

## An online food ordering system for people in university

Introduction to HCI

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## **Abstract**

With the increasing popularity of food delivery in colleges and universities, the traditional telephone order food has inconvenience to the customers and the food delivery store. How to make the food-delivery more quickly and conveniently has become a concern of many college students.

So this report explores and develops new takeaway apps that are easier and more object-oriented than existing apps. Food-delivery app has easy and simple features, but now the food-delivery app is no more convenient for students or working staff, the overall is relatively old, not novel enough, cannot attract new users. Based on this feature, we decided to design a system for students and staff.

The food-delivery should be timely, convenient and comprehensive, many food-delivery systems today, but the function is not comprehensive, and some did not meet the requirements of timely delivery, for international students, not friendly enough. Payment is too simple, layout is too rigid, and the update of information is not timely enough. While we are developing new systems, we keep the basic on-time features that take-out systems have to offer, along with new, new features specifically for students and staff - delivered on time and more comprehensive recommendations.

We first picked three representative people, then use induction and the guidance of Nielson's to development and improvement app .Through three different types of people for the design, the improvement of each, and finishing integration to meet the three types of people ordering food. In the communication with three people, found deficiencies, and make improvements. Using induction and the guidance of Nielson's to analysis in ten convenient.

The new takeaway system makes it easier for students and staff to meet the needs of most people, with a more innovative layout and more appealing to new users.

Key word: Food-delivery, Innovation, Convenience, students, staff

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# 1 Introduction

The online food ordering service is a local restaurant and food cooperative website or application for customers to provide more interactive menu so that the ordering process could be carried out. Ordering food online is designed for its more flexibility and performance, some website or application are make sure that the system has enough navigation function through the picture information or significant logo to guide customer like students follow the steps to finish the ordering food process, apart from that it has been constructed to dealing with large number of orders simultaneously to prevent the food overload. Basically, this online ordering project illustrate how to supervise for good performance and better services for the University users.

All over the world wide, the food delivery already account for the £83 million, the one percent is form total food market and including the 4 percent restaurant and fast food chains, in many mature countries, this number of growth rate will continually to increase at 3.5percent in the next five years, by far, the traditional category that waiting for the restaurant to bring the food to the customer has stands 90 percent, but almost three-quarters are still using by phone (Hirschberg et al., 2016). In this astonishing rate of online ordering may still hide some disadvantage or problem need to handle it, such as website costs, infrastructure cost, security and fraud, privacy laws, computer ethics, advertising cost and customer cost (nibusinesinfo.co.uk, 2015). However, all current ordering applications have more or less problems that cause different groups of people to encounter some problems when using these applications. In this paper, we will analyse the advantages and disadvantages of some existing applications, and finally we will design a application that solve the problems we aim.

## **1.1 The define of existing problem**

In universities, the most common phenomenon is that owing to variable timetable and study pressure during the examination process, it could be more difficult for students to decide when and where to have their lunch. For example, there is just a limit time like 1hour in the lunch time that students could not finish their lunch on time. The data demonstrate that in New York, three of top 10 university have a good showing when examination almost coming, and like University of Virginia has increased 25 percent order spike in the finals NO.8 date (Svokos, 2015). Thus, many online foods delivering requirement derive student take consider the quality of delivering food, timeliness, manoeuvrability and relative accuracy.

To solve this problem, we are going to develop a system, which is designed mainly aim for three groups of people, students and teachers and staffs in university. Using this system, students could have an option to upload own timetables, the system will automatically recommend suitable choices of different restaurants available in this specific time. And this application will have decreased as much as possible to avoid behaviour failure while entering the system, there is no formal knowledge for students to apply it. The main purpose is designed user-friendly Online Food Ordering System.

## 2 Literature review

The present online ordering food economy allow users to apply a single tap of their mobile phone to order from a wide array of restaurants, so the team want to checking some literature to understanding in what reason online food delivery are quite important for people in this century.

this section should situates the team research ,which is need focus on the wider academic community in the online ordering food and to identify the gap within that the literature that the research will be need to address. and the main purpose of literature review is that combine with understanding of each work, point that in which way could fulfilling the need for other research, and located the team own design in the background of existing literature is the most significant point (Ridley and Diana, 2012), through the further study of tracing the intellectual progressing, the team could ability to accumulate the methods of research and study in the literature, and it also as a basic step to be contrast consider and analysis the existing system, and give the positive feedback about the problem that existing system could not be solve it. Hence, following parts will through APP design integrity, specification, use requirement, common issues and emerging technology to analysis the role of online food delivery system in markets.

### 2.1 App design

Online ordering, as a wonderful platform to provide expanding choices and conveniences over the last decade, it allows increase customer stratification and engagement has a long way since 1999, as well as the use of mobile order has been rise rapidly,

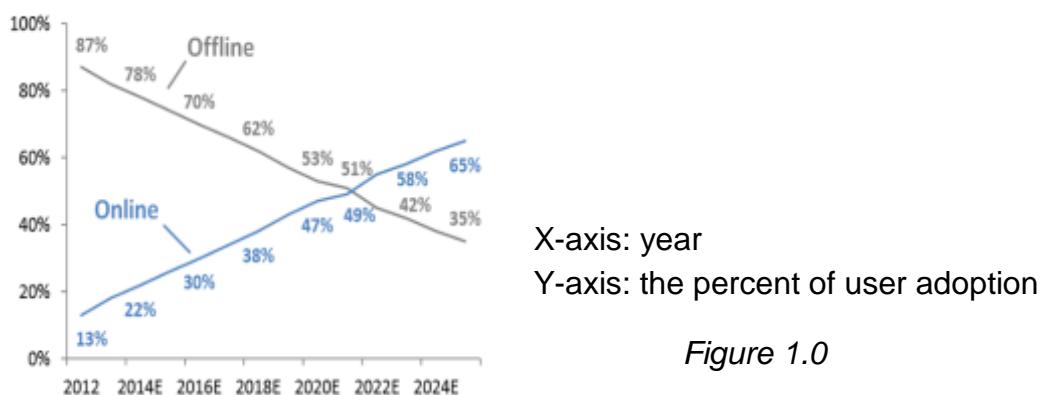


Figure 1.0

Online source: [/www.linkedin.com/pulse/food-ordering-delivery-system-what-how-why-where-rajesh-prabhu](http://www.linkedin.com/pulse/food-ordering-delivery-system-what-how-why-where-rajesh-prabhu)

As the growing statistics could reflect the trend of the further online food delivery already make also more convenient and prevalent way than offline, and it could also account for 65% market share, the more straightforward reason is that innovation app design make people life more easy and reflect a comfortable or high-tech lifestyle (Prabhu, 2016). So, the more effective design is aim to make sure that system accurately matches the demands or intention of users, and as the food delivery take their own place through the rapidly spreading around the world. And the next is that communicate value in messaging, which is described system should contain the reminder if the system have some features shift, at the least, those message may give some value for this open APP, and the exchange between value is crucial to receive the new customers, even sometimes, remaining the existing user is cheaper way. Finally, adjusting inside of app design could as visual sense to affect customer satisfaction, and the main elements is contain about pictures, words, colours, icons and negative space.

Mullany(2016) studies planning ahead for optimal app experience is the first way to understanding which features are most valuable for users to care about, and this step is aim to guarantee this mobile application is worth to open. In another study, freemans (2014) state that in most conditions, the user's sense of enjoyment have directly function to trigger the further ordering food impulse. The particularity of visual optimization will play the important role for user have healthy and enjoyment way to use it, this design should be lies in the redesign of the design basis. This means that many data reviews can be obtained from the original version, and the user has the attitude of the current original visual design, or like, or habits, or tired, these are the points to consider when doing optimization of APP.

## **2.2 User requirements**

A formal statement of user requirements it is include the expectation of users and identifies the requirements are mandatory. 'Uberification of Everything 'article pointed out most of user would like use food-delivery system owing to buy their times and save their effort, the reason is that a great deal of online restaurants give the customer different discount and offer available (Prabhu, 2016),

The research has also identified five specific reason for convenience choices (Juggernaut- Powering on Demand Apps, 2016),

1. Decision convenience -people could view rating and reviews of restaurant, after than their will order form accordingly.

2. Access convenience-people could eat food when they have hungry eating time, since some online delivering application like hot meals may take 15 minutes to go into their location by Spoon Rocket.
3. Transaction convenience-people could selected payment way that they prefer like pay with or Apple Pay.
4. Benefit convenience- people could have more than one choice in selecting restaurants and get it straight to their location.
5. Post- benefits convenience-it will more save time if people selected the food in the previous order details and selected the place that they already add in.  
in other study, Mishra (2017)state that online ordering process eliminates many problems in the tradition orders, for example, the staff in the restaurant avoid unable comprehend what the user orders through phone, maybe difference accents or background interfered, in contrast , it is other significant demand for user to select online delivering food system (Beltis, 2016).

And the team need to focus on the efficient and simply functional demands for user to make them more convenience, and it could play the most important way to decide the successful system maintenance (Hirschberg, 2016).

Thus, in order to meet the customer demands, there is following strategic and research is most of customers' expectation in the food ordering and delivery system (Project, 2016):

1. The home page may need make the web interfile to provide the avenue automatically location where customers will be gather more and valuable information about what about the fast food delivery really does.
2. It could provide the searching facilities by different factors, such as food, shopping cart, customer own, and order.
- 3.This Online Food ordering also assist manage the delivery address online for user details, order details, Food as well.
4. It could receive the order for food, stored and printed it for the customers. Editing, adding, remove, or update of recorded is aim to improved which result could analysis the favourite food for the different type of students.
5. It tracks all the information from the item category, delivery address, customer location etc.
6. It will tackle with monitoring information and transaction of users.
7. Classification the source of item category.
8. Show and explain the information of the food and shopping cart.
9. Manage the information of customer.
10. Requirement whenever the need is prefer to online or by cash in person
11. It will also help them to easy retrieval of orders made by the customers.

## **2.3 Common issues**

Worldwide, the online food delivery market stands at € 83 million, in the next five years, there is a continuous growth rate at 3.5 percent, by far, the traditional model which is waiting for the restaurants to bring the food to the door, and this traditional category has own 90 percent market share, and almost three-quarters are still by using the phone to order a food. In some cases, the online food delivery still have problems.

In recent years, the traditional online food delivery tend to the development direction of Open Table, basically, they are "top-down", starting from the street sweeping, collecting a large amount of catering business resources, improving online service content, and gradually attracting consumers to use online mode to order. However, in the absence of traffic, the lack of existing consumer online ordering habit to develop under the premise of small sales of merchants, some businesses are short-sighted and pay less attention to online ordering and information maintenance, consumer will not come back, since the poor experience.

Sinha (2017) also illustrate psychological customers are not ready to pay for expensive food transportation costs. (DoorDash edits 20% more restaurant listings in the restaurant menu, so customers will not be "starved of stickers"). On the contrast, it will also be a problem if spent a lot of money on hiring delivery driver. These costs continue to grow as the company grows. Lora.S(2016) has proven that removing the rush increase customer loyalty, improve restaurant branding, increase flow of orders and minimizes errors during processing orders are more important technology that the system are desirable to have, in some case, the right direction ordering system software is the solution to allow user apply and enjoy a steady flow of online orders. Also. As the research show over 50 percent people just want to use the app roughly once a month. Design simpler and valuable information of app is other problem that could make user friendly.

## **2.4 development trend of online ordering system**

In the past, many restaurant chains are more upmarket and independent and they do not offer the takeaways or home deliveries (Project, 2016), however, recent year the specialist areas will take the vital role of intermediaries in the provision of home delivery system according to two core subjects (restaurants and customers) and replace the traditional system of customer using the phone communicate with restaurants instead of design websites or mobile app with multiple choices. Thus, Jemima demonstrate the study of the four trends

- 1) many companies within the industry will integer and expand market penetration, as the huge amount of market demands and unsaturated online food ordering market still need to explore the innovative and suitable application for user to apply it. Because of exploit the online food ordering potential the second trend need extrapolated is:
- 2) The growing period of online food ordering system into the more niche markets, the 2015 fortune article highlight the market space available, and it reveal no one product will take over the whole market, however, Noah Karesh provide the new design idea that they could be make chef to serve meal wherever they want, whether is in the pop-up venue, for dinners, we are attempt to create the next global restaurant. So combine with trend 2, there will fetch the next trend:
- 3) Proper financing and technical knowledge properly scale up will allow the online food delivery system success to remaining the few in the strategically corner the market, e-commerce article, this pattern predict already appear in the internationally from 2016. And the next trend is:
- 4) Speed of delivery and flexibility and quality of product options will become the main streams methods to maintain customer-responsive, evolving business model. However, recent database and published there still lack of guaranteed or standardized quality assurance in many services, but, it is also represent the market is quite open-ended, hence, continuous evolving the food-delivery system is worth.

## 2.5 The conclusion of literature review

This literature review contain a wide range of academic areas of study, app design, user requirement, the negative problem, the online ordering trends of the markets. And those research could give the team some suggestion to build a usability, simple, and more practical app with navigational information, the teams understand the most main ideas are needed to increase the apps memorability, recall how autonomous operate when they open a function and allow users have a better experience to solve inconvenient problems .

Apart that from that simplicity and memorability principles also allow the team to consider the layout of app design, for example, in our design, we decide the new online delivering application should have suitable image contrast rate, special color background and some special page icon, through understanding about the main elements that affect the app design, the team consider that it may be minimize time form app selection.

Whereas, through common issues and the development trend in the markets, the team could learn the mobile screen limitation may illustrate that the small size has a negative effect for users to use it. To overcome this problem, the team want to add the new function to show the different restaurants in the

map, ensure that users have their own positions among restaurants, this design may reduce the unnecessary steps during checking restaurants process. And it has also increase the user loyalty. and some common issues also reflect some online food ordering with lacking of some specification design and personalization, specially, as for university environments, the group of university students have demands than the rest of others, and they may choose online food more diversity and flexible timetable, as busy study pressure, they have higher demands the accurate of system information. And the team could combine the app design integrity and human-based management aspect with history of emerging technology to build new real time users feedback ordering food system.

To achieve that, the team learn about how follow the trend of online ordering system development and use the innovative method to attract customers in the simplicity, usability, memorability, and reduce general app vulnerability. And the team based on some extensive or relevant literature associated with the concept, trends, problem and feature of the online food delivery of mobile app, ensure that into the first-generation prototype and second-generation prototype, and minimal the layout and design was kept it consistent for user to apply it regularity. The next step is that what the team design should focus on which areas are the good design or system in the existing system and in order to take the advantage of the existing system that have a meal plan and preparation system.

# 3 Analysis of Existing Systems

## 3.1 introduction

To study our next generation of applications, we will look for the strengths and weakness of the application. We will analyse the existing applications, for which we carefully selected 4 applications or websites: Deliveroo, just eat, Food Delivery, and GRUBHUB. Every application or website serves the user. We analyse the user's satisfaction with these applications or websites. We also hope to study the strengths and weaknesses in depth and make suggestions for improvement.

We will analyse the four existing systems through the following aspects :

## 3.2 Usability

- Accessibility - the design of products, devices, services, or environments for people who have some flaws
- Efficiency - how quickly and accurately users can perform tasks
- Memorability - whether users can remember how to operate it after their first encounter
- Learnability - the ease with which users are able to learn to complete basic tasks successfully
- Errors - It refers to the possibility of making mistakes while using the application due to the unreasonable design of the application. This index should be control as small as possible.

### 3.2.1 Accessibility

All these systems could offer some customers taking away service, but they both lack of collecting customers reviews. Creating a food delivery website aims at clarifying what our users would like to eat, and when they want to eat their food, for that purpose, it is important to promote the accessibility for users. According to Web Content Accessibility Guidelines (WCAG) 2.0:

*"Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language." (Web Content Accessibility Guidelines (WCAG) 2.0 Guideline 1.1)*

### **3.2.2 Efficiency**

It is important to create a content that can guide the users to be more efficiently to have their food. As the guidelines says “Adaptable: Create content that can be presented in different ways (for example simpler layout) without losing information or structure.” (Web Content Accessibility Guidelines (WCAG) 2.0 Guideline 1.3). Using a format or char might be convenient.

### **3.2.3 Memorability**

For the ordering system, because the system is very logical, so for users, they only need to follow the basic ordering logic, they can easily remember how to use this system next time. This principle emphasizes whether a user can remember the application's steps after multiple uses.

### **3.2.4 Learnability**

The principle of learnability refers to that when a user first uses this application, the user can obviously obtain the method of using this application or provide a clear guideline for the user within the application to lead the user to familiarize with and completely use this system to finish what he or she wants to do. It is the most significant principle for the users who are not familiar with this application.

### **3.2.5 Errors**

To reduce the user's chances of making errors in using the application, it is important to follow the habits and logic of most users at design time, and designers should also reduce the factors that may induce users to make mistakes. This indicator also affects efficiency to a certain extent, and if some unreasonable designs lead to a higher probability of mistakes made by the user, it can also lead to a drastic reduction in efficiency.

## **3.3 Analysis of Deliveroo**

### **Advantage:**

- A. Deliveroo provides delivery services as well as marketing and order services, allowing it to provide food from restaurants that do not normally provide delivery services. It makes this application much easier for users to use. In another word, it has a good usability.

B. Open the search function and users will see a drop-down list of possible menus that may be searched which shows the number of these types of restaurants. This design can dramatically reducing the amount of time users need to search and consider, which is exactly how efficiency is reflected.



Figure 1.1 and Figure 1.2

### Disadvantage:

A. The restaurant name is not as clear. In some images, white text is difficult to read. In addition, it is very subtle, but these images have covered the black gradient to mask white text. This is a violation of the errors principle.

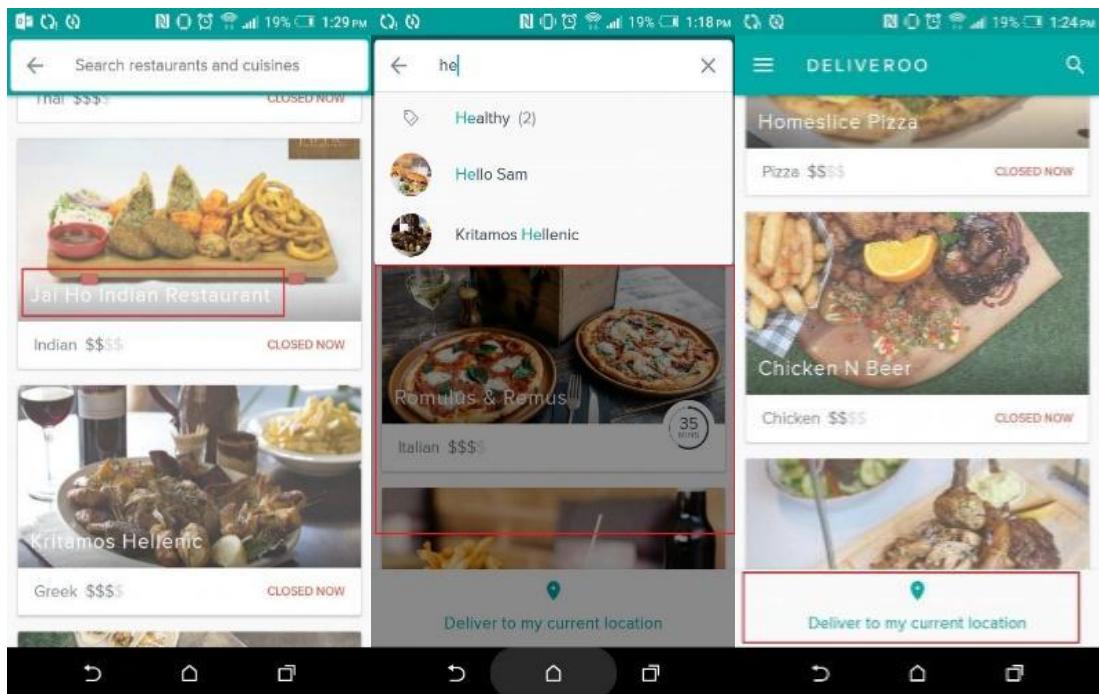


Figure 1.3 and Figure 1.4 and Figure 1.5

- B. When users start typing a search query, they can see that the search is overridden (users can view the restaurants below). This first attracted the user's attention. The images in the background are distracted. This is a bad design because it does not have a good usability.
- C. Deliveroo does not have any such filtering and quick sorting, although it provides the option to change the delivery time. This may result in inefficient user ordering. From the principle of efficiency, this design should be improved.

### 3.4 Analysis of Just Eat

#### Advantage

- A. (Om Tandon) Just eat gets down to business straight away by highlighting the core USP. "Order your takeaway online" is clear and concise. That follows the principle of learnability, users can easily learn how to use this website.



Figure 1.6

- B. The home page shows a group of family and friends to enjoy takeaway food. Red and yellow use emphasizes their brand. Vivid color is also the embodiment of good usability.
- C. Show restaurant name and delivery time, and Just Eat is more descriptive, name, address and rating. Just Eat makes sense when providing delivery and collection, so the user can decide to view the address and proximity, rather than choose to browse it.

A screenshot of the Just Eat search results page. On the left, there's a sidebar with filters for "Sort by:" (Street address, Quality score, Delivery fee, Minimum order price, Offers,侯客 first, Restaurant name), "Cuisines" (All (131), American (25), Asian (27), Chinese (16), Coeliac/Gluten free (8), Healthy (8), Indian (46), International (32), Vegan (1)), and "Delivery fees" (Free delivery). The main area shows a list of Indian restaurants: Ambala Indian Takeaway (Sponsored), Kathmandu Kitchen (Collection Only), Tadka House (Daily Menu), Rukhsana Tandoori (Collection Only), and Jawaan 5 in 1. Each listing includes the restaurant name, cuisine, address, delivery fee, minimum order, and a small image of the food. To the right, there's a comparison section titled "Info, comparison Deliveroo vs Just Eat".

Figure 1.7 and Figure 1.8

- D. "Just Eat" also provides a quick sort of filters that help you make quick decisions for customers to save time. This also shows that designers follow the principle of efficiency. This quick sort of filters can help users to find what they want to order quickly.

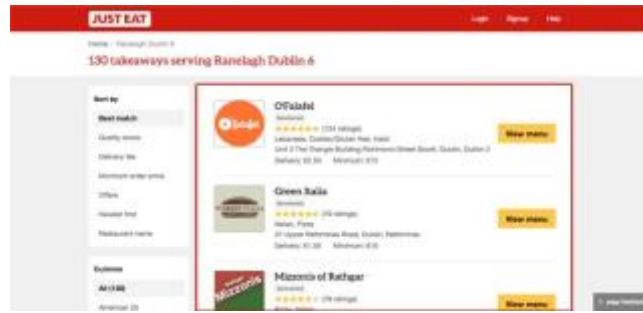


Figure 1.9

### Disadvantage

- A. Just Eat uses the list menu to populate static descriptive results, but only 3 options are displayed without scrolling. This breaks the principle of efficiency, users can not get enough information from the menu.

Figure 2.0

- B. Many people are wary of registration cards: Due to online fraud, most people do not want to register their cards unless they trust the service. In this case, even if you do not let them try your service, you lose. This is a very important function, designers consider different needs of the crowd, and for those who do not want to pay online to provide this feature. This is the embodiment of principle of accessibility.

