Software Design Document
for Smart Fridge Kitchen Assistant

Prepared by the Smart Fridge Team

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CSC 532: Software Engineering

Contents

Revision History

Rev.#	Date	Nature of Revision	Version
1	10.30.2016	ORIGINAL VERSION	1.0
2	11.01.2016	Added to Profile and Item Classes	1.0

1 Introduction

1.1 Purpose

The main purpose of the Software Design Document (SDD) is to provide information on the implementation of the Smart Fridge: Kitchen Assistant. The Smart Fridge: Kitchen Assistant is software developed to help individuals and families take care of their

1.2 Scope

The scope of this project is to refine the existing Smart Fridge Project. This includes creating a user interface for using for a touch screen platform, implementing a customizable nutrition plan for the user, broadening the project to include several inventories, and allowing for a bulk fridge update using information from receipts. Additionally, the product will allow for integration with the Pillar smart house project.

2 Design Overview

2.1 Description of Problem

The existing Smart Fridge project does not have a feature to bulk update. Therefore, the user must manually input all foods into the fridge which is a tedious endeavor. Additionally, the current Smart Fridge project does not provide nutritional information or track the users consumption. Moreover, the exiting Smart Fridge project does determine waste or recommend a temperature for foods in the refrigerator. With these features, the user will be able to more easily use the Smart Fridge to help them live healthier and to help them reduce their environmental impact.

2.2 Technologies Used

This project uses Java EE to create a web-based application to be implemented in full screen on a 3rd generation Raspberry Pi.

2.3 System Features

2.3.1 Bulk Update, and Generalized Inventory –This allows for the user to use electronic receipts to update many items into the fridge at once. Connecting with the Nutritionix API, the software will be able to provide nutritional information given Universal Product Codes (UPCs).

2.3.2 Nutritional Recommendation The software keeps track of an individuals calorie intake and recommend meal plans based on the individuals input.

