Tourist Guiding design based on iPad

Ruibo Zhang
Abstract

Tourist Guiding design based on iPad

Ruibo Zhang

Abstract
Context: This paper aims to draw out a design of travel software (named 'tourist guiding') with perfect function and well interactive, which can be performed on the platform of iPad. This design contains four main steps: the first step is carried out with the concept of user-center design. In order to analysis the user requirements, interviews and questionnaire are conducted to collect the user data; the second step is based on the former research and then draw out the main structure and tasks of our design; the third step is the detail design of the "Tourist guiding"; the fourth step is evaluation and modification. Usability test is conducted in this stage. After the evaluation of the testing result, some modification and promotion work is done to promote the "Tourist guiding".

Goals: By doing this to display the advantages of iPad platform, and try to use iPad to replace the role of laptop during traveling. The "Tourist guiding" with unique operation method, it is very different with the other traveling software in the current market. The "Tourist guiding" with the powerful function, which includes almost all of the functions that travelers needed when planning a trip, as well as during the trip, e.g navigation, plan making. Meanwhile, it also simplified the operation method at the most degree.
# Table of content

1 Introduction .................................................................................................................. 3  
   1.1 Background ............................................................................................................. 3  
   1.2 Aim .......................................................................................................................... 4  
   1.3 Design Concept ....................................................................................................... 4  
   1.4 Delimitation .............................................................................................................. 5  
   1.5 Outline ...................................................................................................................... 5  

2 Literature review .......................................................................................................... 6  
   2.1 Interaction design ..................................................................................................... 6  
   2.2 User centered design ............................................................................................... 6  
   2.3 Usability testing ...................................................................................................... 7  

3 Research ....................................................................................................................... 9  
   3.1 Research process overview .................................................................................. 9  
   3.2 Data collection ....................................................................................................... 9  
      3.2.1 Questionnaire .................................................................................................. 9  
      3.2.3 Interview ...................................................................................................... 10  
   3.3 Result ..................................................................................................................... 11  
      3.3.1 Questionnaire result .................................................................................... 11  
      3.3.2 Interview result ............................................................................................ 13  

4 Designing ..................................................................................................................... 15  
   4.1 Design concept ....................................................................................................... 15  
   4.2 Interface design and structure .............................................................................. 15  
      4.2.1 Journey planning design .............................................................................. 17  
      4.2.2 Design of navigation .................................................................................... 30  
      4.2.3 Additional designs ....................................................................................... 32  
   4.3 Conclusion of design .............................................................................................. 35  

5 Test and evaluation .................................................................................................... 37  
   5.1 Method .................................................................................................................. 37  
   5.2 Measures ............................................................................................................... 37  
   5.3 Evaluation and improvement ................................................................................. 39  

6 Conclusion .................................................................................................................. 41  

Reference: .................................................................................................................... 42  

Appendix: ..................................................................................................................... 43
1 Introduction

With the development of technology and the improvement of techniques, the geography gap between people live in each continent on the earth has been eliminated gradually. The development of tourism enable people can witness the wonderful places where they expecting for by themselves, instead of imaging it from the pictures and words on the books. However, the highly developed information technology does not eliminate the gap between people and the tourism destination completely. Problems like language, custom, traffic, accommodation are all considered as the obstacles during tourism, they key element to solve the problems is information.

“People must travel with bringing the knowledge if he wanted to bring back the knowledge”----Johnson

Fortunately, nowadays, people may really bring the “Knowledge” to travel.

1.1 Background

With the development of Internet, wireless communication equipment, and electronic information technology, more and more advanced electronic equipment entering to the market. These tools make people’s life easier, but also more complicated in some way: people have to make a much more detail plan for their travel before they departure. For instance, to search the accommodation places in the appropriate location and with the acceptable price, booking a flight, investigating the information and location of tourism attractions, design the most appropriate tourists routes, get to the local custom, make a schedule, and so on. In this era of information big bang, the reliability and authoritative of information is decreasing gradually. People have to search and visit for more than ten different website and BBS in order to collect the most reliable information. Finally, the plan was settled. In case of some accidental changes during the tour, people always choose to bring a laptop with them, so that they can re-plan their routes or get other information in time. However, the weight of laptop will bring some inconvenience to the travel, and the laptop is not much available when using outdoors. Thus, the cellphone and tablet PC become the perfect alternatives. Meanwhile, there is a lot of travel software in the market. The problem is that most of these software were designed under all kinds of limitations, thus the function are not comprehensive enough by now, and the reliability is not high enough.

The common travel software we see in the market can be categorized into 3 types. One is booking type; it mainly offers the services of flights booking and train tickets booking. The second one is information type; it mainly offers the introductions about the local tourists attractions, as well as travelers’ comments about the places they have visited. The third one is the BBS/forum type; actually it is the mobile version of Internet traveling BBS/forum. According to our investigation, we found that the penetration of this type of traveling software is rather low. People are tend to use the software like Google Map and Maxthon browser to get their wanted information.
Thus, we consider that there is no existing travel software can fulfill the users’ need completely in function. In addition, these software are suffered with the problems like that the imperfect interactive system.