### 3.5 Analysis of GRUBHUB

Link: <https://www.grubhub.com/>

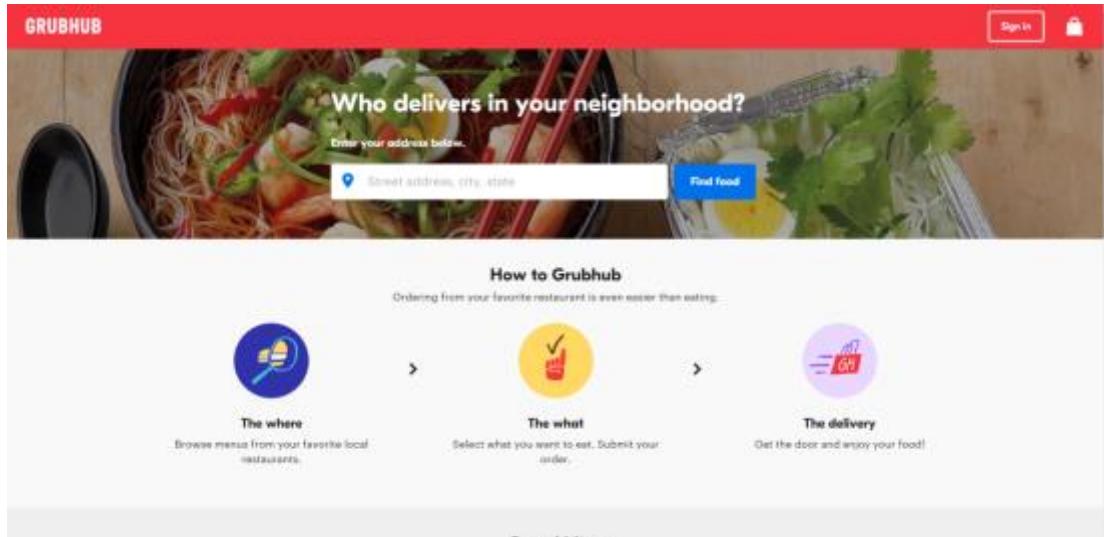


Figure 2.7

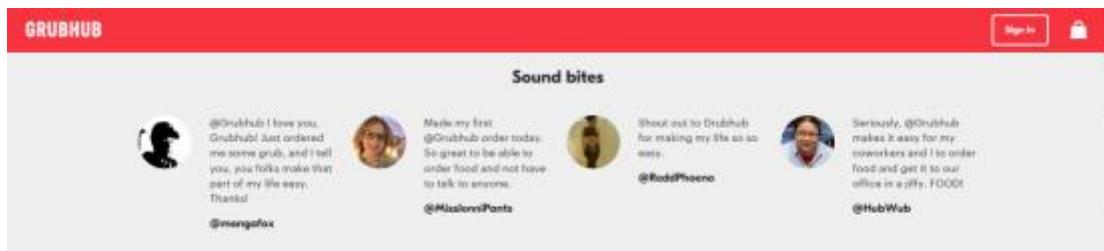
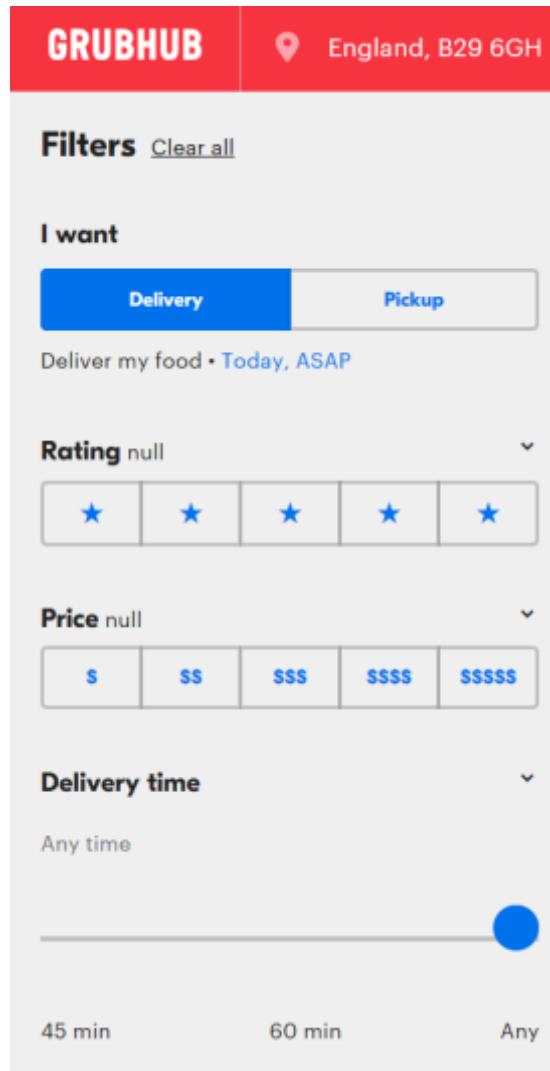


Figure 2.8



*Figure 2.9*

### **Advantages**

- A. As we can see in the homepage of GRUBHUB, there are three guidelines for the most central location of this interface which show users the procedure of ordering food. Obviously, this is the reflection of principle of learnability, users can easily understand how to use it.
- B. The designers design a slider to let users control the expected delivery time of food, which makes it more efficient to operate compared with a input box. This is the best application of the principle of efficiency



*Figure 2.10*

## **Disadvantages**

- A. Users cannot find restaurants around them, which makes it more difficult to make decisions. This bad design breaks the principle of accessibility that means this system has a poor usability.
- B. There is no classification of the restaurants. It takes users much more time to choose a restaurant, in another word, this system is not very efficient which breaks the principle of efficiency.
- C. No pictures about the food, users cannot judge by words whether this food is their favorite, or what the raw materials and practices of these foods are respectively. This feature makes this application hard for users to use, and it does not follow the principle of accessibility.

## **3.7 Summary**

The results of previous empirical studies and our own observations demonstrate that although existing systems are somewhat different from each other, they all have some drawbacks, which lead to some unanticipated problems encountered during use of the system, which leads to poor user experience. So, next we will develop our own systems that address these issues, combined with our own unique insights.

The above is a reference to the existing application analysis after the reference method. But beyond that, we have unique ideas of the system we are about to develop.

1. The application will give a prediction of the number of customers about the current restaurant, when the consumer chooses the restaurant.
2. The above forecast will act on the estimation of the delivery time if the consumer chooses to order meals in the restaurant.
3. If possible, we will design an extra system, which can be based on the nearby delivery man, traffic conditions, the number of customers of restaurants and other indicators to give a relatively accurate delivery time estimates.
4. When consumers browse the restaurant, the app should provide a clear interface to the restaurant.
5. When the user searches for a restaurant, the application should be greyed out to the other sections.

- When users do not want to use this application, you should add a logout button below the main page to facilitate the protection of user information.

### **3.8 conclusion of analysis of existing systems**

According to the current system of research, the team found that the current application to some extent to solve the user's demand for food ordering. We compared the four existing software and found that they each have their own characteristics, such as some for the user to order, some for delivery to the user. However, there are also many problems, such as lack of interface design, accurate delivery, distribution of nearby restaurants according to locations, and product modification services in the ordering process, which make it more difficult for users to learn and use applications. In addition, to further analyse the background and intended audience for this application, we will segment our target audience and analyse their respective needs and preferences. Then combine our analysis of the advantages and disadvantages of existing systems to create our own system.

When it comes to evaluating existing software, it has encountered many problems, such as not being able to pinpoint the shortcomings in the first place and comparing each. Our team dedicated time to study these difficulties. For example, to find the different corner of the border, or drop-down box is covered behind the content. Also, the team members learned some of the advantages and disadvantages of learning online, according to these analysis of each part decomposition, and finally analyse the advantages and disadvantages. More, through the analysis of existing systems, we learned how to design a prototype and improve it better.

# **4 Analysis of Users Requirements**

## **4.1 introduction**

Dining is something everyone can do. According to the statistics of the Youth Daily, the take-away market accounts for 10% of the total food and beverage market. Many people use takeaway, which will exclude many who do not use takeaway. Personas role model is widely used to collect user's precise experience of the product. We should study the role in depth. Instead of choosing a single individual, we should consider the needs of different groups. Creating personas needs to meet most of the needs. For our purposes, we divided the target audience of this application into three groups.

### **1. Student**

Among the overall usage of applications, student type users account for the largest proportion. Mainly for very busy undergraduate students. They do not have much time to cook for themselves, resulting in less meal time and no time to think about where to eat the best. This application is useful for most students. For example, according to the get out of class time students automatically arrange each free time, so that students will not worry about reducing meal time, or far from the restaurant classroom.

### **2. Teacher**

The teacher is one of the users to consider. The teacher is the second largest group in overall app usage. Most teachers have busy teaching tasks and always eat during business hours. This has also caused malnutrition. More, many teachers are very young and require a simple ordering method. The application will try its best to simplify complex operations and allow users to quickly complete the order. Then, according to the free time to change the schedule and advance to achieve the purpose of dining. This is somewhat like the student model.

### **3. Staff**

Staff is not a lot of applications in the user. They want to be able to provide meals under efficient work. More often, they did not have time to dine with their family because of their official business trips. This application is important to them and caters to their.

## 4.2 First persona

	<p><b>Zhongji Song</b></p> <p>Background Age:23 Occupation: student(electronic engineering) Technology level: proficient in computer The frequency of takeaway: occasionally</p> <p>Main points</p> <ol style="list-style-type: none"> <li>1.a second years engineering student</li> <li>2. With a very busy timetable</li> <li>3.Always have no time to eat lunch</li> <li>4. Not used to western food</li> </ol>
<p>Goals</p> <ol style="list-style-type: none"> <li>1. to have lunch every</li> <li>2. To order he favorite food</li> <li>3. To eat something with high protein</li> <li>4. To eat hot food.</li> </ol>	<p>Personal</p> <p>Zhongji is a 23 year old man from Korea. He has a litter sister, He lives in the student's studio. Sometimes he likes to do cooking. Always having barbecue with friends. His timetable is very busy, sometimes he does not have time or place to eat food, always taking food and eating in the classroom.</p>
<p>Frustration and pain points</p>	<p>Technology</p> <p>Zhongji always uses the deliveroo to order food on the internet,</p>

<p>1. the food delivery is not in time, he always have no time to eat lunch</p> <p>2. He need the high protein food, but many food with the high calories.</p> <p>3. He want to have a place to eat the food.</p>	<p>He is used to use the app to order food. He has tried to use different software to order food, but only few of them can work.</p> <p>Because the app is not very popular in the Britain. So many restaurants is not added to the app, so many times he want to eat some home food but he can't find.</p> <p>Many restaurants want have good marks, some the app will give the app money to make the rank higher.</p>
---	---

#### Work

Zhongji is a 23 years old engineering student (2nd year) at the University of Birmingham. As described above, zhongji likes cooking with friends, but because of the busy timetable, he always have no time to eat lunch.

zhongji's classes are very important, in order to catch up with each lesson. He had to sacrifice the time of eating. So it's important for him to order food online and delivery the food on time, so that he can have lunch, many apps cannot support reservations and delivery time is uncertain. However the food without pictures, he don't know what it is.

Zhongji hope he can have a good meal, so that he has a good spirit to continue classes.

## Scenarios

1.

Last week Monday zhongji finished the class at 12o'clock, but he has to attend the exam at 1 o' clock. So he must go to G8 building in time. He want the restaurants to send the food to G8 building, and the next day, he had lesson in Y14 building at 1 o'clock, however the food need to send to the Y14 building as well. Zhongji had encountered only to the designated place to eat the food. It spend he much time on the road.

2.

Few days ago, zhongji has a meeting with his classmates at 12 o'clock, but he got up at 11 o'clock, so he need the food delivery in 30 min, so he want the app can provide estimated delivery time, however he want the time is accurate, because many of them have huge errors. He didn't want to miss the lunch but also be late. Many restaurants want to have a good business, they always give people a very fast speed, but the food delivery is very low.

3.

Few days after zhongji came to England, he didn't know which food he like, he can't judge by text. He wanted to order the fish, but the waiter gave the pork to him, he didn't know what it is, so he was unhappy during the lunch. He wants each food match a picture, so that he can choose the food he likes. Because of regional differences, The nomenclature of many foods is not very clear. Cannot point to your favourite food,

#### 4.3 Second persona

	<p><b>Susan Mccool</b></p> <p><b>Background</b></p> <p><b>Age:</b> 59</p> <p><b>Occupation:</b> teacher (Speech and Language Pathology program)</p> <p><b>University:</b> university of Strathclyde Glasgow</p> <p><b>Technology Level:</b> Good general computer Understanding</p>	<p><b>Main Points</b></p> <ul style="list-style-type: none"><li>1. have a healthy diet normally</li><li>2. Is more enthusiastic to interaction and communication with other people</li><li>3. Less experience by using ordering food Application</li><li>4. Short and unhealthy eating time in the working times</li></ul>
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<b>Goals</b>	<b>Personal</b>
<ul style="list-style-type: none"> <li>• the aims to is this app have amount summary per week or month</li> <li>• the aims to is this app be simple process when using the ordering food</li> <li>• the aims to is this app could pay by cash after receiving the foods</li> <li>• the aims are had more nutritious meal in her working times</li> </ul>	<p>Susan is a 59 years old woman who have a highly awarded Senior Fellowship of Higher Education Academy from Great Britain. She lives in a house, which is little bit far from her university, she has 3 three children s that working in the different cities. And her husband is also a teacher work in the Glasgow university. Normally, they all need eating in the university restaurant.</p> <p>Her favorite food is Pizza, and the color is purple. In her free time she likes to do some exercise like jogging, climbing mountains, Sometimes, she will ask her friends accompany with them to enjoy the fresh air and fantastic scenery when the holidays is coming, But, in her normal life, she is more obsessed with research about child and mental health in her university, since that is her life goal that helping child have more health growing process.</p>

<p><b>Frustration and pain points</b></p> <ul style="list-style-type: none"> <li>• Confusing about some foods ingredients</li> <li>• An overload of functionalist that are not relevant to him</li> <li>• Too many advertisements intervented</li> <li>• she cannot familiar with pay by card</li> </ul>	<p><b>Technology</b></p> <p>Susan McCool is usually use her computer, which runs Windows 10 operation System, owing to the working demands, she could more interested in using the new application, adding the more professional knowledge, higher logical ability and critical thinking, she could apply new application more easily.</p> <p>But there are less online shopping experiences that she have, because she could often consider about online payment security problem. however she prefer like Pizza, she do like ordering food in some restaurants in that it is easy way for her to talk about what she need in the restaurant. Hence, he never try the multiple choices of different restaurant in the one application.</p> <p><b>Work</b></p> <p>Susan McCool is a 59 years old teacher (more than 10 years working experiences) at the university of Strathclyde Glasgow. As mentioned above, she is outstanding person that enjoys using the new technological application. Thus, she could be more likely accustomed to multiple online delivering System</p> <p>The more significant reason for her apply this System is that she wish be earn the times from cooking food at home, and apart from that, in her working time at university, time is quite limitless, sometimes, she need order food more early, and then eat it when the food is ready .however, to have a efficient and happy food times, she aims to have a automate routine eating healthy or positive circle every week. It could make her have more times to enjoy leisure times and reduce the times when there is big queue in the restaurant,</p>
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	Hence, Susan Mccool wants to a healthy, regular eating habit as much as possible of using the online food delivery system.
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## **Scenarios**

### **quickly order the foods in limit lunch times**

In Wednesday, Suasan Mccool, she has plenty of lectures and meeting to attend it , and she could usually want order the food before, when she was looking forward some recommend restaurant food , through the option, she already send her working timetable and this app may provide a range number of restaurants that could have ability to delivering food on times, Susan Mccool could also take this suggestion to fix the busy time problem either to go new search find which new restaurant have offer new foods if she have times. However, she wants this online food delivery application to provide the function that could order food early, may be one day before, since she will have well-organization for another plan.

### **Finding a month eating analysis process**

Susan Mccool, she has a plan to buy some presents for her family in this year Christmas holiday, but she finds there is not enough money in her bank account to buy some gifts, so she wants figure out what is going on in her money activity, in this moment, she could use the money activity to understanding the money process through the some data or diagram, which is show how much money she has spent each day or months, it also benefits for her to realize does the eating foods totally prices over budget. after that she has a better plan to control the budget and buy some suitable gifts for her families.

### **ordering food more early in her working time**

In her working times, in the Wednesday, she has 3 lectures that need her teaching, sometimes she could more often forget eating the food in correct time, and she could usually buy sandwiches and fruits in shop restaurant. In this condition, she may expect that creating the notification in this online food delivering is great solution to alert ordering food, since she may also to order the food when she busy.

She thinks it will avoid less possible to select delivering restaurant that usually on times, because some restaurants are far away from her location, it may cannot be fast and punctuality send food on her hand in a short time. Thus, she proposal that the system will send some message in special times to help her order food early.

### **Pay by cash only**

Susan Mccool think most of online delivering services are only provide the option for paying by card before, but Susan Mccool wants to have different options, because firstly she could receive the food and make sure she could receive for security reason, and secondly, sometimes she wants to use some charges because she usual take some money for some emergency condition, such like buy some drink in small shops. But , the system must be verify the true information of Susan Mccool, after then, the security problem for restaurants also have some guarantees.

#### 4.4 Third persona

 A portrait photograph of a man with dark hair and a beard, wearing a red leather jacket over a white t-shirt. He is looking directly at the camera.	<b>Thomas Vulcovich</b>	
<b>Background</b> <b>Age:</b> 29 <b>Occupation:</b> Staff (School) <b>Technology Level:</b> General computer level	<b>Main Points</b> <ol style="list-style-type: none"><li>Has been working in school for several years.</li><li>Wants to work efficiently.</li><li>Has a little son.</li><li>Always order food online.</li><li>Wants the take away food be more fast</li></ol>	
<b>Goals</b> <ul style="list-style-type: none"><li>Work efficiently</li><li>Travel to more countries</li></ul>	<b>Personal</b> <p>Thomas is a 29-year-old man from Switzerland. He lives in a rent house. In his free time he likes to travel. He travels to a lot of countries and knows a lot of local customs and practices.</p>	

<ul style="list-style-type: none"> <li>• Create and manage a group named DBS Groups</li> </ul>	<p><b>Technology</b></p> <p>Thomas is using a website named Just Eat that can help him order lunch when he is working. He is very familiar with the ordering food websites.</p>
<p><b>Frustration and pain points</b></p> <p>Working time is too much so he does not have enough time to travel.</p> <p>Did not study hard when he was a student, so he lacks some technology.</p> <p>Enjoy the work as a trader but feels a little boring about his staff work.</p> <p>Too much useless information in the website that he uses, so he feels it is a waste of time.</p>	<p>Thomas has a good experience in these websites because he almost use them every day. Whiles, he is a good staff in the university and works hard. He learns some knowledge about advertiser and trade to manage his group.</p> <p><b>Work</b></p> <p>Thomas is a 29 years Staff at the University of Birmingham. As described above, Thomas is an outgoing person who enjoys spending time with friends. Thus, he pays much attention to the balance of living and working. He is trying to do something he like after work. He works as a staff to offer some help for students, is a busy work.</p>

<b>Scenarios</b>	
Have lunch during working time.	As he enjoys travelling, he often posts some pictures in Facebook, and print some pictures. .
Eat a family dinner	
Eat during travel	

### **Scenarios**

#### **Have lunch during working time.**

Thomas offers help for the students, so he is always busy in working times, thus, he often has lunch after lunch time. He enjoys ordering lunch online, but due to his lunch time is too late, most of the restaurants do not deliver food at that time, there are only a few choices he could make. He says that an app could help him having lunch on time is useful, or what he could have for lunch is always sandwiches.

Now, with our app, he could order the food before he come to work. He books a time that he want to have lunch, and then the order will be sent to the restaurant, the delivery will be the time he book. Except that, he also has time to choose what he like.

#### **Eat a family dinner.**

Thomas always do something online after work, he often spends much time on dealing with pictures. and he almost have no time to cook, neither does his wife. Thus, he does not have much time to choose what to eat. So, he always hopes to order his dinner before he backs to home and he could have enough time spending with his family. Our app collects his favor and offer him the food he may like, that can help him save some time and he could do something else instead of scanning the website to choose food.

### **Eat during travel**

Thomas is a group manager, so he always travels a lot at his free time, especially at weekends. Once he went to France, He felt really upset because he could find something to eat. He was in Paris alone, and didn't know where to eat his lunch,

In the end, he had to eat fast food. These situations occur several times a month. Thus, he wants some app that could help him eat suitable food when he is travelling.

## **4.5 Summary**

The simulation of these target users is a very valuable process and it is very important for the team. It enables teams to understand user needs day after day. Helping to design specific application functionality. Each target user's research needs to be considered in the application and can help find hidden vulnerabilities that can be addressed before designing. The role of the scene is the embodiment of user needs, we can directly see what our application needs.

Based on the three users we analysed, and finally, we chose three roles and we tried to find the difference in the narrow target audience.

Every role we define has requirements for the application:

1. The application needs efficient operation, rapid analysis of the schedule and restaurant distribution.
- 2 application steps are simple, do not need to learn.
3. The application should automatically locate the user's location, even if it is far away.

In addition, we have designed three scenes for each typical character. Next, we will use these three requirements and their scenario to analyse the prototype. In addition, we analyse the pros and cons of each prototype and analyse whether the prototype fits the principles we mentioned earlier. Finally, we will make significant improvements on the second prototype.

# **5 First generation prototypes**

## **5.1 introduction**

In this chapter, the process and results of using schedules and subscriptions are first designed and included in the new prototype. According to the principle, three prototypes are proposed, and finally the basic principles and results of the prototypes are summarized.

## **5.2 Prototype Rationale**

To guarantee the diversity of prototypes, each team member will be designed according to (Jakob Nielsen's, 2014) 5 Components of Usability, which is the most important part of the process. Use the method to put certain functions into the application.

We designed three prototypes that were originally designed using pencil and paper in a very rough way. These designs are unclear and do not contain all the correct details. According to these shortcomings, the prototype will become concise, and make full use of the blank. Before creating a prototype, you need to carefully consider the user's needs for the schedule and include the prototype. According to the existing application analysis and investigation, unnecessary functions do not need to join the application, which will affect the user's efficiency. A complete application is a big challenge, which takes a long time to study. The team finally decided to focus its research on the main requirements, allowing team members to design in the same direction, guarantee accuracy, and develop the region.

### 5.3 Prototype 1

#### Page 1 – Log in

This interface clearly reminds users that they need to enter their user name and password to log in to this application, including logins for larger fonts at the top of the page. In addition, under the user name and password, there are forgot password options for those who have forgotten the password. For those who use this application for the first time, they can register to use the application by clicking the "Register" option at the bottom of the page.

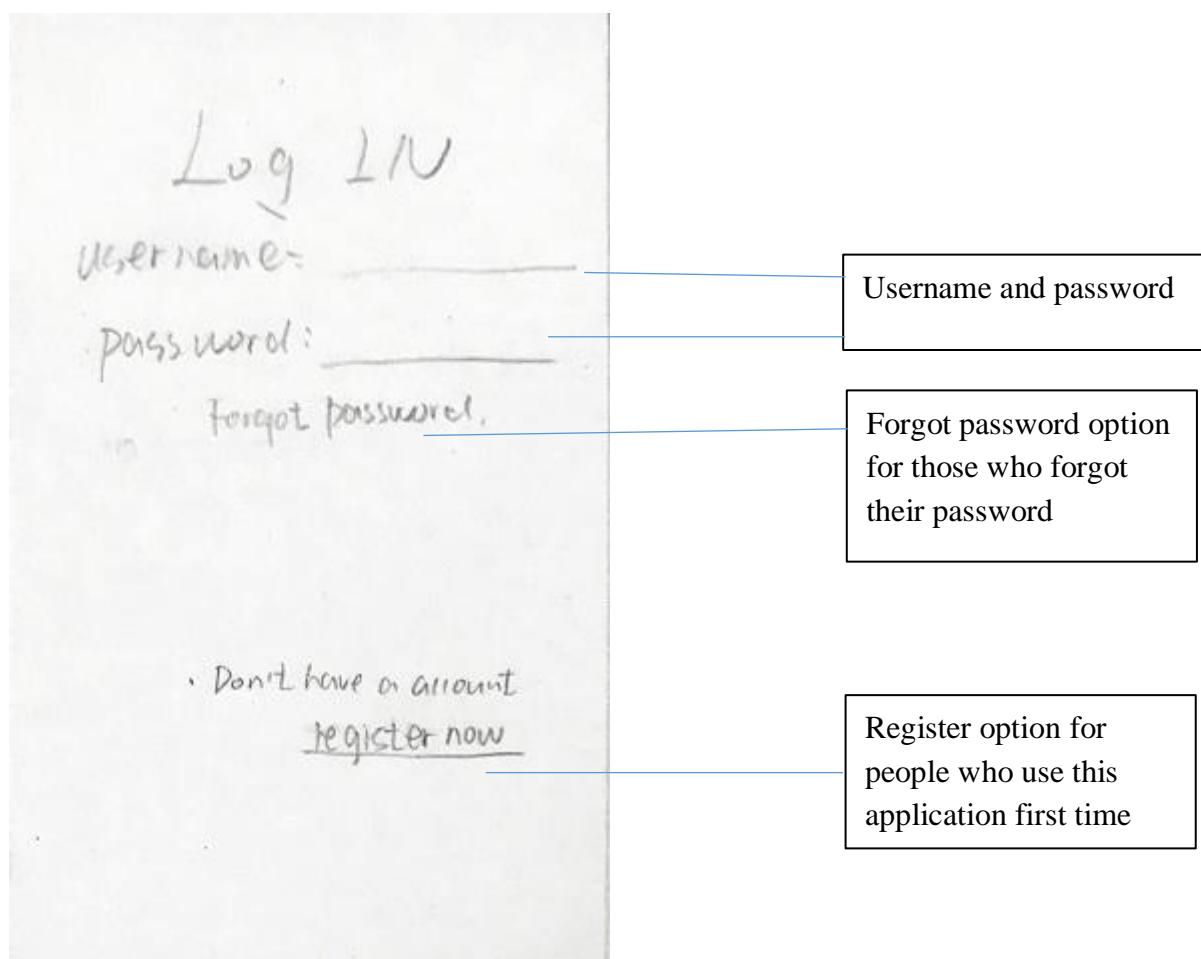


Figure 3.0

## Page 2 – Set regular meal times and places

Since a large part of the population targeted by this application is college students, due to the diversity of student schedules, we will pop up a reminder on the first login to solicit user input if they want to set their meal times and places. If yes, it will jump to figure 3-1 and 3-2, if not, it will jump to figure 4.

