

MESTRADO

MULTIMÉDIA - ESPECIALIZAÇÃO EM CULTURA E ARTES

RESPONSIVE WEBSITE VS. MOBILE APPLICATION: STREET FOOD IN PHNOM PENH

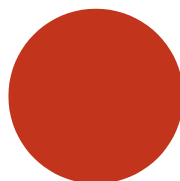
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Responsive Website vs. Mobile Application: Street Food in Phnom Penh

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Resumo

O crescimento exponencial de uso de dispositivos móveis em países em desenvolvimento, as tendências de utilização de Aplicações Móveis e Websites Responsivos, as características e as vantagens e desvantagens entre as duas, incitam a realização deste estudo. Este tem como objetivo comparar a eficácia, eficiência e satisfação (usabilidade) entre diferentes soluções móveis: as chamadas Apps e os Websites Responsivos. Baseia-se na metodologia User-Centered Design, explorando um exemplo de *street food* em Phnom Penh, a capital do Camboja, usando métodos etnográficos tais como observação de campo, entrevistas semi-estruturadas, e a criação de *personas* para determinar as motivações, necessidades e possíveis soluções para o *design* de soluções móveis, tal como avaliar o protótipo em diferentes estágios do seu desenvolvimento. Tem também em consideração a conexão entre a plataforma e as redes sociais dado nos últimos tempos estas se terem tornado a segunda fonte de informação mais importante no Camboja, depois da televisão. É sugerido um protótipo para as necessidades e motivações dos utilizadores que foram encontradas, tal como uma framework robusta comparando as duas soluções móveis de acordo com o protótipo.

Abstract

The exponential growth of mobile usage in developing countries, the tendencies between the usage of Mobile App and Responsive Website, the characteristic as well as advantages and disadvantages between the two, urge this study to be conducted. This study deems to compare the effectiveness, the efficiency and satisfaction (usability) between different mobile solutions: The so-called Apps and the Responsive Website. It draws upon User-Centered Design Methodology, exploring an example of street food in Phnom Penh, the capital city of Cambodia, using ethnographic methods such as the creation of personas, field observation, semi-structured interviews, and online survey to determine the motivations, needs, and possible solutions for the design of the mobile solution, as also to evaluate the prototype in different stages of its development. It is also taken into consideration of the connection between the platform and social network sites due to the fact that it has lately become the second most important sources of information after television in Cambodia. A prototype is suggested for the users' motivations and needs that are found, as well as a robust framework comparing the two solutions of mobile aspect in accordance to the prototype.

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Abbreviation and Symbols

APP	Application
BC	Before Christ
BBC	British Broadcasting Corporation
ELT	English Language Training (Institute)
FB	Facebook
FBAUP	Faculdade de Belas Artes da Universidade do Porto
FEUP	Faculdade de Engenharia da Universidade do Porto
FAQ	Frequently Asked Questions
GSMA	Groupe Spécial Mobile Association
HTML	Hypertext Markup Language
ID	Identity
iOS	iPhone Operating System
NGO	Non Governmental Organization
R&L	Research and Learning
SEO	Search Engine Optimization
TV	Television
UEQ	User Experience Questionnaire
UNFPA	United Nations Population Fund (formerly United Nations Fund for Population Activities)
URL	Uniform Resource Locator
USB	Universal Serial Bus
USD	United States Dollars
UX	User Experience Design

1. Introduction

The world is changing at prompt speed especially in this technology age. Among those technologies, mobile phone is one of the latest technologies and very popular among consumers. We are living in an exciting phase in which numbers of devices actually beats the numbers of the world population. According to the data from digital analyst at GSMA Intelligence, real time tracker put the numbers of mobile devices at 7.22 billion while the US Census Bureau said the number of people is still somewhere between 7.19 to 7.2 billion (*GSMA Intelligence*, 2016). With this increasing amount of mobile devices comes along new needs to satisfy the users' demands. The two technologies that are on debating of which to serve the better purpose of mobile phones are Responsive Website and Mobile Application. Both were stated with various pros and cons as well as in different conditions of usage. This paper brings up a very specific use case to look into this aspect. It is a circumstance of a capital city in a developing country in which the numbers of mobile devices are on the growth as well but many other aspects are still limited.

1.1 Context, Framework and Motivation

Cambodia is a country of a very old culture dated back to at least 5th BC (Chandler, 2008). There are varieties of culture aspects to look into but in this typical context, street food of the modern society is the chosen one. Mainly, due to the fact that the neighbouring countries have developed dramatically on this aspect, Cambodia's content on street food is still not noticeably included yet in the online world.

Although the neighbouring countries have more technology than Cambodia for a variety of tasks, there has not been a particular platform for street food yet. Hence, this can be a case to use for those countries that are on the growth of street food as well.

1.2 Problems, Motivation and Objectives

The main goal of this research paper is to compare the effectiveness, the efficiency and satisfaction (usability) between two mobile solutions: the so-called Apps and the Responsive Website.

It will be done in correlation to create a prototype of street food content and after doing that, study the comparison technological constrains between the two platforms.

With the purpose in mind comes a significant amount of objectives to be achieved as following:

- Compare and contrast the advantages and disadvantages of Responsive Website versus Mobile Application
- Determine motivations, needs of users and suggest prototype solution
- Evaluate and refine the prototype in a cycle process based on user-centered design
- Create a framework comparison both technologies based on the suggested prototype

1.3 Hypotheses and Expected Result

In accordance to the above gathering of information, there are three hypotheses presented:

Hypothesis 1: Responsive Website is a better fit template for this type of content in a scale of a city like Phnom Penh due to the fact that Application is mostly built after the contents were already created on website.

Hypothesis 2: The interactivity of the prototype platform will be based mostly on Facebook due to the dramatic growth amount of Facebook users in this city. Those interactivity contents include things like commenting, reviewing or suggesting new contents to be posted on the sites.

Hypothesis 3: A framework using the suggesting prototype to compare between Mobile Application and Responsive Website.

Considering the current hypotheses and more to come along the research, we expect to create suggested prototype and a robust framework for this sort of content and users' contexts, based on the comparison of the two main technologies: Responsive Website and Mobile Application.

1.4 Methodology

This study draws upon User-Centered Design Methodology as an umbrella to cover the whole testing process, exploring an example of street food in Phnom Penh, the capital city of Cambodia. Ethnographic methods will be used such as field observation, semi-structured

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interviews, and the creation of personas to determine the motivations, needs, and possible solutions for the design of the mobile solution, as also to evaluate the prototype in different stages of its development by usability heuristics' analysis, as well as usability tests.

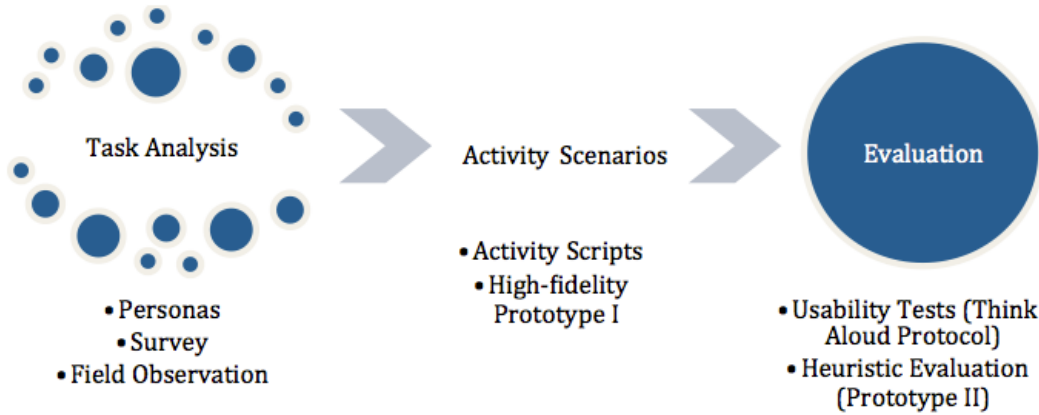


Figure 1: User-Centered Design Methodology of the Research Paper

Task Analysis. Using tasks performed by users to observe them in action to get a picture the kind of details they need in order to perform their tasks and achieve their goals. In order to conduct task analysis, we first create personas based on interviewing potential users and field work observation due to lack of previous study on street food consumers in this city.

Activity Scenarios. After that, the activity scenarios testing will be conducted with a high-fidelity prototype along side using activity scripts compiling from the task analysis. It is to be notified that the prototype will be tested with the potential users in Phnom Penh, the capital city of Cambodia itself due to the very specific case of street food which is only available and consumed by its population there.

Evaluation. This is an important stage to learn from what has been built so far with various different methods of evaluation such as usability and accessibility.

2. State of Art

2.1 Understanding Mobile Context

2.1.1 Growth of Mobile Phones

Beside the fact that mobile usage in the world is actually increasing dramatically, it should be added into account that mobile usage actually surpassed desktop's usage as well (Bosomworth Danyl, 2015).

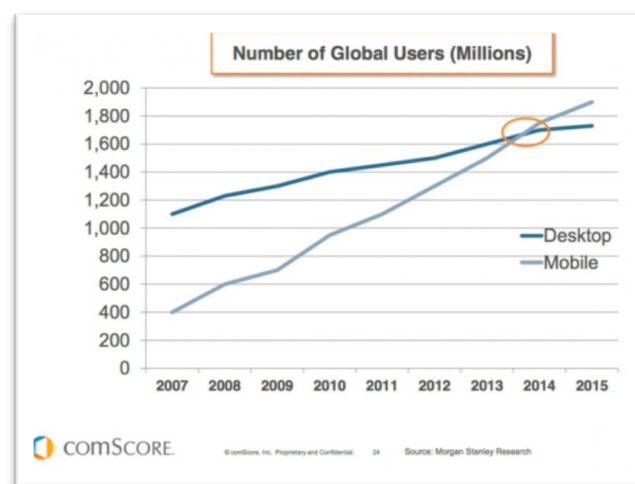


Figure 2: Mobile and Desktop Usage

Likewise, the numbers of mobile phones in the developing countries are also on the rise. A study in India stated that the number of mobile phones in developing countries is over a billion at the moment. Developing countries in this context is referred to the nations classified by the World Bank as “Low Income” and “Lower Income” (Donner, 2008). Mobile Application and Responsive Website are two among the most popular tools for mobile phone users. The reason why these two types of mobile technology are on a debatable level for the potential use of mobile phone could be understood by an online article (Budi, 2016), which has stated clearly the relative advantages and disadvantages of mobile-dedicated vs. Responsive Website as following:

- Responsive sites can support a variety of devices and screen size with a single implementation
- Responsive sites offer content and feature parity (at least to some extent)

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- Responsive sites used to be easier to find with a search engine
- Responsive sites save content and feature maintenance
- Responsive sites tend to be slower
- Responsive sites work less well for complex tasks and content
- Responsive sites do not integrate with existing third party services.

Other interesting comparisons between Mobile App and Responsive Website focus on some more general aspects such as access speed, availability in app store, approval process, content versions, development cost, features, functionality, internet connection, navigation, optimization for device and even user access. Though some aspects were already concluded to be better than others, it is still debatable due to the fact that there could be possibilities to solve it for a preferred template. For example, on pure mobile native app the access speed could be faster but if the contents are interactive and to be loaded from the Internet anyway, the difference between the two are not significant. Hence, the users' needs should be taken into consideration by looking into each element they select.

2.1.2 Responsive Website

Responsive Website has three interesting characteristics: flexible grids, flexible layouts, and media queries (Rapid Value Solutions, 2012). Moreover, it also added the advantages of using Responsive Website such as the fact that it is a single code base, it renders across any screen size, it has improved SEO, meaning it is more likely to appear in the search engine, it cost less in maintenance and development and last but not least it provides control and flexibility.

Meanwhile this study of comparison between Mobile Application and Responsive Website offered three critical areas in which Responsive Website would be most applicable. Those include corporate website/blog sites, media/news sites, and location base services. Hence, the study case of street food in Phnom Penh would more likely be a use of Responsive Website rather than Mobile Application because it is more likely to obtain many food images and use location base service to offer users direction or map of each place.

Besides, it also provides three keys challenges in Responsive Website. The first key challenge is that the user experience is not as rich as Mobile App since the way a Responsive Website created is to fit the same contents on many different types of devices so the selections of contents need to work well with design in order to provide what users needed on those different devices. Second, it is about how the responsive design is navigated. While Mobile Application navigates from left to right, Responsive Website works mostly from top to bottom. The interesting concept is that now that technology is advancing, it is possible that developer can actually make a website navigate like Mobile Application. The third challenge is about the long development cycle. Though the creation of Responsive Website is fewer

than those of different Mobile Application and base website, it needs much more careful content placement and selection to make it works at its best. To develop that part very well would take longer time.

2.1.3 Mobile Application

The two biggest and most trendy Mobile Applications stores are android known as ‘Google Play’ and ‘App Store’ from Apple Company. Both application markets have had more than one million application on going already. To be exact, at the beginning of 2015, 1.4 million Mobile Applications were available in the app store (Statista, 2016a) while a bit later, in November of the same year Android reached 1.8 million apps (Statista, 2016b).

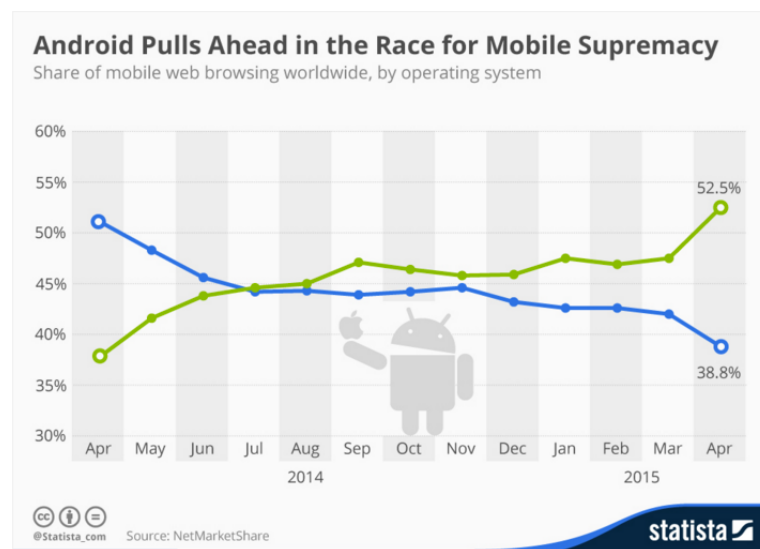


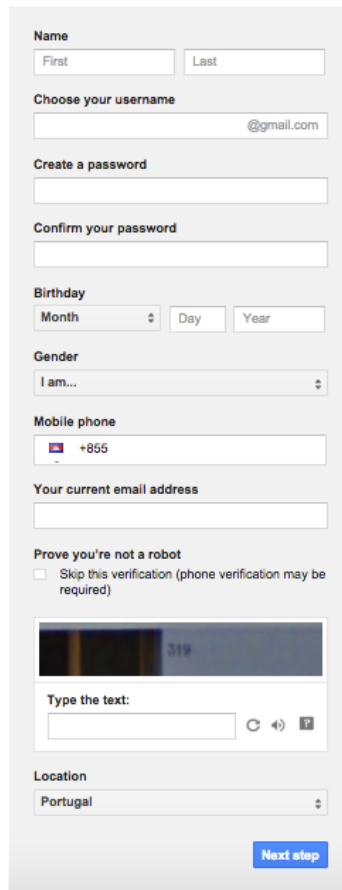
Figure 3: iOS and Android Mobile Web Browsing

Google Play was first released as Android Market back in October 2008, while App Store was launched just a few months in advance in July 2008. Though Apple released first, in July 2014 Android surpassed it in terms of web traffic caused by its users (Felix, 2015).

Another interesting aspect to look into while discussing the use of Mobile Application is what it is needed in order to be able to download an app.

For Android users, they need to have a Google account, simply put a ‘Gmail’. In case they do not obtain one, there is some information and knowledge needed in order to create one.

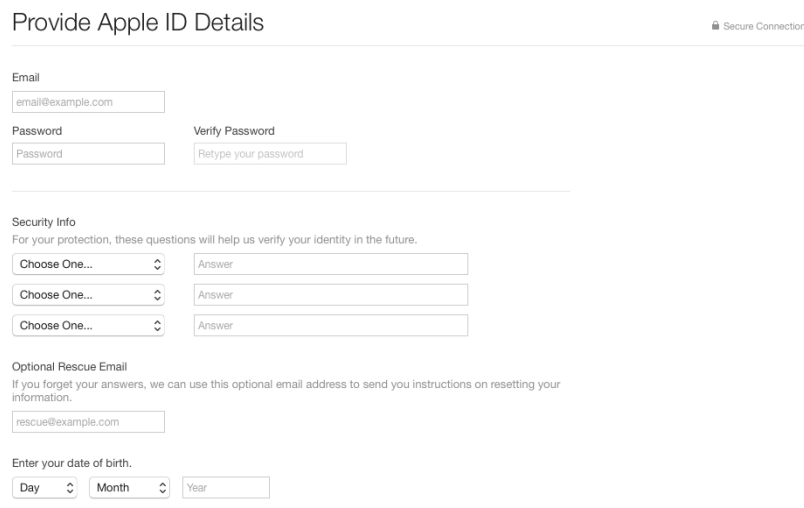
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The screenshot shows the Gmail registration interface. It includes fields for 'Name' (First and Last), 'Choose your username' (with a suggestion '@gmail.com'), 'Create a password' and 'Confirm your password', 'Birthday' (Month, Day, Year), 'Gender' (I am...), 'Mobile phone' (+855), 'Your current email address', and a 'Prove you're not a robot' section with a checkbox to skip verification and a CAPTCHA image showing the number 319. A 'Next step' button is at the bottom right.