1.2 Aim

The aim of this research is trying to draw out a design of travel software with perfect function and well interactive. Our design will base on the platform of Ipad and Iphone. In order to achieve this aim, we need to fulfill the following objectives:

First, collect and analysis the user’s demand of travel software;
Second, plan the software’s structure and function;
Third, design the visual interface;
Fourth, user evaluation.

1.3 Design Concept

Our design project's title is “Tourist Guiding”, it aims to design a travel software that can replace the role of laptop during travel. This design will be carried out on two platform in the same time: ipad and iphone. By doing this to display the advantages of these two platforms. Ipad can play its advantages of function and screen to replace laptop to collect information, make plan, hotel and flights booking, and so on. Meanwhile, it can also achieve the need of GPS. Iphone can use its advantages of portable to replace the GPS navigator, map, guiding, information collection, and make simple plan. In addition, iphone can receive the plan that has been made on the ipad, and carry out its guiding work as previous plan. Therefore, travelers can get rid of the heavy weight of laptop after departure as ipad and iphone are much more light and portable than an ordinary laptop.

When the users have both of these two platforms, they can search information and do other works on the ipad, or make a new plan, and then send the message to iphone, so that users can leave the ipad in the hotel or carry with it when going out. Travelers only need to bring iphone with them to go out. Iphone can play a role as a navigator, as well as deal with emergency situations, for instance, suffered train strike, we have to re-plan our travel plan.

We also consider the whole operation structure when we are designing this software, including the information exchange between servers. Meanwhile, we are also trying to design a solution to solve the problem of information sources’ reliability. This paper is focus on the design on ipad platform, and my partner Songke responsible for the design work on the iphone platform.
1.4 Delimitation

The focus of this project is on the design of software’s interface, as well as the operation structure and function design. It is worth to pay attention to that this project we do is not included programing.

As the time is limited, the social investigation sample is not large enough.

As there is no programing implementation, it reduces the precision of carrying out usability testing to search the software.

1.5 Outline

Chapter 1 includes the research background, research aim, design concept, and delimitation.

Chapter 2 contains the relevant theories: interaction design, user-centered design, and usability test.

Chapter 3 presents the research information, including research process overview, data collection method, and the research result.

Chapter 4 is about the design work of the travel app.

Chapter 5 introduces the usability test and evaluation.

Chapter 6 presents the conclusion drawn from this project.
2 Literature review

In this chapter, important concepts and relevant literature review are going to be presented and discussed.

2.1 Interaction design

In interaction design refers to design interactive products to support people in their working lives and everyday (John Wiley & Sons, 2001). According to Winograd (1999), it is about creating user experiences, which enhance and extend the way that people do things. Winograd describes it as the design of spaces for human communication and interaction. So it is about finding ways to support people to do things in a more convenience and comfortable way. John Wiley & Sons (2001) states four basic activities in the process of interaction design:

First, identifying the user needs and establishing user’s requirements;
Second, developing alternative designs, which can fulfill those user requirements;
Third, building interactive versions of the designs, so that they can be communicated and assessed;
Fourth, evaluating what is being built during the process.

In addition, there are three key characteristics of the interaction design process (John Willy & Sons, 2001): the user should participate through the development of the project; specific usability and user experiences goals should also be identified, clearly documented, and consistent and the beginning of the project; iteration through the four activities is inevitable.

2.2 User centered design

In broad sense, the User-Centered Design refers to a design philosophy and a design process.

The Unser-Centered Design (UCD) concept is first proposed by Norman and Draper(1986:61), it highlights the purpose of the system is to serve the user, instead of using a specific technology and elegant programing. It also emphasis that the need of the users should dominate the design of interface, and the needs of interface should dominate the design of the rest system. This concept has been developed since it was proposed. Gulliksen et al built a new definition about user-centered design (2003: 397), it indicates that while the importance of having a good understanding of the users’ need is stressed, the user's involvement during the design process is also important. There is an international standard ISO 9241-210 (2010), its former is the ISO 13407 (1999), which is the basis of many user-centered design methodologies. It
defines a common process for human-centered activities that throughout a development life-cycle showed as following figure 1:

![Diagram of life-cycle of human-centered activities](image)

**Figure 1: Life-cycle of human-centered activities**

Source: ISO 13407 (1999)

In this life cycle model, four activities four the main cycle of work:

First, specify the context of use; in this step, researchers identify the target market, including the existing users and the potential users, as well as what kind of condition they will use it.

Second, specify requirements; identify the business requirements and the users’ needs.

Third, create design solutions; building from a rough concept to a complete and practical design.

Fourth, evaluate design; this is the most important part, it aims to examine if the design fulfills the specified user requirement, usability goals and complies with general usability guidelines (Benyon, 2010).

In the end of this process, once the requirements are fulfills, the product can be released.