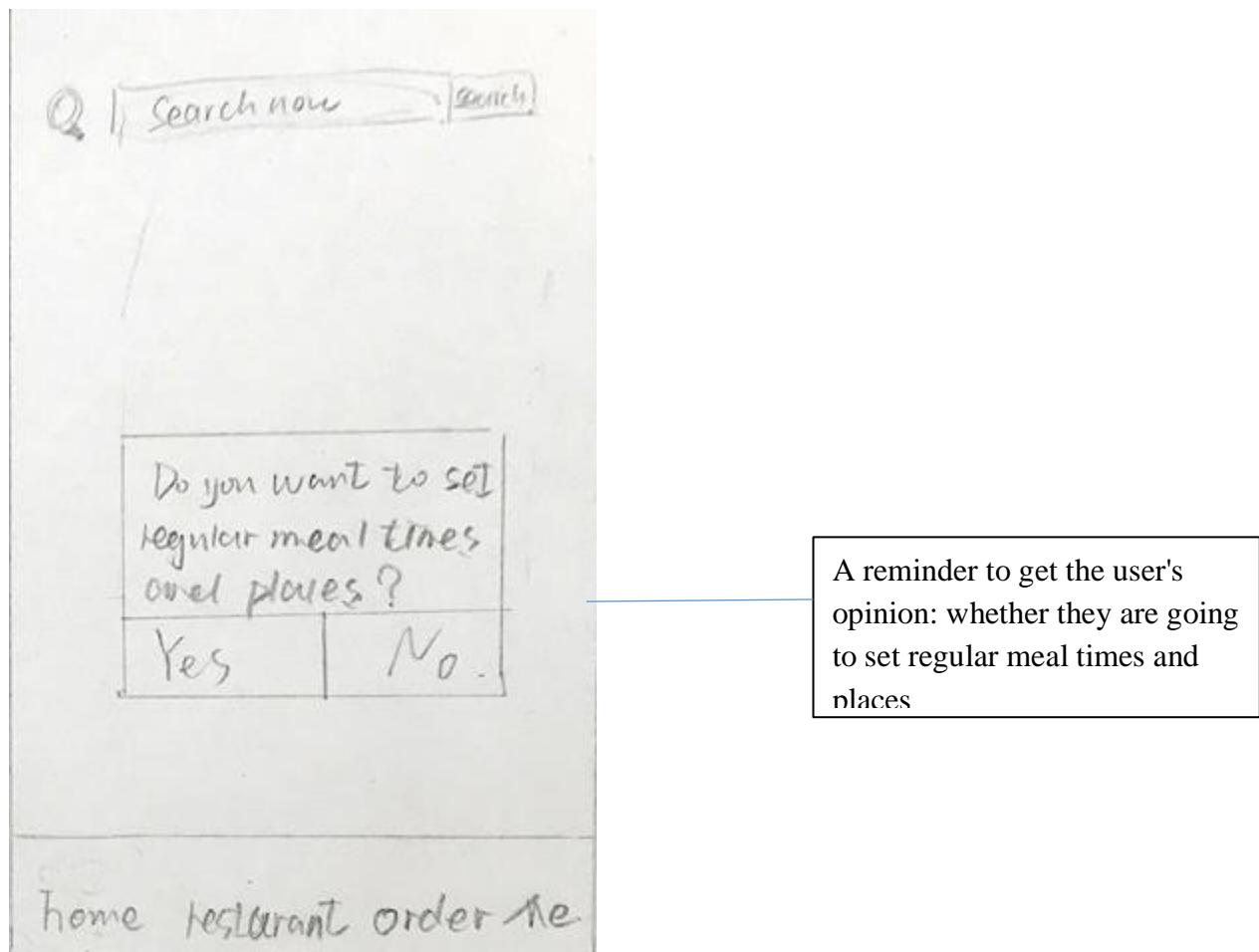


Figure 3.1

## Page 3-1 - Setting regular eating time

Because of the inconsistency in class time during the week, students can set their desired mealtime on any day of the week, and once they have completed this step, the system automatically recommends the appropriate restaurant based on that data.

skip

Your Regular Eating Time.

Monday :  +

Tuesday :  +

Wednesday :  +

Thursday :  +

Friday :  +

Next

A return option, in case of users clicked a wrong button in the previous step.

A skip option, if users do not want to set mealtime in this step

In these areas, users are free to set their expected time for meals

Figure 3.2

## Page 3-2 - Setting regular eating place

Due to the diversity of students' class locations on a daily basis, student users can select multiple of their potential places to dine in this interface, which they can then choose as places to dine during subsequent meal ordering.

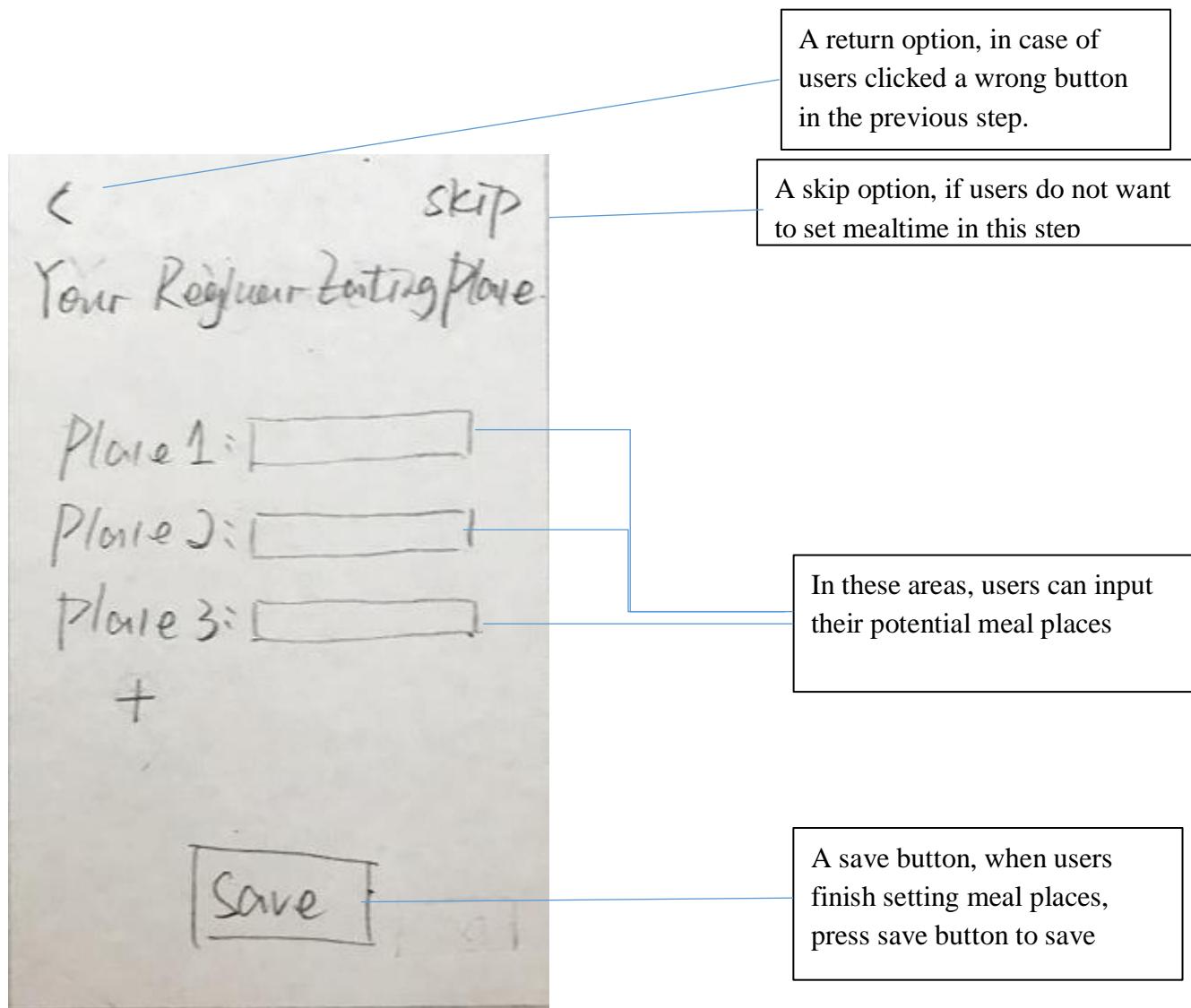


Figure 3.3

## Page 4 – home page

The homepage of this application is a location-based restaurant presentation system, there are several ways to rank nearby restaurants, Such as comprehensive evaluation, the nearest, the fastest delivery speed, the highest rated and so on. Most significant is Restaurant Recommend, the application automatically analyzes the user's previous order behaviors and analyzes the user's preferences then recommend restaurants that users may like. At the bottom there show different buttons for user to follow the step and analysis the understanding what it going on in this application. Additionally, following the principle of efficiency, we added the map function in the upper right corner, the user clicks on the screen will show all the nearby restaurants, for the user to choose. In addition, we added a logo that shows the distance of the restaurant from the destination and the estimated delivery time.

User can click the map and the application will show all the restaurants around

This is a sub-system automatically analyzes the user's previous order behaviors, upload the timetable and analyzes the user's preferences then recommend restaurants that users may like

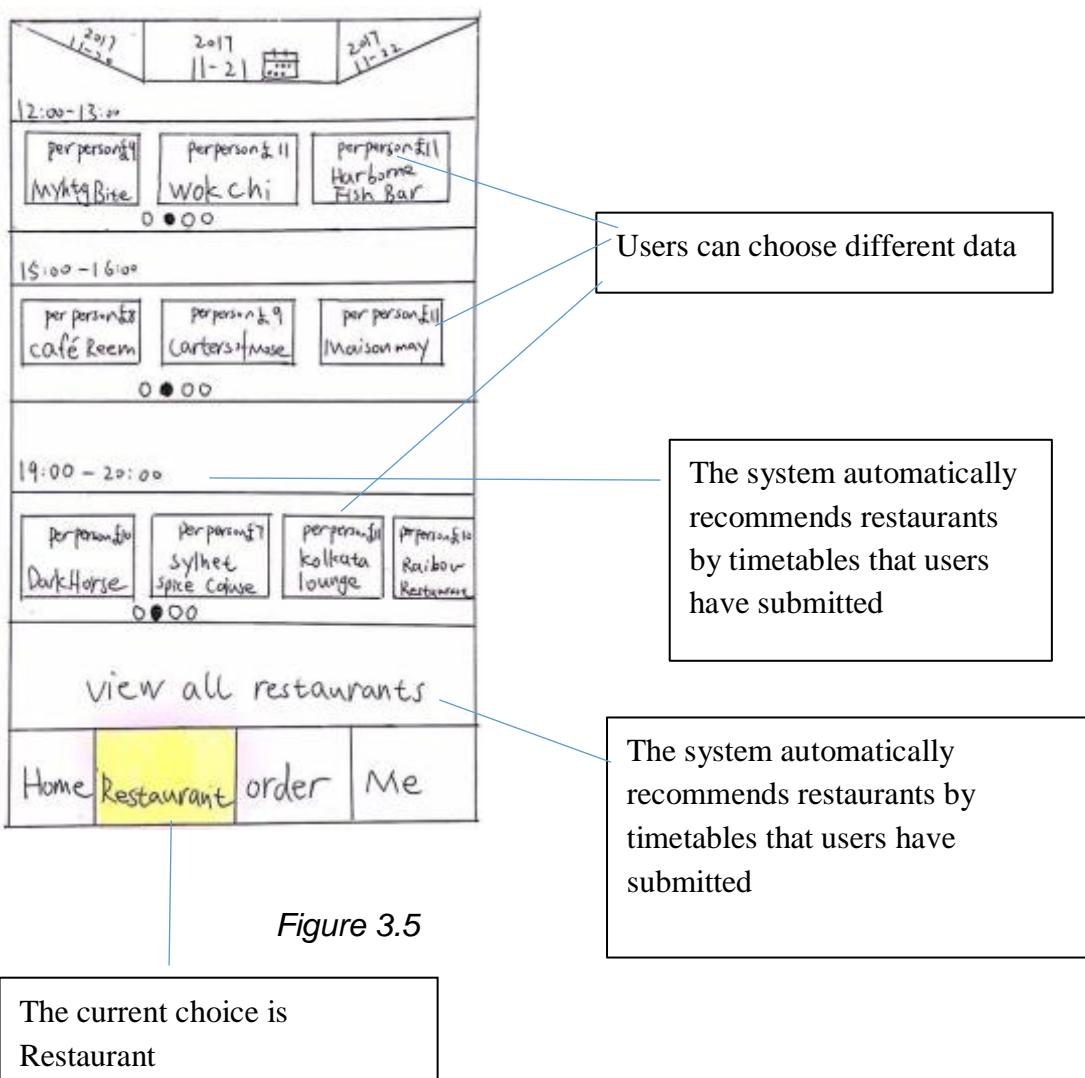
It shows the distance of the restaurant from the destination and the estimated delivery time

Figure 3.4

The current choice is home

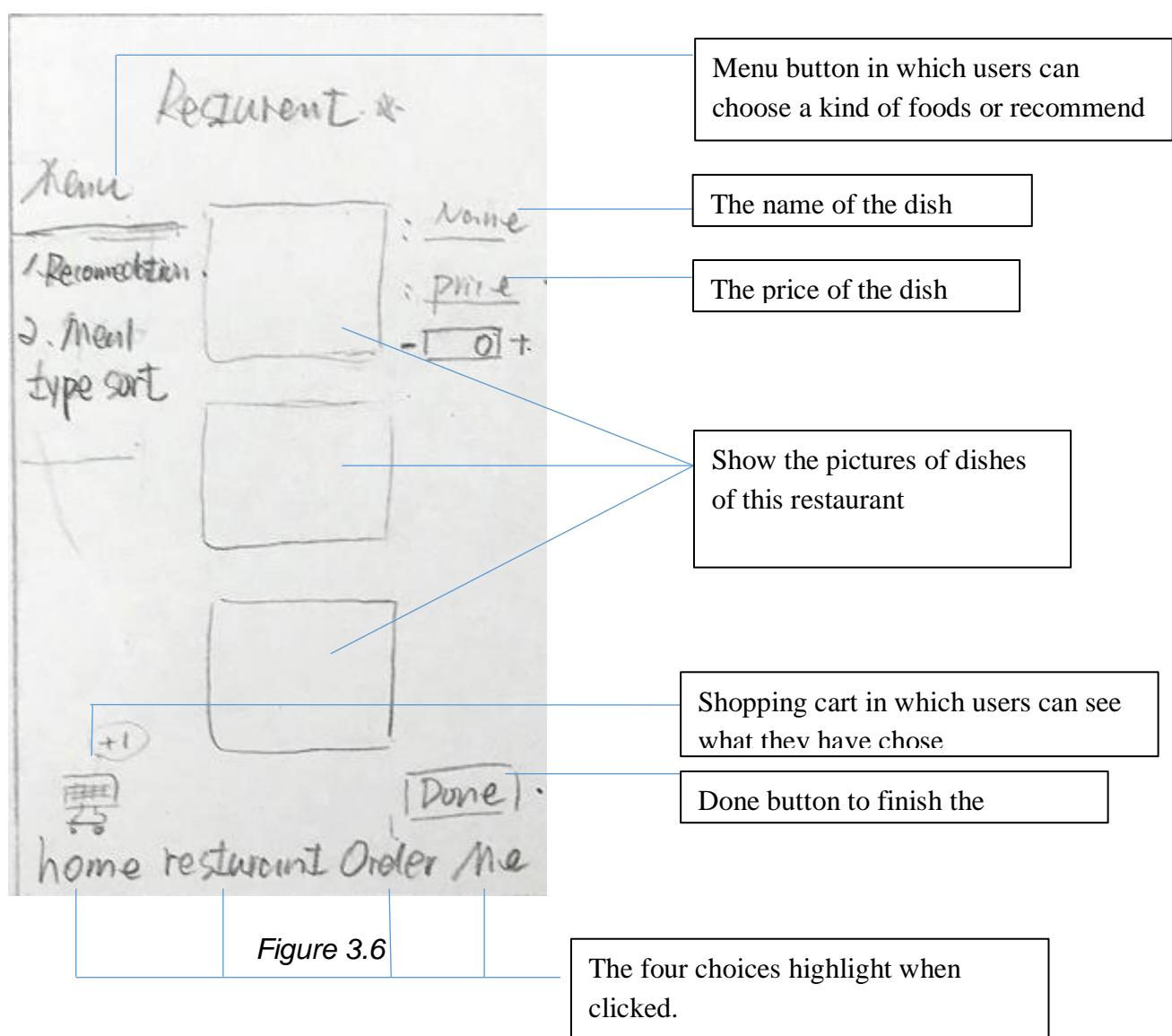
## Page 5 – Restaurant page

In this restaurant interface, the top is the date adjustment, the user can see whether the restaurant in different dates is open. At the bottom, the automatic interface is automatically matched by the system based on the user's uploaded timetable. If the user wants to see all the restaurants, they can click the view all restaurants button at the bottom of the screen. After that there will prompt the search box and different food categories by side, such as Italian, French, Thai, Spanish, and more.



## Page 6 - Order process

This interface is displayed when the user enters any restaurant. This interface shows pictures of the restaurant's dishes, which makes those who are unfamiliar with dishes understand the raw materials and practices of the food, allowing users to better determine the foods they choose. In addition, this interface also provides the price of the display and the number of buttons. The bottom left corner is a shopping cart button, the user can view the selected dishes through it, the bottom corner is the Done button, the user can click it to complete the shopping.



## Page 7-1 – Order page 1

This screen will appear, when the users click the done button. This screen shows details of this order in detail: order details, shipping costs, total price. Below shows the delivery location, estimated delivery time. And the Confirm button for users to confirm this order.

Order

Order ideas : \_\_\_\_\_

delivery fee : \_\_\_\_\_  
pureed : \_\_\_\_\_  
insurance : \_\_\_\_\_  
Prices  
Prices

total : \_\_\_\_\_

Place : \_\_\_\_\_

Time : \_\_\_\_\_

Reference: \_\_\_\_\_ | Confirm

home restaurant Order Me.

The order details will show you the price of the food and food you chose earlier, more and will also show the shipping cost, and the total price

Delivery information include place and estimated delivery time

If the point is submitted, the system will record the order and jump the payment.

The four choices highlight when clicked.

Figure 3.7

## Page7-2-order page 2

As we mentioned before, accessibility is also a very significant principle in user experience. Following this, we added an interface where the user can see the status of the delivery person: taking a meal or being delivered. In addition, users can also see the delivery staff's real-time location display. Besides, users can also get some personal information on this interface, or contact the delivery staff. This design is for those who care more about delivery status.

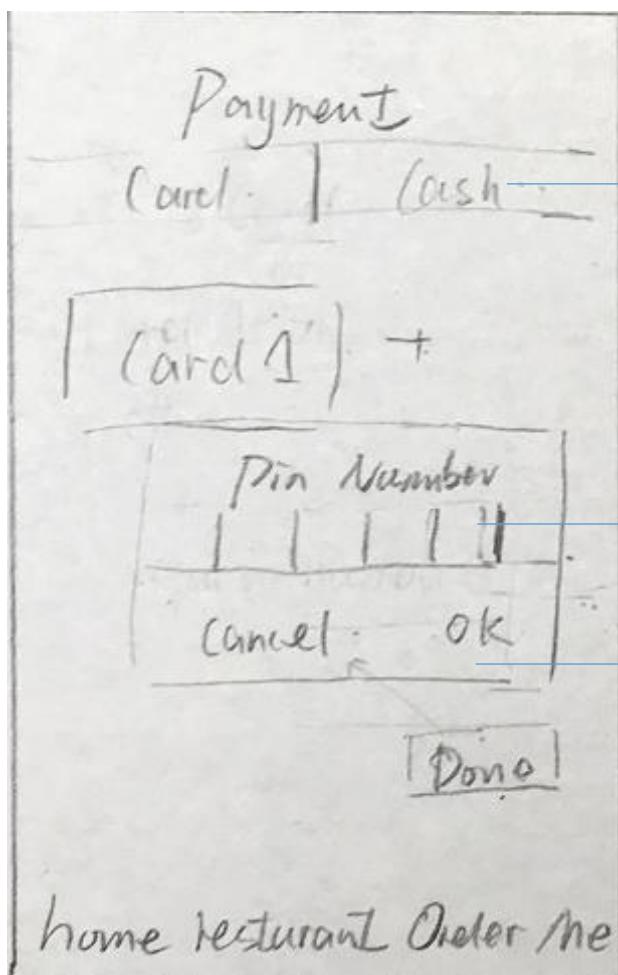
The interface includes the following features and annotations:

- Check finished orders**: A callout pointing to the 'Finished' button at the top.
- Users can call delivery man to know about the information of their food or give tips to them**: A callout pointing to the delivery staff profile section.
- In this map, users can see the delivery staff's real-time location display**: A callout pointing to the map area.
- The current selection status is 'Order'**: A callout pointing to the bottom navigation bar, indicating the selected tab.

**Figure 3.8**

## Page 8 – Payment

In payment interface Users can choose to pay by debit or credit card or cash. The payment link is the most needed security aspects of a complete order process, so at this point we have developed an additional payment password requirement for this system.



The system gives two choices, cash or credit card, credit card click payment now

An additional payment password required

If you do not want to use credit card payment, you can click Cancel to return payment options

Figure 3.9

The four choices highlight when clicked.

## Page 9 – Me

Directly above this interface, users can choose to upload an image as their own symbol. Below it there are some specific options. In my favourite, the system can show the user's favourite restaurant according to the user's habits. The footprint shows the restaurant recently viewed by the user. The rating allows the user to view the rating of the restaurant. In my calendar, users can modify the meal time and place, which will affect the system's automatic recommendation system. Money activities, users can view the recent consumption, the system summarizes the user's last week, last month consumption. In the reminder settings, the user has the option to use a reminder, which is designed for those who forget to order in advance.