2.3.3 Waste Approximation & Energy Saving The system tracks waste, and provides a waste estimation. Additionally, the system recommends a temperature at which to keep the refrigerator based on the contents.
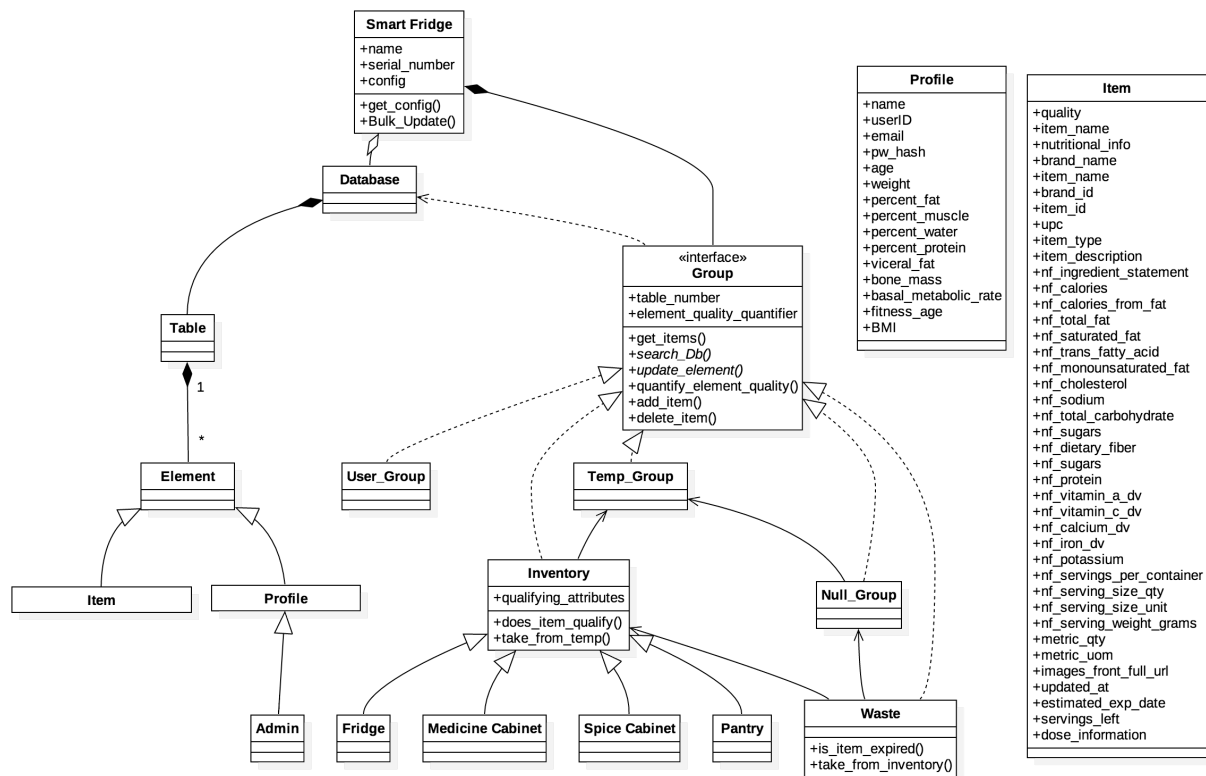
Figure 2.3.1.1: Class Diagram: Bulk Update, and Generalized Inventory
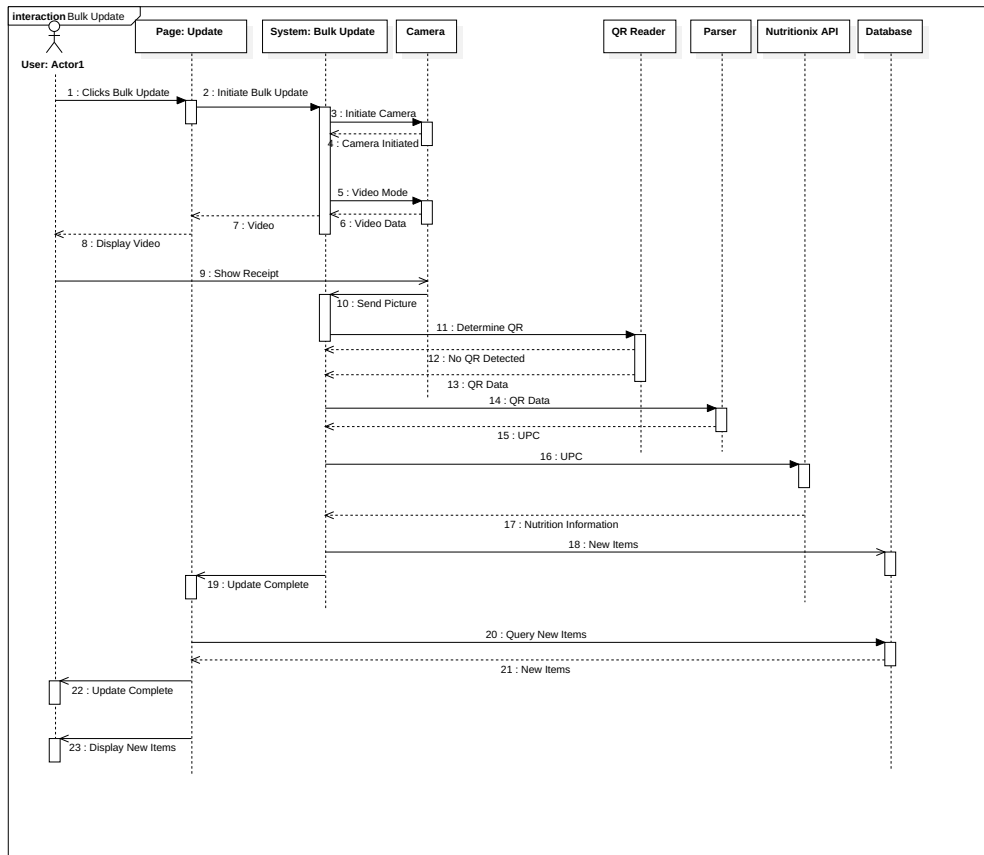
Collaboration1::Bulk Update::Bulk Update

interaction Bulk Update

User: Actor1 Page: Update System: Bulk Update Camera QR Reader Parser Nutritionix API Database

1 : Clicks Bulk Update
2 : Initiate Bulk Update
3 : Initiate Camera
4 : Camera Initiated
5 : Video Mode
6 : Video Data
7 : Video
8 : Display Video
9 : Show Receipt
10 : Send Picture
11 : Determine QR
12 : No QR Detected
13 : QR Data
14 : QR Data
15 : UPC
16 : UPC
17 : Nutrition Information
18 : New Items
19 : Update Complete
20 : Query New Items
21 : New Items
22 : Update Complete
23 : Display New Items

Figure 2.3.1.2: Sequence Diagram: Bulk Update, and Generalized Inventory

Scanner
+UPC
+QR
+ScanQRcode()
+DeterminUPC()

Smart Fridge
+name
+serialNumber
+Attribute1

PersonalizePlan

Recipes
+GetUPC()
+SendUPC()
+GetInfo()

GroceryShop

Connect

Clock
+hours
+mins
+seconds

EnergySave
+workHours
+SetWorkhor()