Figure 4: Registering for a Gmail Account

Similarly, for iOS users they also need to create an Apple ID in order to download an app from the store.



The screenshot shows the 'Provide Apple ID Details' form. It includes fields for 'Email' (email@example.com), 'Password' and 'Verify Password' (Retype your password), 'Security Info' (three questions with 'Choose One...' and 'Answer' fields), 'Optional Rescue Email' (rescue@example.com), and 'Enter your date of birth' (Day, Month, Year). A 'Secure Connection' icon is in the top right.

Figure 5: Registering for an Apple ID

In the case of developing country like Cambodia, English is neither an official nor a second language, thus registration for a new email can still be an issue for many people. To solve this

problem, in some retailed stores, the staff of the store actually creates an account for their customers and download the needed applications right there in the store. But as known, applications are being updated sometimes and it is the jobs of the customers themselves. This is not an actual case being described in any paper before but will be discussed within this research paper to actually understand if the downloading or keeping up to date with application is a problem to them or not.

2.1.4 Existing Food Websites and Applications:

Another interesting information is that there are a few websites with applications for food operating in multiple countries around the world included Cambodia. However, websites like those are more fit to tourists since they focus mostly on restaurants and their audiences are worldwide. Four websites were selected according to their popularity to learn about here as seen in table 1.

Table 1: Summary Information on the Four Travel/Food Websites and Applications

	TripAdvisor	Zomato	Yelp	Foursquare
Info	>290 millions reviews - Started in February 2000 - Operate in 47 countries including Cambodia	- Started in 2008 - Operates in 23 countries, no Cambodia	>70 million reviews - Started in 2004 - 30 countries	>50 million users each month
Content	Flight, hotel, sightseeing, restaurant	Only on food and drink	A wide range of topics from food to education, art and entertainment, different services and more	Main travelling topics such as food, fun and shopping
Mobile Application	230 million downloaded -Android and iOS	Started in 2011 -Android, iOS, Window and Blackberry	Started in 2008	Started in 2009

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2.1.4.1 Trip Advisor, Zomato, Yelp and Foursquare

Trip Advisor

Trip Advisor is one of the biggest travel companies in the world. According to its fact sheets, this travel site acquires more than 290 million reviews and opinions from travellers around the world. It started back in February 2000 in 47 countries including some of the developing countries in Asia such as Thailand, Indonesia, Malaysia and others but not yet Cambodia until recently. The interesting about Trip Advisor is that it does not just look at an aspect of traveling but a combination of other things including hotel, sightseeing places, restaurants, and flights. Some times after the success of the website and while the usage of mobiles are growing, Trip Advisor has created its own application and made available to all mobile devices both on Google Play and App Store and even for window phones market. In terms of mobile phones, there are 230 million mobile apps downloaded so far (*About TripAdvisor*, 2016)

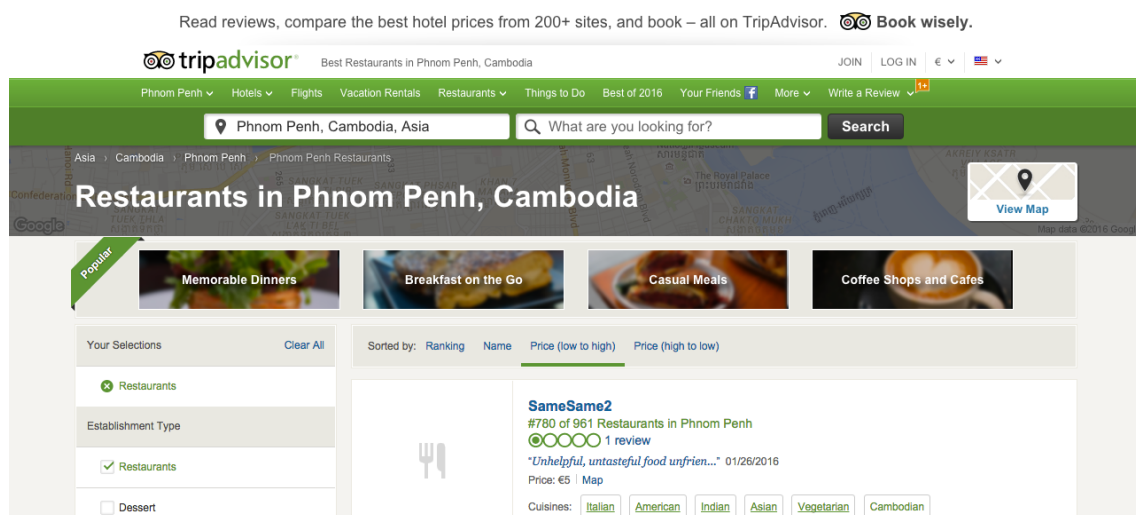


Figure 6: Trip Advisor's Homepage

Moreover, it has introduced three crucial features to this mobile usage, which are 'Near Me Now,' 'Offline Feature,' and 'Neighbourhood.' (*Fact Sheet*, 2016)

- Near Me Now: This feature simply uses the user's current location and offers any clicked options to provide either restaurants, hotels or other needed location near the users.
- Offline Feature: This feature allows users to download and save information of an entire city to use later on. The information includes reviews, locations of the places needed and users can use it later without the necessity of having Internet connection.

- Neighbourhood: Using a combination of the tourist places and providing information of those neighbourhoods.

Zomato

Zomato is another famous food website started in 2008 and so far covers 23 countries. It started in India however not covering the neighbouring countries such as Bangladesh or any other Southeast Asia countries as Thailand, Vietnam or Cambodia. After just three years of launching, Zomato started stepping into the Mobile App world. In 2011, it made available Application on Android, iOS, Window phone and even the Blackberry. The application replicates all the features available on its website. Comparing Zomato to Trip Advisor, the main difference is that Zomato only works on the contents of food. (*Zomato*)

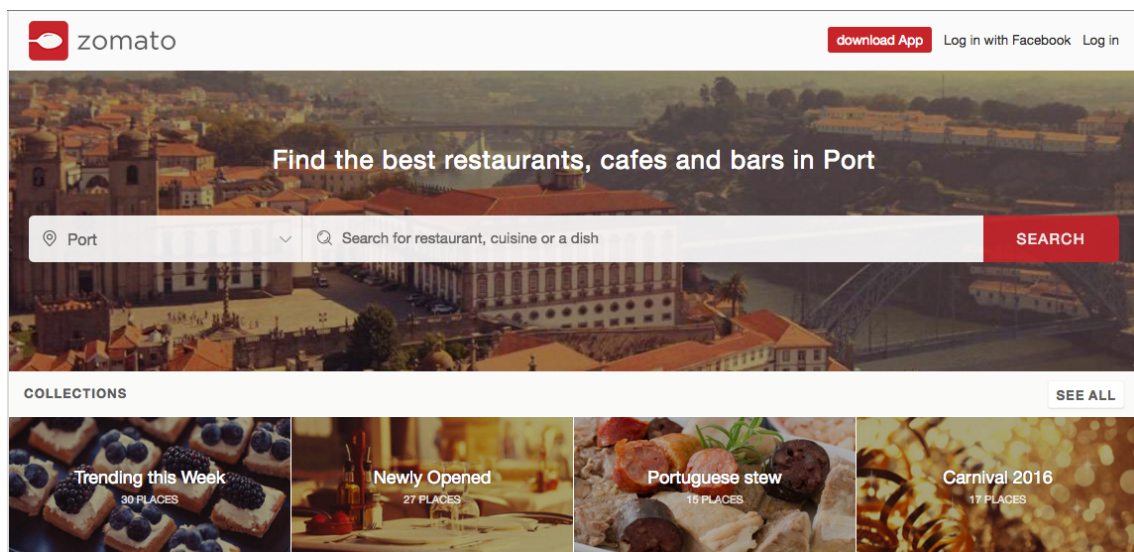
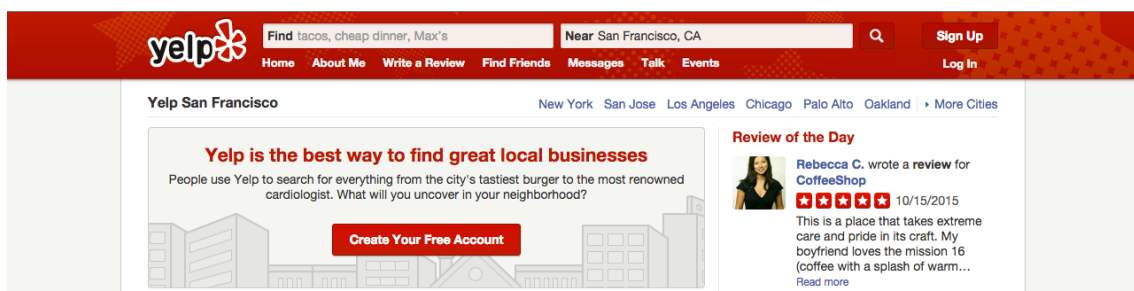


Figure 7: Zomato Homepage

Yelp

Yelp is another interesting type of user generated content website. It started back in 2004 and has so far more than 70 million reviews of restaurants, barbers, mechanics, and other services. Yelp started as Mobile Application just in 2008 about four years after its first launch. However, Yelp works only in more than 30 countries and again, none of those cover Southeast Asian nation. (*Yelp*)



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Figure 8: Yelp's Homepage

Foursquare

This is a location-based application started in 2009. Foursquare stated their community has more than 50 million users each month. The interesting feature of Foursquare is gamification which gives badges to users to go to new places or to do something that fit the categories. Thus users are likely to involve more to win those badges. (*Foursquare*).

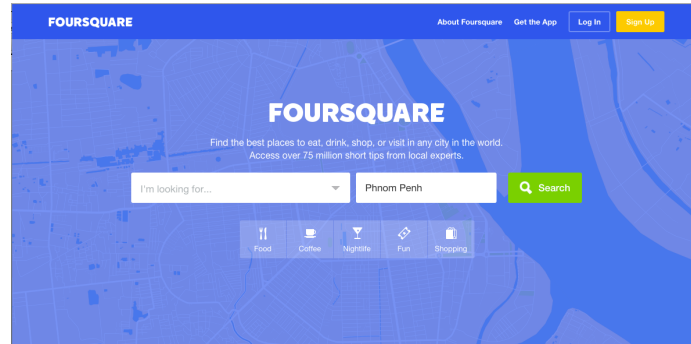


Figure 9: Foursquare Homepage

2.1.4.2 Similarities and Differences

There are some remarkable differences and similarities between these websites and Mobile Application such as the selecting location feature of where the users want to do and what they are looking for.

Three out of the four websites have contents on more variety of topics rather than just food, except Zomato. Plus, when it comes to providing information of each restaurant, only Yelp and Foursquare provide it with the location exactly on the map so users can screen and see it right there. However each application provides more or less the same sort of information such as the name of the restaurant, the price (either exact or not), some images, some reviews or just reviews' titles and rating.

Between these four, Trip Advisor and Foursquare cover contents of food in Cambodia. Thought all the four websites have its own applications, the applications were only made later, a few years after the site started.

2.2 User-Centered Design

The most important part of a creation is that there are people using it after it is created. Hence, user-centered design is the crucial aspect here. 'User-Centered development involves finding out a lot about the users and their tasks, and using this information to inform design.'

(Preece, Rogers and Sharp, 2002). This research aims at designing a prototype for the user and its development along the way from comments and observation reflected by the users.

An important element for making sure that the products are to be used is that it needs to have good usability. Steve Krug stated in his book, *Don't Make Me Think*, that 'After all, usability really just means making sure that something works well: that a person of average (or even below average) ability and experience can use the thing – whether it's a Web site, a fighter jet, or a revolving door - for its intended purpose without getting hopelessly frustrated'(Krug, 2006). Therefore, the product is not just to be built so that it will be out there, but built and tested, knowing that it is user friendly and its usability is satisfactory and well accepted by the users as well. He also added another significant statement that the website designers sometimes expect too much from users. They think that users will go through every little detail on the webpage as they do. Users actually do not think that much; mainly just go get what they want so in order to really know what users want, a simple way is to ask.

To fit how the project will run based on the user experience, the five plane elements of UX of Jesse James Garrett in 2010 are considerably thought of (Garrett, 2010).

Those five planes are Strategic, Scope, Structure, Skeleton, and Surface. The strategic stage is mainly to get to know the needs of the users well before starting on anything at all. Garrett stated that 'The needs of users are the goals for the site that come from outside the organization – specifically from the people who will use our site. We must understand what our audience wants from us and how that fits in with other goals it has.' From that on, it moves to the scope plane which mostly is about 'feature set' of the product. Next, it comes the structure. So after getting the goals sorted out and knowing which features to be included in the product; it is about the information that needs to go in there and how would that serve the purposes for the users. The last two stages are the crucial aspects, the skeleton and surface planes. By then, developers should be working on the design of the site; make the look in accordance to what was gathered earlier and fit into the informatics structure and technologically trait as well.

It is to be expected that many of the feedback from users on the site while testing will fix many doubts during the development stages. However, there are still principles to be reflected along the way as well. Donald A. Norman wrote 'The Design of Everyday Things' in 2002 presented four crucial principles of design for both understanding and usability as following:

- *Provide a Good Conceptual Model*: This simply focuses on making a product that can be humbly understood by its users. 'Allowing us to predict the effects of our actions.' It is okay that the users do not know how to use it in the beginning but as long as it makes sense to them after some testing, they should be able to get a grip of what it does. He gave a very precise example of a bad design of the temperature set control of his refrigerator. The concept of how it was made does not give him the common sense while testing it; hence it was quite impossible to figure it out, let alone using it properly.

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- *Make Things Visible*: It is essential to learn how to use something by seeing what it does. Eyes serve an amazing purpose for the existence of lives. Donald raised an example of the design of old telephones where the users have to press a few keys in order to use a function that they need. It is not any visible at all to them. Thus, if we want users to get it quickly; put it out there, enough that they can and know what it is even you are not there to tell them.
- *Principle of Mapping*: An example of controlling system in the car was raised here. Car is a very complex machine and undoubtedly not easy to be used. That is why there is a requirement of a proper test before being able to run it around town. Still, with the test you learn the basic of driving but it has been updated almost everyday in production in different countries. It is mainly because of how each controlled are mapped carefully in the space. By where the controllers are, you can have a guess of what it might be able to do.
- *Principle of Feedback*: The last but never the least crucial point of designing is getting feedback from the function that was placed. As Steve Krug mentioned that people are not reading the manual to learn how to use a product, they muddle through it. Therefore, with some testing by clicking (using) and seeing its results, people learn to understand each function better.

2.3 Typography

The content is significantly based on information as text; hence, typography plays an important role. In terms of typography there have been a few different views for digital information and in this case concerning small digital devices as mobile phone.

An interesting article has taken a look into the popularity of various font types using on the web society. A well-known article was written about the varieties of fonts chosen to use on many websites and how they normally got selected. He described the many thousand fonts as well as the hundreds font families that provided by several different sources. The options are so big and various that there is not a single correct answer. He compared the lists of the top ten most popular fonts from 2013 and 2014. Clarified the point why many of them stay in more or less the same rank. Simply put '*The rich get richer.*' (Shoaf, 2016). From that he suggested breaking the cycle, try something different something new to stand out. The simple rule was trying to combine two or three typefaces in a unique way. Since this prototype uses UXPIN, a standard prototype program in which some hundreds fonts as well as Google fonts will be available, those will become the exploration. Also, many designers agreed and suggested that San Serif is an easier font family to read on mobile. It prevents 'clutter' and is generally easier to read compared to a serif typeface.

Regarding the numbers of characters for mobile also comes in different answers; fortunately, it is not so much of a difference. As desktop is good to read at around 65

characters, mobile loses about half of that to just 39 characters. And Mobile App could be from 35 to 60 characters (Moss, 2015).

2.4 Context of Cambodia

2.4.1 Street Food

The term ‘Street Food’ could give familiar understanding, as it is a two-word combination ‘Street’ and ‘Food’. However, this concept exists in so many countries especially those in Asia, South America or Africa. Street-food is ready-to-eat food prepared and/or sold by vendors and hawkers especially in the street and other public places (INFOSAN, 2010). The reasons why it is famous among general population of these countries is that ‘Street foods are a source of inexpensive, convenient and often nutritious food for both urban and rural poor in developing countries.’ (Namugumya and Muyanja, 2011). As in Cambodia, street-food is likewise well known by the tourists and regularly consumed by the local but there are hardly any studies about it. A review on street vendors in Asia has stated that ‘Street vending is one of the most important sources of employment for the urban poor in Cambodia, especially women (Bhowmik, 2005). There is no estimation of the actual number of street vendors in Phnom Penh, the capital Cambodia.’ However, whenever mentioning ‘Deep Fried Tarantula,’ one could simply relate it to the street food of Cambodia as it has been brought to the world through tourists as well as online by some famous videos world wide of well-known chefs such as Gordon Ramsay. He went to Cambodia, caught, cooked and tried his very first tarantula on its motherland on his show ‘The Great Escape.’ Also, there are other famous shows in relation to the fame of Phnom Penh street food such as Bizarre Foods hosted by Andres Zimmern and another well-known documentary produced by BBC called ‘Can Eating Insects Save the World.’ In the capital city Phnom Penh, the growth of street food is increasing incredibly. Ten years ago, those street food mainly consisted of porridge soup, fried rice or noodle, Khmer noodle among others. While today there are new and upcoming street food such as grilled eggs with butter, fried mix vary types of meatballs, grilled spicy chicken legs and tips of the wings, green papaya salad, living worms, steaming snails and many more. Take an example from a very successful street food business of grilled eggs by Ms. Thavy started in 2012 just from five tables up to twenty five within just two years. Many of the customers are youth and it gets busier in the evening after they finish their schools or work. This is the “it” place for youth to hang out, chitchat, having their favourite snacks and spend time with their friends; a documentary by Apsara TV in February 2013, Street Food becomes a trend for youth,. Like many other street food inside Phnom Penh, many of these famous places do not have any name as a business. Some other famous ones are mostly around the biggest public school area such as Sisovat High School, Sonthormok High School, Chbar Ompov market, Bak Touk High School and so many more.