### 2.3 Usability testing

The usability testing is a black-box testing technique used in User-centered design to evaluate a product through testing it on users. It can be characterized as an irreplaceable usability practice as it gives direct input on how users use this system in practical (Nielsen, J., 1994). The usability testing measures the usability of a specific
object or a set of objects, for instance, consumer products, web sites, computer interface, web applications, and devices. The aim of usability testing is to discover errors and areas of improvement through observing representative users using the product. In general, there are five aspects that the usability testing measures for the test subjects:

**Accuracy:** how many mistakes did the user make, and if they are fatal or recoverable with the right information.

**Performance:** how much time, how many steps that required for users to complete the basic tasks.

**Stickiness:** how much time does the user spend on the tasks?

**Recall:** how much does the user remember afterwards or after periods of non-use.

**Emotional response:** how does the use feel about the tasks, is the user stressed or confident, if the user would recommend this product to others.
3 Research

In this chapter, a research process overview will be presented, followed by the detail research method and research result will also be presented respectively.

3.1 Research process overview

This project can be divided into 4 stages: requirement identification, software design, usability test, evaluation and modification.

First, requirement identification; we conduct interview and survey to collect data. The questionnaire is conducted for collecting the basic information about travel, and traveler’s basic needs. The interview is carried out with experienced travelers, by doing this to learn specific user demands and desires in deep.

Second, software design; in this stage, the users requirements and expectation are analyzed based on the collected data. And then turns the realizable parts into the real design. Meanwhile, user experiences are well considered. The design team is trying to achieve fulfill functional requirements, as well as make the operation as simple as possible.

Third, usability test; as this paper is not includes programing, so the designer is going to show their design through designing pictures to the participants, and then collect the participants’ opinions.

Fourth, designers evaluate the designs based on the participant’s respondents, and make further modifications.

3.2 Data collection

In this part, we are going to present the data we collected from our investigation, including questionnaire and interviews. The purpose is to get to learn people’s concrete demands, and potential demands when they are traveling.

3.2.1 Questionnaire

We conduct the random sample when selecting our research samples. In order to make sure the randomness of our sample, we hand out our questionnaire in two different ways. One is through the Internet to publish the online questionnaire. The other way is hand out our printed questionnaire in places where people are gathered. We choose the supermarket as out target place as there are always people coming, and most of these people have additional time to take a look at our questionnaire under our sincerely requests, as well as to ensure the cover of different group. Finally, we gathered 40 samples, among this number, half of it comes from the online questionnaire, half of it
comes from field survey.

According to the Ai media marketing consultancy, “The brief analysis of Ipad’s annual sales global market (2010)”, The analysis of the IPAD user’s age attribution, the ages of users between 18 to 36 accounts for the whole number’s 56%, which means the main user group of IPAD is among age 18 to 36. Given our travel soft is designed based on the platform of IFAD, we choose the results of respondents between 18 to 36 as our main analysis objective.

The questions in our questionnaire are designed into two types. One is the basic question, about the respondent’s age, sex, travel frequency, etc. the other one is the senior question, it is mainly about the design of software, and the requirements of demands. For instance, “would you like to share your traveling experiences?”, “would you like to public your location during traveling?”

### 3.2.3 Interview

Four semi-structured interviews were carried out respectively in this project, the detail information about the interviewees are showed in the table below:

<table>
<thead>
<tr>
<th>Name</th>
<th>Mr Li</th>
<th>Mrs Yun</th>
<th>Mrss Kaila</th>
<th>Mr Yang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Female</td>
<td>Female</td>
<td>Anonymous</td>
</tr>
<tr>
<td>Age</td>
<td>25</td>
<td>23</td>
<td>31</td>
<td>35</td>
</tr>
<tr>
<td>Have ipad</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Background</td>
<td>Employed in Tencent company in China</td>
<td>Studying in Uppsala</td>
<td>Studying in Uppsala</td>
<td>Anonymous</td>
</tr>
<tr>
<td>career</td>
<td>Position IT product consultant</td>
<td>Student</td>
<td>Student</td>
<td>Anonymous</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Interviewee information</th>
</tr>
</thead>
</table>

The interview includes two parts. One is for iPhone app, the other one is for iPad app. Each interview was last for about half an hour. In order to learn more information, the ways of questioning is proposed according to the respondent’s characteristics and real situations during the interviews. This paper is for designs on ipad, thus, the author response for the interview about ipad app. The author’s partner is responsible for iPhone app. Therefore, only interview result with iPad is presented here.
3.3 Result

Based on the data we collected, we draw out the following results,

3.3.1 Questionnaire result

Result 1: the current travel software cannot satisfy travelers’ demand.

According to the survey question: *What kind of apps do you use during the trip?*

![Bar chart showing the results of Q1](Image)

Figure 2 Result of Q1

From figure 2, we can see that most travelers tend to use Google map and Google search engine, as they consider it is the direct method to collect information and search for help. There is less than 10% of respondents used travel software.