Profile
+SetPreference()
+GetPlan()

Routines
+favorite
+SetFavorite()
+GetPlan()

Inventory
+Add()
+Delete()
+Search()
+Modify()
+Trash()

1..*
1

Settings
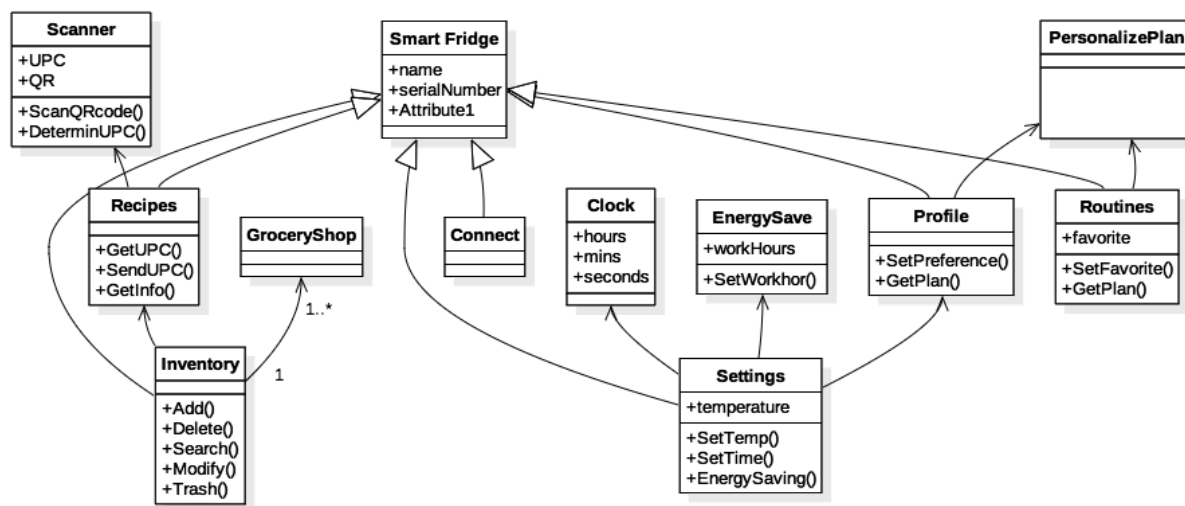+temperature
+SetTemp()
+SetTime()
+EnergySaving()

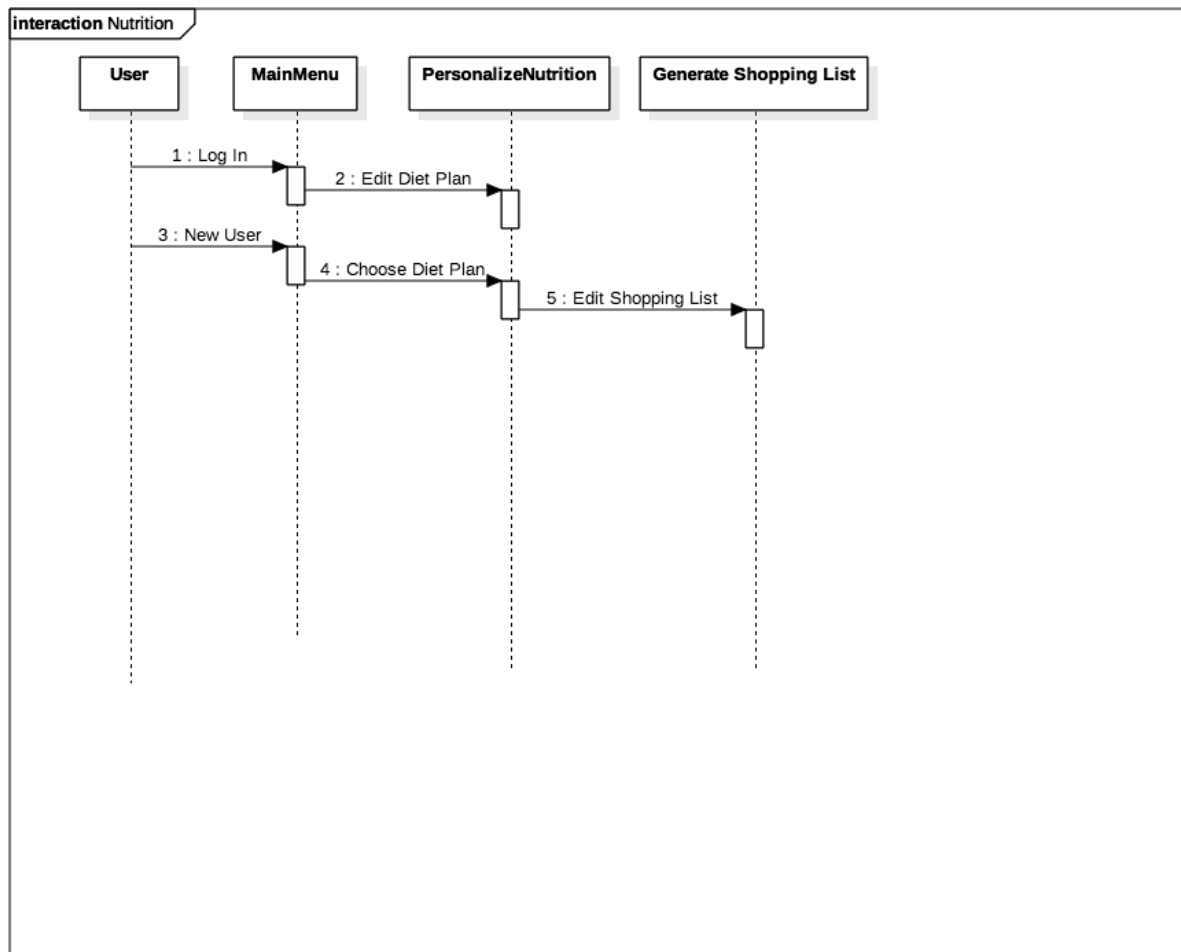Figure 2.3.2.1: Class Diagram: Nutritional Recommendation