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There is some very interesting information and precise knowledge on some histories of street food in Cambodia in a study conducted by Kyoko in 2006 of Policies Issues in Street Vending. This study focused on three countries: Thailand, Cambodia and Mongolia. It stated the four peak periods when the street vending business boosted in Cambodia in table 2 as following:

Table 2: History of Street Food in Cambodia

Time	Description
1979-1980	After the civil war; the population returned to the city after a few years of zero population inside the city. First job for the most was trading. Those who started vending then seemed to have a proper stall in markets or small shops now; many who started after 1990 find it hard to have a proper place.
Around 1993	When United Nation Transitional Authority in Cambodia (UNTAC) came and helped working on the first election. Population increased.
1997-1998	During domestic political crisis; Asian financial crisis and some natural disasters. People turned to street vending to make a living.
Around 2002	The economy recovered.

As of the same source, it is stated that Thailand has much longer history of street vending. However, it is also reasonably understood that street food in Thailand are better taken cared of or improved even though they are also a developing country like Cambodia but they are in a better position and circumstances (UNDP, 2015). Street vending is recognised as parts of their urban development in Thailand and even known as “public eating” according to Gisele Yasmeen in 1996. Here are some summaries on the policies on street vending in comparison between Thailand and Cambodia.

Table 3: Policies on Street Food in Cambodia and Thailand

	Thailand	Cambodia
Laws that prohibit street vending	Cleanliness and Order of the City Act 1992 Traffic and Land Transportation Act 1992 Highway Act 1993	Sub-Decree on Public Order
Laws that regulate street vending	Public Health Act 1992 (requires permission to sell) Orders from BMA governor	
Laws that specify authorities in charge of regulation	Cleanliness and Order of the City Act Public Health Act	Sub-Decree on Public Order Place in and around the

	Traffic and Land Transportation Act Highway Act	market is controlled by market committee, and Khan/Sangkat controls other areas.
Taxes and fees	Sanitation fees since 2000 Street vendors do not pay taxes Extortion and rent seeking in some places	Specified in Business Operation Tax Book All street vendors pay tax daily No document that specifies the fees collected by market committees and police
Registration of vendors	Started in 2000	No registration
Other policy documents	Beautification of city (can impose harsh measures on vendors) No concrete direction for vending activities management, but left to BMA governor's discretion	Bias towards rural development; focus on infrastructure and housing in urban areas; rather than workplace support
Social security	30 baht universal health coverage	None
Possible success cases	Self-management; Private agent under concession from state; management in private land	Vendors' Association able to cultivate sense of trust

From this table, a clear assumption can be made in relation to street food of these two countries. It is seen that Cambodia is still way behind in terms of all types of rules, policies or in any chances development or consideration at all.

2.4.2 What has been done online so far?

Taking into account the significance of social networks revealed that Facebook has become the second most important channels for accessing information in Cambodia (Phong and Sola, 2015). We can see the huge growth of online contents and that includes street food as well. The same source arose a question about the efficiency of Mobile Application in this country. Even though one in three Cambodians used or had used Facebook, the application is not even close to being the most popular one. They prefer using their mobile phones for playing games, listening to music, taking pictures and listening to radio. For this reason, the

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study has favoured on creating a prototype of Mobile Responsive Website rather than a Mobile Application.

Now take a look back within Cambodia itself when it comes to the online world. What has been done so far? There are also some noticeable online contents on social media of street food such as the new Instagram pages called instakhmerfood, vrecommend as well as instafoodkh, in which the same contents are shared to a Facebook page. The sharing of content was mostly picture of the food on Instagram but later on it added location, prices, contact number and more. Also, one of those Instagram pages shares the same contents to Facebook. Here are some details of these pages:

Name	Date Started	Types	N. of Post	N. of Likes	URL
instakhmerfood	Jul 13	Instagram	>1200	>7500	https://www.instagram.com/instakhmerfood/
vrecommend	Apr 13	Instagram	>500	>800	https://www.instagram.com/vrecommend.co/
instafoodkh	Jun 15	Instagram	>200	>10k	https://www.instagram.com/instafoodkh/
Instafoodkh*	Nov 15	Facebook	N/A	>6k	https://www.facebook.com/instafoodkh/

Table 4: Information on Phnom Penh Street Food on Social Media

Although “vrecommend” and “instakhmerfood” are not dedicated to just street food but many of their contents are about street food and are shared on regular basis. Whereas for “instafoodkh,” which runs the same contents both on Instagram and Facebook, there is less content and started much later but contains many more followers and numbers of like. Though that cannot really prove any point but it is an interesting aspect to take a look at. So far, beside these social media pages and some other blogs post by tourists visiting Cambodia, there is not yet any website devoted specifically to just street food in the capital city of Cambodia.

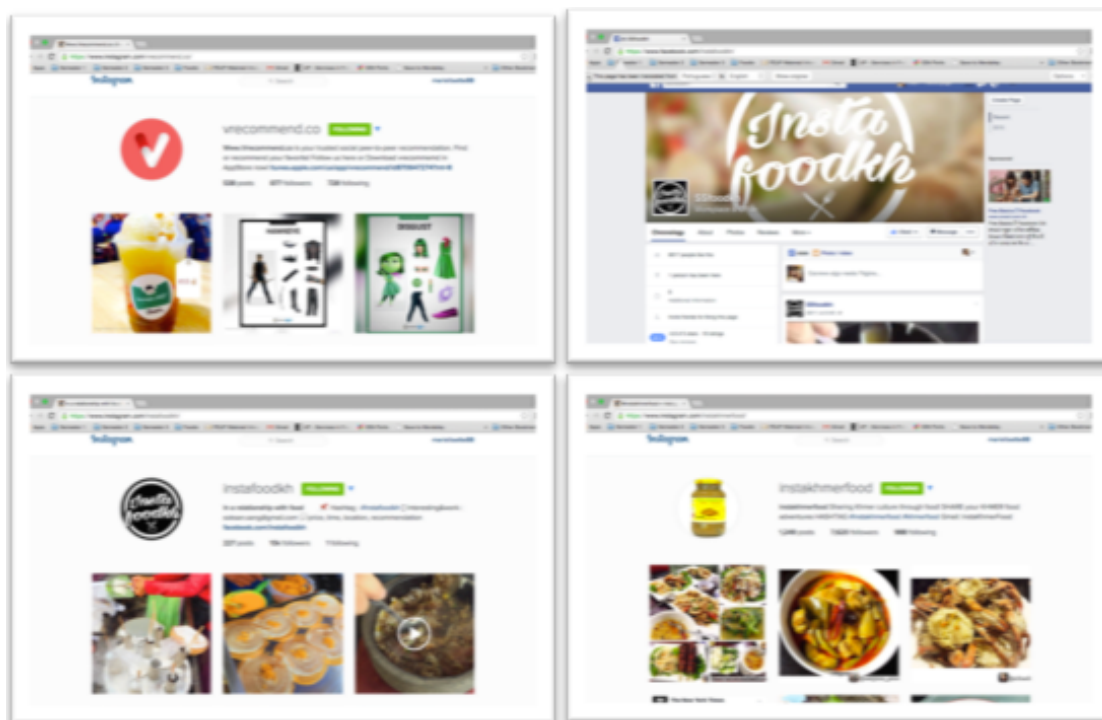


Figure 10: Phnom Penh Street Food on Social Networking Sites

2.4.3 Internet in Cambodia

An interesting research of Youth in Cambodia has revealed some interesting updates of youth in Cambodia in terms of media as well as mobile phone usage such as:

- There are 19.1 million mobile phone subscribers in Cambodia. This is higher than the population of the country because many people use more than one SIM card for mobile phone.
- In Cambodia, the Internet is available via mobile phone, USB modem, Internet café, and some workplace or home, and is provided by more than 30 companies.
- A third of young people (15 to 24 years old) reported access to Internet (BBC Media Action, 2014).

This shows that the numbers of mobile and Internet users in Cambodia is very interestingly promising among young people. General web surfing fell as the third most popular reason for them to use Internet. Thus, creating an interesting site could possibly be a mean for them to surf and use more.

Meanwhile, according to some estimate, there are 1.65 million smartphone users in Cambodia (Khmer First Holdings, 2013). Remarkably, the numbers of Internet users is growing in Cambodia, from just 2.7 millions in the end of 2012 to more than 5 millions of nearly 15 millions population as of 2014 with a prediction of reaching almost 65% by 2020

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(Xinhua, 2015). Likewise, there has been an outstanding growth of mobile phone in Cambodia, 39.5% in 2015, a 51% increase from 2014 and almost 100% increase from 2013. Not just mobile phone but smart phone is also on an increase 31.5 % increased in 2015 compared to the previous year which equals to 28.3% of total amount of mobile phones (Phong and Sola 2015) alongside with the great latest technology available for mobile phone such as Responsive Website and Mobile Application, more effort should be put into making this an information serving platform for its users These numbers are all very noteworthy and showing the possibility of youth using mobile phone and Internet in Cambodia.

2.4.4 Cambodian Youth

Cambodia has the youngest population in South East Asia with 2/3 of the country are under 29 years old and 1 in 3 people between 15 to 29 years old (BBC Media Action, 2014). Also, due to the facts that there are many migrations happening among youth every year for better education or economics (UNFPA Cambodia, 2013), youth becomes the main target of many studies of this country. Likewise, youth are the potential users to drive many factors of Cambodia; thus they are the target group of this specific research.

3. Methodology

3.1 Task Analysis:

In order to create a prototype for usability testing, it is important to understand first what the goals of the users are.

As this research paper is one of the first to look into contents of street food in Cambodia, it is hard to base the users' goals on such specific case based just on existing literature reviews since there are not really any. Thus, four methodologies were chosen to fulfil the task: creation of personas, semi-structured interview, field observation and online survey.

3.1.1 Personas

The creation of personas was also based on information gathered from the interview and fieldwork through audio calls. There are four main personas mainly differences in current status and life style:

Table 5: Persona – THIDA

Thida (Female)	- Age: 19 years old - From: Kampong Cham - Current Address: Phnom Penh - Education: Freshman in Finance and Banking - Mobile phone: Samsung Galaxy A3 - Application: Android - App Type: Facebook, Line, YouTube - Usage: mostly to call and text friends through Line, rarely call - Texting: using half English half Khmer, sometimes using the English fonts for Khmer as well. - Transportation: Honda C90
Monthly Spending	- Allowance: 250 USD - Shared house rent and bills: 110 USD - Food: 3.5 USD per day - Internet: 5 USD on phone only - Mostly she shared cooking schedule at

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	home with the other two girls who shared the house but once or twice per week they would go to eat out mostly street food since it is cheap and delicious.
Street Food	Her favourite type of street food is grill food. Seafood is the best but she cannot have it too often because it is more expensive. It could cost up to 5 USD per person per meal for grilled seafood. Normally, she would have grilled eggs, chicken legs and wings, frogs, meatball, noodle salad, noodle soup, fried rice and so on. Sometimes she sees some Facebook newsfeed sharing those street food places but normally she would just ask her friends. She doesn't mind much of hygiene as long as it is not too bad since it is street food. However, she doesn't like overpricing places and rude sellers.
First used Internet	She first used internet just two years ago when there was a first internet shop in her town, which she had to pay 50 cents per hour. Back then she just used it to check for some universities' information in Phnom Penh and some English words.

Table 6: Persona – BORA

Bora (Male)	- Age: 25 years old - From: Phnom Penh - Current Address: Phnom Penh - Education: Graduated Bachelor in Sociology - Current Position: NGO staff - Mobile phone: iPhone 5S - Application: Apple App - App Type: Games, Social Network - Usage: Playing games, checking news, checking FB... - Texting: a lot of English with people from work and some friends, else using Khmer fonts - Transportation: Honda Dream 2015
Monthly Spending	- Salary: 400 USD - Lives at home with parents - Spends mostly on food outside home and clothes
Street Food	Eats out at least a few times a week with friends after work. Each time spending about 3 USD at least and could be up to 10 USD. Sometimes friends from school, other times after playing football, or with people from office. Normally his friends know the good and new places. They love trying new types of street food.
First used Internet	He first used internet when he was 17 since his parents bought a shared computer at home for him and his sisters. Mostly used it for game back then and old social network site like Hi5.

Table 7: Persona – RAKSMEY

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Raksmey (Female)	- Age: 17 years old - From: Phnom Penh - Current Address: Phnom Penh - Education: Grade 11 of ELT private high school - Mobile phone: iPhone 6S - Application: iOS - App Type: Games, Whatsapp, Line, YouTube, Facebook - Usage: Call, text and chat with friends and family. Checking information and posting on social networks. - Texting: Mostly English - Transportation: CRV Car
Monthly Spending	- Allowance: More than 500 USD/Month - Food: At least 10 to 20 USD per day - Shopping: Around 200 USD At home, she has a maid to make sure that there are always meals available. However, she likes hanging out in café with friends during the afternoon and many times go to street food after. But Raksmey only likes places that are clean and look nice. She doesn't mind paying more.
Street Food	Her favourite type is soup. She goes many times to Bitter Gout soup near Olympic Stadium since there's a nice car park place and it's convenient. It usually cost about 10 USD per person per good meal and drink. Normally, she would have the soup and grilled spicy shrimp. She knows that place from her friends but it is hard for her to find new places since she doesn't trust the hygiene at many places in town and she need space to park.
First used Internet	She first used internet since she was 10 years old. Her father had a computer for her and her sister to play and learn typing. She always has Wi-Fi connecting at home, which

	is paid by her parents. She likes posting things on social network and sharing where she goes, what she does or eat. She has a few thousands friends on Facebook and love posting photos on Instagram.
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Table 8: Persona – SOVAN

Sovan (Male)	- Age: 23 years old - From: Kratie - Current Address: Phnom Penh - Education: Graduated Bachelor in Design - Current Position: Private Company staff - Mobile phone: LG G3 - Application: Android - App Type: Photo Edit, Games, Social Networks - Usage: Editing photos and short videos, playing games, checking FB and Instagram - Texting: with most friends in English, with people from work and family usually in Khmer using English fonts - Transportation: Honda Click 2013
Monthly Spending	- Salary: 750 USD - Rent a shared house with a good friend - Spends mostly on rent, bills, food, and clothes
Street Food	Eats out almost everyday or at least pack to eat at home. Each time spending about 3 USD at least and could be up to 7 USD. Mostly go with close friends, and sometimes with people from work. He is a good at tracking information about where and what to eat. Always print screen when he sees such info or write down when his friends talk about it.
First used Internet	He first used internet when he moved to live in Phnom Penh when he was about 18 years old, so about five years ago.

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	Mostly used it for doing schoolwork and researching for new design ideas.
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3.1.2 Semi-structured Interview

This interview was conducted with five people from different background and social status to try to diverse the users. The interviewees include high school students, university students, staffs of NGO and private companies. It was made during the second week of February 2016.

Here is the list of questions in the interview:

Personal Information:

- How old are you?
- What is your current position?
- Where are you originally from?
- What is your level of education?
- How much English have you studied?
- Have you used them often in text?

Mobile Phone and Internet:

- What kind of phone do you use?
- When did you first use Internet?
- What were you using it for?
- How often do you use it now?
- Which one you use more? Desktop or mobile?
- Have you ever used it to look for food?
- How?
- Do you have application on your mobile phone? How many?
- Mostly what types of applications are they?
- Do you download from the market yourself?
- Do you access website? What types?
- How much do you think you can trust that information from the internet?

Street Food

- How often do you eat street food per week?
- What kind of food?
- How much do you spend on food outside home per week?
- How much of those are on street food?
- How do you find out any of those places to go?

- How do you locate it?
- What do you know to go there?
- What would be the priorities to decide to go?

Noted that there were also some interview protocols included within the interview such as informing the interviewees the following:

- The goal of the interview
- The fact that their voices are being recorded for jotting down the responses
- Inform them to ask in between if there are doubts

Results are presented in the table as following:

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Table 9: Result of Semi-Structured Interview

I.D		1	2	3	4	5
Personal Info.	Sex	Female	Male	Male	Female	Male
	Age	27	20	17	16	24
	Originally From	Province	Phnom Penh	Phnom Penh	Phnom Penh	Phnom Penh
	Current Position	NGO Staff	Student	Student	Student	Designer
	Organization/School	Int. NGO	2 Universities	Private School	Private School	Private Company
	Level of Education	Bachelor Degree	Bachelor Degree	High school G11	High school G10	Bachelor
	Level of English	Good	Very Good	Very Good	Good	Medium
	Mobile Phone	Samsung S3	Iphone	Iphone 5S	Iphone	Iphone 5S
	Mobile Text	Prefer text in EN	Mostly	Mostly	Half EN, Half KH text in EN	Little, Khmer fonts mostly
	First Time Using Internet	19 years old, 2008	13 years old, 2006	11 years old, 2010	13 years old, 2013	17 years old, 2009
Mobile & Internet	Purpose Back Then	Email at work	Internet Store, Download Music & Email	Home, Game	Friends' phones, YouTube, game	Game, Hi5, YouTube
	% of mobile and desktop	50% 50%	50% 50%	70% mobile	95% mobile	50% 50%
	Purposes	Desktop for work and home Mobile for quick check news & FB	Reading news, FB, Social Media, game, Chatting with friends	Facebook, chatting,	Chatting with friends, FB, YouTube	Email, research, FB (phone, YouTube)
	Mobile Apps	Android	Apple App	Apple App	Apple	Apple App
	Number and Usage		About 100	Less than 100	Just a few	Just several (small space)
	Website	Through Google search	Through Google or just school sites	Rarely, Google translate	No	From Facebook
	Online Trust	90%	Depends	80%	60%	50%
	Numbers of time per week	4	3	2	Half or once	7
	What kinds?	Grill Food	Seafood	Meatball, Sandwich, Snacks	Fried noodle, porridge	Grill Food
	Weekly Food Expense	50 USD	30 USD	10 USD	10 to 20 USD	50 USD
Street Food	Weekly Street Food Expense	30 USD	10 USD	10 USD	2.5 to 5 USD	50 USD
	Finding out the info. how?	FB Share, Friends, Google to restaurant sites	Friends, Instagram page random page but mostly expensive	Near school, friends	Through FB, Finding through each restaurant page	Facebook share and saved, friends, look around
	Location	Asking friends, map	Asking friends	Friends bring to the place	Location on cover page	Friends, Facebook
	Criteria for selection	Type, hygiene, price, taste	Cleanliness, type of food, type of people	Taste, Price, hygiene	Staff attitude, price	Taste, Location, Clean
	Priority	Hygiene and price	Type of food	Taste, clean, price	Attitude, hygiene	Too far-no, price

One of the interviewees shared an interesting aspect about the creation of her iPhone Apple ID that ‘My Apple ID was created by the guy who worked in the store that I bought the mobile. He then gave me the password that I need to remember for any future use’ said a 16 years old female from private high school grade 10th in Phnom Penh.

