

EZ-Shopping Application

Software Requirements Document

*Document containing all the requirement for the new application*

*Developed by :*

*Chen, Zeyu*

*Mi, Feng*

*Xu, Haoke*

*Zhu, Weida*

# 1. Introduction

## 1.1 Purpose of the requirements document

This document details the functionalities required for the new App, Easy Shopping (ES).

## 1.2 Scope of the product

The primary audience are customers who expect shopping more convenient. And the developers of the app “Easy Shopping” are also the target of the document.

This app is intended initially to change people’s traditional consumption patterns. People used to shop at some place considered to be time-saving and money-saving based on their own experience. But it’s always not right. By using “Easy shopping”, shopping efficiency would be greatly improved.

## 1.3 List of definitions and abbreviations

This section contains the definitions of all used terms, acronyms and abbreviations in the document.

### 1.3.1 Definitions

|  |  |
| --- | --- |
| Most helpful customer | The customer whose review achieves the highest grades quarterly in one product. |
| E-statements | The statements generated by our app when customers choose the self-checkout payment method. |
| Foreign commodities | The commodities imported from other countries and the description of the commodities is not written in English. |
| Customer reviews and grades management system | The system that is responsible for documenting the customer reviews and grades on commodities. |
| GUI | the use of a graphical user interface display computer operations |

### 1.3.2 Abbreviations

|  |  |
| --- | --- |
| ES | easy shopping |
| GUI | Graphical User Interface |
| OE | operating environment |
| As | assumption |
| De | dependence |
| Co | constrain |

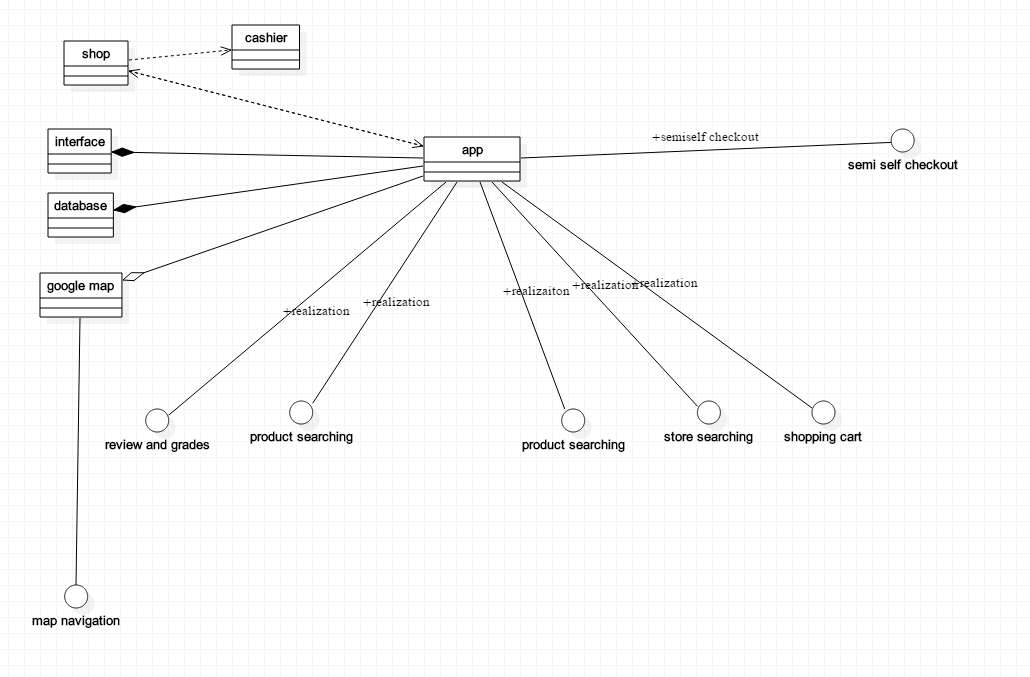
## 1.4 Overview

“Easy Shopping” is an App with information retrieval, navigation and self-checkout functions which makes shopping more convenient. In chapter two a description of the system and its environment is given along with a model that describes the software. Chapter three contains the software functional and non-functional requirements. In the chapter four, the risk of software development would be analyzed. Finally in Appendix, state diagrams are presented to illustrate the flow of the system.

# 2. General description

## 2.1 Product perspective

Nowadays, many people confuse about the locations and products while they want to do shopping. Besides, they usually get lost and confounded when entering a big supermarket and do not know what to choose. This app “Easy Shopping” presents a easier way than general method to handle this problem. Graph 1 is a class diagram of easy shopping which shows different components about how to interact with each other.