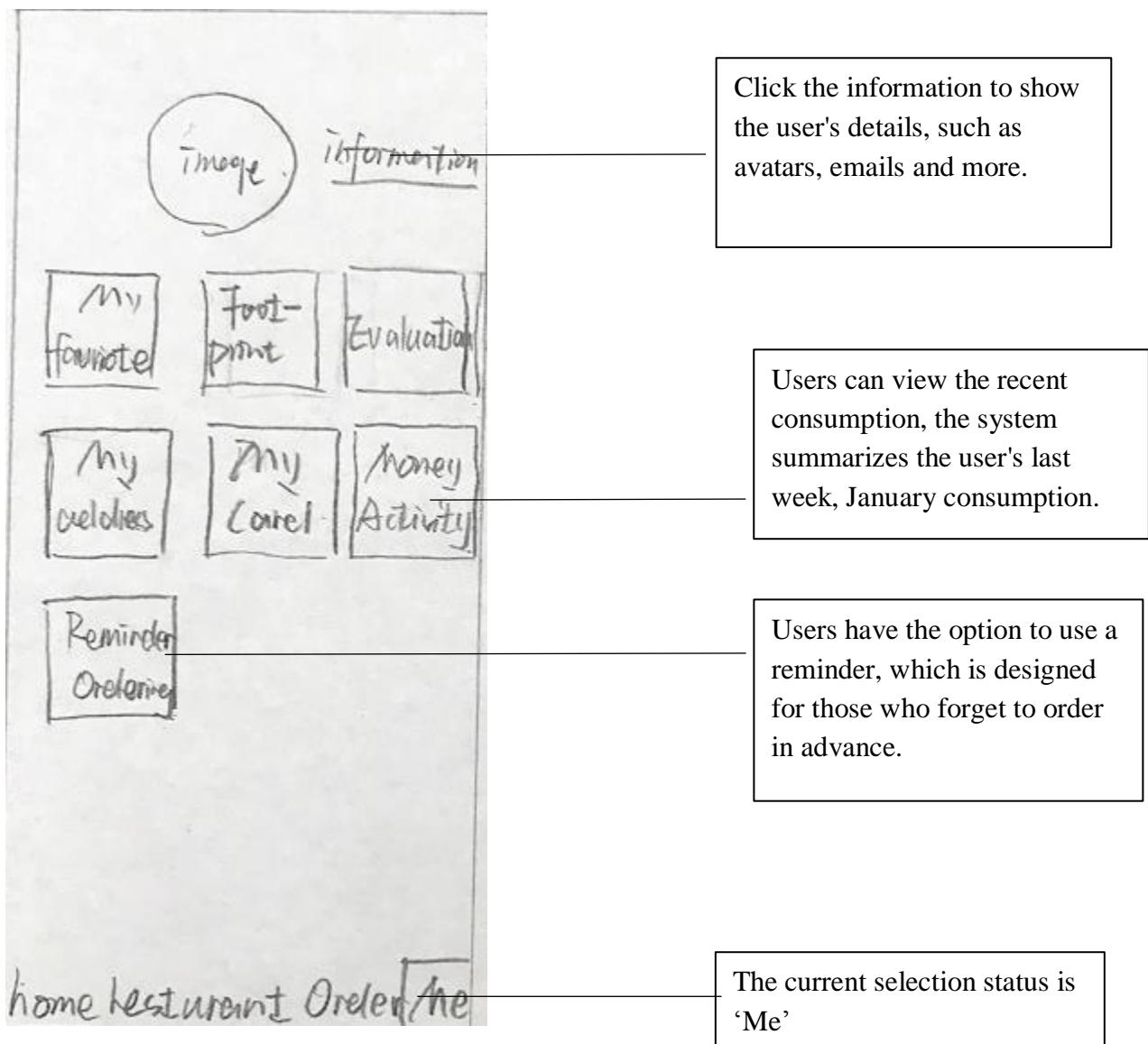
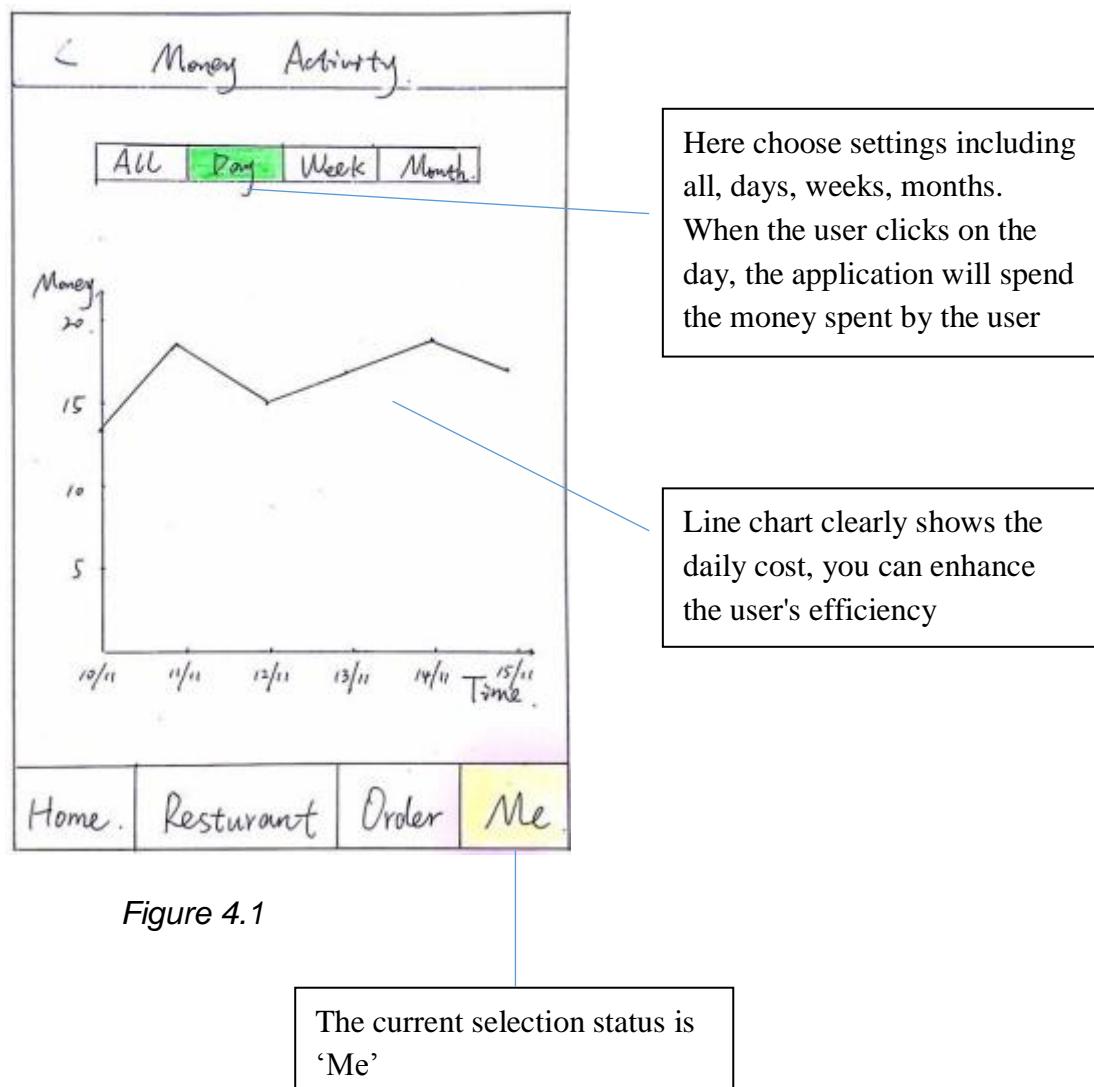


Figure 4.0

## Page10 Money Activity Page

For those people who want to know how much they spent on this booking app, this function is very significant. In this page, users can see their all, daily, weekly and monthly spending. The system displays the data by automatically generating a line chart.



## **5.4 Prototype 2**

Tool used:

Primary target group:

### **Rationale:**

As exemplified by zhongji song, students need to go to many different places to have lessons on different days, however Students always have a lot of classes, so often have no time to eat or have little time to eat. at the same time, in different place to having classes, it means they always change the place to have meals, so the delivery always need send to the different places. For international students, they often do not know the meaning of the name of the dish, so they want the food with the pictures, to facilitate their order. Because of students, we need more stylish and more innovative interface.

## Page 1: - login in

This interface design, to follow the simple and convenient purpose, but cannot lose their own characteristics, for students, have their own appeal, but also need to add students to the schedule and place of the class, but need to increase the button to skip this feature, and this function cannot be very awkward, so that students understand what this function is to use, so that students at a glance, not To think about how to do it. Because it is only in the login screen, so as long as the input once, you can omit the next time.

PIN entry is handled by a pop up on-screen menu, before the user touches the appropriate button.

### Process

Upon pressing the OK button, the user is either

1. Taken to the 'home' page, if the PIN was correctly entered.
2. Back to the landing page, select a new account, or register a new account, choose to re-enter their own timetable and location.

The Interface clear and concise, at a glance, there is no extra text and graphics,

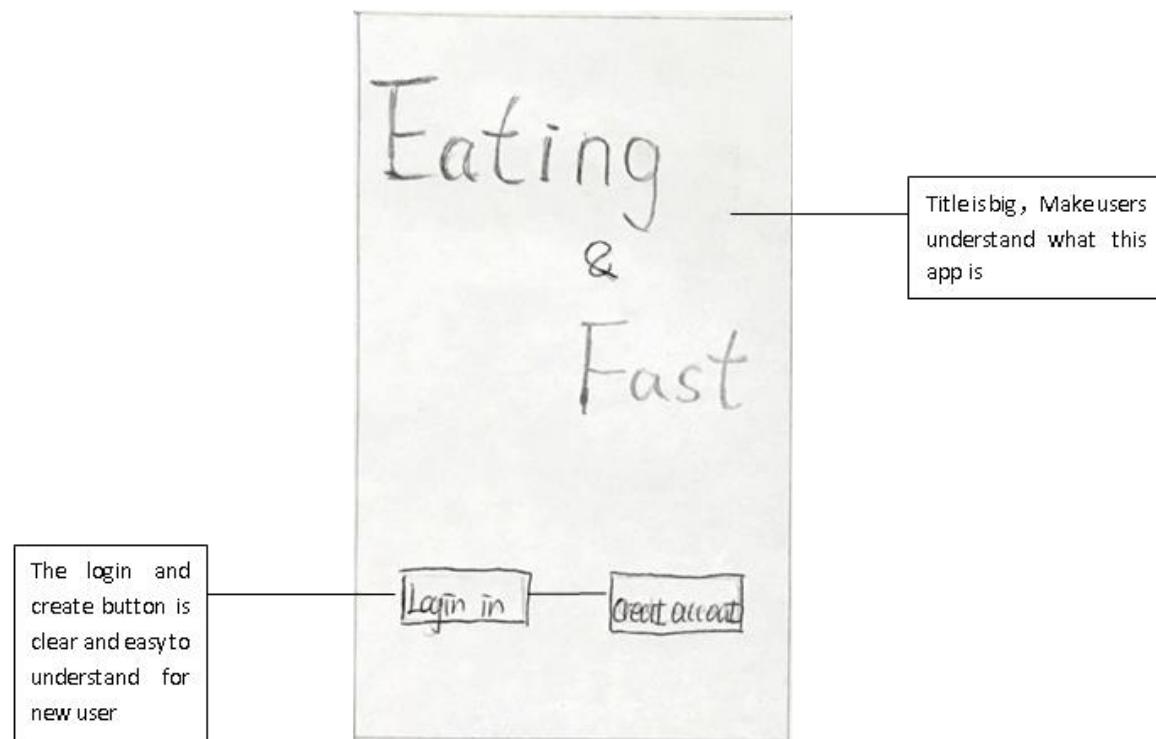


Figure 4.2

## Page2 the information page

This page uses a classification method, respectively, enter different information, time and place. Students can use this interface to enter their own timetable, this information will be used in the subsequent order, making it more convenient.

Therefore, the design below contains a wide array of novel features, including:  
1.time-----you can enter the time when you choose to have meal every day, when you finish it, the app will recommend the best restaurant for you at the most suitable time.

2.place-----when you enter the Basic Information, likes name, phone number or address. In the future, you can choose one of them to order food, you will needn't to do it again, however the app will tell the users that they can change all of them anytime anywhere.

The time and place on an interface, more convenient to choose and find, select the time or place, the selected part will automatically zoom in to facilitate the view or fill in the face of students more sense of operation.

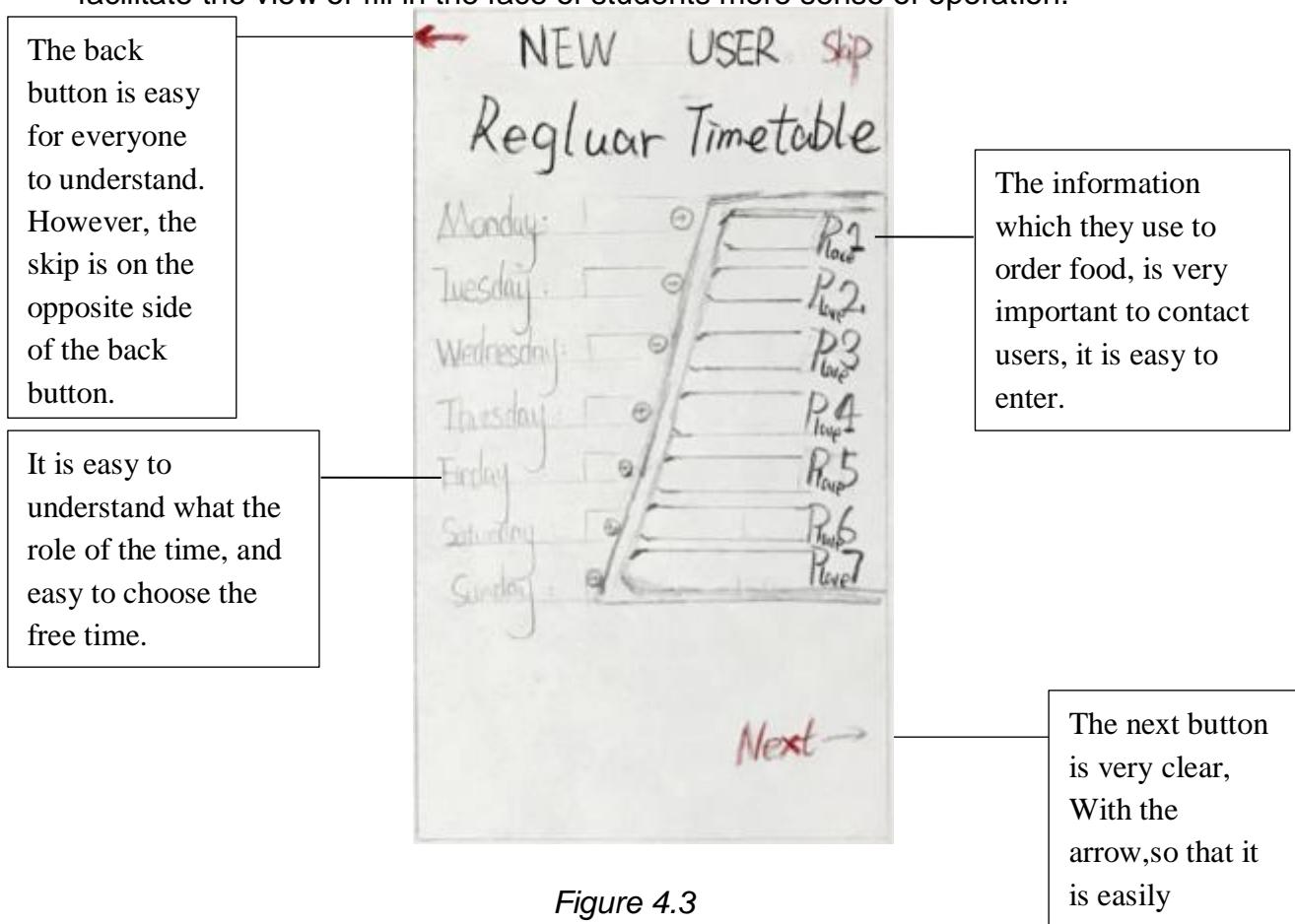


Figure 4.3

## Page 3 home page

Home page with all the maps in the form of user-friendly to quickly know their location and restaurant location, more convenient to find restaurants and places to send meals, for students, more operational

Coupled with simple and easy to understand the mark, you can choose different types of restaurants, this design, making the home page more concise, more attractive to students.

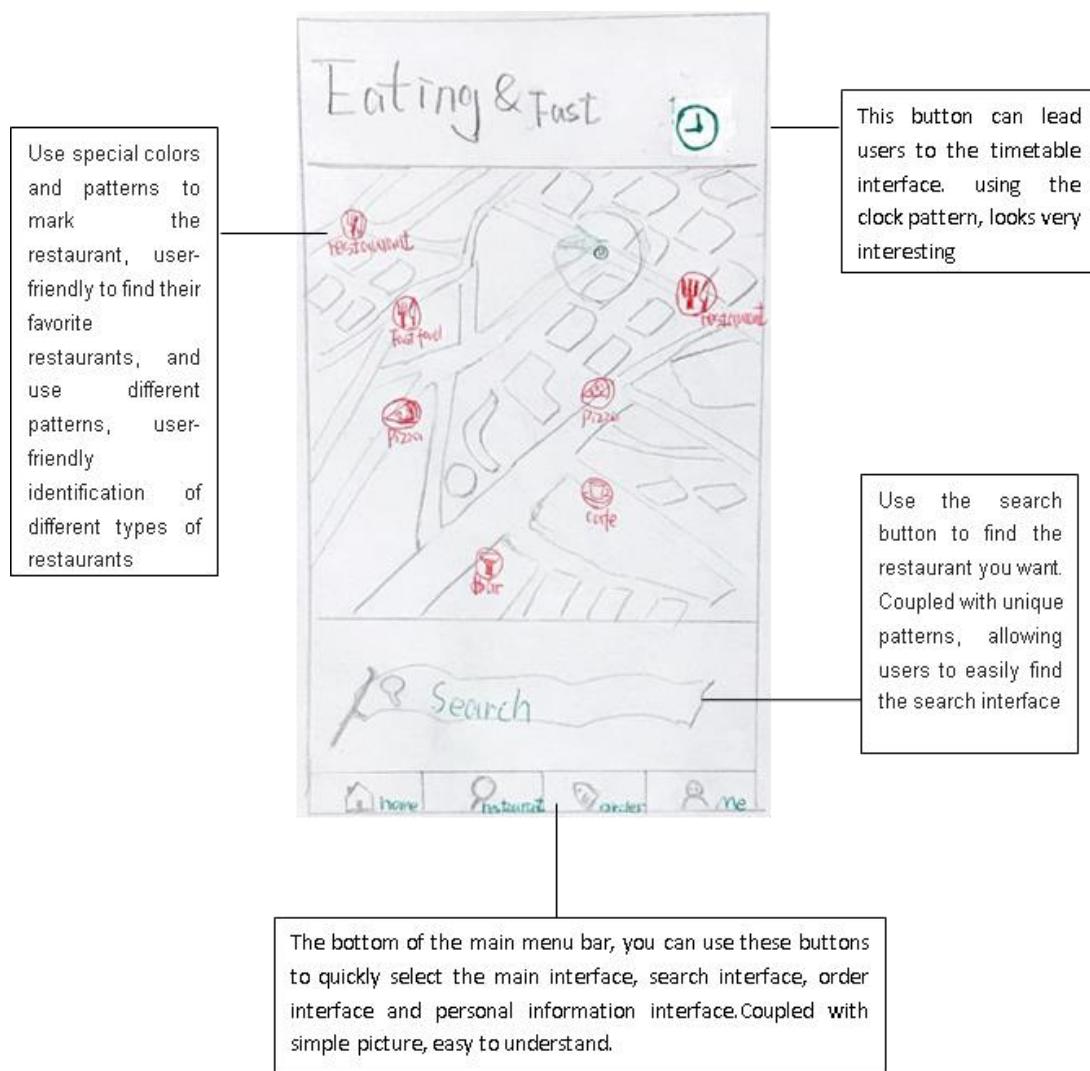


Figure 4.4

## Page 4

The following interface is ordering and payment. We will combine the timetable before, recommend the appropriate restaurant, and to the designated place, the page layout is as neat and tidy as possible. The destination is very strong. Without too many fancy things, try to present the restaurant as a whole and make the order easy to operate.

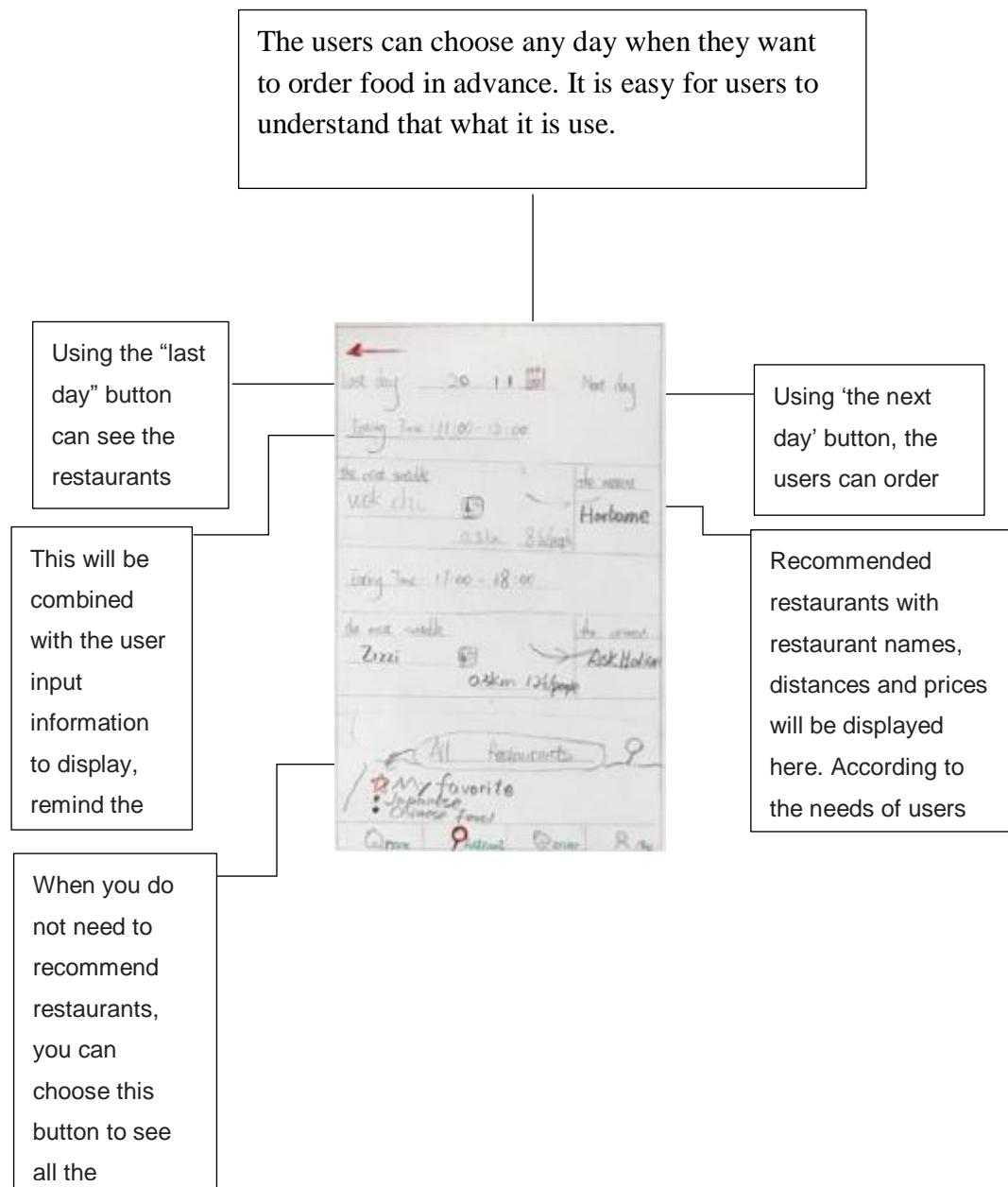
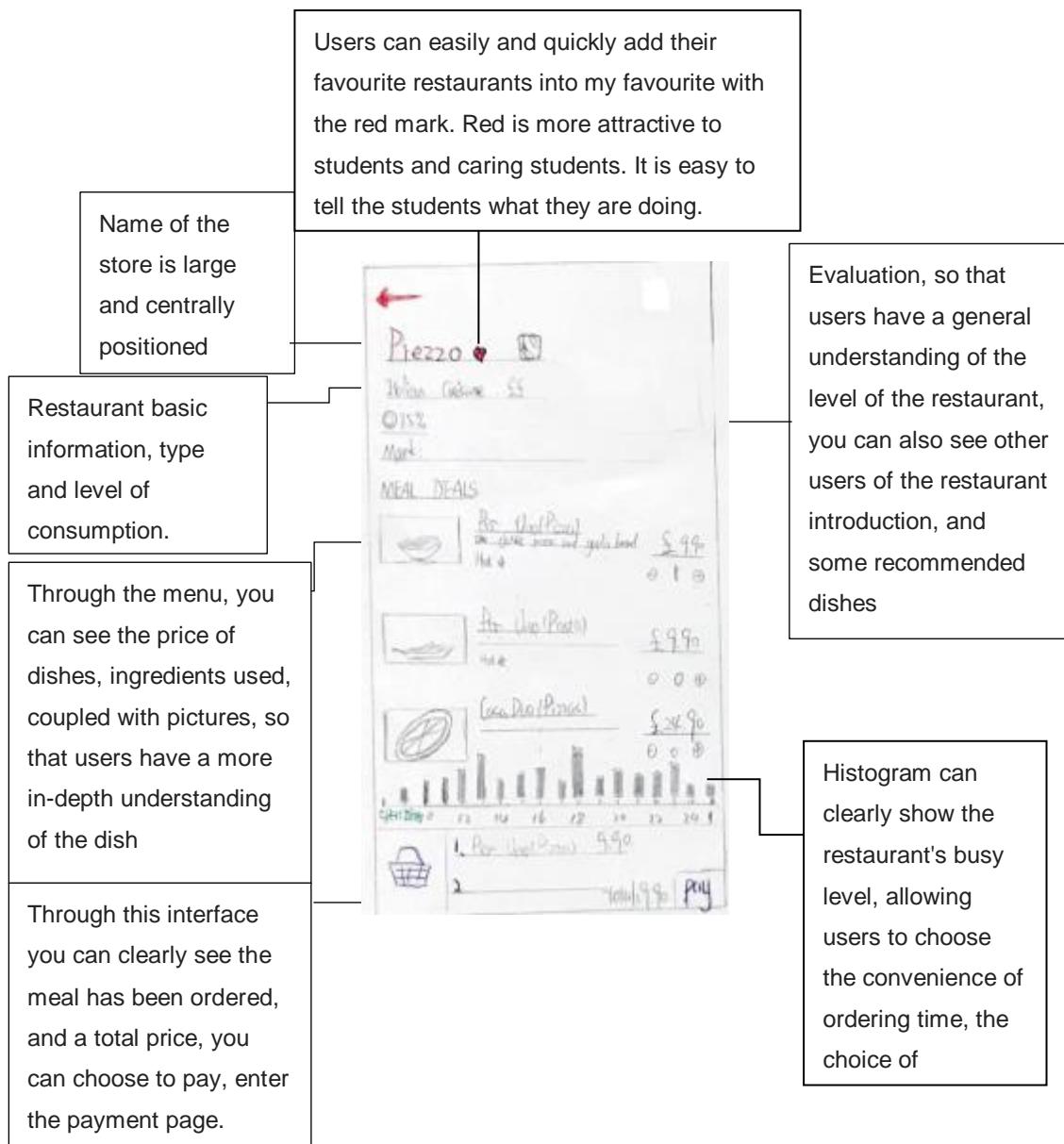