There is a simple pattern from all the responses of these interviewees. All of them have at least medium or good knowledge about mobile and Internet use and they are regular street food consumers. The younger ones tend to start using Internet much sooner than the older ones and the reason could possibly be due to the growth and availability of Internet in this country. The main usage of mobile is for something quick, chatting with friends or accessing social media. The main way to access a website is through Google. And how they find out information about new places to have street food is mostly through friends and Facebook. Moreover, the case of finding location does not seem easy since they actually have to talk to friends for the exact location or to bring them there. The main contents to know about each place appear to be mostly about hygiene, taste, price and location.

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3.1.3 Field Observation

Field observation is counting on the experiences of the writer as a citizen of the capital city for many years. Meanwhile, it is also including an observation done on an audio call to a street food location at peak time to observe the environment and the consumers. The case was at a street food location known by the name '009', which sells all types of meatballs, seafood and fruit juice.



Figure 11: Phnom Penh Street Food – Sisovat 009

Location: Near Sisovat High School (Known as 'Meatball Sisovat')

Type of Food: Mix Meatballs is the speciality but also having available chicken wings, all types of drinks, fried rice, ice cream on stick and many more

Time: Around 6pm on 30th March 2016. Each table or customer would spend from 40 minutes to 2 hours eating and chatting.

Environment: A ground floor connecting two flats, with about 100 people at peak time. There is a small parking place for motorbike right in the front while nearby exists a charged parking lot as well. Two big TVs inside, with many small tables at knees level in both flats as well as several more on the street just outside. Many of the phones used by customers are Samsung and iPhone.

Customers: Mostly university students, private school students or company/NGO staff rather than high school student though it is very near a high school. The reason could be due to the price.

Price: Usually people share the bills, 2\$ to 3\$ per person

Staff: Many young staffs, some look even less than 18 years old; about 10 sellers over all with one or two main sellers who were in charge

Cleanliness: Every plate is covered with a plastic bag so there is no need for washing. Each table has a trash bin under but there are still some used tissues on the floor here and there. The table are wiped clean after customers left but not the under table.

Serving Process: When customers walk in, they go and choose the types of meatballs they want, come to the table and wait for the staff to bring them after frying.

Average waiting time is about 10 minutes at peak time. On each table, there are different jars of chilli, soybean sauce, and a basket of drink (Coke and energy drinks)

The Observed Group: A group of three friends, university students. One of them wears a university uniform. Paying a total bill for mixed meatballs of 270,000 Riels (6.75USD) including drinks. The discussion during eating was much involving showing things off from the smart phone. They use motorbikes as vehicles for travel (Honda Dream). Assumed to be studying together since they are discussing about classmates and a subject from class. One among them uses an iPhone.

From that, it provided two reasonable conclusions. One is that most of the street food consumers are university students, private high school students and company/NGO staff and they normally spend about 2 to 3USD per person.

3.1.4 Online Survey

An online survey was the last stage of gathering information in order to analyse the tasks of users. It was available online for about 5 days from 14 to 19 April 2016 during the time of Cambodian New Year which made it a bit harder due to the facts that Cambodians are on holidays and the majority left the city to go visit their family in the provinces. For these five days, 30 respondents reacted to the survey.

As seen appendix A and B, the survey was made into both English and Khmer language and the users can choose the most convenience. The selection of English doubled Cambodian language and the number of male and female is almost exactly the same. Beware that this is not a quantitative survey thus the numbers cannot be taken into account to represent the entire audience of youth living in Phnom Penh who consume street food. The purpose was mainly to get to know the audience better meanwhile learning about their needs of Internet usage in search for street food in this capital city. The respondents originally from the capital double those from other provinces. Almost every single one of them uses mobile phone but just 20 of those use computer/laptop to access Internet. Else, the numbers of iPhone is more than double of Android and Window combined. 24 of them use more than 10 hours of Internet per week and many have started using it since at least 5 years ago. Though many of them prefer App to website on mobile, 7 of them actually claimed in preference to mobile website with reasons. It provides more detailed information, it does not consume much space, it is more familiar and it can be searched through Google. Whereas the reason of App is mostly that it is faster and easy to use. At this point, it has not been followed up yet that the term website that the users used could also refer to Responsive Website. However, Responsive Website is a type of websites and to include the questions in this stage might just confuse the respondents more because the details and technical differences are not familiar to them. Hence, if it were to be conducted as Responsive Website, the result might even present a more positive outcome. More than 20 of these 30 users consume street food at least 3 times per week and mostly they found out about it from friends

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and family as from social media like Facebook or Instagram. The information needed by users were ranked according to their priority as below:

- 1) Friendliness of staff (service)
- 2) Hygiene
- 3) Types of food
- 4) Price, Menu and Location
- 5) Parking Space, Reviews and Photos

Another interesting aspect referred by the users to be included in the information is the taste of the street food itself. Many seem to care a lot that it has to taste good in order for them to go and try the food.

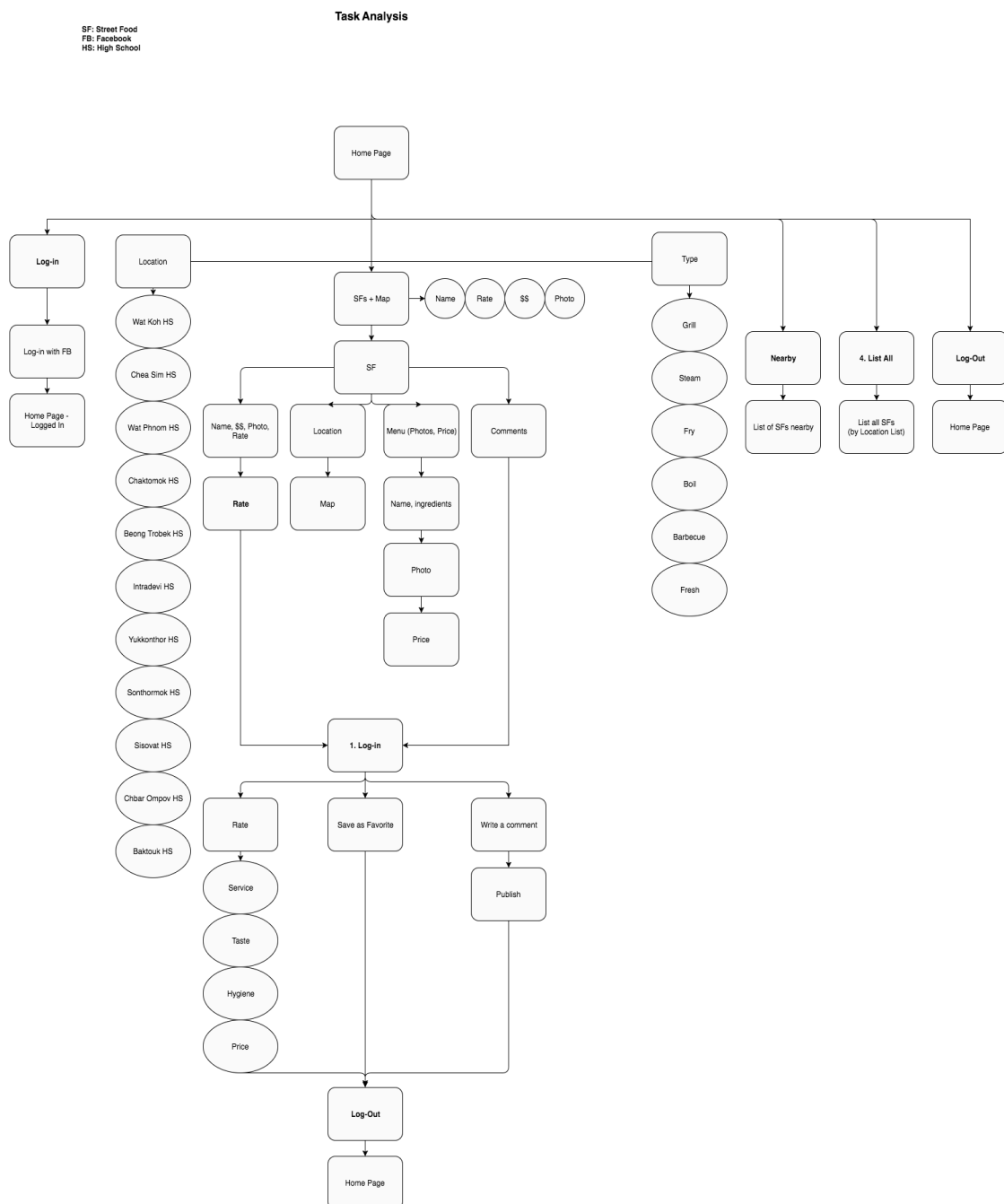


Figure 12: Task Analysis Structure of Phnom Penh Street Food

In the following list, there are all the possible tasks analysed on the content of the street food site, they are ranked from the most prioritized task to the least.

Task 1: Search for street food place to go, steam food near Bak Touk High School

1. Go to **Home Page**
2. In Location Box, select **Bak Touk High School** – In Type Box, select **Steam**
3. After the next page is revealed with street food options and the map of its' location, select one of the display of street food

Task 2: Search for new trendy street food to go

1. Go to **Home Page**
2. Scroll down to **Trendy Street Food This Week**
3. Select the choices of favourite

Task 3: Search for location of a street food place, Fried Rice Bak Touk 007

1. Go to **Home Page**
2. Type in **Location Box** – Rice Bak Touk
3. Select from the suggested list of street food
4. Look at the location as address or on the map below

Task 4: Check the rate of a street food, Fried Rice Bak Touk 007

1. Go to **Home Page**
2. Type in **Location Box** – Rice Bak Touk
3. Read the rate of **Fried Rice Bak Touk 007** from the suggested list of street food

Task 5: Search for prices of dishes of a grill street food in Sisovat High School

1. Go to **Home Page**
2. In Location Box, select **Sisovat High School** – In Type Box, select **Grill**
3. Select one of the display lists of street food
4. Read the menu and its prices

Task 6: Rate one steam street food in Intradevi High School and log out

1. Go to **Home Page**
2. In Location Box, select **Intradevi High School** – In Type Box, select **Steam**
3. Select one of the display lists
4. Click on **Rate**
5. **Log-in** with Facebook
6. Click on the stars of each item to rate
7. Click on **Finish**
8. Scroll up to the top right of the page
9. Click on **Log out**

Task 7: Comment on a barbecue street food in Bak Touk High School

1. Go to **Home Page**
2. In Location Box, select **Bak Touk High School** – In Type Box, select **Barbecue**
3. Select one of the display lists
4. Scroll down to comment
5. Click on **Comment Box**
6. **Log-in** with Facebook
7. Write the comment
8. Click **Publish**

Task 8: Post photos in comments

1. Go to **Home Page**
2. In Location Box, select **Bak Touk High School** – In Type Box, select **Barbecue**
3. Select one of the display lists
4. Scroll down to comment
5. Click on **Comment Box**
6. Click on **Post Photo** icon
7. Select the photo from the folder it locates
8. Click **Publish**

3.2 Usability Test:

To conduct the usability test of the first hi-fi prototype of street food, three scenarios were created in correlation with the tasks analysis. A famous UX design platform known as 'UXPIN' was selected to create the prototype due to its richness of usage and availability. The prototype is divided into three different forms according to each scenario.

The recording technology was well considered and prepared before the testing due to the fact that the testing is to be done online with people from a distance in Cambodia. The best practice for each respondent would be to talk and be recorded on Skype via their laptops or computers while testing the prototype on their mobile phones. As Skype video cannot be recorded for analysis usage, another recording program is used called 'QuickTime Player,' to record screen conversation. However, again this program could record only on screen video without the audio; hence, 'Soundflowerbed' was used as it could record directly from the audio of the computer without audio from the microphone. It was not a perfect option because the conductor could not hear what the respondent says during the testing. Yet, in a way it is relatively good that the respondents are left alone to figure it out all by themselves as they would do in real life situation.



Figure 13: Technology for Conduct Usability Test Prototype I

Before each test, the respondents were briefed with the overall objectives of the test, asked permission to record their voice/video and asked some basic questions related to them such as:

- How old are you?
- What is your education level?
- What is your phone model?

- How often do you consume street food?

After that, they are sent the scenario to read and understand what situation they are in and what task they are supposed to do. Before receiving the link of the prototype, they get to ask any questions about the scenario and clarify any doubts they have. Then they are left alone to fulfil the task and requested to speak out loud along the way of completing as ‘Think-Aloud’ methodology. Last, after they finish completing the task, they are asked to give final feedbacks on the prototype. The questions are:

- What are the things that you like about this platform?
- What are those that you dislike and wish to change for better usage?

The entire process takes about 25 to 30 minutes for each respondent.

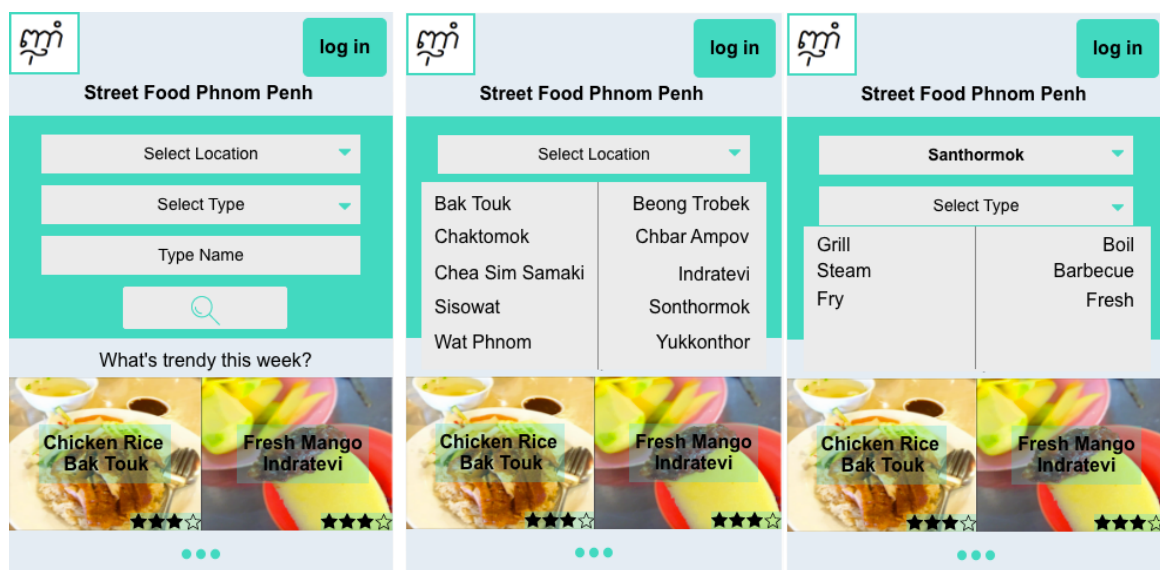
3.2.1 Prototype I

3.2.1.1 Scenarios

Scenario I:

You are in grade 10th of Santhormok High School and just finishing biology class at about 4:30pm since the teacher leaves a bit early. So you have about an hour to grab a quick snack with friends before English class starts at 5:30pm and you will be having dinner at home after class. So some grill eggs with some chicken wings would be perfect and cover enough till dinnertime. Beware that you are students so would not want to spend much money maybe 10,000 Riels (2.5USD) and your friends can share the meal.

Task: Go to your phone and search on street food website for **grill egg near Santhormok High School** and **note the prices** so you can tell your friends.