## 2.2 Product functions

Our app has 7 features and the Chapter 3 has the specific requirements of these functions. You can find the functional requirement, unfunctional requirement and some constrains in the 3rd chapter. Here lists the 7 product functions below:

1. Offer the list of shopping depending on the willing of the users and the distance to the shops.

2. Show the route to the shops and the goods by use of the static and dynamic map inserted.

3. Search the type of the goods based on the words and scope of the customer type and sequence the order of the goods based on the button the customer click.

4. Review the value of the goods and the comment made by other customer.

5. Use the shop list to make the process of trade easier.

6. Take easier method of payment to avoid long time wait in line.

7. Help the customer understand the commodity via foreign language translation

2.3 User Classes and Characteristics

|  |  |
| --- | --- |
| User class | Description |
| Customers(high priority) | 1. This app is designed for people not very familiar with surroundings. They can use this app to locate the shops based on their willings like the commodity they want to buy or the distance to the shops.  2. People who want to know more details about a certain commodity. The app can offer the reviews and grades about the commodity to help the customers to make judgments.  3. People like to try foreign commodities.  4. People who tired of waiting in a long queue. |
| Shop staffs | 1. Cashier that need to deal with the E-Statements when customers use a QR Code scanner to generate order.  2. The stuffs need to do some translation about the description of the commodities.  3. The stuffs who are responsible to make the most helpful customer whose review is rated by other customers as most helpful free of charge. |

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## 2.4 Operating Environment, OE

OE -1： The application of easy shopping is developed for any customers who have a cellphone with Android or ios system.

OE -2：Under the Netscape web server: enterprise using SSL and personal certificates.

OE -3：Accessing the Oracle database (currently on system sisjajp, but soon to be on a new database server)

OE -4：New code will be developed in Java.

## 2.5 General Constraints

CO-1: When too many people use our software, the sever may not be strong enough to hold that pressure.

CO-2: Some shops may not support our software because they do not in favor of the idea behind our software.

CO-3:People who use the cellphone which is not perform under android or java platform can not use this software.

## 2.6 Assumptions and dependencies

AS-1: Most of shops that support the easy shopping application.

AS-2: Stuffs in the shops which support the easy shopping application are trained to use this application.

AS-3: The translation provided can make the customers better know the foreign commodity.

DE-1: Customer reviews and grades management system can run normally.

DE-2：The inserted dynamic google map can locate the shop correctly.

# 3. Specific requirements

## 3.1 Functional requirements

### 3.1.1 Store Search

#### 3.1.1.1Description

As the interested product name input into the search bar, the store information will be showed in the app in a sequence of distance order.

#### 3.1.1.2 detail

1. a search bar should be provided----customer can input specific interested product name, some specific product categories or just the store name.

2. a list of store information will be shown, which includes store name, distance to the destination, contact information and hours

3. the store information shown is in logical sequence based on some priority:

1) If the customer only input the store name, the specific store is of the highest priority.

2) If the customer input specific interested product names or some specific product categories, the store which contains all these product is of the highest priority.

3)Then store could be arrayed in a sequence of distance order.

3.1.2 Navigation

#### 3.1.2.1Description

Link Google Map to the app to start the navigation to the selected store. Once arriving, static internal store map is provided——navigation function optioned.

#### 3.1.2.2 detail

The app could use the function of Google map. As customers choose the destination, the navigation function could be started to lead to the selected store.

Once arriving, the app could provide the detailed internal map of the whole store as the guidance. The map specifically shows what every floor contains-- the brands, product categories, the shelf numbers.

Selected product shelf number should be provided. With the information, customers could shop easily by watching the map.

Navigation function of the internal store is optioned.

**3.1.3Function: Shopping cart**

3.1.3.1Description: This function provides the customer a summery shopping list of products which customer select themselves during browsing the application.

3.1.3.2Detail1: After customer finished searching products in the search bar, every product in searching results should have a “shopping cart “ button.

3.1.3.3Detail2: When customer clicked the shopping list button products would automatically add into the shopping cart list and system should recorded this list in the database until customer cancel the product.

3.1.3.4Detail3: Customer can easily remove the product from the shopping list which they selected before.