Figure 4.5



*Figure 4.6*

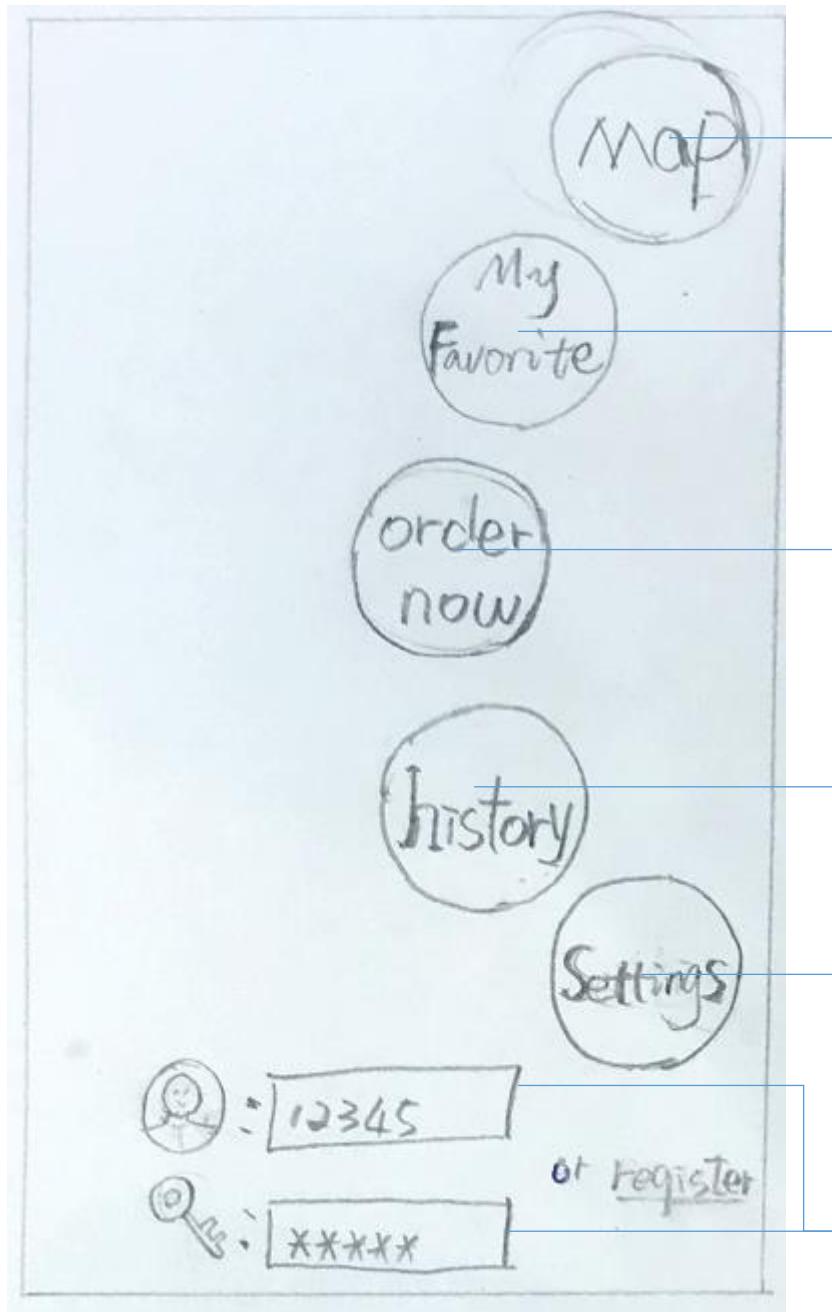
## **5.5 Prototype 3**

### **Introduction**

For the staffs, they are always busy with work, thus, the requirement of efficient is the most important point in my design. In the third prototype, availability of use, and accessibility should be considered as the most important points, it means that in the third prototype, the window should be simple, it won't contain much information. Only the important information will be put on.

### **page1: Log in**

For the staffs, they always want to use something efficiently. So that the log in should be very easy. The first time the user should type in his/her account number and PIN, and the second time he/she uses it, it will be logged in automatically, and this page will be the home page.



There are five main menus that users could use easily to do what they want to do.

Figure 4.7

The user's account name and the PIN. If there is a new user, he/she could press register to get an account. If the user has registered and logged in, he/she won't see that bars next he/she uses the app.

## page2: Map

When press Map button, this page will occur, it is a simple map that help the user find where the restaurant easily. For this purpose, this page shows only the distance and the location about the user and the restaurant.

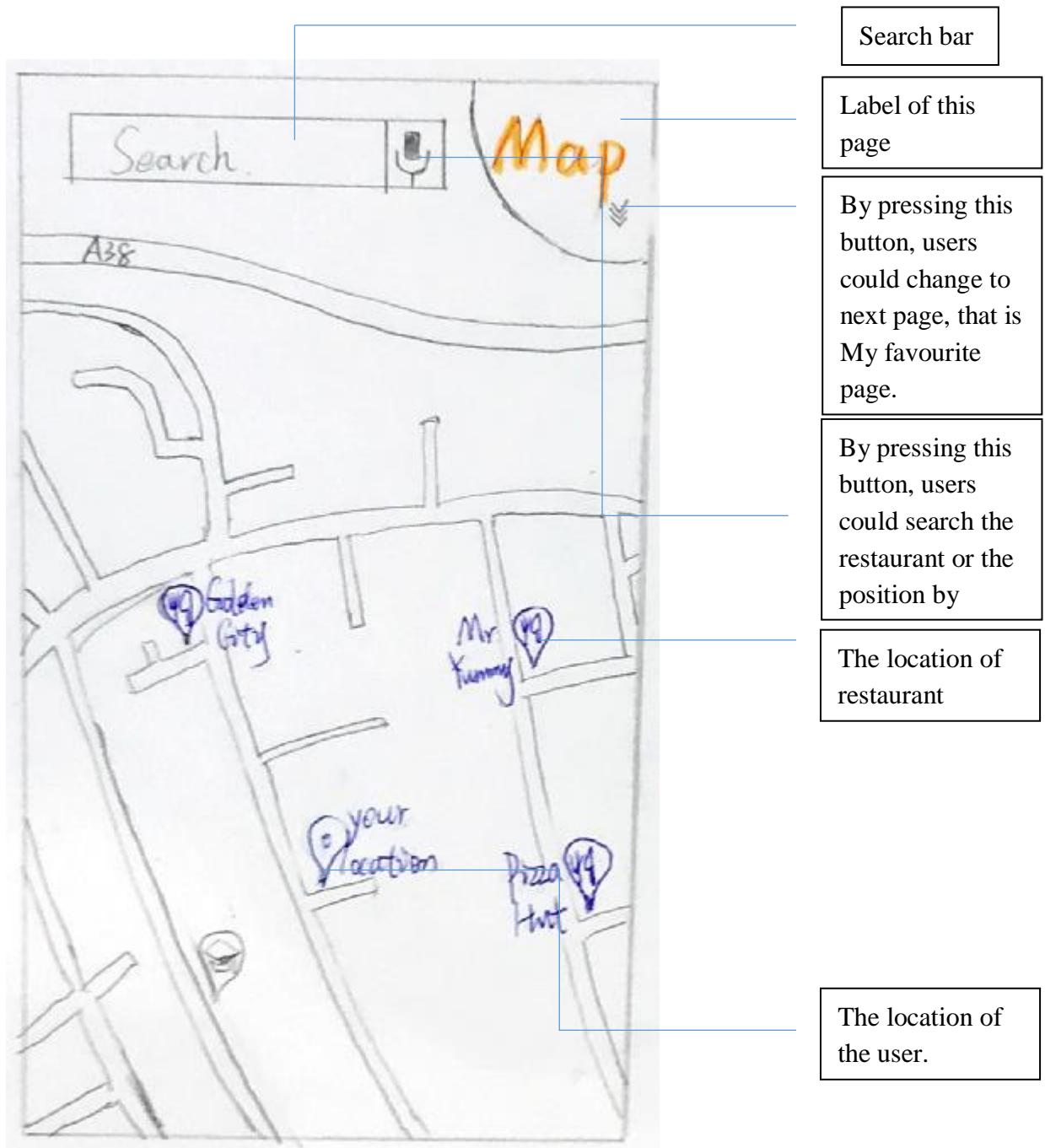
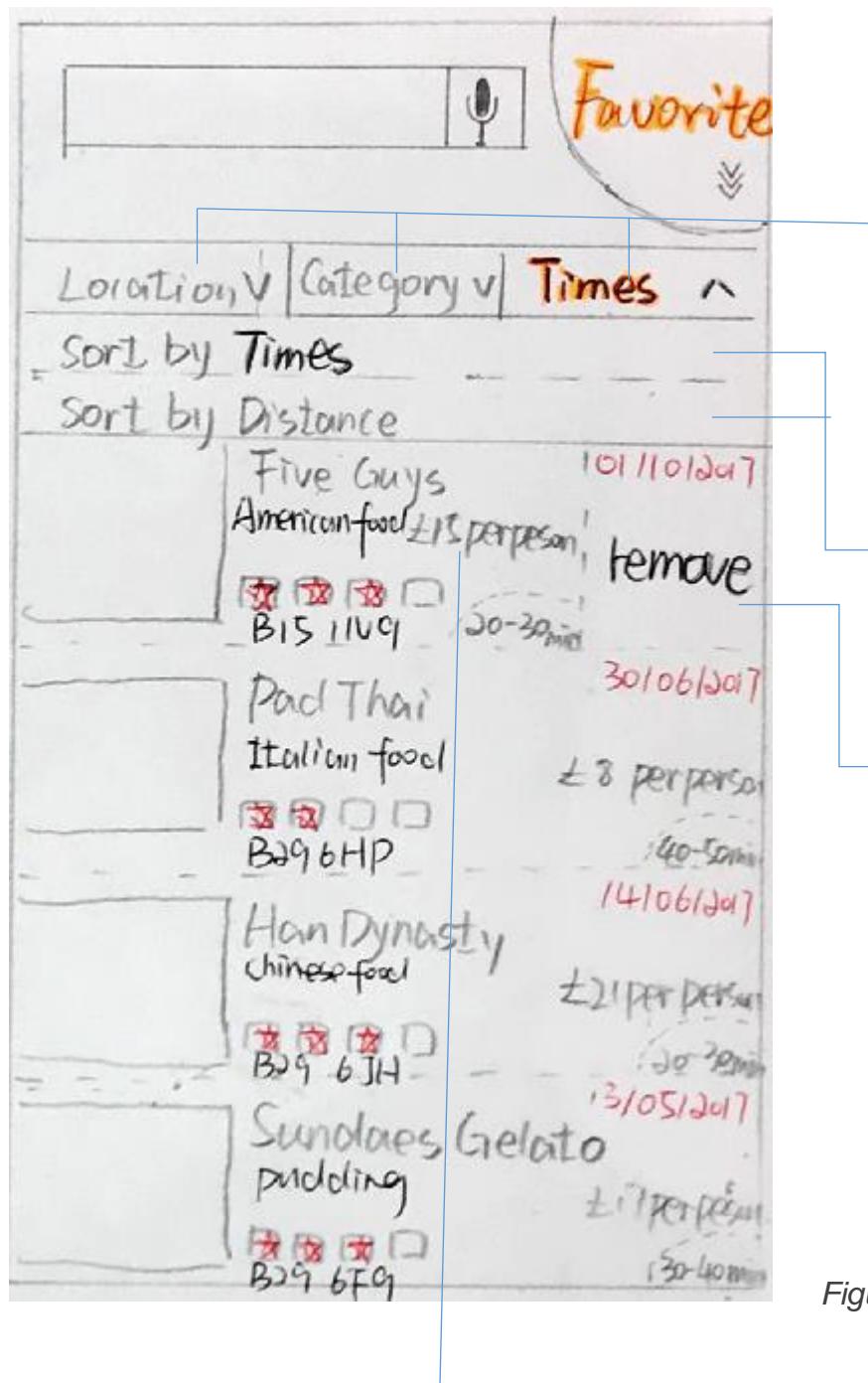


Figure 4.8

### page3: My favourite

This is a page about user's favourite restaurant. It is designed for the user finding the restaurant he/she like best, and it can reduce the time that he/she uses to find the restaurant. Thus, the user could save time during he/she is ordering food.



These three bars show the restaurant sort by location, category or by time. It shows the restaurant by distance, by category, or by the delivery time. Here we choose sort by time, and the arrow shows the times menu was opened

The first sort rule and the second sort rule.

The remove button here helps the user to delete the restaurant he/she does not want to see.

Figure 4.9

This bar shows the information of the restaurant, it contains the name of the restaurant, the category, the rate, the location, the cost per person and the deliver time of the restaurant. Because we choose times as an example, the nearest ordered

## page4: Order now

The Order now page is designed to satisfy some user's requirements, it makes the ordering menu more changeable. The filters make that order a typical food easier than without these choices, and the recommend by timetable could let the user find the timetable available restaurants. Thus, makes it more efficiently to order.

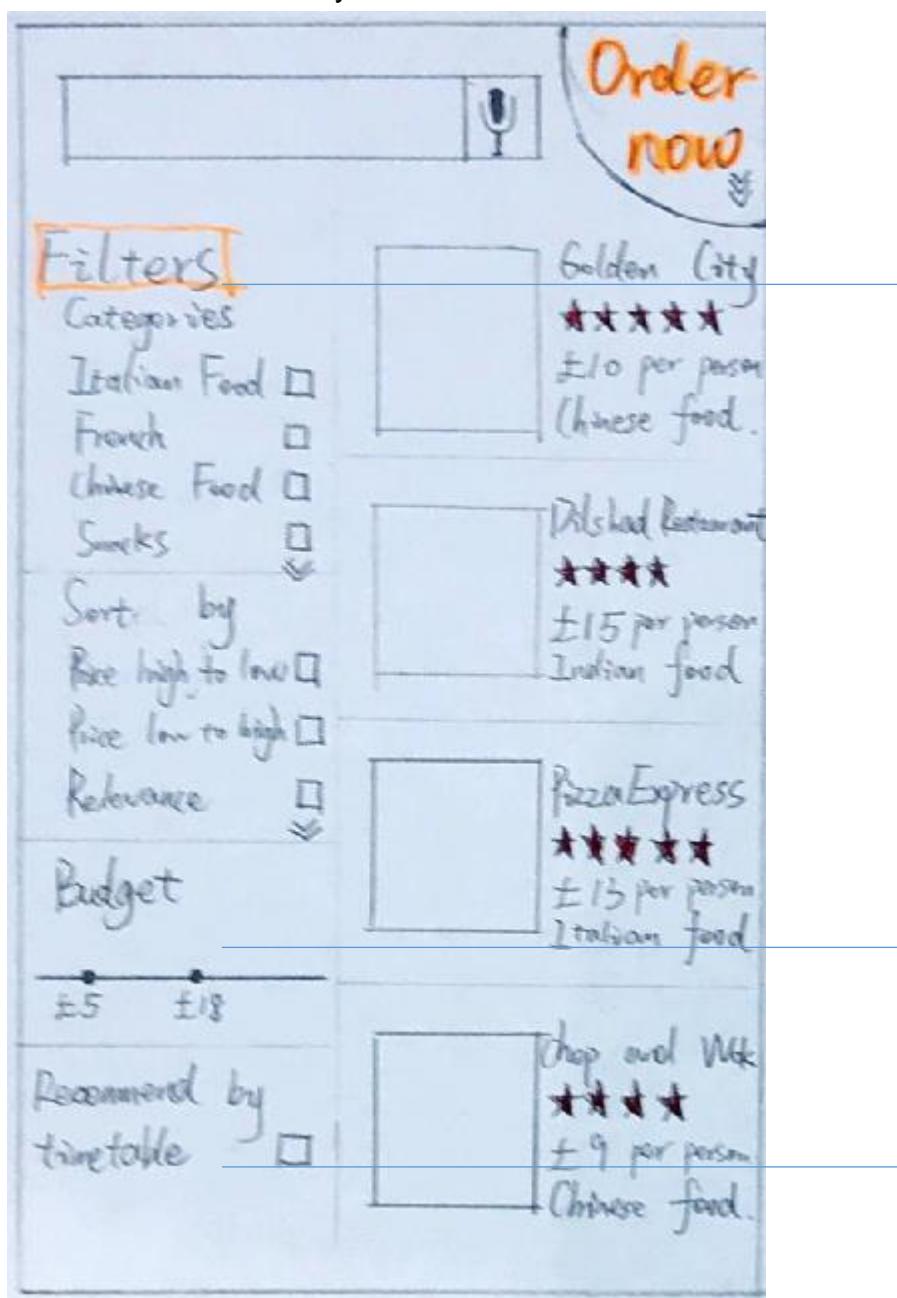


Figure 5.0

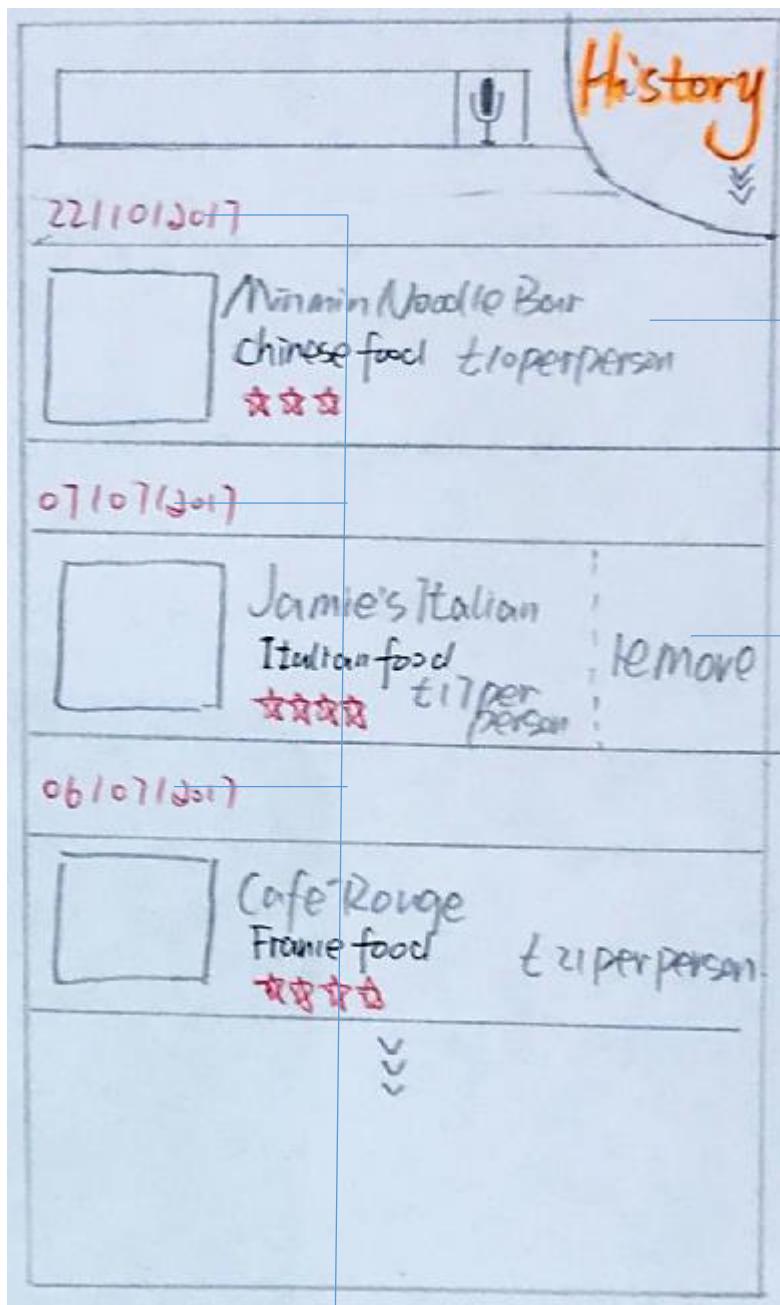
Here is a filter menu which the user could choose the restaurant sort by categories or other rules, remember these are multiple choices.

Here is a menu that the user could choose the budget from the lowest to the highest.

It is choice whether the restaurant would be recommended by timetable, if chosen the multiple choices will be the second rule of the sort, and the restaurant will be shown by the timetable available rule.

## page5: History

The History page is designed to help some users who always choose the same food. It contains the ordered list and sort by the time nearby. The user could also remove the restaurant if he/she does not like it anymore.



This label shows a restaurant that the user ordered last

The remove button let users delete the restaurants they do not like.

There are time labels that shows the time of the order occurred, and it is sort by time.

Figure 5.1

## page6: Settings

The Settings page is designed for the user that wants to change something easily. It contains my account to get some changes about the account, Time table is the most important thing for the staffs that makes their lives more convenient, users could change their timetables at any time they want.

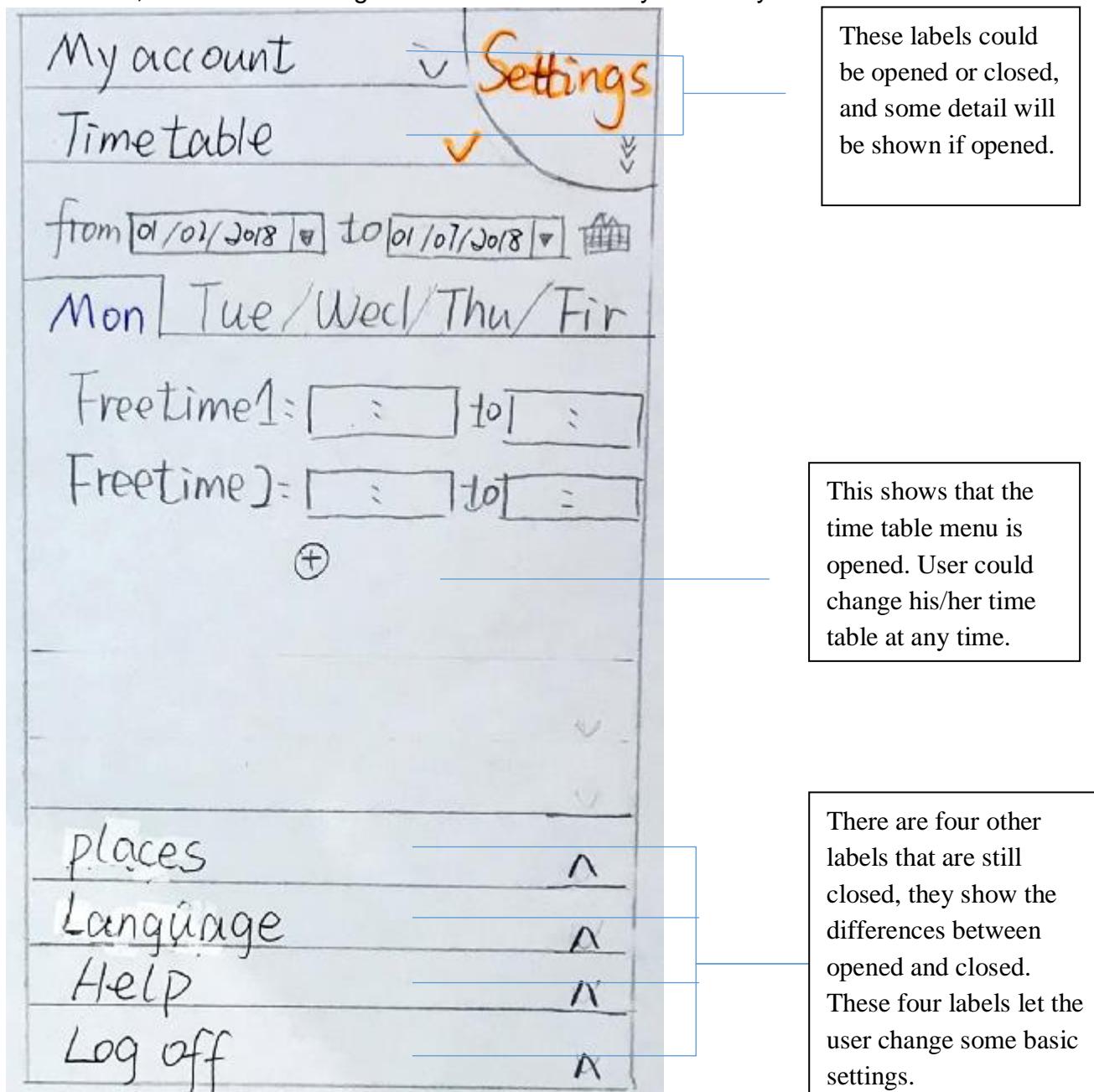


Figure 5.2

## 5.6 Evaluation of prototype 1

Elicitation	Severity	Discussion/ solve
1. Visibility of system status		
The selection mark is not obvious	1	In some page, striking colours are a key to increasing user convenience. Use bright colours to highlight current or selected options.
Some parts will be connected, and not separated	1	Some options are linked together, causing confusion to the user. Each part must be clearly separated so that the user can understand the meaning of each part.
Uploading timetable progress tips	2	When the user upload timetable, there is no prompt to show the state of the system at the time of upload, the user does not know whether the need to wait or the next step.
We need to respond to this behaviour in a reasonable amount of time	2	It can be provided using a loader or a time-left graph.
2. Match between system and real word		
Language disability	3	When the language is the local language, people can easily use it. However, many international students may have some difficulty in understanding terminology, but this will be very difficult for travellers. There are two options that can change this situation. First, setting language-changing options makes it easier for international people to use their own language. Second, setting some animations on the buttons helps maximize the way people choose.