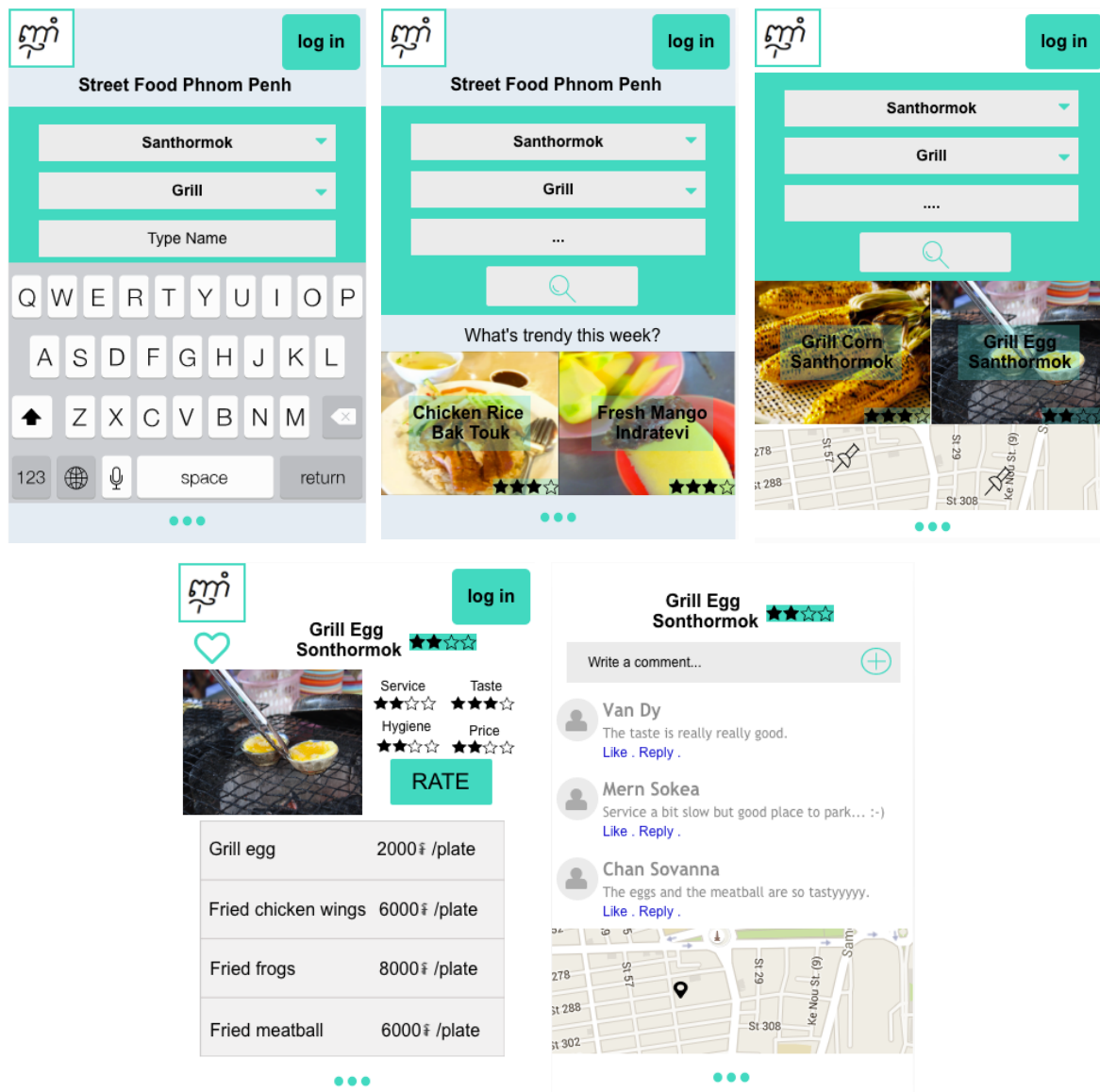


Figure 14: Prototype I for Scenario 1

Process:

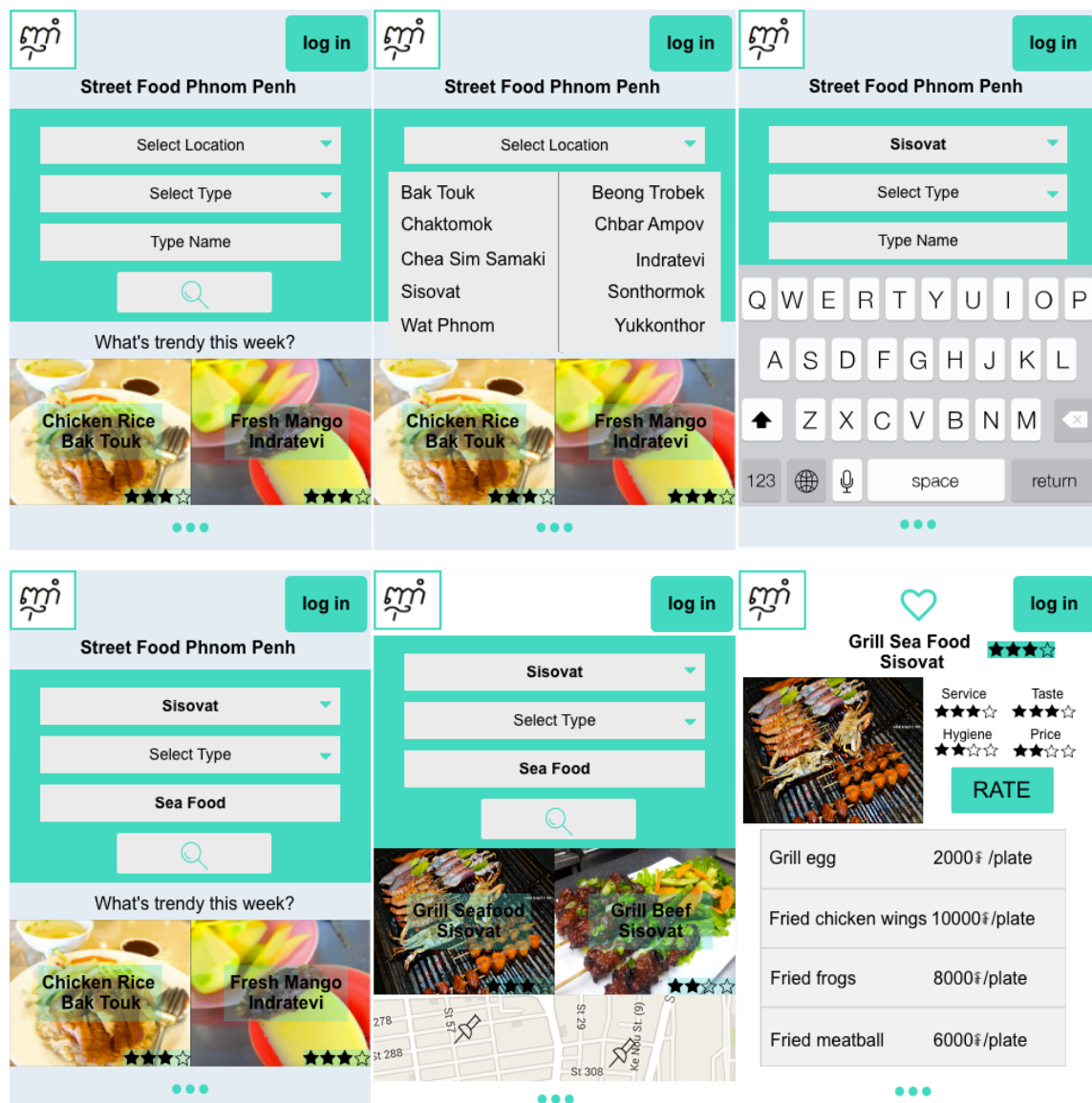
- 1) Go to the main page of the site with a link provided
- 2) Click on 'Location Box' for a list of location
- 3) Select a location
- 4) Click on 'Select Type' for a list of type of street food
- 5) Select a type
- 6) Click on 'Type Name' and a typing keyboard appears
- 7) Click on the keyboard to pretend to write
- 8) Click on 'Search' icon to go through the searching process
- 9) A new page listing of searched street food places was presented with a pinned map below
- 10) Click on one street food place
- 11) A new page listing details of the particular street food place revealed (in this case, Grill Egg Santhormok)

- 12) Read the information of the prices
- 13) Click on more to view more comments of the place

Scenario II:

You are an NGO staff working in Toul Tompong area. Your work finish at 5pm but the traffic is bad and you are tired so you think of having some gathering with some friends for some street food outside. Since you live alone, you would not want to go home and cook again after this so if it is something as meal and with some rice and a beer, it would be perfect. There have been a few places that you usually go with them between this area of work and your home behind the Royal Palace. Your name is Keo Thida.

Task: Go to your phone and search on street food you used to go, **Sisovat Seafood** then **save it to favourite**.



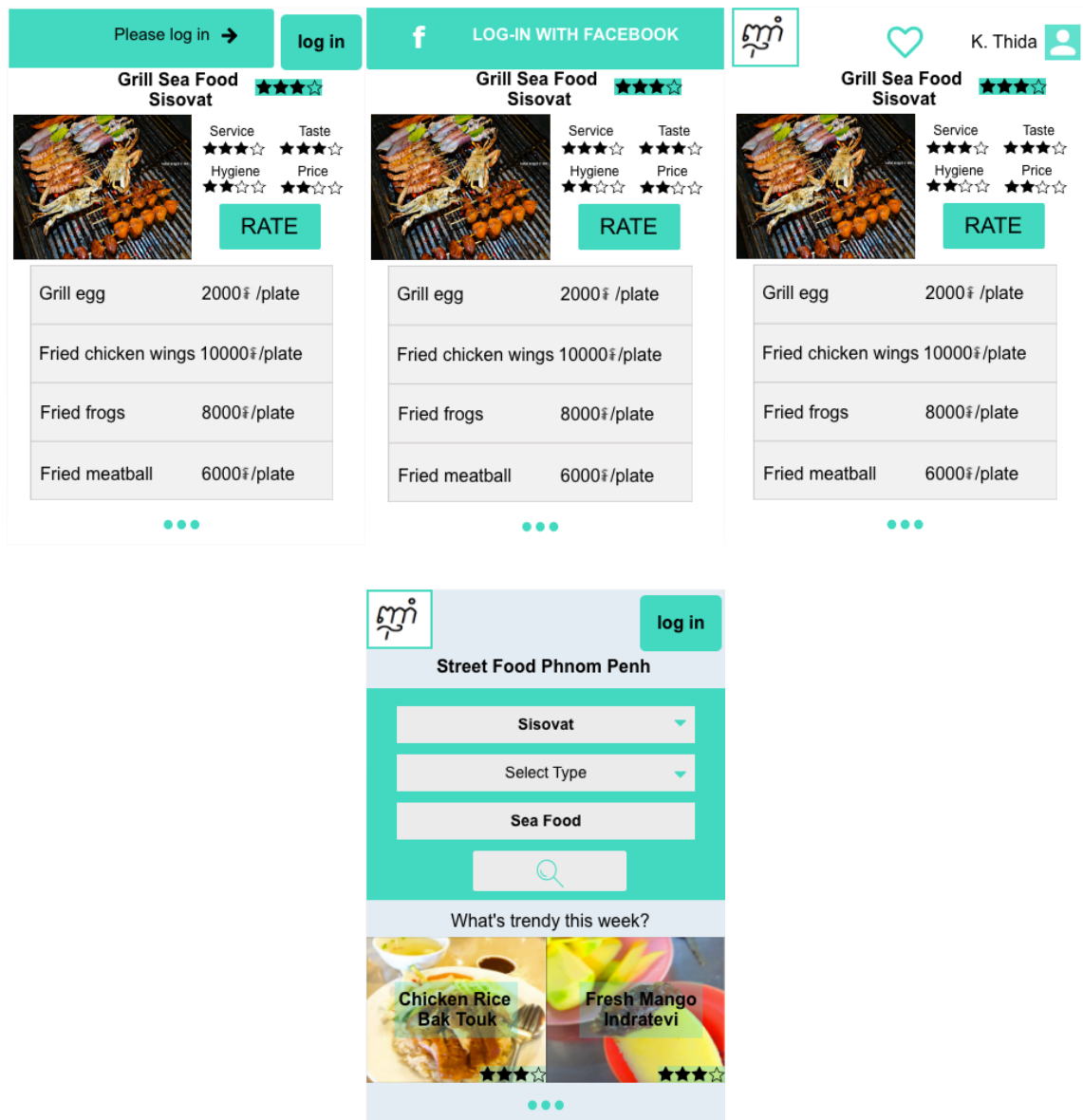


Figure 15: Prototype I for Scenario 2

Process:

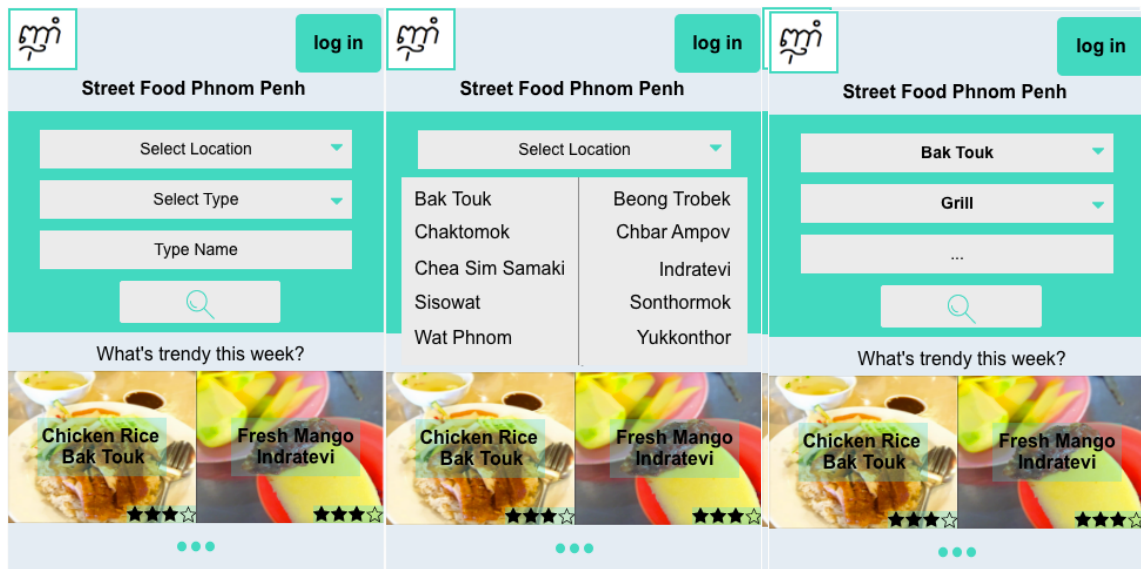
- 1) Go to the main page of the site with a link provided
- 2) Click on 'Location Box' for a list of location
- 3) Select a location
- 4) Click on 'Type Name' and a typing keyboard appears
- 5) Click on the keyboard to pretend to write
- 6) Click on 'Search' icon to go through the searching process
- 7) A new page listing of searched street food places was presented with a pinned map below
- 8) Click on one street food place
- 9) A new page listing details of the particular street food place revealed (in this case, Grill Seafood Sisovat)
- 10) Click on the heart icon to save as favourite and a request to log-in tap appears

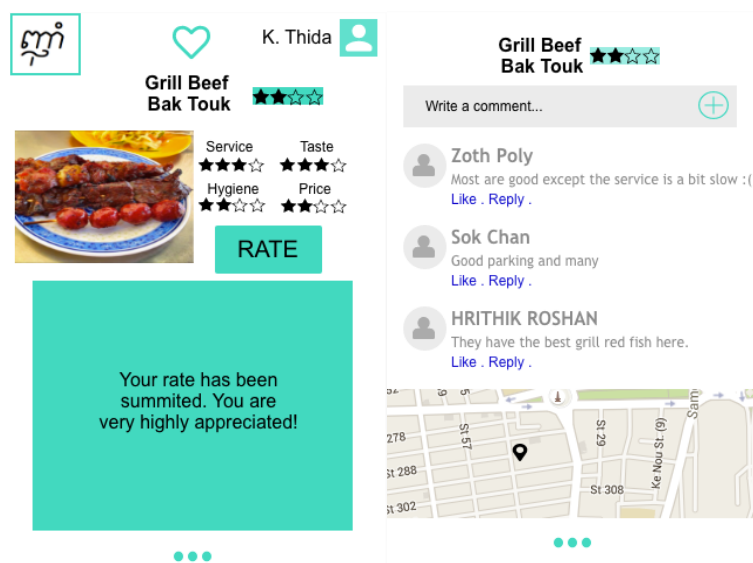
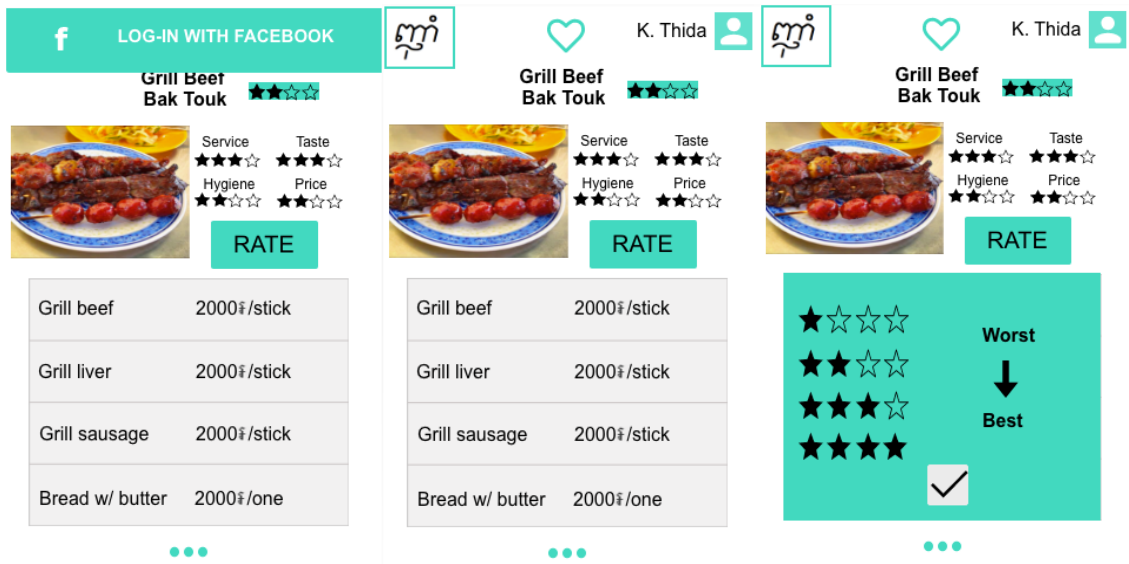
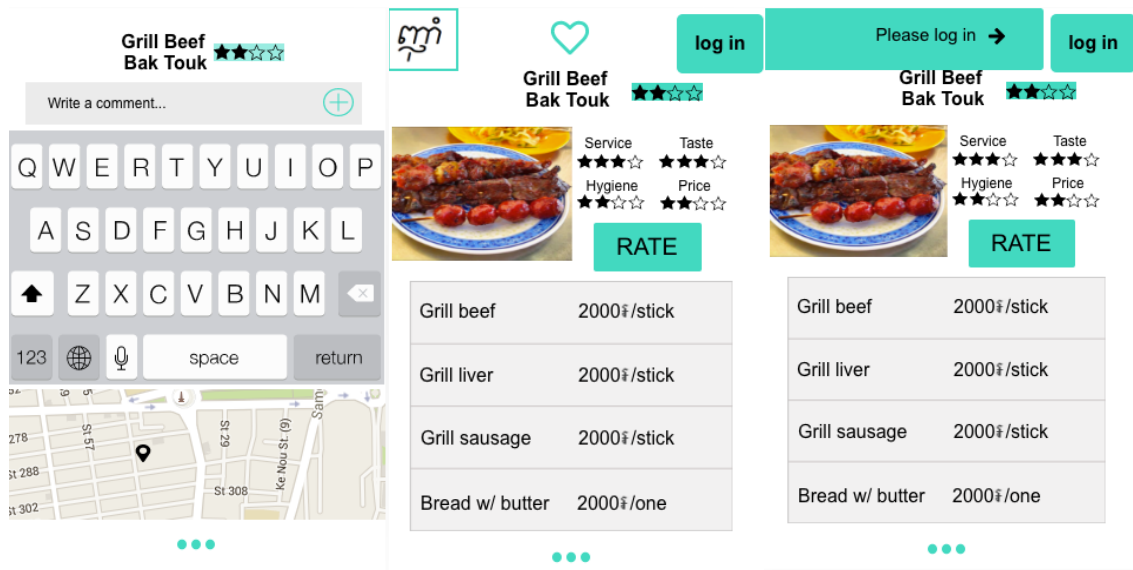
- 11) Click on Log-in and a log-in with Facebook tap appears
- 12) Click on Log-in with Facebook
- 13) A new page logged-in as Thida K. replaced
- 14) Click on the heard icon again
- 15) The place is saved as the icon turned into coloured