### 3.1.4 Customer Reviews & Grades Features

#### 3.1.4.1 Description

Users can use this features to review the value of the commodities and the comment made by other customers. In the app, when users see the description of commodities, they can also see the reviews and the grades made by other customers below. Furthermore, they can judge whether a review is useful by seeing the grades shown on the top right corner of the review.

#### 3.1.4.2 Details

1. When the customer chooses payment method of self checkout, he can review the goods he just bought and grade them( the grades scope is 0 to 10).

2. The customer who chooses payment method of self-checkout can also have the right to evaluate whether other customer reviews are useful by grading them view(the grades scope is 0 to 5).

3. The reviews and grades (customer grades & commodities grades)are documented in our database after the customer submits them and then the app upgrades the average grades and the reviews content . The reviews and grades on commodities are listed below the description of the goods.

4. The app will quarterly award the customer considered to provided most helpful review of a certain commodity.

### 3.1.5 Product Search Bar

#### 3.1.5.1 Description

Provides lists of information which includes the prices, reviews , product description after customer type in the products in the search bar.

#### 3.1.5.2 Details.

1. Before customer type in anything, there should be a default setting that some specific shops which have paid the advertisement fee should be recommended to customers automatically at the initial interface.

PS: At the initial stage, no shops paid for the advertisement fee so the place of the advertisement should be replaced with the advertisement of ourselves.

2. After customer types in the information in the search bar and click the search “button”, the corresponding listing information which match the information which customer types in the database should appear under the search bar.

4. If customer does not select the order of the listing shops, the default setting should obey the order of the release time which the shop release products in one week.For example: if there are five shops which released the same products. Shop A and shop B released at 0:00 in last Monday, shop C released at 0:00 on last Tuesday, shop D released at 0:00 on last Sunday, shop E released at 0:00 this Monday. Then if the customer search for the same product the default appearance order shall obey E A B C D or E B A C D. Because A and B released at the same time so the order of A and B could arrange randomly.

5. There could be some recommendation of lists of auxiliary items (at the side of the interface) they may want to purchase along with their main shopping product which they searched.

### 3.1.6 Translation

#### 3.1.6.1 Description

Provides users with lists of thing they want to purchase in desired language no matter in what language they type in search bar.

#### 3.1.6.2 Details

1. First when customer enter the app there should appear a selection button (which is in English) which language does the customer prefer, there are four languages options: English Chinese German Spanish.

2. When user select the desired language , all the information and interface inside app should be translated into the desired language automatically.

3. If user did not choose language selection , the user would enter the app automatically in 10 seconds and the default language in the app should be English and English would automatically be the desired language.

4. Inside the app, whatever language of the words user types into the search bar(the “whatever language” limited into Chinese, English, German, Spanish ), the words which the user typed would be automatically translated into desired language inside the system to identify .

For example: If the user select English as desired language when the user types in “酱油”, the system would first translate “酱油” into “soy sauce” automatically inside the system to identify and then the search results would still appear in English.

Other situations:

If the language of words the system can not identify , the system should tell the user that there is no result and it may be because the user type in wrong expression or the language is out of “Chinese German English and Spanish”.

### 3.1.7 Self-Service checkout

#### 3.1.7.1 Description

Customers could use the app to read the barcode of the things which they want to buy, and the app could count for the price of the things. Then the customer could give money to the cashier, who will check the customer's’ bill on the smartphone and the things they want to checkout, which significantly improve the efficiency of checking out.

#### 3.1.7.2 Details

1. First, when enter the app, there is a button called checkout online for customers. If the customers click it, there will transfer to the scan site.

In the scan site, there is an interface to access the phone camera to get the image of the barcode. 2. The customers could use this site to scan the barcode, once the app successfully read the barcode, it will print the things according to database on the screen, and ask whether it is the right thing they scan.

3. If the customers click no, the app will repeat the scan site, and if they click yes, the app will add the things to shopping cart, and turn to shopping cart site.

4. In shopping cart site, there is a button to add(scan) more goods, and a list of all the thing they want with their price.

5. The cashier check the goods, and the shopping cart, if they are correct, the cashier could ask them to pay for it. After all the deal be done, the cashier could use administrator account to turn the goods in shopping list of customer’s account to be with the state “paid”

For example: the user scan a barcode of a pan, then there is an item called pan in they shopping list, and the customer could see the price of it. Then he go to cashier, and the cashier check the shopping list and the things the customer want to checkout, if all is correct, the cashier get the pay of the pan and turn the item “pan” in the shopping list to be “paid”.