Result 2: Google map is significant

In figure 1, the percentage of using electronic map, like Google map is up to 75%, it is the most popular software among respondents. According to the analysis of current travel software by researchers, most of those software do not contain the function of map. The help for users will be very limited if this software is without map function. In addition, the users are obviously unwilling to change to Google map. After they check the information, they need to go back to the software. It is inconvenient for users. Thus, the **map function** should be the put in the core position in our designing.
Result 3: Tour information is very important

According to the question: *Have you met the situations as followings during your trips?*

![Bar chart showing the results of the survey questions.](image)

**Figure 3  Result of Q 2**

From the above figure 3, we can see that there are 60% of respondents hoping to get information about the traveling sites. Thus, the travel information search function should be included in our design.

**Result 4: Navigation function is necessary**

We can see that most respondents have suffered with the problems about finding location from the above figure. Thus, the navigation function should also be included in our design.

**Result 5: Public user's location during tour**

We assume that we can public the users' location when traveling, to let friends can see their travel location mutually, as it may be interesting and convince for others to find the travelers. After our investigation, this function will be alternative for the users to choose open or close.
From the above figure 4, we can see that there are 21% of our respondents wouldn’t like to public their location at all. 55% of respondents indicate it would be selective depends on the real situation. Only 24% indicate it is ok for public. Thus, as this function is related to private issues, so it would be alternative to use or not.

**3.3.2 Interview result**

Information 1:
Low trust with the booking system in iPad’s app. Respondents would rather use the common booking website like momodo.com and booking.com to book hotel, flights, etc.

Information 2:
During the trip, because of the network restriction, most respondents can only use the wifi in hotel. Under the condition without wifi, most of them choose to shut down the network service on mobile phone or ipad as the expensive charge.

Information 3:
Generally, it is hard to make sure the things follow the schedule when visiting the tour attractions. This is because there are always accidents that make people have to change their original plan.

Expectation 1:
A score system as reference standard for tour attractions, as well as the other traveler’s comment on the attractions.

Expectation 2:
Provide local restaurant location and other information. Respondents indicate, they usually ignore the collection of eating. After they arrived the destination, it is always hard for them to identify the most appropriate restaurant.

Expectation 3:

Don’t like too much information showed on the screen. Users wish there is a good filtration system to help them search the attraction information effectively.
4 Designing

This section is going to present the concept of design, as well as the design of interface and the structure.

4.1 Design concept

The design concept in this project is generalized according to the user’s requirement and expectations we discovered from our interviews and survey. It can be characterized into 5 points as followings:

(1) Powerful function

This design project is based on the user’s demands, so the user’s requirements with the travel software are well considered. The aim is to make iPad replace the role of laptop during traveling.

(2) Simple structure

The structure of this travel software must be very clear and simple. Try to reduce the changes between different function’s operations. Make sure that the users can get fully understand with the software’s structure and function in short time.

(3) Simple operation

Simplified the process of each operation.

(4) Universal design

Universal design refers to that the design of software should take full consideration of the user’s mental model. Try the use the manner that most acceptable to general public when designing button or panel. As this software is design for operating on the platform of iPad, the design should try to follow iPad’s mode of operation as well as possible. So the users will be able to familiar and understand with the software as soon as possible.

(5) Nice interface

Users always like the beautiful appearances.

4.2 Interface design and structure

The inspiration of design comes from the bench in real life. For example, you have to assemble a toy car on a workbench, your action is to get the wheels from the parts box on the left, then to the right of the tool area to get a screwdriver, and then assemble it in the central workspace. It is the same thing when you are dealing with designing travel software. Showed as following picture 1:
Picture 1

Top setting panel

Left panel:
- Attraction
- Restaurant
- Shopping

Right panel:
- Google map
- Free working area
  (drag the needed icon into this area and use it when needed)

Journey plan panel

Connect & Help

Picture 2

Picture 1 and picture 2 are the main interface of the software. This interface is composed with 6 components.

The top setting panel contains 3 function icons: Setting, Google earth, and search.
The left panel contains 3 components of planning journey: **Attraction**, **Restaurant**, and **Shopping**. This is just like a parts area of working bench.

The right panel contains 3 components of planning journey: **Long-haul traffic**, **Short-haul traffic**, and **Accommodation**. This is just like the tool area of the working bench.

The bottom part is the journey-planning panel. The whole thing is just like you are assembling a toy car. You need to put the needed parts together.

The last part is the background of this interface. This background is not a simple picture. It is Google map. Users can drag it like using the Google map. Meanwhile, it is also a free working area. User can put the icon which un-needed temporarily in this area. At the same time, it would also show the general information of the journey that the user has already set (the yellow lines and the red thumbtack in Picture 1).

### 4.2.1 Journey planning design

An example is presented to show the design work.

When the user wants to plan a Journey to Paris, the first thing he needs to do is to locate Paris. There are two ways to locate Paris. One is use hand gesture drawing on the background of the main interface (Picture 3). The other one is to touch the search button into the search interface to search this city. Showed as picture 4:

![Picture 3](image)

![Picture 4](image)

The search interface can be divided into two parts. One is the search box; the other one is the filter. The search box is for the input of search content and result showing. The search subject can be anything that users want to learn, city, hotel, attractions, restaurant, etc. the filter is for filtrating the search results. The map on the main interface will change to the chosen location automatically after the user locates Paris.

