



Bilkent University

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Department of Computer Engineering

# Senior Design Project

*ShopCart*

## Project Specifications Report

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# 1. Introduction

People have been shopping to meet their needs. All of us have to buy food and beverages to be able to survive. People are cooking, storing food in refrigerators, or ordering some meals. While using the ingredients for such kinds of aims, they are consumed and run out. When the refrigerator becomes empty, people usually prepare a shopping list and buy the depleted products by following that list. However, sometimes they cannot remember all the stuff that should be bought from the market and usually they forget some of the depleted products to write down on the list.

ShopCart is a mobile application that allows people to keep the depleted vittles, ingredients' data and remind them to buy what they need. The data consists of a product's monthly consuming frequency, how many days that product is out of stock, etc. To keep that data, users scan the barcode of the depleted product, enter its name manually or scan the photo of it before throwing it into the bin. Thanks to these ways, the depleted product will be automatically added to the shopping list and kept its numeric data, depletion time, etc. Multiple users will have profiles and create a community if they live together. Thanks to this feature, everyone in a group can add & remove the data. Users define home on the map and when any of them leaves the home, s/he will be notified about the shopping list. Users also can edit the list after buying it or they can wish to not buy it again. This app aims to make people's lifes easier and more regular. Keeping their life standards stable and protecting their eating habits, increases the quality of life.

Within this report, firstly project description is going to be described. Then, the constraints of the project will be analyzed in several subsections. After that, professional and ethical issues that may arise will be discussed. Finally, project requirements will be given within two distinct sections which are functional and non-functional requirements.

## 1.1 Description

This project aims to make people's life easier by organizing their shopping cart lists and tracking what foods they are consuming.

With an easy-to-use user interface, our users will be able to register into our app and log their supermarket goods by scanning the barcode, entering it manually, or scanning the image with their smartphone.

Our application will help the users to remember to go shopping when they leave the house or whenever they are close to a supermarket.

With the community features, users will be able to see what other people in the home have bought. This is useful such that the same product will not be bought unnecessarily and the user will be aware of the situation of the fridge. It will also be possible to calculate weekly costs and the most bought items. Our application will also suggest more affordable alternatives to most bought products.

Users will have the flexibility of choosing the frequency of shopping (e.g. once a week or once a day) so the notifications will be sent based on this frequency to avoid spamming the user with notifications.

## **1.2 Constraints**

### **1.2.1 Economic Constraints**

- Google Play Console requires 25 \$ for developer registration. App Store requires 99 \$ annually if we consider it to use.
- Firebase Database and Crashlytics are free. Github pages feature is free for the website of the app.
- AWS (Amazon Web Services) is free for 12 months in restricted usage.

### **1.2.2 Ethical Constraints**

- Code of Ethics by the NSPE is going to be followed during the development of the project [1].
- Personal information will not be shared with third-party services and is completely protected by us.
- Location service will be used with the permission of the user, home location data is preserved and not shared with any third parties.

### **1.2.3 Implementation Constraints**

- The application will be developed for mobile devices. IOS and Android-based smartphones will be suitable to use the app.
- To track and review the development, Github will be used as a source control tool.
- The services provided by cimri.com API, Google Maps API will be used to collect the data.
- The application will be developed by the OOP paradigm.
- The app will prioritize providing the best user experience in terms of

performance, functionality, simplicity, and user interface.

#### **1.2.4 Sustainability Constraints**

- The app will be sustainable because the API provided by cimri.com will offer the most current prices of products around the user. The data will be up to cimri.com.
- Home location, group members can be edited at any time.

### **1.3 Professional and Ethical Issues**

#### **1.3.1 Professional Issues**

- Because of the piracy problem the source code of the project will be private.
- In order to keep the progress of the project, our team will be meeting twice a week. According to the schedule of the project, our meetings will be Scrum meetings [2]
- All of the team members will be involved in decision-making about the project democratically.
- Each team member will be assigned a role in order to apply the divide and conquer strategy.

#### **1.3.2 Ethical Issues**

For the ShopCart project, we will use General Data Protection Regulation (GDPR) [3] and any personal data about users' shopping behavior will not be shared with third-party companies, it will be anonymous.

Codes of Ethics will be applied in our project [4,5,6]. All of the open-source codes used in the ShopCart project will be indicated if there are any and license management will be handled appropriately.

## **2. Requirements**

### **2.1 Functional Requirements**

#### **2.1.1 Depleted Product Specific Requirements**

- A user can scan the barcodes of depleted products.
- A user can manually enter the code of a depleted product.
- A user can delete depleted products in the community they are connected to.
- A user can get email recommendations.
- Users can see the history of their actions
- Users can get statistical information about their food usage and their food waste.

### **2.1.2 Community Specific Requirements**

- Users can create communities and add other users to these communities.
- Communities can be connected to the map of the system so there can be recommendations about close-by markets.
- The admin user of the community can choose the frequency of emails the users of the community receive.
- When a user leaves home they will get recommendations.
- A user of a community can see the products the other users of the community have added.

### **2.1.3 Software Requirements**

- The application will use MySQL to store information.
- Google Maps API will be used for map implementation.
- The frontend of the application will be written in React Native.
- The backend of the application will be written using Python.



## **2.2 Non-Functional Requirements**

### **2.2.1.1 User Interface and Human Factors**

- An interface with easy-to-use components and vivid colors that will not disturb the user should be used.
- The number of components on the main screen and on the screens directed after it should not exceed seven and confuse the user.
- Labels of tappable components, such as button names and screen labels, should be self-explanatory.
- It should have an interface that users can easily use without the need for an extra learning process. Potential users should be able to use it with their current application usage information.

### **2.2.1.2 Application Content**

- The application to be made should solve a problem in daily life or suggest a much more practical solution than the ongoing habits.
- The usability of the application should be increased to provide a better experience with the sounds and routers to be used in its content.

### **2.2.2 Reliability**

**Users can make some mistakes while using mobile applications:**

- To avoid these, confirmation pop-ups should appear on many transition screens and confirmation processes.
- Operations other than the user's request should not occur, except where otherwise permitted.

### **2.2.3 Supportability**

- Must support both mainstream mobile platforms (iOS and Android)
- Must be able to read in accordance with various barcode systems.
- Must be able to integrate various cards into the system successfully.
- Should contain all possible order materials in the household.

#### **2.2.4 Efficiency**

- Users should be able to order the products they want in a much shorter time than normal purchases.
- Users should be able to control the deficiencies in the household automatically, rather than using traditional methods.
- The application should predict orders according to user habits and shorten the order and thinking process.

### 3. References

- [1] "Code of Ethics National Society of Professional Engineers", *nspe.org*, 2016.[Online] Available: <https://www.nspe.org/resources/ethics/code-ethics/>. [Accessed: 10- Oct- 2021].
- [2] "Scrum - what it is, how it works, and why it's awesome," *Atlassian*, 2020. [Online]. Available: <https://www.atlassian.com/agile/scrum>. [Accessed: 10- Oct- 2021].
- [3] "What is GDPR, the EU's new data protection law? " GDPR, 2021 Available: <https://gdpr.eu/what-is-gdpr/> [Accessed: 10- Oct- 2021]
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- [6] "Official Legal Text," *General Data Protection Regulation (GDPR)*, 2019. [Online]. Available: <https://gdpr-info.eu/>. [Accessed: 10- Oct- 2021].