## 3.2 Non-functional requirements

### 3.2.1 External interface requirements

1. The interface access to smartphone camera should return the image of camera.

Priority 1

2. The interface access to Google should return the map, location, route.

Priority 1

3. The interface access to database should return the resource of shop, and goods.

Priority 1

4. The total time of reaction of all the interface should be in 2 seconds.

Priority 3

5. The communication safety of each interface should be ensured.

Priority 3

6: Interaction with the user will be provided by a command-line interface.

Priority: 1

7: Interaction with other system will be provided by a web-based interface.

Priority: 2

### 3.2.2 Performance requirements

1. The EZ-Shopping system will be able to process at least 700 operation at a time.

Priority:4

2. The total time of installing the app should be at most 3 minutes.

Priority 5

3. Response to each interaction shall take less than 2 seconds.

Priority 2

4. The EZ-Shopping system shall only search objects only if the characteristics of the objects match the requirement of the customer.

### 3.2.3 Design constraints

1. The EZ-Shopping system shall implement a computational grid.

Priority: 1

2. Programming language.

Priority: 1

3. The EZ-Shopping system shall only search objects only if the characteristics of the objects match the requirement of the customer.

Priority: 1

4. The EZ-shopping system will select the resource for the customers.

priority: 2

### 3.2.4 Software quality attributes

1. The EZ-shopping system should be able to run for at least a week without interruption.

Priority: 2

2. The database shall be easy to understand and operate to most staff in market.

### 3.2.5 Other requirements

1. The UI should be easy to use for 8-year-old to 85-year-old customers.

Priority: 4

2. The EZ-shopping system could be run on the majority of smartphone on the market.

Priority: 2

3. The language used in the product will be English, Spanish, German and Chinese.

Priority: 2

4. If the APP suddenly broken, the system will requeue the state of the processing.

Priority: 4

4.1conditions of risk occurrence and likelihood:

4.1.1product-related risk:

1. Aiming at function of search bar:

(1)The main risk would occur from matching degree of the input information with the expected data in database.

a. What if the same product may have multiple formal names and the database ignored some of them.

b. The customer typed in jargon name of the product and jargon name is usually not recorded in the database.

c. If customer type in several products to match which shop contain most of them the matching complexity and rate of successfulness would decrease rapidly and what if some of the products are matched and some of them are not matched.

(2) The information updating speed of the database for example one product has already been sold out but the available information still remain in the database it would make many troubles.

4.1.2 Aiming at function of linking google map to navigate

(1) Some stores may have several entries and the distances to the wanted products vary significantly for customer to reach by different gates and google amp usually only navigate to one of them.

(2) Some internal static maps of the shops are very complex so it would be very hard to depict accurately the position of the shelf number.

(3) Some customers choose the shops at the place which there is wifi like home ,office, school, but once they begin to start going to shop some 2G network or if in some place the network signal is not very well the navigation would fail.

4.1.3. Aiming at function of translation:

(1)The differences of syntaxes in Chinese, German, Spanish, English may cause inaccurate translation and it would cause chaotic in the database for matching the customer needs in the search bar.

(2)When customer type in words in foreign language in the search bar whether the reliability and the accuracy of internal translation could satisfy the need to match the inputs with specific information in the database.

4.1.4 Aiming at reviews and grades:

(1).Some unfaithful shops may virtually buy the products which they sell themselves by registering bunch of multiple accounts and make good comments themselves in order to improve the good rate of the product.

(2)Some customers do not making comments carefully and some of them are too lazy to select the comments.

4.1.2Process-related risks:

The The navigation function may occupy many internal memories so some customers would get stuck in using the app in their mobile phones or computers, if this situation happens developers should use parallel programming skill to address the issue and they may not good at it. (likelihood: strong)

The legal risk to use google map as navigation it may cause some legal issues.(likelihood: slightly)

The updating of database may cost bunch of time and human power after the app releases, the costs would add continuously.(likelihood: strong)

Due to the complexity of the app there are many works for QA team to test and once they observe problems whether they can have efficiently communication with developers.(likelihood : strong)

4.2possible causes and consequences

Consequence 1 (caused by 4.1.1(1)): If the matching degree of the input information with the expected data in database is very low it would cause bad customer experience and if the matching degree is extremely low the shops would lose huge amounts of customers.

Consequence 2 (caused by 4.1.1(2)): If the information updating speed of the database is very slow for example one product has already been sold out but the available information still remain in the database. It would cause bad customer experience that customer would be stood up.