After Paris has been located, the system will update the information both in the left and right panel according to the current city.
When users want to get the information about the tourist attractions, he needs to open the left panel by dragging the attraction icon to planning his journey, showed as picture 5:

![Map of Paris with attractions highlighted](image)

**Picture 5**

The attraction panel shows the attraction information of the located city. Meanwhile, the attractions are characterized into 3 different types: **Culture**, **Monument**, and **Scenery**. For instance, the **Culture** includes all kinds of museums, the **Monument** includes the Yi Erfei Tower, Triumphal arch, etc. The **Scenery** includes the nature scenery like Great Falls, Al Pace Hill.

In addition, users can select the attractions they preferred through the filter in the top of the attraction panel. The main part of the attraction panel is the attraction list. The attraction list shows the information of current located city, and sorts the information according the different attractions. From Picture 5, we can see that the first item is the score for Yi Erfei Tower, it is 10 stars, which means this attraction is very popular for tourists. This score is from the users evaluation after they visited this attraction. At the same time, the map shows the location of attractions in the list by label them in A, B, C, D…with thumbtack (Showed in picture 5).

If the user wishes to gain more detail information about this attraction, he only needs to click this attraction. The middle of the screen will show the detail information. Showed as picture 6 and picture 7. User can scroll the detail information panel in the
The detail information panel includes the introduction of attractions, open & close time, price, pictures, and other users comments on it. Of course the users can also add their own comments.
Now, the user wants to make a full journey plan to Paris. First of all, he needs to build a new journey. The journey plan’s creation and modification is finished in the journey plan panel. The journey plan panel has three levels. The current page is the existing journey list showed in picture

The bottom left corner in picture 8 is the New button of creating a new journey. The bottom right corner is the Edit button, which is used for setting the detail information about the journey, e.g. the schedule. The nation icons in the middle are the existing journey plan. The icon is set automatically according to the target place in the journey plan. For instance, the first plan is to USA, the icon will show as the flag of USA. If the journey plan contains several countries, the flag of the first arrived country will be the icon. If it is the first time that the user uses this software, the journey plan panel in the bottom is empty.

When the user click the New button to add a new journey, a dialog box comes out, and requires the user input the title of the plan, start data. Then it will enter the schedule edit page. Showed as picture 9:
The left side of schedule edit panel is the **Back** button. The small circular icon next to the **Back** button is used for showing the former day. As it is the first date of journey, this small icon shows “0 th”. The left “+”, which used for adding another day’s schedule or shows next day’s schedule. Because the current page shows in the picture is the only day, so the icon shows “+” to add a new day. The yellow icon in the left side is sun, it used for moving to the former day. In contrast, the right side is the moon icon, used for moving to the next day. If there is no a next day, it would create a new day when click it. In the middle part of this banner is the edit list. Now we can see that there are five icons, we can also consider it as an empty space needed to fill contents in it: traffic ---- destination----- traffic-----destination-----traffic. In the “traffic” icon, user can put all kinds of traffic tools in it. In the “destination” icon, user can put the attractions, restaurant, shopping, and hotel in it.

Now, the user starts to edit his journey. First, he needs a flight tickets to Paris. The user opens the Long-haul traffic item in the right panel of journey planning. Showed as picture 11:
This page contains three chooses: flight, train, and ship. According to our investigation, most respondents have low trust with the booking business in app. They would rather to book flights and hotels through the common website, like “momondo.com”and“booking.com”. Therefore, the project is not going to integrate these website’s booking business into this app. Instead, it would provide the main booking websites’ link in it. After users finished the booking stuff, the user goes back to this app to fill some general information about the departure time, arrive time, and destination. When the user finishes the flight information, he needs to drag the flight icon to the first empty place in the edit banner by his finger. Showed as the following picture 12:

![Map Interface](image)

**Picture 12**

The **Long-haul traffic** represents for a traffic method, as well as a destination (airport, port, train station). Thus, the system will add a new space for traffic, by doing this to set the traffic tools from the airport to next destination.

The **Short-haul traffic**’s setting is the same with the **Long-haul traffic**. The one thing is different, that is the users do not need to set the time and destination again, the system will set the routines automatically according to the former and next location. But here is a precondition that the local traffic company website should connect with this app to gain the traffic information includes the routine and price. Shows as picture 13:
If the user wants to visit the Erfei Tower, what he needs to do is just the same with dragging the flight. Showed as picture 14:

This kind of operating method is universal both in the right and left panel of journey planning. Meanwhile, the user can also adjust the schedule in the free working area. For instance, the user wants to change the sequence of Erfei Tower and Louvre, see the picture 15:
Delete operation, shows as following picture 16:

The system will add the new space according to the current situation to convenient users to add new destination and traffic tool.

Picture 17 shows the finished journey:
Picture 17

This user plans a 8-day journey to Paris. The picture 17 shows the eighth day’s journey. A simple routine of current day will show on the map. The orange icon of “Start Navigation” button is used for navigation. The detail about this function will be discussed later.