Whether the statement used is the same	2	Disparate sentences can confuse users with understanding, whether the terms are similar. For two dissimilar terms, one can be removed and only one used. This way users do not have to wonder if awareness is different.
Per capita consumption is not simple enough	1	"Per person" can be replaced by "average". The price information provided in large quantities should be concise and the user can save a lot of browsing time. Sentences of the same meaning can be described in a few simple words
Return or cancel the action should be simple words	2	Many parts of the prototype has a return or withdrawal operation, but the words or labels are not unified, which is not friendly to the user. 1. Unify all the words or labels. 2. Should use everyday language.
3. User control		
The part that allows the user to move is ambiguous	3	When the user made a mistake, for example, to determine the delivery time and place. Requires the system to provide a revocation option to return operation. When the system state is wrong, you need a location to save the user's data.
Order transaction records are deleted without recovery	3	Order transaction records are deleted without recovery There is no function in the transaction history to delete previously deleted records we need:

		1. Add options to store recently deleted transactions. 2. before being deleted, to remind the user to confirm
<b>4. Consistency and Standards</b>		
Order and buy order consistency	0	The process of choosing food, including the process of adding to a shopping cart, should be sequential. When making a purchase, it should be guaranteed that the order of showing the price and payment is the same
Whether the system's actions correspond to other control elements	1	Completed the basic interactive features. Similar elements should be put together.
Interface close to the existing app's design style	2	Keep as much familiarity with existing app as possible, which allows users to reduce the time needed for help Such as the recommended page delivery time and distance, which is very friendly.
Date inconsistency	2	The dates need to be unified, not "day" on one side and numbers on the other. This will increase the user's difficulty. When dates are not the same, users are left wondering whether different languages, situations or behaviours mean the same thing in different situations. We need to have a uniform date format. 2. If you have a specific number in one interface, then the next time you display the numbers in the other interfaces should look the same.
<b>5. Error prevention</b>		
Users are given lots of wordy options, with no clear explanations	3	The “restaurant” feature provides all restaurants and the favourite restaurants, but it is excessing to add the

		classification about the restaurants. The “favorite” part should be high light, and be different from other parts, because this part is same as other part, the users may be confusion.
Lack of non-verbal tips	2	When clicking on the search, no prompt is entered, and the user is not sure if the text can be entered. We can use the cursor to solve.
6. Recognition rather than recall		
Too many options on many pages	2	The “search” features provides many restaurants, we can know how far the restaurant is from us, but to many options, like 500m, 1km, 1.5km. We don’t need to many options.
Font is relatively small and low contrast	1	App fonts need a little larger, the text description is more concise. Make users clearly know what they need, more convenient.
Every food needs to know what to include, How many calories in this food	2	Need to balance the nutrition to maintain health, so the need for food nutrition. The contents of the food need to be listed, or indicate how many calories it contains.
7. Flexibility and efficiency of use		
Several options of selection ordering the food make the system complex more than it’s effective and convenient.	2	The flexibility is aim to the easiness how to expand the new function adding in this system. Adaptive change ability stronger of the system reflect the system higher flexibility and efficiency of use, the following case is described how to update and modify some flexibility problem.

		<p>1) There is needed some integration with some duplicated options.</p> <p>2) The essential functions should put it in the priority position in that user may take few second to finish what they main purposes.</p>
the system has the recent order options that can help user to ordered again and speed up the history of ordering	3	<p>Remaining the flexible and efficient could trigger that the number of intermediate users is much higher than the number of primary and advanced users. And this designed need meets demands for most users.</p> <p>1) Selecting from the history orders list is more effective option for any user to find what they have a dinner, afterwards, they could quite finish the new orders by using select the history orders.</p> <p>2) The system may need to go further progress, which is putting more pictures and diagram, it may provide the more direct the visual effects.</p>
Address bar does not automatically provide any nearby address	2	<p>In choosing a place to eat, the address box is empty, which reduces the user's efficiency for the user.</p> <p>Solution</p> <p>Set the address box to a default address</p> <p>2 Give some hint addresses in the neighbourhood</p>
8. Aesthetic and minimalist design		
1. The screen design is generally neat, but there still are some white space make the system stranger,	3	The direct feedback of user is that most of them just focus on sweep the principle Internet, users browse the web's

<p>and it has lost some colour highlight the more significant process and options that make the user with experience or without understanding the important steps.</p> <p>2. The number of iconography is too few and loss some contrast item</p>		<p>action is not read, not to see, but sweep. Easy to scan means to concentrate, weaken and remove irrelevant information.</p> <p>Minimalism have significant role to affect the prototype, not only contain the important information, but also some of features should simplicity, unify and highline</p> <p>The way to solve</p> <ol style="list-style-type: none"> <li>1) The different page should contain different corn with some colour, ensure that the user could better understanding for the whole functions.</li> <li>2) There should have the colour contrast with options and unselect button. And the icons should become bigger when is selected.</li> </ol>
dialogue information contrast is not minimalist	3	the user could follow the each detail to find which function is priority or not, so there should show the more simple and effective interface at convey information, in the further design, the dialogues design will show different size and background colour, in some case, the user may easy to find the location that they stay.
9. Help users recognize, diagnose, and recover from errors.		

In our first prototype, it does not occur an error message window when some errors occur. It does have the option to redo or undo the mistake action.	2	When an error occurs, show an error message window that remind the user what he has done, and then make sure he could undo it though the error message window. So, we need to add the error message windows in next prototype.
In our first prototype, a confirm message of payment has been designed, but the security is still not good enough, because if the user lost his card, everyone else could use his card to make a payment.	3	Show a confirm window whenever the user need to make a payment, and create a unique security PIN.
10. Help and documentation		
In our first prototype, the help menu has not been implemented.	2	It does not show how to use this application. Some users will not be able to use this application. A clear notice that the user should do will be in the next prototype.
There is not help documents in our first prototype to help the users set his own app.	2	Help documents are needed, and some pictures to show the process.

			
	<b>zhongji song</b> Student	<b>Susan Mccool</b> Teacher	Thomas Vulcovich: Staff (School)
Scenario 1	Send to the designated location	Finding a suitable restaurants recommendation	Have lunch during working time.
Score	6	5	6
Reason	Although there is a function of adding different addresses on the ordering page, there is still a problem of whether to be delivered to the designated	owing to the multiple restaurant choices for her to selection, it could save her times on working days, the recommendation pages show the different recommendation solutions in	He always has lunch after lunch time. When he uses our app, after he loads up his own time table, the system will collect some restaurant that offer food delivery. Thus, help him save a lot of time, and help him eat several of food instead of

	place. Not all locations can be delivered, and special places such as classrooms of schools need to be swiped for credit card access.	each free hour, but she still cannot understand the location of the restaurants	eating sandwiches. Now, with our app, he could order the food before he come to work. He books a time that he wants to have lunch, and then the order will be sent to the restaurant, the delivery will be the time he book. Except that, he also has time to choose what he like.
Scenario 2	Served at the designated time on time	Ordering process	Eat a family dinner.
Score	5	3	5
Reason	Although users may choose to be served at the designated time, there may be situations where all restaurants are unattainable, which is inevitable and therefore needs to be provided with an undelivered remedy.	The ordering food process in this system is perhaps more duplicate options, she thinks the system does not provide the simply steps for her.	He can now order his family dinner when he takes a train home, it is much convenient for him to order the food after he arrives home, and now he could have more time staying with his family members. It seems to be useful. But on the other hand, this app does not offer him family dinner, he has to choose the restaurant and scan the menu to order the family dinner. He prefers that he could buy the whole family dinner without searching the restaurant and the menu.

Scenario 3	Menu with pictures	Checking the money activity	Eat during travel
Score	N/A	7	4
Reason	Many restaurants use fake pictures to deceive users and cannot achieve the effect of allowing users to watch pictures	the money activity could tell some trend about decreasing or increasing of amount of money, this diagram cannot solve the problem, since she was always look forward the useful function that may estimate spending money trends in the future, and she could understand whether the recent consumption over her budget or not, apart from that the layout could not show the more detail about which type restaurant be attract her most.	When he is travelling to another city, it won't take him much time to choose a restaurant that he could eat his lunch or dinner. The restaurant will be shown after his log in his accountant. The system will get his location and then show him where the restaurant is. He could also order his food before his arrival, thus, he could choose the delivery location before he arrives and then the food will be delivered when he arrives.
Overall			
Score	3.6	5	5
Reason	The page is very ordinary, unusual in all other apps, no user reviews, no way to tell a favourite, but the new features make it easy to choose where and when to eat. Did not want the bill a column, there is no	This design could meet her most of demands, sometimes it is convenient for her contact with delivery mans, but some options is not clearly understanding for me such as payment process, she did know the restaurants location where it is.	He thinks this design could meet most of his requirements, especially, ordering a family dinner, it is quite convenience for him to select the option in a special restaurant, as there is a function show average consumption.

	consumer details, but there is a reminder function, it is humane		
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## Summary

The first prototype was designed by us, we encountered many problems, such as user experience, application problems. More and more, we invited three users to test. Through the evaluation of the results, we found that the timetable project needs to be strengthened, many of the interfaces left blank, and some of the interfaces are complicated. We need to document these issues so that the final version can learn from them.

## Recommendations

Based on the first prototype design and the assessment made by the target user, we identified many missing areas that needed improvement. We think the user experience is the most important.

1. Each page needs to be prompted about the status, which can increase user's usage.
2. Increase the language settings, select the international mainstream language to join the application.
3. Unify all the words of the same meaning, according to user needs to select a word instead of the same meaning of the word
4. When users order, you need to increase the prompt again to confirm the user's choice.
5. The interface design need to find the most suitable type, not too complicated nor too simple.
6. The interface must be separate for each item to guide users to order to increase efficiency.

7. The application should set the withdrawal operation When the user an error occurs, save the user has set the operation of the previous step.
8. The ordering process should be consistent, such as adding food and buying food in the same order.
9. The date and time are uniform specifications and there should not be both dates and numbers. Uniform specifications will increase user accessibility.
10. In the input part of the need to add a cursor to the user prompt where you can enter.
11. Fonts need to be increased to the right size, allowing users to use more convenient.
12. For food, you need to label the calories to make it easier for users to calculate calories.
13. The colours of the options need to be unified in one colour and the size needs to be the same. Design time as simple as possible, can increase the user's ordering efficiency.
14. When the user pays, setting a payment password helps the user to pay quickly without having to enter the card number and security code again.
15. Set up a help document to provide users with operational help, which is necessary for the user

## 5.7 Evaluation of prototype 2

Many of the more detailed concepts have great potential, but many are still needed to make sure they are simple enough to use. In fact, the depth of functionality provided is its greatest strength and weakness. For example, innovative functionality, such as shopping with other people can have a discount, however, it is clear greater consideration must be paid to the feasibility of such designs as.

The next step is to evaluate the key elements of the prototype under the guidance of Nielson's ten usability heuristics. When possible, analyse specific roles. After that, before the key recommendations for future iterations are finalized, how the prototype solves each persona will be evaluated

Heuristic	Severity	Discussion / ways to solve
#1 – Visibility of system status		
Lack of necessary feedback	3	<p>The home page is a map that offers many benefits, but also faces many issues that can be used accurately when inaccurate positioning or not finding your favourite supermarket, and you need to be familiar with the local surroundings. View also need to invest more attention, for the more pressing time is not suitable for users.</p> <p>Two techniques could be deployed to ensure this:</p> <ol style="list-style-type: none"><li>1. You can add a button to return to easy mode button</li><li>2. Simplify the map, or combine the map with the text, add operating instructions, and add special markings to some special places.</li></ol> <p>For future versions, the latter is not suitable, this design is too much trouble, but make the operation more complicated, the former is more feasible. Simple, easy to use, but also in</p>

		any case.
<b>#2 – Match between the system and the real world</b>		
Overly long descriptions of options, with ineffective division of services	1	<p>It is superfluous to have both All restaurants and the search restaurants. It should be combined, and automatically jump to designated page. For transaction currencies, local currency should be used, some locations should be spoken, and local guidelines should also be followed to facilitate the delivery of food to designated locations. Also, International students can use their own currency for payment, this app can automatically help students in accordance with the exchange rate conversion.</p> <p>For example, when you are in the United States, use the dollar to pay, at that time, when you returned to England, you should pay in pounds. And the American students in Britain can convert pound sterling into dollars for payment</p>
<b>#3 – User control and freedom</b>		
No way to return to the homepage from subsequent pages	0	From each page, back to the main page, or back to the previous level, easy to use, and easy to find the button
A clear 'cancel' button available on every page	4	<p>However, whilst clear, it is unnecessary to have a cancel button, when the users don't want to order the food, or want to change the restaurant.</p> <p>In the future, adding a cancel button is very necessary.</p>
<b>4 – Consistency and standards</b>		
The registration method should apply to the current user's general registration method	1	Choose to make it easier for users to login, try to simplify the registration process, while protecting the user's information security
Payment method should follow local principles	----- --	Different regions have different payment habits, should be able to increase the function of the region can be selected, automatically switch payment methods, choose a more efficient

		form of payment.
<b>#5 – Error prevention</b>		
Cannot make comments and suggestions	3	When I use the app, if something goes wrong, or if there are some good suggestions, I cannot contact the developer of the app, need to add contacts in the app, if you have any questions, feel free to contact the developer.
<b>#6 – Recognition rather than recall</b>		
Every food needs to know what to include, How many calories in this food.	2	Need to balance the nutrition to maintain health, so the need for food nutrition. The contents of the food need to be listed, or indicate how many calories it contains
<b>#7 – Flexibility and efficiency of use</b>		
A key to choose delivery time	0	Use to achieve a good time to enter the location, in the choice of restaurants at the same time, will automatically help users choose the right time and place, more humane, simplified ordering process, the order more efficient
A page into a lot of information	3	In the page to add a lot of information, it seems that the pattern is too compact, not convenient for users to obtain key information, in the next job, you should simplify the page, try to highlight the important information.
<b>#8 – Aesthetic and minimalistic design</b>		
Strong background colour	2	Use bright colours to highlight the highlights, for student users, the screen uses a more vivid colours to attract students to use.
<b>#9 – Help users recognize, diagnose and recover from errors</b>		
Yet, not clear means of informing the user of specific issues	3	If there is a usage problem, there is no way to solve the problem now In the future, Solutions that have problems in use will be added, such as contacting a designer or having a dedicated customer service to address such issues
<b>#10 – Help and documentation</b>		

Not applicable for Food delivery

			
	Zhongji song-students	<b>Susan Mccool Teacher</b>	Thomas Vulcovich: Staff (School)
Scenario 1	Balance nutrition	Find a suitable recommendation restaurant	Have lunch during working time.
Score	4	4	7
Reason	Although there is no clear indication of calories, but each dish has the composition of food, you can determine the calorie	She could easily follow the navigation from this app design, but the innovation design in the enter the timetable may make her confusion, as there could have enough information tell her how to	It has a timetable that could help Thomas order food online, and the timetable is easy to use. By using this app, he could get his food though he often eats lunch very late.

	content.	match between the real timetable, but she thinks the recommendation restaurants pages show quite value information, because she could also search all restaurants by different sorting way.	
Scenario 2	Delivered to the designated place on time	Ordering process	Eat a family dinner.
Score	8	5	3
Reason	Can use this app, select the nearest and sent to the fastest restaurant, but also with the map function, you can perfectly know how much time left, and sent to the location, it is easy to contact the person.	She could follow the page navigation without any problem, but in her busy time, when using this system, the restaurant recommend just could tell her this restaurant meet the fast delivery demand, it could not specify in which location that restaurant stay in.	There are too many choices, but few of them are telling him which restaurant could offer food for the whole family. There is too much information in this app, and he only needs a little. For that reason, Thomas could not give a high mark in this part.
Scenario 3	Billing Details	Checking the money activity	Eat during travel
Score	7	N/A	7
Reason	The daily spending on each month is clear, very convenient, a few weeks to make a comparison of bills, at a glance to know	No system from displaying the activity of money after few months, this is her expectation, even this system could give some recording about history order, and she think there is show that the	Actually, Thomas often eats something during travel, this app could help him find the suitable restaurant, and here is much information so that he could understand which one is the one he wants best.

	whether their spending more or less, for the rest of life has a much-planned arrangement.	evaluation about money activity.	
Overall			
Score	6	3	6
Reason	The overall colour is brighter for students, more sense of operation, the demand for meal ordering according to timetable is basically satisfied, but also to meet the basic requirements of students, to make some changes to the details	This design could not meet her most of requirements. Although the map navigation shows the restaurants location, the multiple information is not illustrating what she expected.	Above all, it is a good App that could match most of his demands. It has a bright view and it makes the user feel fresh. The functions of this App are well designed, and it could be used easily. It could help him save time and order food efficiently.

## Summary

Through the prototype design for the first time, students need more colourful colours and richer operation sense, but cannot lose the function that the system should have. In the layout, we should follow the key information to highlight and simplify important information. For different users, the design should be more comprehensive, different payment methods, for different regions, new users or old users, to show a simplified and rich way, it should be more convenient and clear. At the same time as much as possible to meet people of different ages, more importantly, when a problem occurs, the user should be clear and quickly find staff to solve, for the

user's information security is very important.

## **Recommendations**

1. Add a button to return to easy mode button
2. Increase the ability to pay in different currencies for easy access to students from different countries.
3. Adding a cancel button on the payment page.
4. Unified registration methods to simplify the registration process, to protect user information security
5. When there is a problem can contact the staff to help solve the problem, increase contact information.
6. In the menu bar, increase the expression of nutrition, user-friendly choice of different nutritious food.
7. Simplify the page content, highlight the key information, the page layout, make the user more convenient and clear
8. Use a bright background colour, for students, the page is more novel, more new gravitation

## 5.8 Evaluation of prototype 3

Elicitation	Severity	Discussion/ solve
1. Visibility of system status		
There is some unnecessary information that may slow down the user.	1	In the page My favourite, when the user chooses one of the three classifications, the second rule of sort will be shown, but it is not necessary.
Some information may mislead the users.	1	In the page My favourite, the second rule of sort might mislead the users.
2. Match between system and real word		
The price only shows the pounds, so it limited range of the users.	3	The App only shows in pounds, and it will limit the users, there should be a transfer of money to satisfy more users.
Users could change languages so that more users could use the App.	0	In the Settings page, the users could change the languages instead of using system languages, this setting could satisfy more users.
3. User control		
There should have a return button in each page, so that the users could return to last step.	3	In our third prototype, there does not contain a return button, if the user mistake something, he/she could not return to the right step quickly.
There should be some warnings before some irreversible steps.	3	Some of the pages need warning window, such as the payment page, when the users want to pay for the meal, a confirm window should be shown.
4. Consistency and Standards		

The system should have same signs to show the same things.	0	In our third prototype this function is good. There are some marks that have the same function.
The appearance, layout, and grouping of the interface elements should be consistent.	1	In each page of our third prototype, the appearance, layout, and grouping of the interface elements are consistent.
<b>5. Error prevention</b>		
There should be some tips about the layout.	3	In the Log in page, there should be some tips to the layout of the user's account and PIN, and in the register menu, that tips should be seen as well.
There should be some explanations that the users could understand the special mark.	2	In the page 2 to page 6, each of them has a special mark that shows the user could change to next page, but there is no explanation to be shown, and some of the users will have difficulty to understand them.
<b>6. Recognition rather than recall</b>		
The system should be concise so that the users would not pay much attention on how to use it.	2	In our third prototype, the appearance and layout are easy to understand. Thus, the users could use the system easily.
The information provided by the interface should be timely.	1	In our third prototype, some of the information provided by the interface is timely, so that the users have not to find the relevant information from another part of the system.
<b>7. Flexibility and efficiency of use</b>		
The system should provide shortcuts, for example, the system should define the necessary functional keys	2	In our third prototype, there does not have a return button, which could help the users to get to the last steps easily.

The system should not have much steps to realize some function.	3	In our third prototype, each of the page has a search bar, but it is not necessary because users would not search all the time.
<b>8. Aesthetic and minimalist design</b>		
The screen of the system should not be too crowded, and the density distribution of the interface elements should not be inhomogeneous.	3	In our third prototype, each of the page was designed for this requirement, it was designed to let the users use it efficiently, but the layout is too crowded and there is not emphasize some important function that user usually prefer to select it.
Some of the elements on the user interface should not be too large or too small, and the colour, shape, or text of the elements should not be inappropriate and difficult to identify	1	In our third prototype, each of the page was designed suitably for the users, except some old users want the text to be larger.
<b>9. Help users recognize, diagnose, and recover from errors.</b>		
There should be some message when the user makes some errors.	3	In our third prototype, the warning message is not contained. It should be added in the next prototype.
There should have some confirm message whenever the user would do something irreversible.	3	In our third prototype, there does not contain any confirm message. It should be added in the next prototype.
<b>10. Help and documentation</b>		
The system should have help menu that could help the users with some basic problem.	0	In our third prototype, the help button is contained, it could offer some help whenever the users need it.

The help should contain something about how to use the app, and in some other way like cartoon or some moving arrows instead of only in words.	1	In our third prototype, the help document was only designed in words, it should have some other ways in the next way.
--	---	---

			
	<b>zhongji song</b> Student	<b>Susan McCool</b> Teacher	Thomas Vulcovich: Staff (School)
Scenario 1	Balance nutrition	Find a suitable restaurant recommendation	Have lunch during working time.
Score	N/A	7	6
Reason		After she finish upload the timetable, she could easy to find the recommendation	Tomas always have lunch very late. At that moment, not many restaurants offer

		restaurant by her times, since there is a selection button that she will select the recommendation, it is an efficient way for her search different type of sorting ways to find the suitable restaurants that meet her demands, and she said the multiple choices could give the exchange information in the real times.	food deliver service. By using these App, Tomas only needs to upload his timetable, and he could find which restaurant offer food deliver service at that moment.
Scenario 2	Delivered to the designated place on time.	Order food process	Eat a family dinner.
Score	8	5	3
Reason	You can use this app to choose your free time, choose to eat, and better yet, choose one day later, not just today. However, the layout of the page is more repetitive, the date and week repeat. Users will be confused, resulting in the choice of error.	because she usually orders similar food options, sometimes, she just want to press few button and finish this kind of process, but when she order the food, she will always need learn the delivery real time functionally, that means, those requirement is not clearly for her demands.	For the reason that Tomas always works late, he wants to order food when he is on the way back home, and also buy something that he could share with his family. He wishes there is a list of restaurants that he could find to order food for the whole family. He finds it is hard to get an app that sort by the type of meals.
Scenario 3	Billing Details	Payment aspects	Eat during travel
Score	N/A	5	1

Reason		<p>she could select the pay by cash, in this option may positive and effectiveness cater for her, but sometimes, when she add the pay by card as her option, she will more consider the secure problem, since when she pay online using credit card, the system ask for to enter the same pin numbers with the back of her credit card, and she may worry about some situation that if someone take her will easy to finish the ordering the food process, however, the prototype 1 lack of the discernible for her own, thus, sometimes she will feel unsafe when pay online.</p>	<p>Tomas often travels to another city where he never went before. By using our App, he could find where he is and where the nearest restaurant is during his trip. He could also order food before his arrival. That is really convenient for him.</p>
Over all			
Score	4	5.6	6
Reason	Very convenient to choose the time and place to send meals, but did not do the labelling of food content, and the bill details are not, in the layout is relatively old, and many other app	<p>This design meets her most of demands, and the innovation design attract to use this application, but there still loss some option that she expected like money activities. And she still confused about how cancel some of food she may want to order.</p>	<p>It is a good App that really makes his life more convenient, it helps him work efficiently and it really saves his time. He feels happy that this App was designed.</p>

	have the same place, cannot stand out .		
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## **Summary**

Above all, the third prototype could satisfy some of the users, it offers a lot of services, and makes the steps easy. This prototype help some of the users order food efficiently, because it is simple and only shows basic functions. However, it still has some problems. The information is too consistent that some of the users will not get used to it, such as some foreign students that they could not understand what the real meal is through the name of the meal. From the other hand, the old users would have difficulty when they are using this App, because there has no help that they could change the front size, and it also have few help about the fresh designs.