Scenario III:

You are a university student majoring in Teaching English as a Foreign Language in IFL. You just finished your final exam today and it was Friday so you and a few good friends from class want to explore a new street food place, to eat and celebrate. You went to a new place that you found from the Internet, Grill Beef Bak Touk. The information you got looked accurate as the photos you saw matched the real food. Moreover, The food taste really good but the service is way too slow and a bit pricy. You want to rate the place and note this down for other friends. Your name is Keo Thida.

Task: Search for **Grill Beef Bak Touk**, rate and comment.





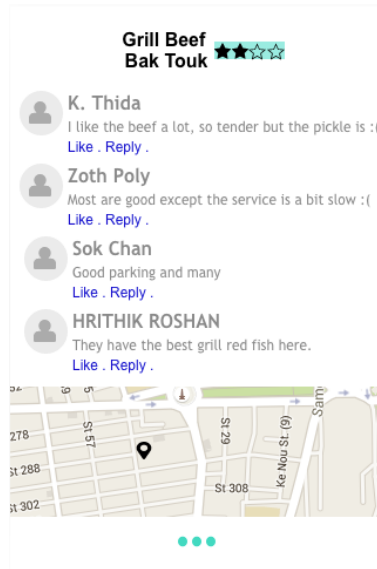


Figure 16: Prototype I for Scenario 3

Process:

- 1) Go to the main page of the site with a link provided
- 2) Click on 'Location Box' for a list of location
- 3) Select a location
- 4) Click on 'Select Type' for a list of type of street food
- 5) Select a type
- 6) Click on 'Type Name' and a typing keyboard appears
- 7) Click on the keyboard to pretend to write
- 8) Click on 'Search' icon to go through the searching process
- 9) A new page listing of searched street food places was presented with a pinned map below
- 10) Click on one street food place
- 11) A new page listing details of the particular street food place revealed (in this case, Grill Beef Bak Touk)
- 12) Click on 'Rate Icon Box' to rate and a request to log-in tap appears
- 13) Click on Log-in and a log-in with Facebook tap appears
- 14) Click on Log-in with Facebook
- 15) A new page logged-in as Thida K. replaced
- 16) Click on 'Rate Icon Box' again
- 17) A box stating the rate from worst to best appears
- 18) Click on the rating stars
- 19) A thank you box appears to thank the respondents for rating
- 20) Click on the thanks box to continue to normal page
- 21) Click on 'more icon' to read comments
- 22) A new page of comments and pinned map appeared
- 23) Click on 'Write a comment' to write a comment and the keyboard appears
- 24) Click on the keyboard to pretend to write
- 25) The comment was posted

3.2.1.2 Respondents

There were 10 respondents selected to interact and comment on the prototype. The respondents are potential users as they are regular consumers of street food and routine mobile users. They are from a range of ages from 15 to 30 years old and have various occupations such as high schools students, university students, teachers, private company and NGO staffs. Three respondents were set for each scenario except the first one. The first scenario has an extra respondent to just test if the prototype works and to give an overall comment. The first scenario is mainly about understanding the template and seeing if it is attractive to use at all.

3.2.1.3 Result

3.2.1.3.1 Overall Observance

Most of the testing went smooth as expected though among all, only three cases got to use the all the technologies as planned, meaning to use both mobile and computer at the same time. Though, all were requested to have Skype account, a mobile and a laptop/computer with secure Internet coverage, not everyone did as so. The testing continued anyway and the result deemed to serve well eventually.

3.2.1.3.2 Calculated Evaluation

A special evaluation system was selected to use for the testing due to its practicality of evaluating the satisfaction, efficiency, and affection of the prototype. It is known as 'User Experience Questionnaire.' This evaluation package has its own set of questionnaires for the respondents to rate after using the prototype. There is also available tool to input the data result, which is automatically processed and the output is presented.

Items																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
7	7	6	6	6	6	6	5	4	6	5	5	7	6	5	5	5	5	5	5	5	5	6	5	5	5
4	6	2	3	2	6	6	5	5	2	5	2	5	5	5	5	3	3	3	6	3	6	4	3	4	6
6	7	1	3	2	6	7	1	2	1	6	1	5	6	6	6	2	2	3	6	3	6	2	1	2	7
5	6	5	2	4	6	5	3	3	3	6	2	6	6	4	6	3	3	3	6	3	6	6	4	2	6
6	6	1	1	1	5	7	4	2	1	7	1	6	7	7	7	1	1	1	6	1	7	1	1	1	7
4	4	5	5	5	4	5	4	5	4	5	4	4	5	4	4	5	4	4	4	5	4	5	4	4	4
3	7	2	1	4	6	6	4	5	4	3	1	5	5	4	5	3	4	4	4	3	3	3	2	2	3
6	6	1	2	2	6	7	3	7	6	7	2	6	6	2	6	4	2	4	4	3	5	2	2	1	5
5	4	3	3	4	4	5	5	6	2	5	3	6	5	5	5	4	3	5	5	4	5	3	6	6	6
7	7	1	1	1	7	7	4	4	1	7	1	7	7	6	7	1	1	1	7	1	7	1	2	2	1

Figure 17: Data Entered for UEQ

	1	2	3	4	5	6	7		
annoying	☐	☐	☐	☐	☐	☐	☐	enjoyable	1
not understandable	☐	☐	☐	☐	☐	☐	☐	understandable	2
creative	☐	☐	☐	☐	☐	☐	☐	dull	3
easy to learn	☐	☐	☐	☐	☐	☐	☐	difficult to learn	4
valuable	☐	☐	☐	☐	☐	☐	☐	inferior	5
boring	☐	☐	☐	☐	☐	☐	☐	exciting	6
not interesting	☐	☐	☐	☐	☐	☐	☐	interesting	7
unpredictable	☐	☐	☐	☐	☐	☐	☐	predictable	8
fast	☐	☐	☐	☐	☐	☐	☐	slow	9
inventive	☐	☐	☐	☐	☐	☐	☐	conventional	10
obstructive	☐	☐	☐	☐	☐	☐	☐	supportive	11
good	☐	☐	☐	☐	☐	☐	☐	bad	12
complicated	☐	☐	☐	☐	☐	☐	☐	easy	13
unlikable	☐	☐	☐	☐	☐	☐	☐	pleasing	14
usual	☐	☐	☐	☐	☐	☐	☐	leading edge	15
unpleasant	☐	☐	☐	☐	☐	☐	☐	pleasant	16
secure	☐	☐	☐	☐	☐	☐	☐	not secure	17
motivating	☐	☐	☐	☐	☐	☐	☐	demotivating	18
meets expectations	☐	☐	☐	☐	☐	☐	☐	does not meet expectations	19
inefficient	☐	☐	☐	☐	☐	☐	☐	efficient	20
clear	☐	☐	☐	☐	☐	☐	☐	confusing	21
impractical	☐	☐	☐	☐	☐	☐	☐	practical	22
organized	☐	☐	☐	☐	☐	☐	☐	cluttered	23
attractive	☐	☐	☐	☐	☐	☐	☐	unattractive	24
friendly	☐	☐	☐	☐	☐	☐	☐	unfriendly	25
conservative	☐	☐	☐	☐	☐	☐	☐	innovative	26

Figure 18: User Experience Questionnaire

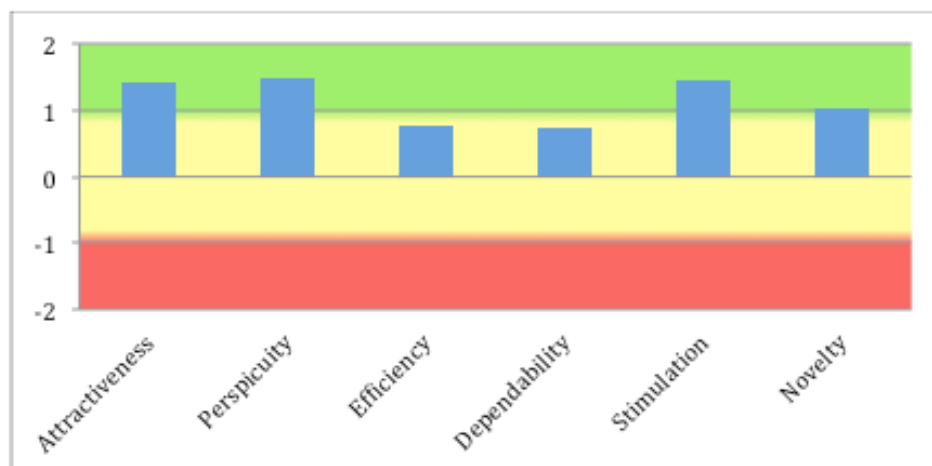


Figure 19: Result of UEQ in Regard to 6 Scales

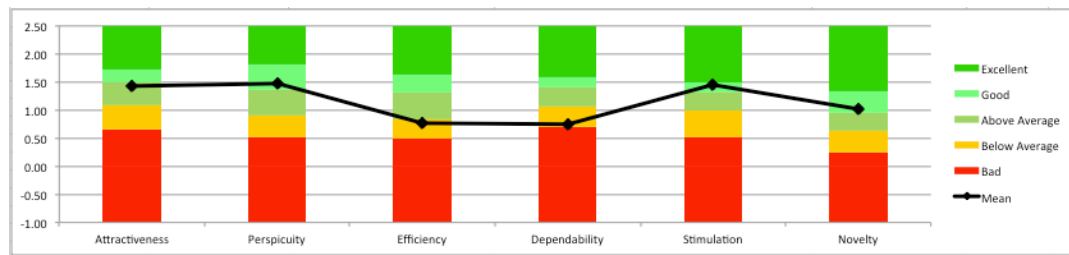


Figure 20: Result of UEQ as Benchmark

There is not any negative reaction of this prototype at all according to the evaluation of UEQ, which defines that it is a positive prototype to use.

The highest values were for perspicuity and stimulation of the prototype. Perspicuity focuses on if a product is easy for users to get familiar with; while stimulation refers to the fact if a product is exciting and motivating to use. However, there are also two low values rated by the respondents, which are Efficiency and Dependability. Efficiency brings about the ideas that users do not need to solve their tasks without unnecessary efforts; while dependability aims if the users feel like they are in control of the prototype.

3.2.1.3.3 Preferred Features and Positive Comments

Many of the respondents shared the ideas that they really appreciate the concept and the work put into this because there is really a need to use this platform since there has not been such a tool to search for street food and they always have to ask people when they want to go to one. The second positive comment is mostly about the simple navigation and easy to understand tasks. Moreover, they are also satisfied with the information provided by each street food places especially the pricing, rating and comments from other users. The first feature of 'Trending This Week' is also favoured. Then, a few have commented on the language that it does not matter at all to be in English since those are not very difficult words and easy to know what it means when they start using it. Last but not least, they love the default options provided in each selection such as the locations and types of food so they do not have to actually type a lot, just select and it will run through.

3.2.1.3.4 Suggestions for Changes

There were two negative feedbacks that were predicted to be received from the users due to the limitation program (UXPIN) that was used to make the prototype: slowness and some functions that do not feel real such as typing on the keyboard, the process of rating of each category, the limitation of contents and such. Almost every of the respondents commented on its slowness because they have to load the prototype of their phone and they mostly use cellular Internet.

Moreover, there are more interesting comments in terms of the many steps it takes before they finally arrive at the page they want, as well as a request of having more photos of the menu

so they can actually see what kind of food they are eating, the location of the place and how it looks like as well as the quantity of the food for the prices they are paying. Regarding the prices as well, one of the respondents gave a warning that it might be hard to be very specific since there are no rules, so the sellers can change the price whenever they want and people would get upset if what they see is not the same as reality. She suggested putting a range rather than a fix price. Another comment was about the explanation of each function; though there is not much confusion of what to do but a respondent suggest to have some more help explaining these new functions to new users such as by clarifying the wording or adding extra help page. Almost everyone was confused of 'Type Name' function since they do not really know what to type in there and a few even mention that it is not important.

Table 10: Problem and Solutions of Prototype I Usability Testing

Problems	Possible Solutions
1. Slowness	- Use more slide feature rather than loading the whole page when possible
2. Crowded homepage	- Reduce the selection feature
3. Limited contents	- Add more contents on trendy this week as well as the listed page
4. Uneasiness of 'Type Name'	- Integrate with select 'Type Name'
5. Too many steps to achieve the wanted content	- Reduce the steps to search for each place
6. Too few photos	- Add more photos for each place
7. Fixed price might change in short term	- Try out using price per person in stead
8. Function explanation	- Clarify the function by word whenever possible
9. Better use of the map	- Not much possibility due to the limitation of the prototype design software/tool

3.3 Heuristic Evaluation

The next step in refining the prototype is the 'Heuristic Evaluation.' In order to conduct this evaluation, the prototype got improved due to the comments and solution after the first usability test using the same UX design program 'UXPIN.'

Since heuristic evaluation bases on the ideas of getting critical evaluation by professionals in the field, the ten heuristic aspects developed by Jakob Nielsen in 1994 were selected to use (*Heuristic Evaluations and Expert Reviews*). However, not every aspect of the ten could apply and be evaluated in this prototype owing to some functions that are not available yet such as text recognition and error recovery thus only seven aspects were chosen and those will be explained

below. In the mean time, additional questions were also added for the respect to get comments on this prototype considering between Mobile Application and Responsive Website.