If the user wants to check the third day’s journey, there are two ways. One is to click the sun icon in the bottom banner to back day by day until the third day; the other one is to click the ‘Back’ button, back to the former level to choose data 3.

The structure between journey plan panel and data selecting panel is showed as following picture 18
According to our investigation, the researchers found that it is hard to follow the original schedule exactly during the trips, as there are always some accidents make travelers have to change the original plan. In most cases, except the flight time, the other time is un-stable and flexible. Most travelers set the time by personal experiences. Thus, the actual journey may delay or shorten. In terms of this problem, this app can set the time for users automatically. The system will calculate the general costs of time in each attraction, and then makes a schedule for user. The most important point is that the system will adjust the schedule according the user’s spending time on the attraction. We believe this will be a very humanity design. Of course, the users can set the whole schedule by themselves.

When the user wants to make the schedule by him, he needs to go into the journey-editing page by clicking the edit button. Showed as following picture 19
Uses can easily change the *detailed itinerary panel* and the *journey-plan panel*. When the user clicks the edit button in the right side of the banner in these three levels, it will enter to the corresponding detailed itinerary edit panel.

In addition, users also can switch between these three detailed itinerary edit panels. The detail design with the itinerary panel will be introduced as followings:

**Detail design of Journey-plan panel**

This design is showed in picture 20:

![Travel plans interface](image)

**Picture 20**

The above picture 20, shows the detailed itinerary panel of trip to Paris. The left side is the trip selecting. The right side is the detail information about chosen trip. In this picture, it shows the 8-day trip to Paris. Users can adjust or delete or add new plan in the way of dragging. Then chose one day to enter the specific schedule. Users can edit the plan’s tittle in this interface, or preview the plan, transmission the plan to iPhone, or delete the whole plan, etc.

When user choses a day from it, the system will turn to the detail itinerary panel, showed as following picture 21:
Picture 21

Picture 21 shows schedule of the 8th day of trip to Paris. The default timetable is set by the system automatically. Of course, users can also set the timetable in manual, showed as picture 22:
In addition, users can also add some conditions to help the system set the timetable, showed as picture 23:

**Picture 23**

According to our investigation, users are usually suffered with the problem that there is no network during the trips, which means users cannot check the plan without network. In terms of this problem, this project designs a text-navigation program, showed as picture 24:

**Picture 24**

The text-navigation’s basic principle is that use the map information to generate a simple map and text messages with GPS coordinates. The simple map is drawn by connecting the GPD coordinates, the usages is just like the first invented GPS, there is no map, only with coordinates. The text messages are the basic of streets and important buildings. For example, “Go directly for 100m, and arrive on the XXX road, then turn left, go for 500m.” this function can be used without network. Only needs the GPS and electronic compass can work normally. Although the performance is not so good as there is network, but it is better than nothing. This is all about the design of the edition function of App.
4.2.2 Design of navigation

As the former design has mentioned about the navigation, here the picture 25 shows the way of entering the navigation system:

![Map with navigation markers and start navigation button]

**Picture 25**

It is default that the departure position is the destination of the former day. For instance, after 7 days travel in the trip, the user back to hotel, so the starting position of the 8\textsuperscript{th} day is this hotel. If the user’s location is not in the hotel, when he clicks the navigation button, the system will prompt if the user would like to use the current location to start navigation. Picture 26 shows the page of starting navigation:
At the top of navigation page, the distance from current position to the destination will be showed, as well as the traffic tool and corresponding time and costs. The right side is a switch, which can choose to turn on or turn off to decide if the user would like to use his direction. If it is turn off, the map will use the up side as the north, the compass shows the user’s direction.

Below the compass, there is a “360° ” display. This “360° ” display is an interesting design. When users click this button, the system would change to the First-person perspective display, shows as picture 27:
The sources of this image are from the first person perspective from Google map. The interesting thing is that users can take the advantage of the orientation sensor in iPad to see the surrounding circumstances. The user only needs to turn or life the iPad, then he can see the images of the corresponding position. And the images can be updated when the user moves. We think this design is not very practical, and it will consume a lot of data transfer. But it is really an interesting idea.

Given changing plan is common situation that people met during the trips, the navigation is design with delete operation. Users can delete the attractions during the trip. The operate method is: select the un-wanted attraction, and click the delete icon in the right bottom corner. However, a new attraction cannot be added. If the user wants to add a new destination, he needs to go back to the edit panel to finish it.

**4.2.3 Additional designs**

(1) This part includes the design of the setting interface, and log on interface. But this is just a general design, not a completely design. The purpose is to show the structure of the structure.

By clicking the setting button in picture 28 to enter to the setting interface:
The setting interface contains the account setting (picture 29), user setting, navigation setting, system setting, friend setting (33).

**Picture 28**

**Picture 29**
(2) In addition, the design about Google earth is also presented.

At the top of this app, there is an icon of Google earth, showed in picture 31:

![Picture 31](image)

(3) Help function

Since this app is very different with the existing travel app, it is necessary to take a
simple guiding to help users to use this app in the first time. This help function contains two parts, one is for first time using of this app; the other one is for problem solving.