## **Recommendations**

First of all, the third prototype could satisfy some users' demands because it could make the steps easily.

Secondly, the basic information on the third prototype could let the users know which restaurant is the best choice, and it really save time for the users.

Thirdly, the basic information on the third prototype could not help the new comers know the meals, they need more information or explanations about the meals.

Fourthly, the function of changing front size should be added to satisfy some old users that may make the App more accessible.

## **5.9 Conclusion of first generation prototypes**

Above all, the three prototypes are all designed to satisfy the demands of the users, they all have basic functions that the users could upload their timetables and get the recommended restaurants according to the timetables; they all could make the steps of ordering food less, and offer the service that make the order food efficiently. Each of the three prototypes has its special main points, the first is focusing on the humanization, it contains lots of help that the old users with less knowledge about intelligent apps could use it easily; but the appearance is still having some blanks, and the timetable needs to be strengthened. The second prototype is focusing on the technology, it contains colorful appearance and rich operation sense, and it may attract the young users' attention. It has much information that the international users could understand the meals completely, but too much information makes the appearance comprehensive, and it sometimes could not help the users work efficiently with that designs. The third prototype is focusing on the efficiency, so that the appearance, layout, and grouping of the interface elements are designed suitably for the users who want to save time, it could help the users order food efficiently wherever and whenever they want to have an order, but the third prototype is lack of information and a little not user-friendly that the users who do not know the meals, and the users who do not used to the intelligent apps might have difficulty in using this app.

From the three prototypes, we learnt that when a good design should concern not only the basic functions but also emphasis. It should not only focus on one point, if so, when some other users are using the design, they may feel a little not user-friendly about it. The design should not only follow the principle but also should follow the users' requires. Only in this way, a good design will be put out.

# **6 Second Generation prototype**

## **6.1 Introduction**

We combined the first generation prototypes, analyzed the three prototypes, and decided to use the third prototype's basic framework as our final prototype, but with some of the features removed and some of the features from the other two prototypes, such as the one we reserved prototype3 landing page, the combination of voice and map search capabilities, through the stars to indicate the user's satisfaction level. Setting in the page, an increase of timetable can be modified to make this feature more complete. Based on this, we added a button to each interface that combines the return function with the one-click access to the specified page, but we will redesign the column by category to make the page look less crowded. Removed the bottom of the page selection function, which is a button to reach the designated page button repeat.

The use of more innovative pages, the use of bright colors, and each section of the functional design compared to the first generation prototypes more reasonable and comprehensive.

In first generation prototypes

## **6.1 Design Tool**

Before you publish the final version to users, you must modify it. We designed the prototype to reduce the error generated. It can also help us improve the final prototype, and through it to meet the needs of each target user. So, need some tools to design.

## **6.2 Prototype**

### **Paper**

Designing with paper is the most versatile method for quickly designing sketches without any restrictions. This prototype allows many people to gather together to design, and can record everyone's thoughts.

## **Blackboard**

This design is suitable for team members in the meeting, each design their own part, and then team members to explain their own design part, and stitching on the blackboard to make the prototype more perfect.

## **Power point**

Power point is considered as one of the simplest design tools, it does not require high technical requirements, and almost everyone has used a wide range of applications. But from the picture is still not fine enough, many designs cannot be achieved.

## **Photoshop**

It is an image processing software developed by Adobe. It can finely edit images and is a great design tool for prototyping. It has a professional layer to facilitate user testing. However, its demonstration effect and the links of each map are not very close, and the software requires high technical requirements. Most people do not know how to use it.

## **Balsamiq**

A GUI model and website wireframe generator application. It allows designers to arrange pre-built widgets using a drag-and-drop WYSIWYG editor

We decided to use balsamiq software, a very useful software design tool that combines various objects such as select boxes, maps, and buttons. It can be coloured to evaluate the efficiency and usability of the application. Use balsamiq also placed some graphics, you can assess the accessibility of the application. Our team has used balsamiq, which saves us a lot of time and meets our needs.

### **6.3 Prototype Rationale**

As discussed in the results of the first generation of evaluations, team members found that the need to refine timetable functionality. And make the application can automatically recommend a variety of restaurants based on the experience of many users. More, the team suggests the status of the order that needs to be provided after the payment is successful, and shows the location of the delivery person. Finally, to allow users to check monthly

spending, the team also presented some line charts to show consumption histories intuitively.

Based on these, the team decided to further explore a new generation of prototypes. To this end, the team is evaluated from different perspectives. The first is the function, followed by the user experience. We will create the second-generation model; the design of the second-generation prototype is based on the advantages of the first-generation combination and innovation. The first generation had three prototypes and the team decided to synthesize based on the three prototypes.

Through heuristic analysis, we can extend to the second generation, and we have also joined the HCI principle.

## 6.4 Presentation of Second prototype

Page 1

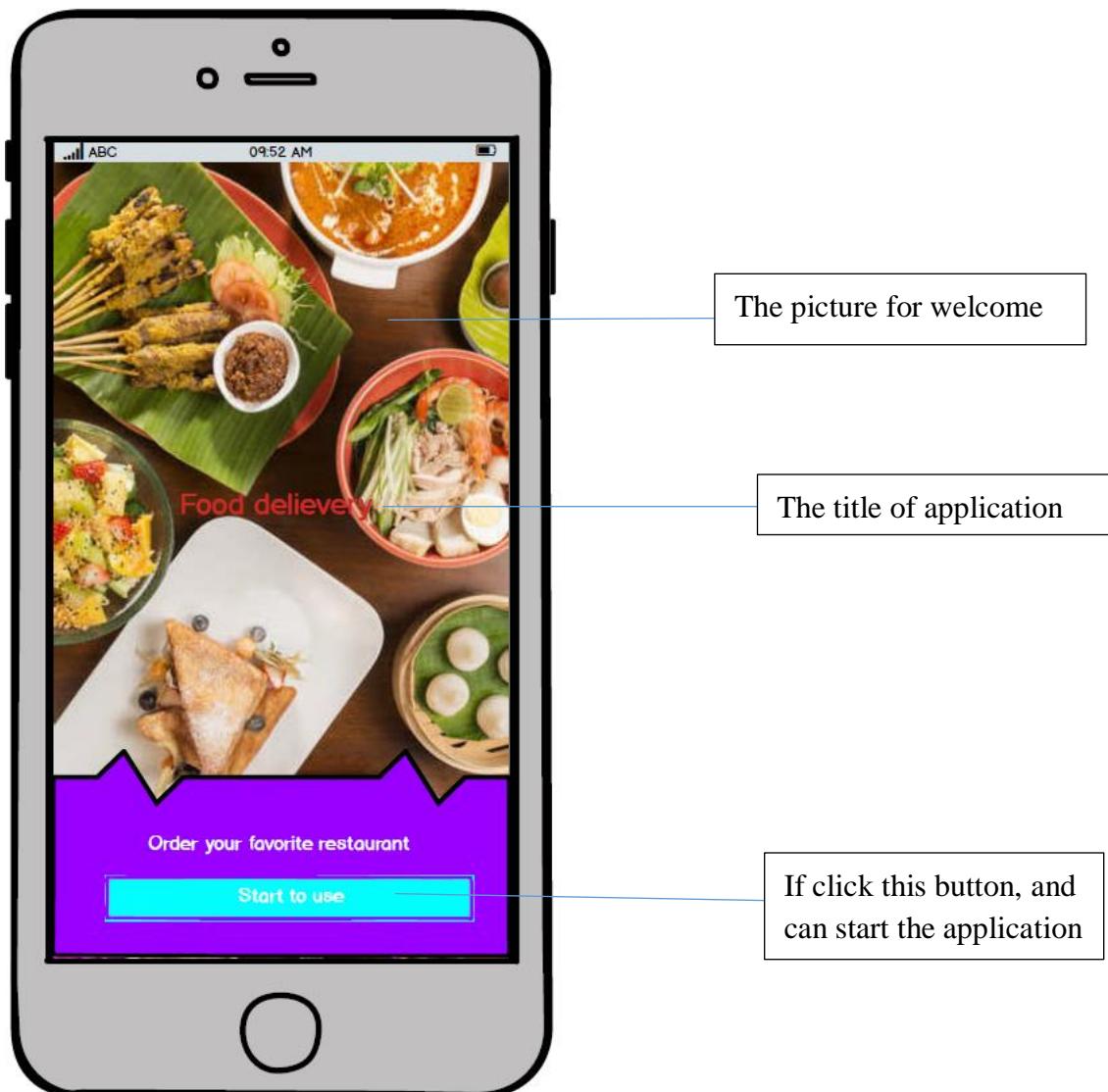


Figure 5.3

## Page 2

When user first use this application, this is the first page for use to login and they could have multiple ways to login such as Facebook, twitter, g+.

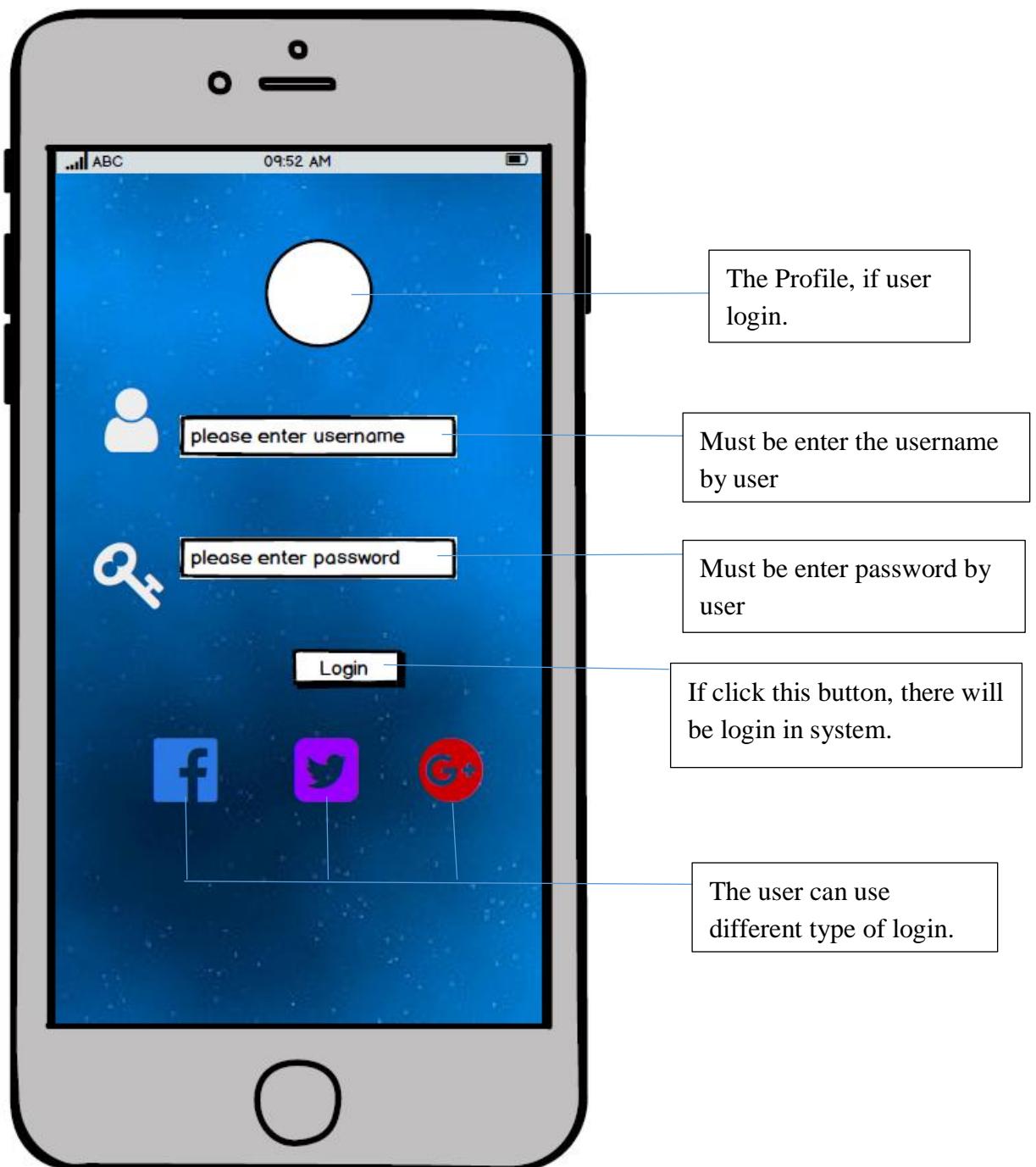


Figure 5.4

## Page 3

Because of the inconsistency in class time during the week, students can set their expected mealtime on every day of the week, and once they have completed this step, the system will automatically recommend the appropriate restaurants based on that data.



If the user doesn't want to use the timetable to set up with their account, they can click this skip.

User can set up the time from start time to end time.

The user can choose the free time in here.

User can choose the back button to return the last page.

When the user complete the free time, then they can click the submit button.

Figure 5.5

## Page 4

This is the main page of this application, in which users can choose one of the five main functions include Map, My favourite, Restaurant, History and Settings. Once enter one of them, the menu will automatically converge to the upper left corner, and will be opened again if users slide down the corner button.

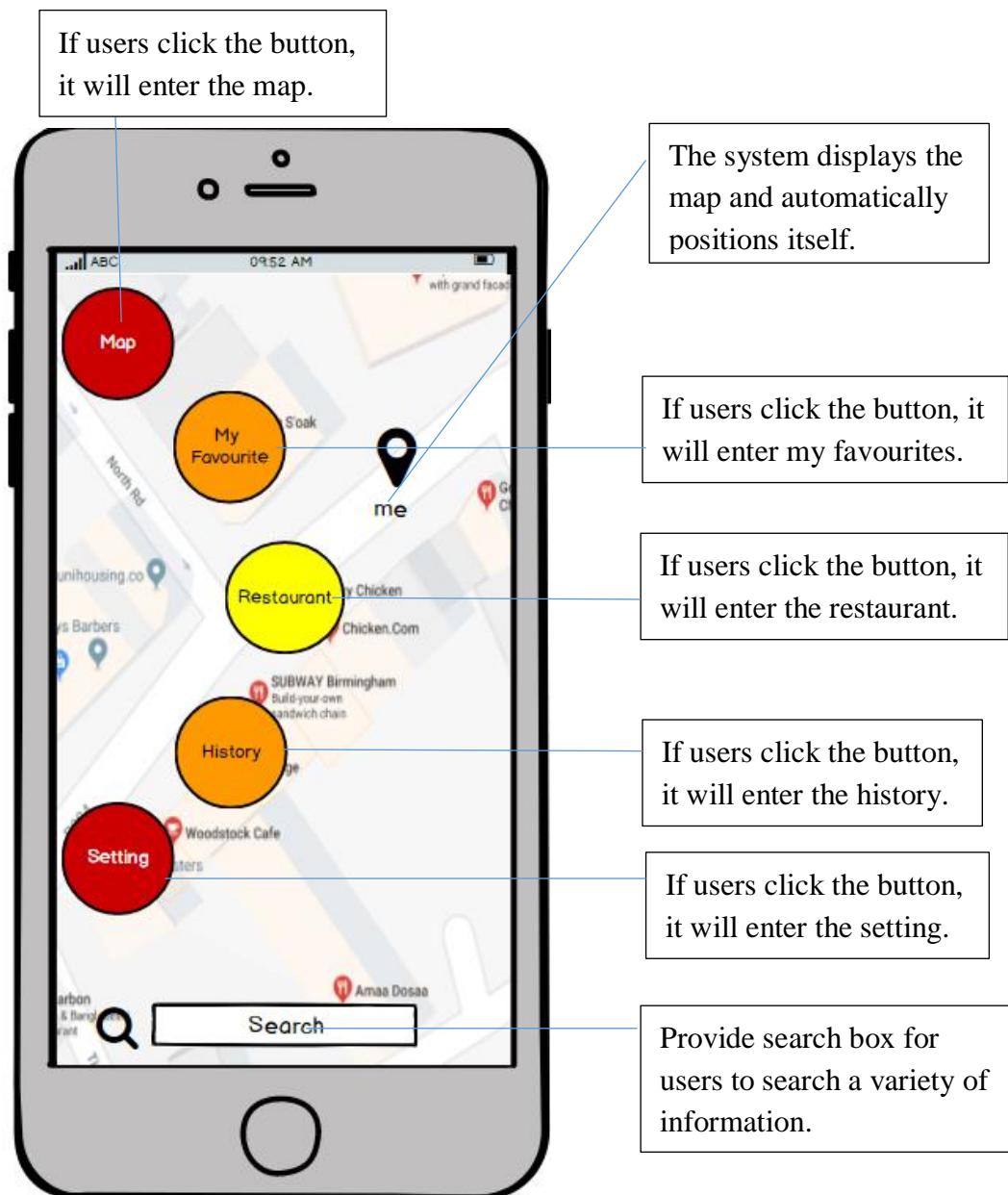
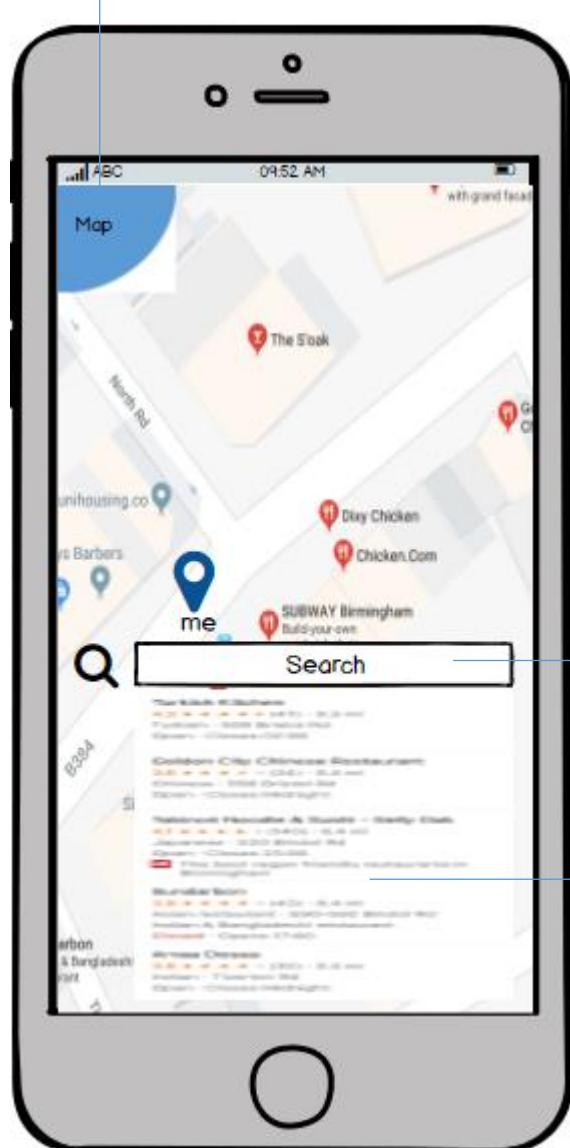


Figure 5.6

## Page 5

This page is a location based function which users can choose restaurants by click on the map directly or search in the search box then find them.

This is a multi-function button: If the user clicks the button once, the system will return to the previous page (if applicable). If the user pulls this button, the system will return to the main menu, which shows the 5-main functions of this application.



Provide search box for users to search a variety of information.

By searching for a restaurant, a drop-down list appears showing information about each restaurant in the neighbourhood, including distance information.

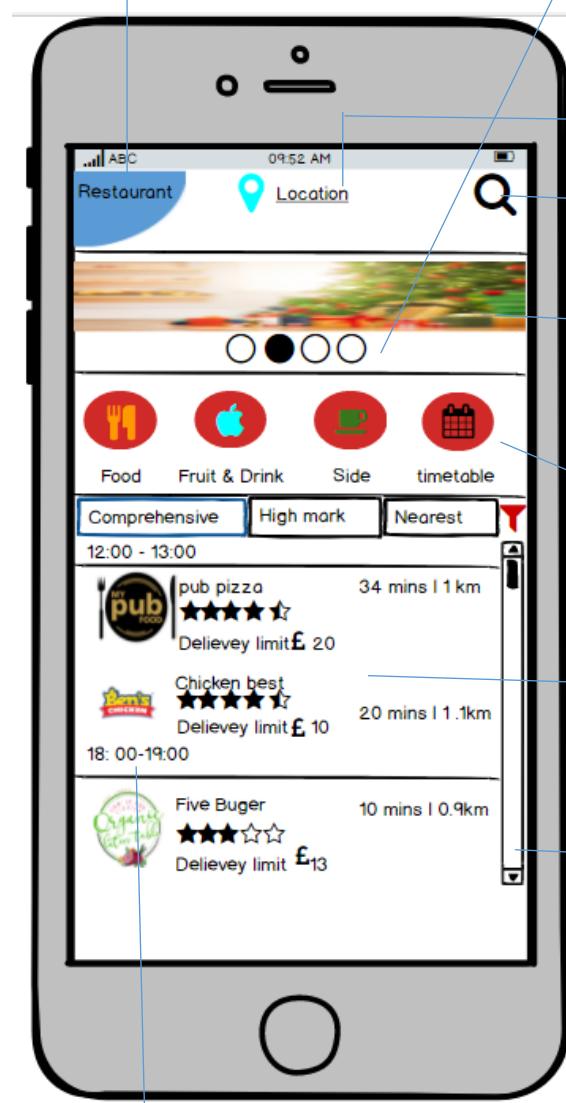
Figure 5.7

## Page 6

This is the homepage of the application, which shows activities and advertisements, automatically recommend restaurants and search icon and so on.

This is a multi-function button: If the user clicks the button once, the system will return to the previous page (if applicable). If the user pulls this button, the system will return to the main menu, which shows the 5-main functions of this application.

The circle icon indicates the currently displayed picture.



This icon automatically locates the current location. Or users can choose their own current location.

Users can click on the search button to open all kinds of restaurants

After a period of time, the app will do some activities and advertise through the billboards

The user sets the free time directly by clicking the calendar icon.

Display various information about the restaurant, including per capita, arrival time.

The user can pull down the box to show more restaurants

The system assigns a restaurant for each time period.

Figure 5.8

## Page 7

This is the search page, which shows different categories of foods provided to users. Aside by the search box, there is a microphone icon, once users click this icon, they can input anything by speaking to the device.

This is a multi-function button: If the user clicks the button once, the system will return to the previous page (if applicable). If the user pulls this button, the system will return to the main menu, which shows the 5-main functions of this application.