3.3.1 Prototype II

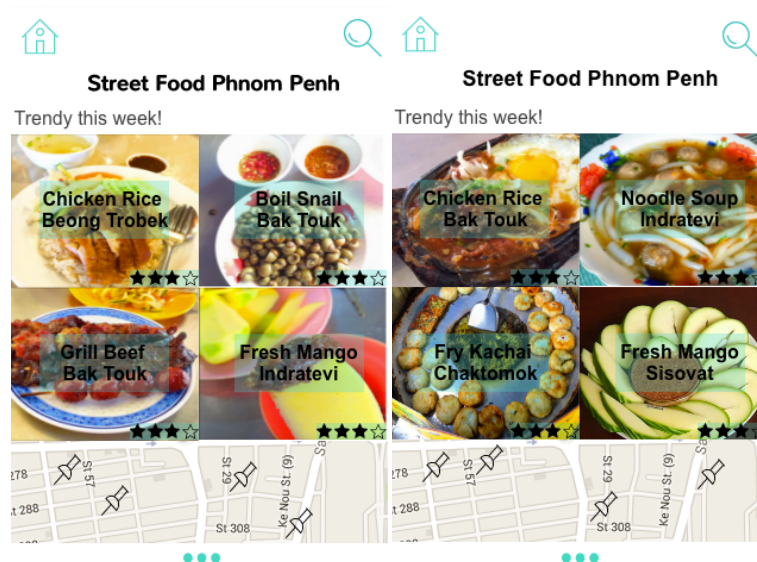
3.3.1.1 Scenario:

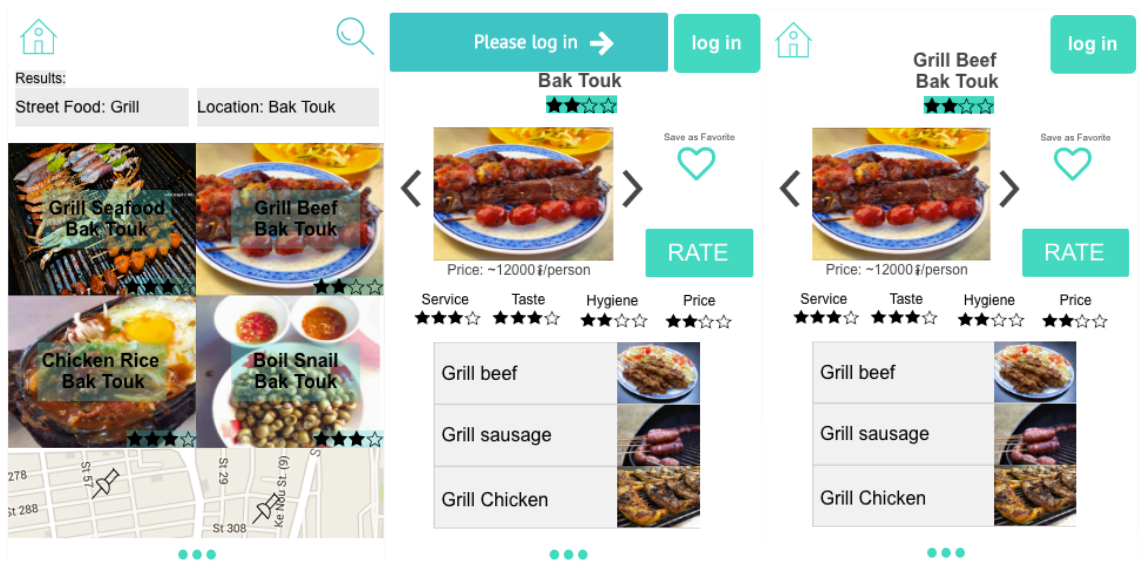
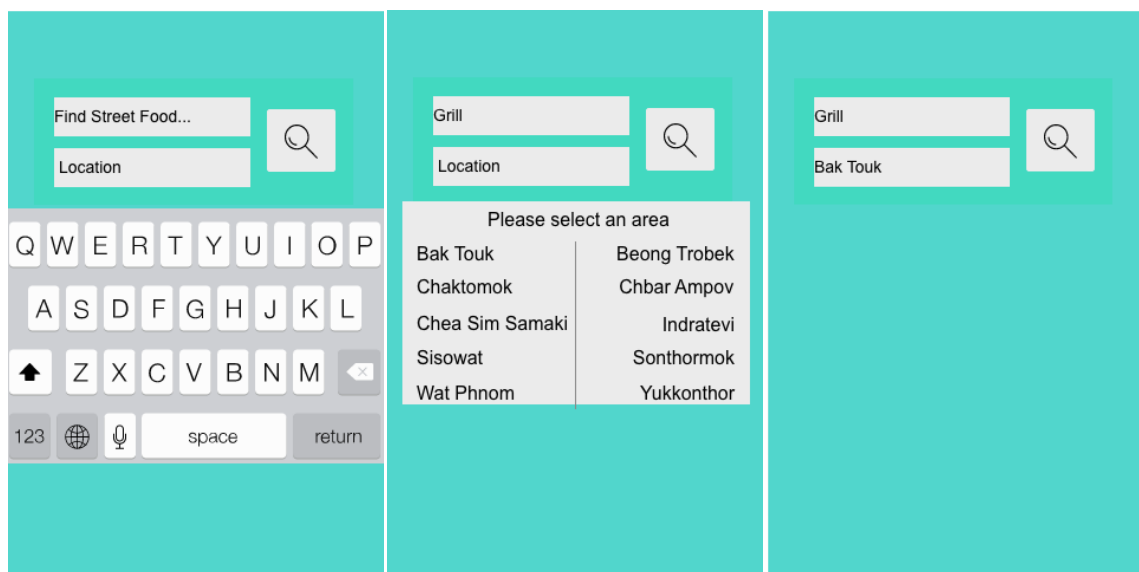
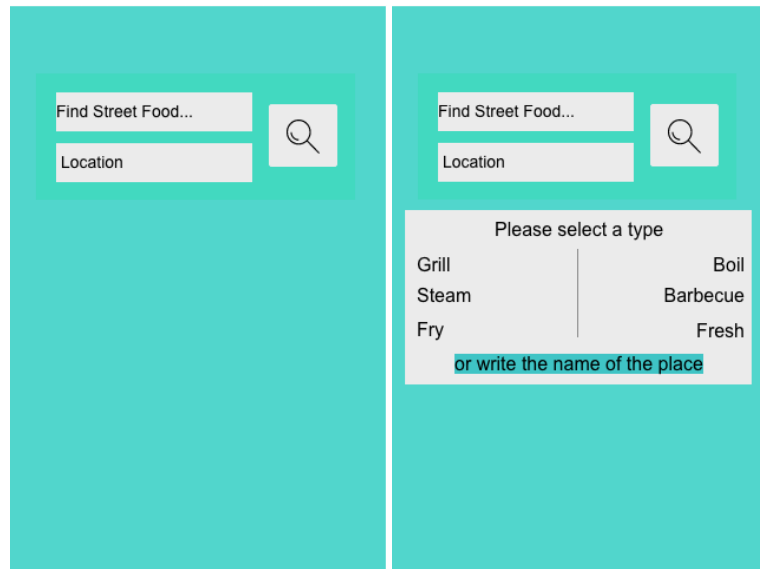
You are a bank staff working around Bak Touk area. Your work finishes at 5pm but the traffic is bad and you are tired so you think of having some street food with some colleagues before going home. Since you live alone, you would not want to go home and cook again after this so if it is something as a meal and with some bread and some drinks would be nice. Maybe something grilled, which would be quick too so let's try finding some grill food near Bak Touk.

Task: Go to your phone and search on **grilled street food** around **Bak Touk** area. Let's look at the prices as well and see if it looks good enough to go. You can **save it as favourite** to check later on as well.

Other tasks that you could do if you want:

- Rating
- Giving comment





Email

Password

Login

Or

Log in with Facebook

Log in with Google+

Email

Password

Q W E R T Y U I O P

A S D F G H J K L

⬆

Z X C V B N M

⬅

123

🌐

🎤

space

return

you.name@yahoo.com

Login

Or

Log in with Facebook

Log in with Google+

🏠

Grill Beef Bak Touk

★★★★☆

You

🏠

Save as Favorite

♥

RATE

Price: ~12000\$/person

Service

★★★★☆

Taste

★★★★☆

Hygiene

★★★★☆

Price

★★★★☆

Grill beef

🍖

Grill sausage

🍖

Grill Chicken

🍗

...

🏠

Grill Beef Bak Touk

★★★★☆

You

🏠

Save as Favorite

♥

RATE

Price: ~12000\$/person

Service

★★★★☆

Taste

★★★★☆

Hygiene

★★★★☆

Price

★★★★☆

Grill beef

🍖

Grill sausage

🍖

Grill Chicken

🍗

...

🏠

log out

🏠

You

log out

Favorite

Comments

Photos

Grill Beef Bak Touk

★★★★☆

Grill Seafood Bak Touk

★★★★☆

...

🏠

log out

🏠

You

log out

Favorite

Comments

Photos

Grill Beef, Bak Touk

You

I like the beef a lot, so tender but the pickle is :(

10 Like .

...

47

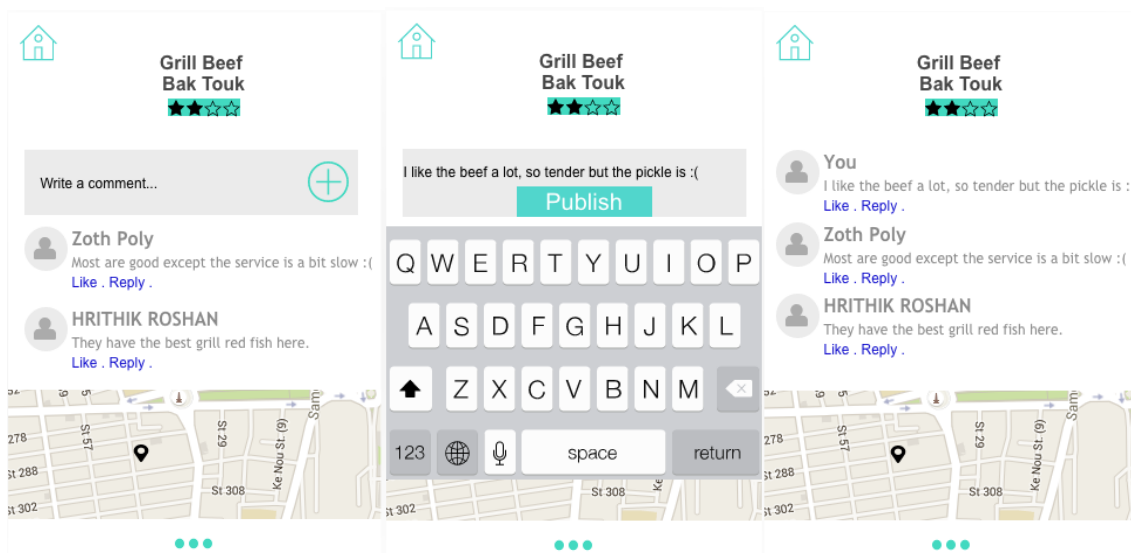
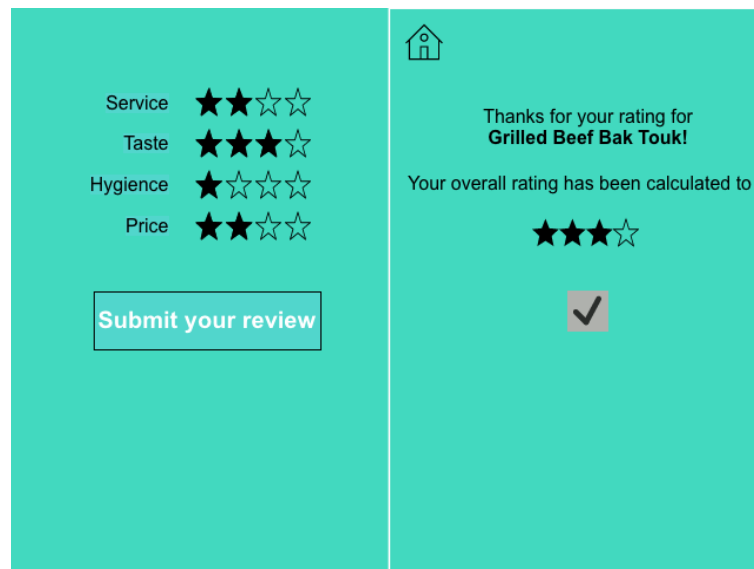


Figure 21: Prototype II for Heuristic Evaluation

3.3.1.2 Respondents

Five specialists were selected to evaluate this updated prototype. However, this assessment is only being made in a few days due to the fact that there is not so much time available. The evaluators were given proximately a few days to take a look carefully at the prototype, try out the tasks and interact with the prototype in order to understand the prototype fully. The respondents include designers, informatics students and even website/application developer who has been working for some years in this field in Phnom Penh, Cambodia. They are students of the specialists' field and from a variety of places such as Portuguese engineering student from FEUP, Cambodian engineering student in Évora, Portuguese design student from

FBAUP, Cambodian design student in Berlin, and a web/mobile designer/developer who has worked in Phnom Penh on food field for many years.

3.3.1.3 Result

3.3.1.3.1 Visibility of System Status

Half of the comments agree that the contents and functions of the prototype were well defined and serve its purpose good. However, some also mentioned that the user experience design is not very good yet. Some first time users might not be able to guess what to do on the landing page. Another complaint is mainly about the dysfunctional due to the program itself since there was only one sample of street food being made, so when they click on other places it did not work. There are also some design comments in terms of the display of each street food places such as ‘Image is important and shouldn’t be hidden under the restaurant’s name.’

3.3.1.3.2 Match between System and the Real World

This concept focuses mainly on the familiar language that is used in the prototype so that it is easy for users to use and understand what to do. The reactions are quite positive in this aspect as it seems fine and easy for the user to figure out. One of the evaluator stated ‘the concepts on the menu are very familiar to the users. It shows the location and popular food in those places.’

3.3.1.3.3 User Control and Freedom

This point received the most negative comments and it is in need for improvement according to the evaluation. Mainly, the comment is about the Home Button and Back Button. It was mentioned in the questionnaire that there is not enough Back Button and Home Button to go back to where they were or to get away in case the users change their minds or want to stop half way. One of the evaluators even gave an example such as ‘After clicking login, you cannot come back if you decide that you do not want to log in now.’ The fault also applies to other part such as saving to favourite, rating and commenting.

3.3.1.3.4 Consistency and Standards

There are many affirmative outcomes from this piece; however, four crucial traits were picked out as well. The first one is the fact that the logo and name should be included and used as Home Button rather than the Home Button itself. The second one is about the search function. Though this feature has already been updated from the last usability test, there is still complains that there could be a better way to improve it. For instance, one of the assessors wrote in the questionnaire that ‘There should be a screen to display as food category, so users

can choose quickly the type of food they like.’ The third remark is about the usage of ‘triple dot.’ This feature is chosen to use many times in this prototype according to the functionality of the program for making this prototype. Since this program does not allow scrolling up and down as how reality works, these three dots are used to simulate this feature. Last but not least, there was a very critical useful mention that ‘The login requirements are inconsistent. If I am not logged in, I can see that I can “Rate” although when I try to, it asks for my login. This is good. When I go to the comments section though, I can only see that I can comment if I am logged in. Either the same principle should be applied or a "you have to be logged in to comment" label should be included.”

3.3.1.3.5 Error Prevention

Mostly this aspect refers to the precaution by the creation of the prototype itself in a term that the developer has thought of and tried to prevent users for making mistakes while using or trying to figure out the prototype. The question is quite general so the result from the evaluators are quite confusing rather than constructive also considering the fact that the prototype could provide everything as a real product could. For example, one of the evaluator wrote that ‘I try to find a street food on search page without type any name or location, but it still displayed a result. It should ask user to enter the name of street food or location.’ This is mainly about the function of the prototype, each function of the prototype could create a few interaction but those interactions are so simple that it is a click and go, not like in final product where it would confine users to type the needed information first, while another gave a simple positive comment on the approach chosen for rating function and log-in by auto filling in information.

3.3.1.3.6 Aesthetic and Minimalist Design

Most of the comments received by this point has much to do with design and could somehow be assumed that the design of the prototype is not very good yet. Here are some of the statements by the evaluators:

‘Perhaps some spacing between pictures are needed. Some free white space are as important as contents to give a harmonized, easy-to-use look and feel.’

‘I don't think just only restaurant name and image are enough. Some sort of short description and price, for example, are useful for users to make their decision.’

‘Yes. But I think the hierarchy of some elements it's not correct in some cases, because the ones that look more important (that are bigger, brighter, more highlighted...) are not the ones that are more important in the screen. For example, in the "Grill Beef Bak Touk" screen one of the most important things to see its the name of restaurant but the log in and rate buttons are way bigger.’

3.3.1.3.7 Help and Documentation

Though most think that this prototype is easy to use and simple to understand, they still suggest that there should be some sorts of helping layout or FAQ since this is new anyway and for first time users, it might be a great help to them to figure out where to go or what to do.

The last analytical criteria in this questionnaire is the comparison between Mobile Application and responsive mobile website of which one might fit better for such contents and usage needed. More of them suggested that Mobile Application is a better option due to the trends among food contents, the contribution from users as social networking site, the loading time as well as the access to the mobile device's functions. However, among those there is also a statement adding to the fact that considering the simple contents and functions needed by the users, a Responsive Website is enough to represent the content. Plus some more advantages of Responsive Website that it can be used on other platform such as PC and tablet which would display information like map in better ways and can also be ported to an app with some available tools such as ionic.

3.4 Final Prototype and Framework

After analysing and considering the comments and suggestions made by the specialists in the heuristic evaluation, many aspects of the prototype have changed especially in terms of design. It contains more or less the same contents as the last prototype from the usability test; however, the looks and the convenience of the usage have been improved. Although this prototype has been refined after all these stages, there are undoubtedly aspects that could be made better. Beware of the change or accessing the prototype through Facebook due to the importance of Facebook usage within the target users.

Meanwhile, now that all the contents are finally been cleared finalised, the framework comparison between the two solutions of mobile can be compiled. Bear in mind that this framework is based on the notions of the importance contents and functions of the street food final prototype below figure 22.