The first time using help is design for users when they first use this app, it will introduce the basic components and functions of this app, and shows the critical operation in the way of video. The problem solving help adopt the traditional content way to classify the common questions and answer them with texts.

4.3 Conclusion of design

The function of this app for iPad is rather much, so the main challenge in this design is how to make the complex design to be a simple operation. It is very complicated to design a completely app for us in a short time. There are a lot of detail information needs to take into consideration on the connection between each function, as well as the connection between each button. Meanwhile, the aesthetic problems are also needed to be full considerate. In order to make sure there is no unreasonable situation, the designers spend a lot of time on researching the structure of this app. As a work bench structure design is adopted in this project, it made a lot of work have to be completed in a single interface, which means this structure has a very high requirement on the balance of designing. Each button’s function and position have to be well considerate. The general structure of this app can be showed as the following picture 32:
In order to take further improvement, after the all design work has been completed, a usability test will be carried out to find the existing disadvantages and the possible confusion point for users.
5 Test and evaluation

Detail information about usability test and evaluation is going to be presented in this section.

5.1 Method

As this project is not planning to realize the programing, the usability test is carried out in the way of showing pictures and slides. Researchers design tasks according to different functions, and ask users to complete these tasks to test this software’s structure and function. By doing this to discover the problems in this app.

The research questions are:

1) If users can understand the operation of the app after a simple teaching?
2) If the user can be independent of the operating app?
3) If users can understand the app icon mean?
4) If the user is satisfied with the operation of the app?
5) If the user is satisfied with the travel information provided by the app?
6) If the experienced users can use the app more effectively?

The usability test contains three parts:

**Pre-test:** it is mainly for collecting participants’ basic information, e.g age, experiences of using iPad.

**Test session:** it designs different tasks for participants to test the problems with this app.

**Post-test:** it is mainly collecting the participants’ feelings with the tasks and suggestions.

5.2 Measures

The test environment is the participants’ home. The test objective is this app in iPad. Before the test sessions starts, a brief introduction about the basic operation of this app. The purpose is to imitate the video presentation which to be done in the help function. And then test the task1, task 2, task 3 in sequence. During the test, we suggest the participants to think aloud in order to collect the user’s opinions. The following information is going to be record in this test:

- The errors users make.

- The participants’ opinions (we believe that meaningful information)

- Understanding and use of terms and labeling.
Recruiting participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>- 20 - 32</td>
<td>4</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>- male</td>
<td>3</td>
</tr>
<tr>
<td>- female</td>
<td>1</td>
</tr>
<tr>
<td><strong>Ipad Experience</strong></td>
<td></td>
</tr>
<tr>
<td>-yes</td>
<td>3</td>
</tr>
<tr>
<td>-No</td>
<td>1</td>
</tr>
</tbody>
</table>

Tasks

The total number of test is 3. Each test has a scenario. Each test can be divided into several sub tasks. The tasks are as followings:

*Test one (Planning trip plan):*

Scenario 1:

The summer holiday is coming, and you are going to have a nice vacation to Paris. You were heard that Tourist Guiding is a fresh app to plan specific trip. It really attracts your attention, so you are going to try this app to plan a trip to Paris. Now, you are at home and going to plan your trip by Tourist Guiding.

**Sub task 1:** set your flight from Stockholm to Paris;

**Sub task 2:** set a full day’s journey, and finally back to hotel;

**Sub task 3:** make a detail schedule of this day.

*Test two (Adjusting trip plan)*

Scenario 2:

Yesterday, you have made a full plan for 8-day trip to Paris. However, you find that the Louvre is not open in the weekend, so you have to switch the plan of visiting Eiffel Tower on day 7 with the plan of visiting the Louvre on day 8.

**Sub task 1:** find the schedule of Paris trip;

**Sub task 2:** find the itinerary on day 7 and day 8 of Paris trip;
Sub task 3: complete the changes of itinerary to Louvre and the Eiffel Tower.

_Test three (Navigation):

Scenario 3:

Finally, your journey has started, you are just arrived at the airport of Paris, you are planning to use your ipad to navigate.

Sub task 1: find your schedule of day 1 from the main interface, and find the navigation icon, start navigating;

Sub task 2: now you are going to the Eiffel Tower, unfortunately, it starts to rain, you want to cancel this plan, and move to the next destination;

Sub task 3: You have just deleted the plan to the Eiffel Tower, the rain stops, you want to do the original plan, and so you have to recover the plan.

5.3 Evaluation and improvement

According to the researcher’s observation with the tests, we have collected some problems with the app and valuable suggestions. After analyzed and evaluated these data, some improvement has been done with this app. The detail showed as followings:

**Button**

According to researcher’s observation, there are 3 participants among 4 showed hesitated to add a new journey. But finally they found this button. For these 3 participants, this “New” button is not obvious enough for them. Given the page structure and appearance, we cannot set this button too big, so, the app will introduce this button in the first presentation of “Help function”, to show this button and function particularly in the video presentation.

**Increase operation method**

Three reasonable operation methods are discovered from the participants, which can be adopted in this design.