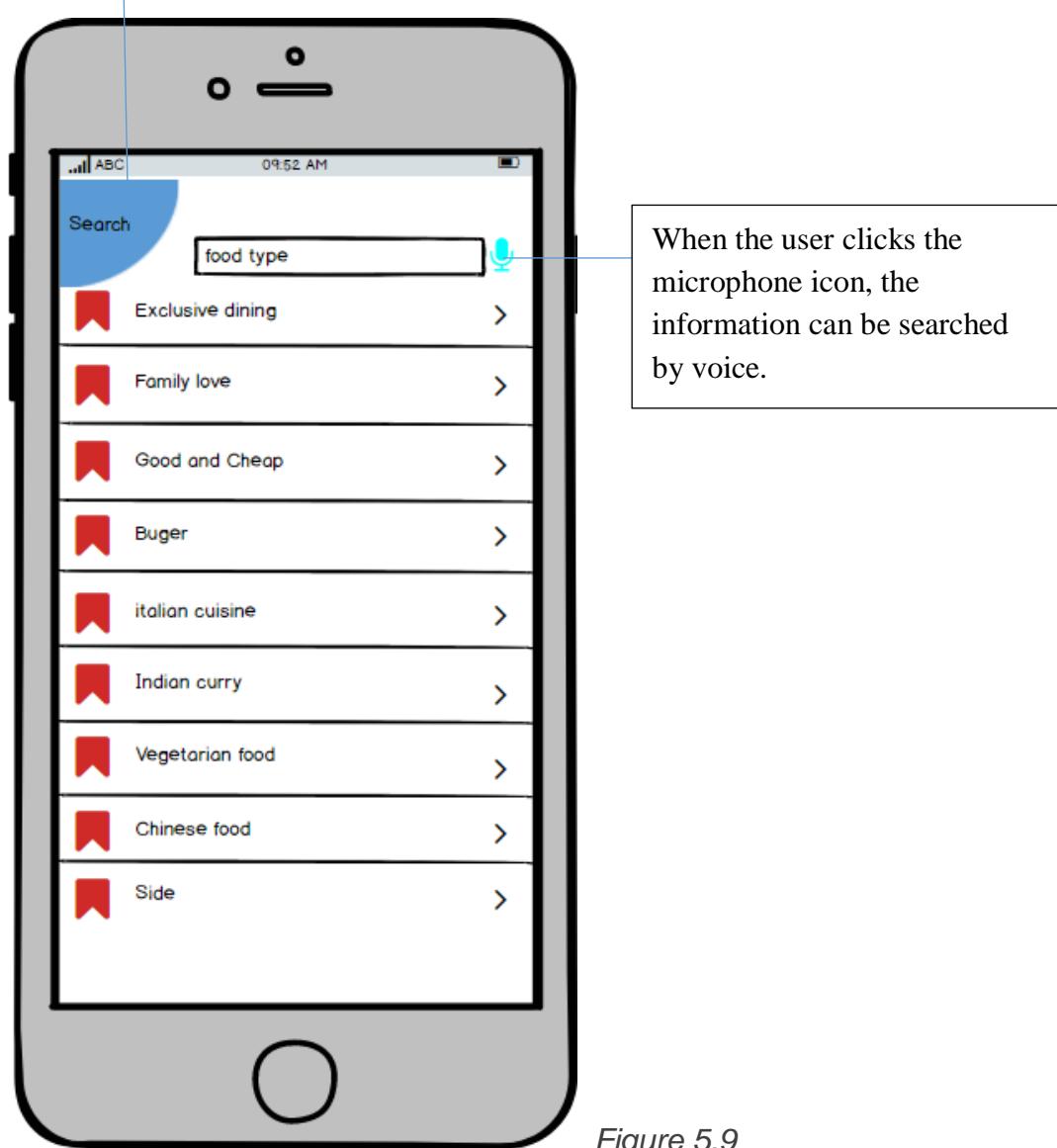


Figure 5.9

## Page 8

This page is one of restaurants, which is show different foods detail by detail, The system automatically plots the data for this particular restaurant: This chart shows how busy the restaurant is at different times of the day, which helps users avoid ordering at peak times.

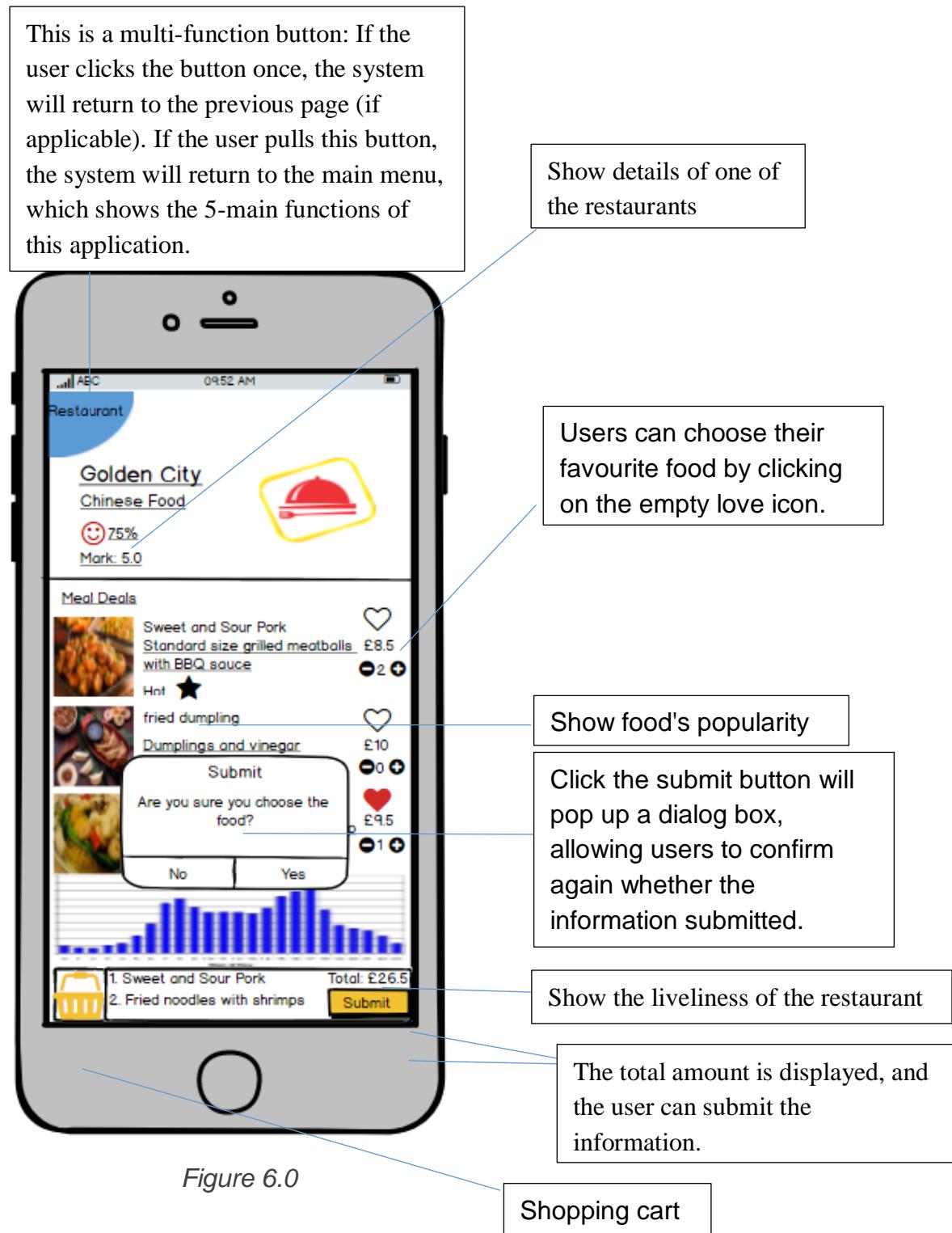


Figure 6.0

## Page 9

This page shows the location of the deliveryman in order to show the status of the food ordered by the user.

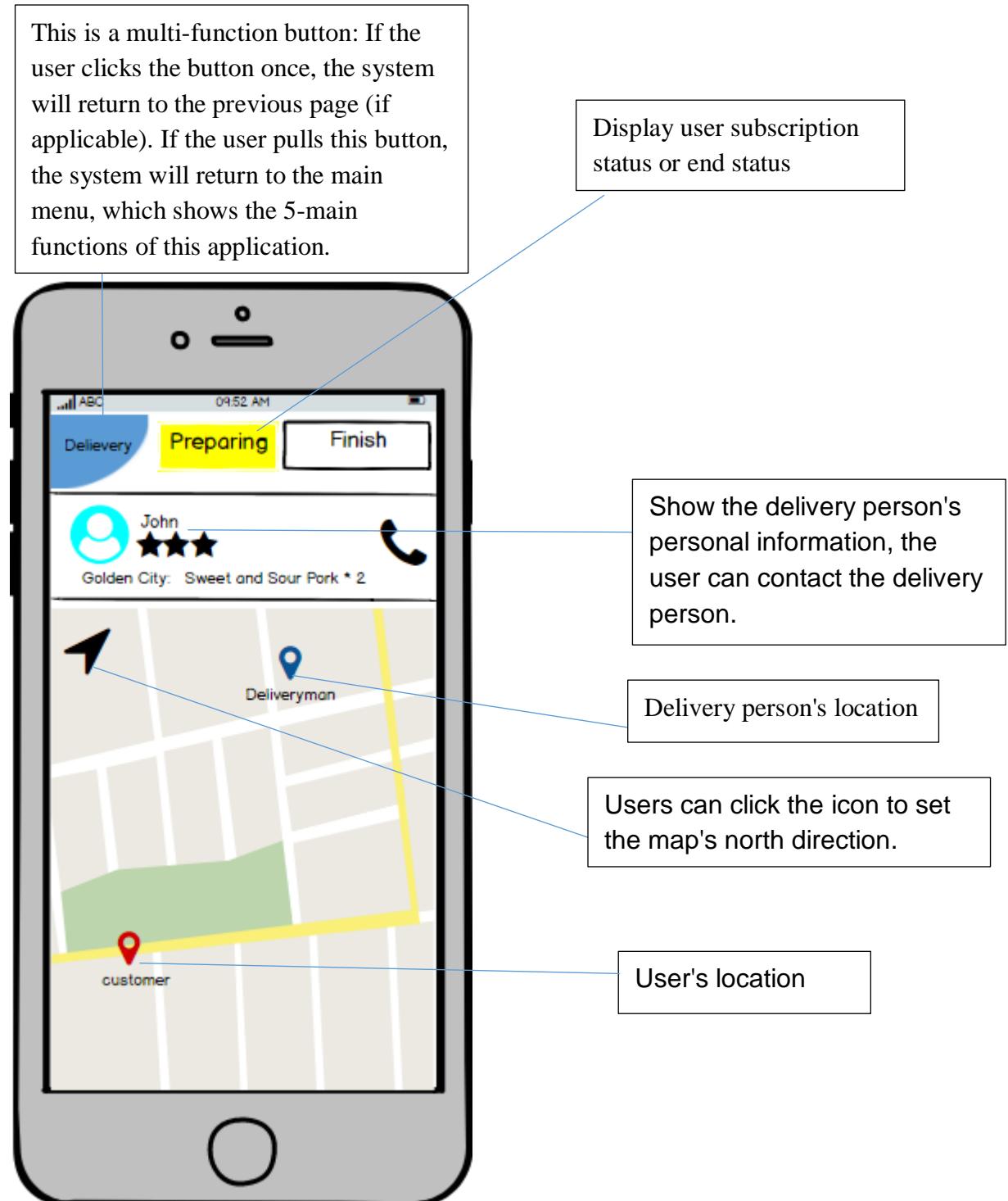


Figure 6.1

## Page 10

this is the history page, which is recording the user experience on this application, and the team design more colourful layout for users to understanding the about accuracy rate of delivery, that means red colour tell users about low accuracy rate for delivering food, yellow show the delivering process have been late few minutes, green demonstrate the delivering rate is on time.



Figure 6.2

## Page 11

this is the favourites page, which is show the different sort type restaurants detail such as by distance, times, the most attract one is the restaurants in the map, the user could clearly find the favourite restaurants in which location, and each restaurant have different information for the user to have a deeper understanding.



Figure 6.3

## Page 12

this is a me page, which is show different functions for user to select, such as searching the money activity, adding the payment way, and so on. The user has an option to update each function, for example, if the user wants to change existed free time detail, they just re-enter the new details again, the most important is that the team design have language and money exchange for the international people, and word size is for people who need to make the word bigger that can see clearly.

This is a multi-function button: If the user clicks the button once, the system will return to the previous page (if applicable). If the user pulls this button, the system will return to the main menu, which shows the 5-main functions of this application.

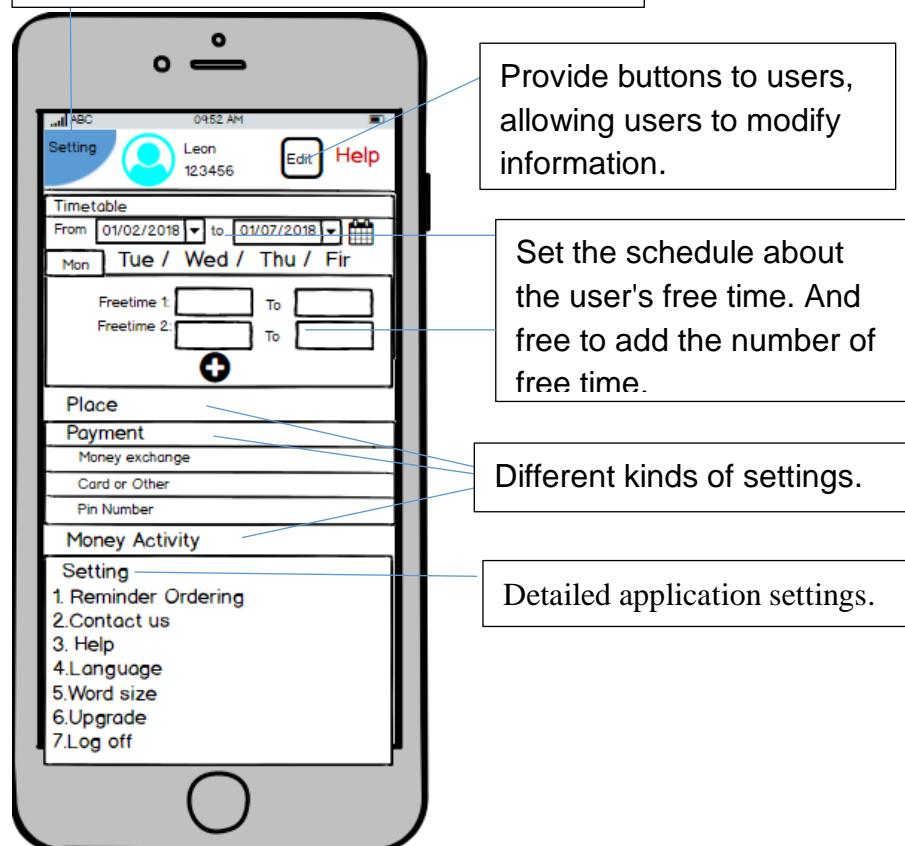


Figure 6.4

## **6.5 Second generation evaluation**

This prototype can be done because it meets the needs of the target user. However, due to some limitations, the best features of the prototype may lose some. Clear highlight part allows users to view the current selection status. Refine the timetable is necessary to increase the user's quickness. It is possible to add some of the recommended restaurant information to quickly get to know restaurants that utilize various assessment methods as they browse the homepage.

More, the tracking of the delivery person is helpful for the user to check the status of the order. Finally, collect all the orders the user has purchased and generate a line chart about the order. When users need to view previous order transactions, they will see the trend of order consumption. Based on these adjustments to their own future order.

## **6.6 Evaluation of prototype**

### **1. Visibility of system status**

Lack of necessary feedback.

Each page can be reached through buttons to other designated pages, is very convenient, and through the button can be contracted will not seem page crowded, very novel, to attract users, the operation is also very convenient, no extra operation. More stylish.

The face of all ages, regardless of the elderly or young people, there is a corresponding app style, the elderly are more traditional pages, young people are relatively new, the main page with the map, it is easy to find restaurants.

The disadvantage is that users need to experience and learn new operations, for some older people is not very convenient, take time to adapt, but when adapted to this feature, in the future, the operation will become more concise.

### **2. Match between the system and the real world**

The page placed too much information, more complicated.

In the restaurant page, placed too much information, the user cannot find the key information, but also affect the normal order, in the user information column, should not all the information on the side, you can sub-display, easy to find and use.

Two techniques could be deployed to ensure this:

1. Remove useless information
2. The information is classified and summarized, making the page look more simple

For future versions, the first is not suitable, some information is very important. We can't remove it. So, we take the first way to solve this problem

### **3. User control and freedom**

A clear 'cancel' button available on every page

Still don't have the cancel button, if the user wants to cancel the order, this can be troublesome, without the function of one-click cancel, and the user can be very puzzled only by returning the button, whether this one is reserved or cancelled.

#### 4. Consistency and standards

Most of user had usually prefer use this application, since the layout into very innovative, and there may clearly understanding what the main function that they have, and all the bar and appearance, layout and grouping of the interface elements name are consistent, the most vital design that users comment on that is the restaurant information is vivid and enough for them receive it, that means it bring a lot of conveniences for user to order a food and they could save time to analysis the restaurant general evaluation the system. In the colour contrast aspects, the history page could contain three different colour that could show accuracy of service times in each restaurant, however, some users will recommendation some of information is too much deal that they could find the useful or special for themselves. And sometimes, the format of feedback information has lost, and some page style are not consistent with other pages.

#### 5. Error prevention

Most of user demonstrate there is a little page could return some messages when users make a mistake in the process, the less tool-tip may not efficient prevent the occurrence of mistakes, for example, in the payment process, the system should give them some feedback that tell user it could not be over fail with three times, it may guarantee the less error behaviour after.

#### 6. Recognition rather than recall

Users said the navigation function is useful, since user could follow the main menu to decide which part is user's favourite, apart from that the easy and clearly structure that could follow the steps and finish the ordering process. However, user point out some images that they may easy to be misunderstanding like calendar. For example, in the search restaurant pages, user may have little confusion with calendar that what function it will be contains, in this aspect, in order to making mistake, and user may forget to use it correctly, the prompt is necessary problem for user understanding and misuse about some functions.

#### 7. Flexibility and efficiency of use

The system has provided default value, so that, when the users are using this, he/she need not to pay much attention on how to use the App. The system

offers basic functions that could make it easy to use, it could reduce the steps of ordering food, that could satisfy some users' demands, for example, the staffs are always want the ordering steps being easy. The App was also designed some short cut that makes the steps easy, but the press to return and slide to open the menu might confuse some of the users.

#### 8. Aesthetic and minimalist design

The appearance, layout, and grouping of the interface elements are designed in a suitable way, so that the appearance is not too crowded. When the users are using this App, they could understand each part of the system easily. Thus, makes it a good App that could help users order food efficiently. These designs are designed to satisfy some users' demands, such as students and staff, who want to have a consistent layout.

#### 9. Help users recognize, diagnose, and recover from errors..

The system has some warning messages, such as confirm message when the user is making a payment that could help some old users to confirm whether the trades are really what they want. There are some other warning messages that prevent the users doing something irreversible, and could help users know what they are doing.

#### 10. Help and documentation

Help manuals are one of the main ways for users to learn more about applications. Setting up help documentation in the second generation is very effective, to enhance the user's learning. More, the second generation also designed the option to contact us, which has the most direct help for users.

### **6.7 Evaluation by HCI principles**

#### **Accessibility**

- A. As we can see in the timetable page, users can choose to set their timetables to make the system recommend restaurants or foods to them. This design is aiming for those who have flexible timetables and want to have some delicious food from restaurants. It makes delicious foods from faraway restaurants accessible to these students. This is in line with the principle of accessibility.
- B. There are two setting options called language and word size, users can change languages and adjust the size of words showed in this

application. This design is designed for people who have poor eyesight or those who want to use another language to order food by this application. The options could make it accessible to old people and international students.

- C. In the ordering page, a map which shows the positions of delivery man, restaurant and destination is provided for users. For those who care about the status of orders, this feature allows them to more intuitive understanding of the current order status. This is also a reflection of principle of accessibility.

### **Efficiency**

- A. As one of the most inventive features of this app, the multi-functional button in the upper left corner greatly increases the system's productivity and users' efficiency. If the user clicks the button once, the system will return to the previous page (if applicable). If the user pulls this button, the system will return to the main menu, which shows the 5 main functions of this application. It is a combination of return button and menu button. It achieves two functions with one button. This design follows the principle of efficiency.
- B. The button 'Map' provided in the main menu could also help users to find restaurants around them quickly. This reduces the time users need to search for restaurants in some certain situations. This also means that users can complete what they want to complete a specific operation in a shorter period of time. It greatly increases the efficiency of this application.
- C. While users searching the restaurant, a list of detailed food categories is displayed below the search bar. It can help users to make decision about what kind of foods they want instead of thinking about and input. This list of detailed food categories can greatly increase the efficiency of ordering.

### **Memorability**

- A. Because the basic ordering process is very logical, so the ordering process for users will be very easy for them to remember, that is to say the principle of memorability in the ordering software is relatively easy to meet. Of course, our system is no exception, it follows the principle of memorability.
- B. As we mentioned, the multi-functional button in the upper left corner is a combination of a return button and a menu button, which makes it much easier for users to remember how to operate this system and conduct ordering foods. This feature is a verification of principle of memorability.

## **Learnability**

- A. From a learning perspective, this application has a relatively high degree of difficulty, and users need to adapt to this multi-function button (including clicking back and dropping back to the main menu). We know that the traditional application usually has a menu bar at the bottom, the user can select different modules through the menu bar. For this application, an innovative way to interact requires a certain amount of learning costs for the user.

## **Errors**

- A. As the main page shows, there are five round buttons with slightly larger sizes representing five main functions respectively. This design is not only to allow users to more clearly understand the content displayed on the page, but also to a certain extent, reduce the probability of the user points the wrong button compared with smaller buttons.
- B. In the map page, while users want to search a restaurant around them. The results appear densely in the lower part of the phone screen, apparently, these results show the way for the user is very difficult to accurately click. In other words, this design runs counter to the principle of errors.
- C. When the user selects what they want in a particular restaurant, an extra reminder appears after the clicking submit and lets them confirm again that they are thinking of the correct food, reducing the chances of the user's errors occurring. This proves that the design follows the principle of errors.

Positive aspects of the second generation

- 1. The elements of layout, appearance between interface has been consistence
- 2. The information of each restaurants have contained a lot of detail that can make user more clearly understanding the general ability of restaurants.
- 3. The me page have different selection like money activity, reminder order and so on, user could base on those functions meet their own demands.
- 4. Feature about recommendation restaurants make some user simple to accomplish their goals.
- 5. Feature about money exchange and language, even international people could use it comfortable to understanding how much their need pay in their own country's money.

6. The design menus has more innovative ideas, make sure one button come true two functions, which return the last page and go back the main menus.
7. The map design is more specific, as the map function could return image information about delivery man, and the user could also have located their own position.

Negative aspects of the second generation.

1. No function to alert user the accuracy rate of delivery food in a special restaurant
2. No feature is cancel some of order in their own shopping basket.
3. The icon have different design, it may make users confused about Which main function it has.
4. This app should contain more help icons in each page.

## **6.8 Conclusion of second generation prototype**

In this prototype, the team designs are designed more humanitarian and innovative, the prototype is designed for the users that they need a timetable available restaurant and also for the users who often eat food irregularly. It contains basic functions and add new other functions like money activity, map, language, and exchange money and word size. In some case, it could meet different users' requirements, for example, for example some stuff who do not the location of restaurants, the map options may have clearly image for them to locate themselves in the map and the foreign students could change the money exchange and language, this design is for users to have a comfortable experience. Considering the old users and some other users who have difficulty in using the intelligent phones, there some other humanitarian designs, for example, the olds could change the size of the front. Above all, in the new menus' design, it could increase efficiency, memorability, usability, accessibility, but this design may scarify a part of learnability, which means uses need take few days to learn this new menu design. Through second generation evaluation, the team could learn which parts we should weight higher than other, since there is no one design that could be prefect 100 percent in each part, based on the feasible analysis sometimes, satisfy one of part for app usability is reasonable method, and in the future, the team may also focus on how to increase the learnability for the user.

Through the design and research of the second generation prototype, I learned that the design should have different styles for different people, but in the meantime, it is necessary to have a specific purpose instead of meeting each one's needs. For the operation to be novel but not complicated, for take-away app, the color should be warm, but not absolute, the different pages of different features presented feeling is not the same. And for the study of other

apps, plus the production of first generation prototypes, we learned how to make your app stand out in many apps, focus on developing apps that have their own characteristics, and combine development with reality. The user experience is the ultimate.

## 7 Recommendations

Although our second-generation prototype has evolved from the perfection of three different prototypes of the first generation, in order to develop the system in the real world, some problems raised in the above analysis need to be solved.

In some pages, we used different colours to represent different states, which lack of consideration to those who are not sensitive to different colours. Therefore, a colour-blind mode should appear in the settings for those who need it.

Besides, we put a search box in the map page for users to search for restaurants, but whether this is a more appropriate choice than to remove the search box remains to be verified. Because when users use the map to search a restaurant, usually they do not need to search a specific one in a small area.

Another major problem is that there are some aesthetics problems with the prototype due to tooling or user of the tool, such as the choice of colours, the accuracy of the layout. And the proportion of different buttons in the page.

It is worth mentioning that we designed an innovative way of interactive mode that users can complete two operations with a button: chick the button on the top left corner once to return to the previous page and slide it down to back to main menu.

## 8 Conclusion

This article is mainly divided into four main parts, literature review, study the advantages and disadvantages of existing systems, analysis of the scene of the three different types of people scene description and demand characteristics, and design two generations of different versions of the prototype, the first three parts of the main basis for the design of the

foundation. Before doing the design, we do the literature analysis of the survey, in view of the impact of mobile phone applications and the basic principles of mobile phone applications. On this basis, we have to study user needs and ordering system common problems, and finally we discuss the development of online ordering system mobile in the market. For the purpose of analysing and designing user-friendly mobile applications, we next analysed different similar existing systems, analysed their respective advantages and disadvantages, and summarize what advantages we can use in our system, and what disadvantages our system should avoid. Then, we divided the target users into three groups and selected a representative person as the template for user needs analysis. According to the different characteristics and needs of these users, we put forward the requirements for the following prototypes. Then we designed the first prototype, including three different prototypes, and applied the three prototypes to three users to analyse whether the application met their requirements. Finally, we designed the second prototype according to the analysis results, and analyse the advantages and disadvantages of this system according to HCI principles.

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