（made by Feng MI）

Consequence 3 (caused by 4.1.1.2(1)):This may make the customer waste more time on the way to the shop they want to go. And when they step into the shops, there probably still a long way they need to go. By this means, the mood of our customers can be affected.

Consequence 4 (caused by 4.1.1.2(2)):When the customer chooses the route that the app presents and he finds the shelf doesn’t has the commodities he searches, he may think the shop do not have this commodities and stop concerning buying this commodities. But in fact, the shop may have this commodities.

Consequence 5 (caused by 4.1.1.2(3)):This may make customers think the navigation features unpractical. So when they need to find the route to a shop, they may choose to use other methods (for example, ask other people for help or use another app.) If this happens, the popularity of our app can be decreased.

Consequence 6 (caused by 4.1.1.3(1)):If the commodity list our app presents is not related with the willing of the customer, the customer cannot find the commodity they want.

Consequence 7 (caused by 4.1.1.3(2))When the translation in the description of the commodities cannot offer the customer the information that they want to know, this can make them believe that the translation feature in the app is unpractical to use. So they will gradually forget this feature if this happens many times.

Consequence 8 (caused by 4.1.1.4(1))When this happens, the customer may felt that not only the shops is dishonest, but also our app.So when the next time they want to see the reviews and the grades of the commodities, they won’t choose to use this app.

Consequence 9 (caused by 4.1.1.4(2))The customer may feel that the values of reviews and grades in our app is lower than other similar apps because other apps may have better mechanism to avoid this happen. So when they want to see the reviews, they will choose other app instead ours.

Consequence 10 (caused by 4.1.1.5(1))This may cause that many shops do not support our app, they think if some customer stole some commodities, the profits may become lower by using our app.

Consequence 11 (caused by 4.1.1.5(2))When the cashier cannot deal with the E-Statements generated by customers using a QR Code scanner, this can cause not only the cashier and the customer but also other people waiting in line waste a lot of time.

Consequence 12 (caused by 4.1.2.1(1))Some customers may uninstall the app in their mobile phone because the app run in a very slow speed. Besides, when the shops find our software cannot run smoothly in their computer, they will not choose to support our software.

Consequence 13 (caused by 4.1.2.1(2))This may cause our app’ reputation decreased. Furthermore, if this happens after the customer gets used of this features, they may feel very frustrated because this change make them life very inconvenient.

Consequence 14 (caused by 4.1.2.1(3))This may cause the profit that our app make become less. So other aspects of our app (for example , the number of employees or the funds invested in research can be influent by this way.

Consequence 15 (caused by 4.1.2.1(4))This may cause the quality of the software decline. When the software quality decline, our Market Share of Brands also decline.

**4.4 countermeasures**

**4.4.1 Aiming at function of search bar**

a. We can give a more detailed description of the product from the database in order to avoid this risk. Also, updating the database regularly will ultimately reduce the risk by constantly updating the descriptions. There will also be a section in which customers can make any suggestions about the searching problems.

b. We can provide the algorithms to balance between the distance and the matching degree of the product. For example, if a customer would like to buy seven kinds of products, and there are two stores, and one store has six product matches but is 20 miles away while another store has five product matches and is only five miles away, the one which is more balanced will have priority. This will cause the second store to be at the top of the list.

c. Communication should be developed between the software developer and the store information department regularly to get the information about the product that has been sold out and newly produced items.

**4.4.2 Aiming at function of linking google map to navigate**

a. When providing the store information, a more detailed location should be presented. For example, when one wants to buy fruit, the correct entrance of the store will be given to get the customer to what they want to buy in less time.

b. If the customer starts the navigation but there is no signal, the app will provide a detailed static map instead. If it is hard to depict the accurate position of the shelf, a range of the shelf numbers will be given instead to narrow down the results.

**4.4.3. Aiming at function of translation**

When some foreign words were typed in the search bar, it will be transformed into some english keywords and then start a search function in our database to avoid chaos. The translation database should be updated regularly and if it still doesn't work efficiently after a while, maybe we will give up our own language database and link our app to the google translation database.

**4.4.4 Aiming at reviews and grades**

When a comment is sent, its IP address should be detected and recorded. If the same ip address shows up many times in a period of time, all the commands sent from that address will be deleted to avoid the virtual comments. In the meanwhile, useful comments can be awarded as a motivation for more active message.