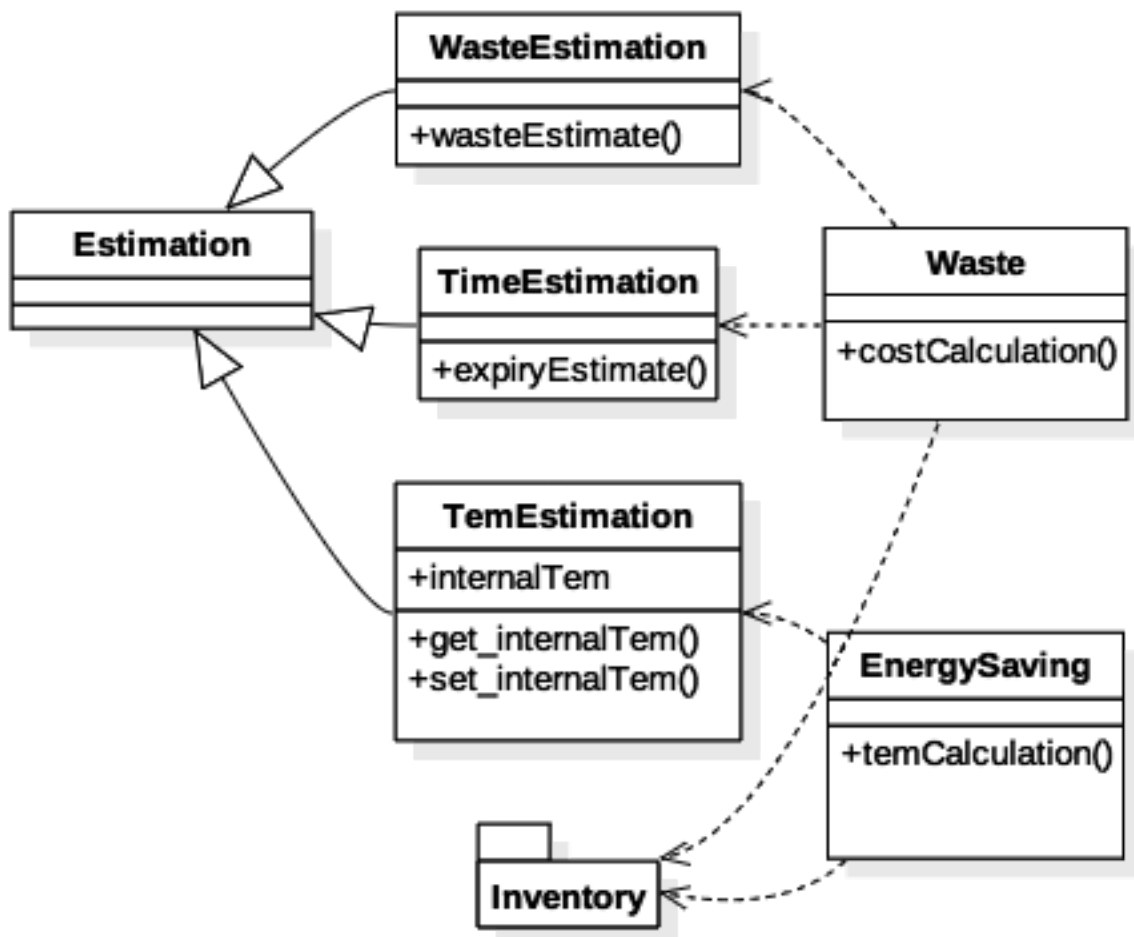Figure 2.3.2.2: Sequence Diagram: Nutritional Recommendation

