages regarding users' account. The Account Details will displays user's account details, such as user name, addresses, phone number, and Payment settings. In Orders, user can view ordered history, and track purchased items. User can also make a purchase or buy grocery items from the mobile application. In addition, user can decide to search or recommend recipes by choosing Recipe menu. The system will generate a recipes based on current items stored inside user's fridge.

4.0 Appendices

4.1 Acronyms and Abbreviations

SyRS	System Requirement Specification
IEEE	Institute of Electrical and Electronics Engineers