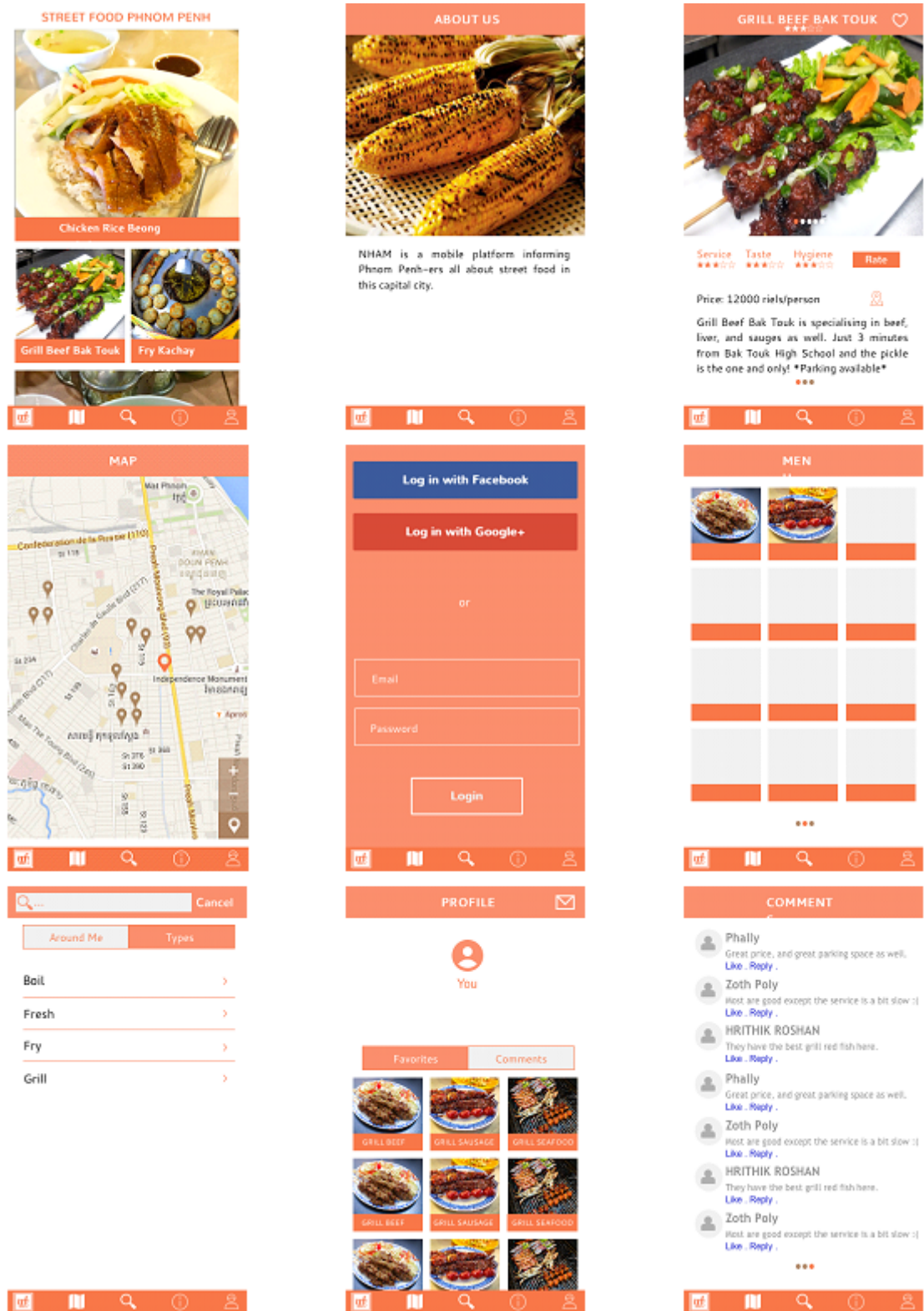


Figure 22: Final Prototype

Those include:

- Home Page: Trendy Food (Street Food which are most viewed by users in a week), and the five main functions (Home Button, Map, Search, Setting, Profile).
- Map: All available street food in Phnom Penh
- Search Page: Three main functions; type for names or location, search by locations around me and search by selecting the known areas
- About Us
- Profile Page: Favourite Places Saved and Comments.

And here are the inclusive comparisons between the two commonly used platforms on mobile in accordance to the result of the prototype in comparison on both platforms: Mobile App and responsive mobile website.

Table 11: Framework of Street Food in Phnom Penh in Comparison of Mobile App and Mobile Responsive Website

I.D	Description of Function	Mobile Application	Mobile Responsive Website
1	Budget	Cost more due to the fact that for all these contents to be available and widely used by users, at least a few different apps need to be made which are iOS, Android and Windows Phone.	Cost less since it is only made once and can apply to all the different types of mobile available in Cambodia considering also the variety of Chinese phones.
2	Content Display (Home screen, Contact)	Images are surely an important contents elements; hence will be loaded faster in Mobile App.	The first time accessing could be a bit slower than app but after the caches, loading of images should not be more of a problem.
3	Map	A big role being played by the use of location detection in the function of mobile itself.	Two later technologies also provide the possibility of catching the current location of users for mobile web. One of the ways is to connect the website directly to the available Google Map App in the mobile or using HTML 5

			Geolocation.
4	Access	Need to download from Apple Store or Play Store. But after, it is only one click away from using.	Can be accessed just by URL.
5	Performance	Mobile Application tends to perform better; however, there are possible aspects to do during the development stage to improve the performance of Responsive Website (Wroblewski 2011).	
6	Offline Function	Can be very helpful for some contents such as Menu or Prices or each place.	N/A
7	Typography	Suggested aspects based on the prototype. Font Type: Just one or two. One should be San Serif. Font Size: 12 to 16 depending on the role of the text. 16 for title, 14 for sub title and 12 for normal reading text. Numbers of characters: Less than 35	

Typography and images.

The first version of the prototype font 'Arial' were chosen to use from San Serif font family. As it is the first prototype, the look and the accuracy of it were not much of a focus yet. The second prototype involves heuristic evaluation meaning hearing from experienced people like web/mobile designers. The suggestion on typography of this second prototype was to use two mixed fonts rather than just an Arial, and it should be something unique and stand out.

For the final prototype as a result of the collections of reviews from various sources of potential typography among many on the digital world as well as improvements from comments of heuristic evaluation, two San Serif fonts type were chosen to use: Nunito and Cantarell. The fonts sizes are mostly between 14 to 16 points. 16 font size is only used for big title, while 14 is for sub-title. Text are in Cantarell and in size 14 except on the menu page where it goes down to 10, still readable due to the small amounts of text but needed to be done so in order to fit three dishes for each row. The characters are always less than 35 for each row and the maximum is only used for full text reading such as in 'About Us' or description of the street food. Else, most of the contents are just names of the places and the dishes which is around or less than 20 characters. Image is an important element of the prototype after text. The images are mainly used in two forms here in order to be consistent. As seen in Home Page, the big image is 300*250 pixel and the smaller ones are 145*120 pixels, with enough wide spaces aside for attractiveness and the easiness of comprehension. On About Us page the size of the image is a bit bigger due to the little content needed there, 320*280. While on the Menu Page, each of the image consists of 93*74 pixels; the main idea is to fit three images in a row and still have some white spaces around.

Performance. The speed performance of Mobile Responsive Website creates one of the big down for it in terms of speed comparing to Mobile Application. However, there are suggestions to pay more attention on making the product to improve these sorts of performance meaning making users download less by managing both size and number of files. Here is a list of things that developers could do:

- ‘- Use image sprites to group multiple images into a single encoded file.
 - Bundle together and minify CSS and Javascript files.
 - Limit or remove dependencies on heavy Javascript libraries—especially if they are just being used for one or two functions.
 - Likewise, limit the use of CSS grid systems.
 - Use proper HTTP headers to ensure files are appropriately cached in the browser’s memory
 - Where appropriate, take advantage of modern browser capabilities like Canvas and Appcache in HTML5.
 - Use CSS3 properties for rounded corners, gradients, text shadows, and box shadows.’
- (Wroblewski, 2011)

Though Mobile Application came out with more positive outcome on each stages of the comparison, Responsive Website on mobile still seems to be a better fit for this context for two main reasons:

- The significant differences between the two platforms are speed and functionality. Though Responsive Website could be a bit slower but if all the functions are made carefully to improve speed and considering all the comfortable usability of mobile itself, both speed and functionality are not significantly different from Mobile Application.
- Second, bearing in mind that this will be the first platform of this sort of content which is hard to gather information and needed a whole lot of updating to always be current and trendy for its users, Responsive Website reaches a much larger audience in one shot and it is less difficult to create from scratch comparing to Mobile Application.

4. Conclusion and Future Work

Many of the testers have claimed to highly appreciate the concept of creating this prototype since they mentioned that there is a need of such tool to search for street food in Cambodia. Though the numbers of testers are very small and cannot represent the whole city of Phnom Penh, it is an interesting and inspiring part of the outcomes. Plus, the crucial types of information that users need in order to decide which street food place in Phnom Penh they should go to are figured in rank as friendliness of staff (service), hygiene, types of food, price-menu-location, parking space, reviews and photos. The evaluation on both prototypes I and II have given a very constructive feedback to update the final prototype. Prototype I was based mainly on normal potential users while Prototype II based more on the specialists in the field; people such as designers and informatics. Moreover, the prototype itself has also taken into consideration the direct connection with Facebook, the most used social networking site in Cambodia. It is a direct and first suggested login for users while using this Street Food prototype. It also linked directly to Facebook in order to give comments on each street food place. Last, a robust framework was compiled in comparisons of the two mobile solutions: Mobile Application and Mobile Responsive Website. Both solutions have been compared on various aspects as a result of what the contents of the prototype look like in the final prototype. Though there are more positive aspects of Mobile Application than Responsive Website, the website on mobile phone still fits better for this sort of contents of street food in Phnom Penh, capital city of Cambodia for the size of its contents at the first stage of creation as well as the possible development to improve speed and functionality to being far least different than those of Mobile Application.

For future work purpose, due to the fact that this is largely a theoretical comparison between these two solutions, it would be ideal to actually build both platforms and test them in real life to know how far different it really makes. Most of the time and effort in this study has been taken to create the prototype and gathering crucial contents of what this prototype might

look like since this is the very first one of street food. Future researchers who want to look deeper into these sorts of context and technology could start from what has been created here: a mobile prototype on street food in a developing country like Cambodia and a robust framework comparing the prototype result as in Responsive Mobile Website and Mobile Application.

Last, there is a clear interest in the importance of understanding such concept as this paper so far has been selected by a few well recognized publications such as an Ergonomics Conference in Croatia, HCI International in Canada and Common Ground Community Publishing after the reviewing of the abstract version. Though the publication has not happened yet for the first two publisher, the paper is currently in the process of final reviewing process in Common Ground Community Publishing.

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6. APPENDIX

Appendix A: Online Survey in English

Street Food Consumers in Phnom Penh

This questionnaire is targeting youth living in Phnom Penh age 15 to 30 about information related to internet usage and street food. Note: Street food refers to all those types of food selling on the street both mobile and fixed, it is generally known as 'Food on Pathway'

***Obrigatório**

How old are you? *

Escolher ▾

Sex *

☐ Male

☐ Female

Where are you from? *

Escolher ▾

What device do you use to access internet? *

☐ Mobile Phone

☐ Desktop/Laptop

☐ Tablet

☐ Outro: _____

What model of devices? (eg: Iphone 3, Samsung S3, Desktop Dell,...) *

Sua resposta

How many hours per week are you on the internet? *

☐ Rarely

☐ Less than 3 hours

☐ 3 to 5 hours

☐ 5 to 10 hours

☐ More than 10 hours

How long have you been using internet? *

☐ Less than 3 years

☐ 3 to 5 years

☐ 5 to 10 years

☐ More than 10 years

Do you have applications on your phone?

☐ Yes

☐ No

How many applications do you have on your phone?

☐ Less than 5

☐ 5 to 10

☐ 10 to 20

☐ More than 20

Have you ever checked any website on your mobile? (for example: www.com)

☐ Yes

☐ No

Which one do you prefer, mobile application or mobile website?

☐ Mobile Application

☐ Mobile Website

Why?

Sua resposta

Do you know how to search for an application and download one?

☐ Yes

☐ No (someone does it for me)

How often do you have street food per week?

☐ Rarely

☐ Less than 3 times

☐ 3 to 5 times

☐ 5 to 10 times

☐ More than 10 times

Have you ever go on the internet to search for where and what to eat?

☐ Yes

☐ No

How do you usually get information about street food?

☐ Friends and family

☐ Social Media (Facebook, instagram...)

☐ Website

☐ Outro: _____

If you have to decide to pick one street food place to go and eat with your friends, how important do you need to know these? *

	1 Not Imp.	2	3	4	5 Very Imp.
Price	☐	☐	☐	☐	☐
Hygiene	☐	☐	☐	☐	☐
Menu	☐	☐	☐	☐	☐
Location	☐	☐	☐	☐	☐
Type of food	☐	☐	☐	☐	☐
Read Comments from others	☐	☐	☐	☐	☐
Parking Space	☐	☐	☐	☐	☐
Friendliness of staff	☐	☐	☐	☐	☐
Photos of food	☐	☐	☐	☐	☐

Is it disturbing if you are required to log in with your Facebook account in order to post a comment or share a photo of street food?

	1	2	3	4	5	Very Disturbing
Not at all	☐	☐	☐	☐	☐	

What do you need to know about a street food place in order to decide to eat there?

Sua resposta

ENVIAR

Nunca envie senhas pelo Formulário Google

អ្នកញ៉ាំអាហារតាមផ្លូវក្នុងក្រុងភ្នំពេញ

ក្បួនសិទ្ធិខោសាវចារកៅកាហ្វេដើម (ពីថ្ងៃ ទៅរាល់ថ្ងៃ) នៃលេខអាជ្ញាបណ្ណបញ្ជូនឈ្មោះនិងការបង្កើតអាហារតាមផ្លូវ
 ការបង្កើតអាហារតាមផ្លូវនៅទីនេះមានលក្ខណៈសាមញ្ញ និងងាយស្រួល ដែលបានរៀបចំឡើងសម្រាប់អ្នកប្រើប្រាស់ទាំងអស់។
 របាយការណ៍អាហារតាមផ្លូវនៅទីនេះអាចជាឯកសារយោងសម្រាប់ការធ្វើការស្រាវជ្រាវ និងការគ្រប់គ្រងអាហារតាមផ្លូវនៅក្នុងក្រុងភ្នំពេញ។

*Obrigatório

តើអ្នកអាចប៉ុន្មាន? *

Escoller ▼

ភេទ *

☐ ស្រី

☐ ប្រុស

តើអ្នកមកពីខេត្ត/ក្រុងណា? *

Escoller ▼

តើអ្នកប្រើប្រាស់ឧបករណ៍អ្វីខ្លះដើម្បីភ្ជាប់អ៊ីនធឺណិត? *

☐ ទូរស័ព្ទដៃ

☐ កុំព្យូទ័រ

☐ បន្ទះ Tablet

☐ Outro: _____

តើឧបករណ៍ទាំងនោះមានទំហំប៉ុន្មាន? (Iphone 3, Samsung S3, Computer Dell,...) *

Sua resposta _____

តើអ្នកប្រើអ៊ីនធឺណិតប៉ុន្មានម៉ោងក្នុងមួយសប្តាហ៍? *

☐ តិចជាង ៣០ ម៉ោង

☐ តិចជាង ៣ ម៉ោង

☐ ពី ៣ ទៅ ៥ ម៉ោង

☐ ពី ៥ ទៅ ១០ ម៉ោង

☐ លើសពី ១០ ម៉ោង

តើអ្នកប្រើអ៊ីនធឺណិតយូរប៉ុណ្ណាហើយ? *

☐ តិចជាង ៣ ឆ្នាំ

☐ ពី ៣ ទៅ ៥ ឆ្នាំ

☐ ពី ៥ ទៅ ១០ ឆ្នាំ

☐ លើសពី ១០ ឆ្នាំ

តើអ្នកមានកម្មវិធី (app) នៅលើទូរស័ព្ទដៃដែរឬទេ?

☐ ទា

☐ គ្មាន

តើអ្នកមានកម្មវិធីប៉ុន្មាននៅលើទូរស័ព្ទដៃ?

☐ តិចជាង ៥

☐ ពី ៥ ទៅ ១០

☐ ពី ១០ ទៅ ២០

☐ លើសពី ២០

តើអ្នកដែលលែងមើលប្រសាសន៍លើទូរស័ព្ទដៃដែរឬទេ? (ឧទាហរណ៍ www..... .com)

☐ ធ្លាប់

☐ មិនធ្លាប់

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Appendix C: Heuristic Evaluation Questionnaire

Heuristic Evaluation on Street Food Phnom Penh (Prototype 2)

This is a detailed questionnaire seeking feedback from expert in informatics and design field on the content of Street Food in Phnom Penh, Cambodia.
It is a part of a master thesis in the University of Porto, Portugal conducted by a foreign student from Cambodia, Marie Ros.

Please read this scenario below and complete the tasks!

Scenario:
You are a bank staff working around Bak Touk area. Your work finish at 5pm but the traffic is bad and you are tired so you think of having some street food with some colleagues before going home. Since you live alone, you would not want to go home and cook again after this so if it is something as a meal and with some bread and some drinks would be nice. Maybe something grill which would be quick too so let's try finding some grill food near Bak Touk.

Task: Go to your phone and search on **grilled street food** around **Bak Touk** area. Let's look at the prices as well and see if it looks good enough to go. You can **save it as favorite** to check later on as well.
Other tasks that you could do if you want:

- Rating
- Giving comment

Please use this link to get to the prototype for completing the tasks:

<https://collaborate.uxpin.com/e4abc78b211c6d0c25bc82ca4fa1c07ece1afbed#/pages/52524388>

PRÓXIMA

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Google Forms

Heuristic Evaluation on Street Food Phnom Penh (Prototype 2)

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*Obrigatório

1. Visibility of system status

Are the contents and functions of the prototype well defined and serve its purpose? *

Sua resposta

2. Match between system and the real world

Does the prototype speak the users' language (with words, phrases and concepts familiar to the user)? Does it seem like the information appear in a natural and logical order? *

Sua resposta

3. User control and freedom

If you make mistake, and need an 'emergency exit' to go back to where you want to be as fast as possible, is it feasible? *

Sua resposta

4. Consistency and standards

Are contents and functions of the prototype consistent and follow a clear standard? *

Sua resposta

5. Error prevention

Do you think that the prototype has any efficient error preventions? *

Sua resposta

6. Aesthetic and minimalist design

Are all contents relevant and needed? *

Sua resposta

7. Help and documentation

Do you think that this prototype need to provide help or some sort of documentation to explain users in order to use it? *

Sua resposta

Mobile Application vs Responsive Website

For the case of this prototype, which one do you think fits better between Mobile App and Responsive Website? Please give reasons.

Sua resposta

Any other comments?

Sua resposta

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