_**First, the left and right panel**_

Both of these two participants click to open the journey instead of dragging. The previous design is to open the journey by dragging. Thus, we set that both click and drag can open the journey.

_**Second, the edit panel in the bottom**_

When the participants are asked to switch two destinations, them try to drag the icon directly to the other one, so we change this design from picture 33 to picture 34:
Third, navigation modification

One of the participants indicates, it is too complex for him to enter the navigation. He wishes he could enter the navigation in this app directly if next time he uses it, instead of goes into the navigation edit, and then he can find the navigation button. He hopes it would be simpler. In terms of this problem, we add a navigation button in the main interface, showed as following picture 35, after click this button, the system will question which journey the user would like to navigation, then it enters to the navigation interface we have mentioned before, see picture 26.

Meanwhile, we keep the previous design with the navigation button. Both of this two enter methods have their disadvantages and advantages. The previous design is convenient for temporary changes of plan, but it is a bit complex to enter the navigation; the new added design is convenient for using the navigation, but complex for modification.

In the post-test, participants indicate that the design and structure of this app is acceptable and easy understanding with the design. Thought it is a bit different with the existing travel software, it is easy to operate the system after a bit familiarization with the new app.

Some participants also put forward some suggestions, such as weather forecast services, driving navigation mode, download the travel plans from network. However, due to the limitation time, we cannot add more functions in these app, but it will be recommended to the future research.
6 Conclusion

This project is carried out for two month, including the investigation, design and testing.

Based on the User-Centered Design concept, we try to use a formal design process to carry out the design work of iPhone and iPad. User requirements are investigated; idea is showed by designing pictures; problems are discovered after the usability test; modification is taken after evaluation.

As the programming is not realized in this research, the usability test is much more difficult and limited. Anyway, the design result is satisfactory.

Well consideration with the interaction between user and the app is taken when designing the app’s structure, operation, component, and icon. This app’s powerful function and reasonable operation makes the complex travel plan to a simple and easy task.

However, this app still exists problems. There is not real perfect design in the world. We met problems when designing the app, which compel us to compromise. It is possible to realize this design as a real product. If this app were realized, it would help the travelers all over the world to take a comfortable journey, instead of carrying a heavy bag during the whole journey, and reduce the complex of making a trip plan.

We believe the good interaction design of this app will bring a good interactive experience for users. It will be more than travel software to guide a personal travel.
Reference:

Holley Long, Kathryn Lage, Christopher Cronin, (2005),"The flight plan of a digital initiatives project, part 2: Usability testing in the context of user-centered design", OCLC Systems & Services, Vol. 21 Iss: 4 pp. 324 - 345


Appendix:

Questionnaire

Research on Tourist Guiding’s app

We are currently doing research on Tourist Guiding’s app. You are kindly requested to take few minutes and answer these questions to help us get useful data for our research. Your responses will be kept highly confidential.

Thanks for your time.

1. Gender *
   - Male
   - Female

2. Your age *
   - < 19
   - 19-29
   - 20-30
   - 30-49
   - 40-59
   - > 60

3. How often do you travel per year? *
   - 0
   - 1
   - 2
   - 3
   - 4
   - 5+

4. What kind of traveling style do you prefer? *
   - Private tour
   - Group tour
   - Others ______________________________

5. Which operation system of your mobile phone *
   - Android
   - Iphone iOS
   - Symbian S60
   - Windows mobile
   - Not clear
   - Others ______________________________

6. Is there a function of GPS position in your mobile phone? *
   - Yes
   - No
   - I don’t know
14. Do you think it is fun to travel together with other unknown tourists who have the same destination with you? *

☐ Yes
☐ No
☐ I don't know

15. Have you made new friends during your trips? *

Never ☐ ☐ ☐ ☐ ☐ Always
☐ It is hard to get the precise location by asking the local people
☐ Looking for the public toilet, and vending store
☐ Looking for my separated companions
☐ I would like to know the interesting tourist attractions
☐ I don't know how to get to my target tourist attractions
☐ Others ________________

9. How do you deal with the situations above if you not? * [multiple]

☐ Consult with travel agents
☐ Asking help from the people around
☐ Search on the mobile Phone
☐ Call experienced friends
☐ Use the local map
☐ Others

10. Are you willing to share your traveling experiences with others on Internet-sharing platform? *

☐ No ☐ ☐ ☐ ☐ ☐ Extremely like

11. I would like to share my travel experiences and pictures with my friend through: *

☐ [multiple]
☐ Twitter
☐ Facebook
☐ LinkedIn
☐ Others ________________
☐ None

12. How often do you share pictures with your friends by Phone’s apps? *

Never ☐ ☐ ☐ ☐ ☐ Frequent

13. Are you willing to show your location information during your trips? *

☐ No ☐ ☐ ☐ ☐ ☐ Extremely like
14. Do you think it is fun to travel together with other unknown tourists who have the same destination with you? *

- Yes
- No
- I don’t know

15. Have you made new friends during your trips? *

- Never
- Sometimes
- Always