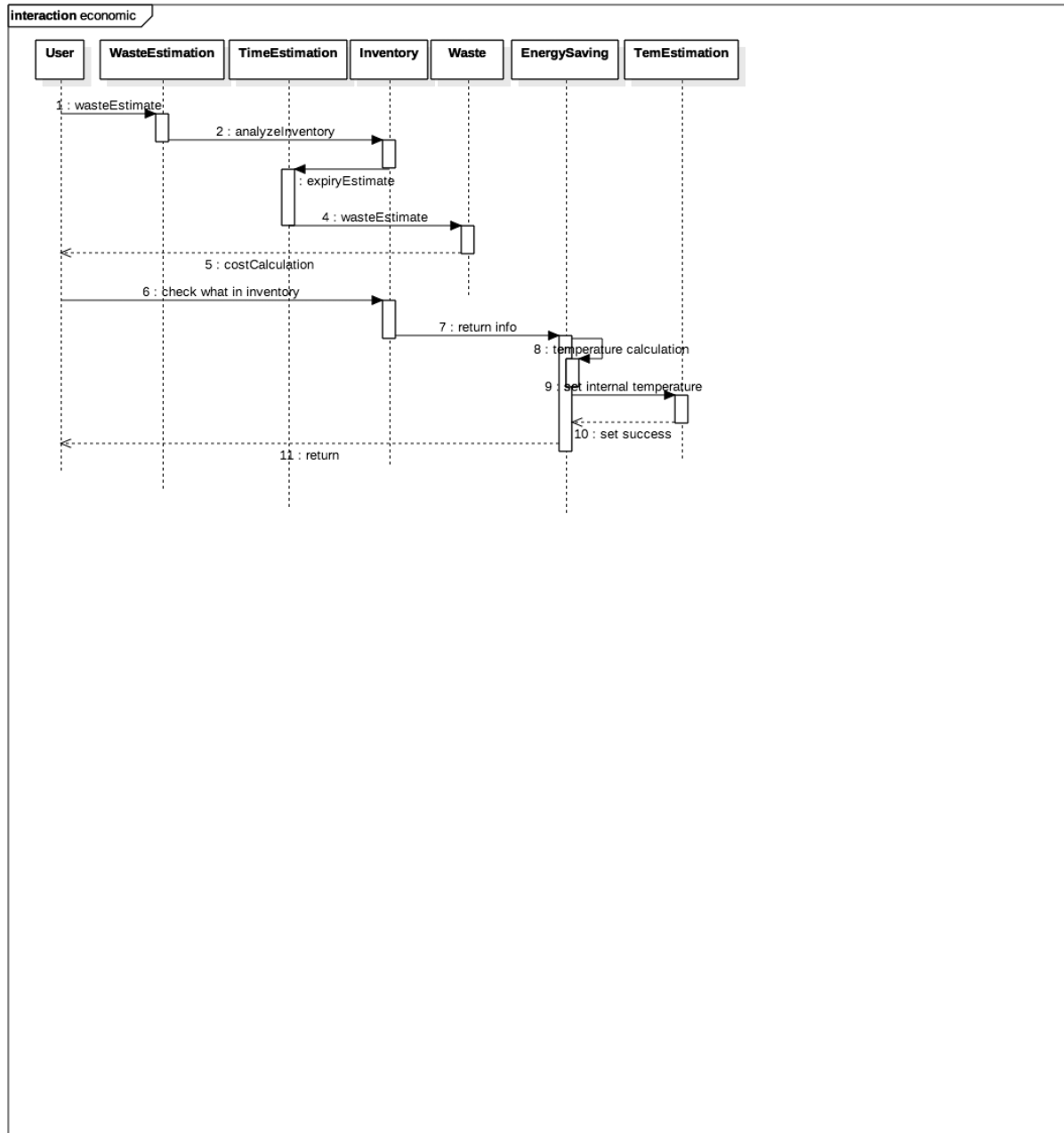Figure 2.3.3.1: Class Diagram: Waste Approximation & Energy Saving

Figure 2.3.3.2: Sequence Diagram: Waste Approximation & Energy Saving