

DEVELOPING USER INTERFACE MOBILE APPLICATION FOR TOURIST

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ABSTRACT

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Mobile phones have become full-featured mobile computers, and the usage of this technology were developed promptly. Interest towards the usages of mobile phone as an intervention in developing new application for user were also seem very promising.

Much has been discus about the role of mobile application nowadays. Mobile apps that been design and created by the genius content developers, mostly are the applications that try to solve the problem facing by the user out there. Design process that has been conducted earlier in the study has led towards the invention of Thru Eye Apps. The applications are focusing on user interface and usability, and this were a baseline in developing the Thru Eyes Apps. The Thru Eye apps were developed to ease and guide tourist while traveling. With the establishment of this application, user will able to travel easily even though they travelling for the first time. Thus, this research paper discusses the user interface design process of forming Thru Eye apps in assisting tourist while travelling.

Keywords: Mobile Apps, Tourist, Touchscreen, User Interface.

1. INTRODUCTION

1.1. Background

Nowadays Malaysia's Tourism Industry is expanding rapidly. This will make Tourism a major industry in marketing Malaysia as a destination of excellence and a major contributor to the socio-economic development of the nation. Malaysia is a third world country. The tourism industry not only fulfils tourists from the European countries but also from the Middle East and some of the African country. Statistic showed that there are also first-time tourists to Malaysia and the number increases every year.

According to Ministry of tourism and Culture Malaysia, statistical review in 2018 showed that visitors' arrival in Malaysia have reached up to 25.83 million and receipts up to RM84.1 billion. Meanwhile, in 2019, visitors' arrivals in Malaysia were up to 28.1 million and receipts up to RM92.2 billion. This proved statistically that the tourism industry is one of the major economic contributors in Malaysia.

Together with this fast-growing industry are the support of enhancement of connectivity to the wireless internet through smartphones, where mobile tourism become a new trend and

become highly demand. Most of the tourists use conventional printed guides such as brochures, printed maps and travel books as a guide and reference before travelling. This is not efficient and it's become more difficult for first-time tourists.

Wang (2012) mentioned how mobile technologies, especially through smartphones and mobile integration can lead to innovational products that may boost travel and tourism (Wang D. P., 2012). In 2011, the Hong Kong Tourism Board designed tourist mobile apps that allow tourists to find information and locations of points of interest (POI) and also promoting events and dining outlets in Hong Kong. This convenience does not only serve as a channel for travellers to find information but also allows the conception of travel products and services through video clips and graphical illustrations (Tsang, 2010). Along with smartphone penetration growth, mobile applications are also becoming more popular and being used widespread and more smartphone owners use these Apps for travel (Sinda Agrebi, 2014). As such it is debated that the integration of smartphones into daily habits have overflowed and start to influence modern travelling behaviour (Wang D. Z., 2014), thus making related activities a more integrated part of everyday habits. This in return sets the basis for users to actively use travel apps during the travel process. Studies indicate that mobile technology allows pre and post-trip activities to be executed on-site (Wang D. Z., 2014). Mobile apps have the potential to identify tourists' needs and requirements and use them strategically to recommend alternatives or solutions that are really personalized and exclusive to that person. Contents are adjusted to their changing travel contexts and this provides added value to the experience of tourists dynamically (Dimitrios Buhalis, 2015). These technologies have helped travellers with what they perceived the trip would be by defining their needs. This affects their travel behaviours remarkably.

Mobile applications were first made popular by Apple Incorporated when it introduced the App Store that came with the iPhones. Google then followed suit by incorporating Google Play Store into android smartphones. Both offered a chance for developers to distribute their apps to the mass since 2008. Mobile apps could significantly help ease traveling woes for travellers. This role can be attributed not only to the universality and portability of mobile technology but also for its many features and functions that are supported by context aware systems (Gavalas, 2011). Furthermore, a recent study on tourism says that smartphones play a significant role in mediating the tourists' experience (Wang D. P., 2012). Mobile Apps are an important part of the customers' experience. They use mobile apps not only to look for destinations and attractions, but also for other travel-based needs such as travel agencies, entertainment devices, translation services and checking-in for airline flights (Wang D. P., 2012). Tourists are also able to share travel experiences instantly with their social networks through the mobile social media (Wang D. P., 2012). Therefore, it is suggested that mobile technology alters tourism experience by disorganizing the borders of experiential learning through the anticipatory, experiential, and reflection stages of the tourism experience (Wang D. Z., 2014). This verified that apps for tourist or traveller are significant and are preferred by users that also give impact towards its usage.

Designing the application for tourists is challenging. Designers need to follow certain guidelines and design principles that have been established by experts. Mobile device interface design is more restrictive than desktop interface design because of relatively limited computing and communication power, smaller platform sizes, an always-changing context (Tarasewich, 2003). User interface and usability need to be considered when designing the application followed by user-needs, in this case the tourists or travellers itself. Interface designers should be able to aid users and reduce their complexity while using the application (Ali Darejah, 2013). An interface that is designed without paying attention to users' ability will make it confusing for users and create many problems in building up a correct conceptual model (Wagner, 2002). The principle of user-centred design stated that there is no single

proper design that can cater for the needs of all groups of users. This makes it more important for a mobile app to be developed based on the needs of the target users' cognitive ability (Ali Darejah, 2013). Interface designers also need to be alert to the diversity of users, as what is mentioned by Costa (2006) that the user interface goes beyond regional boundaries, it may use different styles based on its environment (Costa, 2006)

Previous studies have been done but were more focused on the usability and technical perspective. Many studies that were carried out regarding the development of mobile technology for tourists focus on how to make mobile technology more intelligent and contextaware that it can in the future introduce more relevant recommendations to support tourists on the move (Gavalas, 2011). This paper is establishing the design process of Thru Eyes apps following the design principle and established guidelines to make it easier for tourist while traveling. This application is targeted to tourists that are planning to travel to Malaysia. Hence, this paper presents an overview of the process in designing this application to suit the users' needs.

2. TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM is a theoretical model used to help explain and understand the functional application of information technologies. Normally It is presented in different contexts (William R. King, 2006). The Technology Acceptance Model or TAM is an information system theory that models how a technology is adopted and used by users. The model represents one of the most influenced explanatory models of the human behaviour theories.

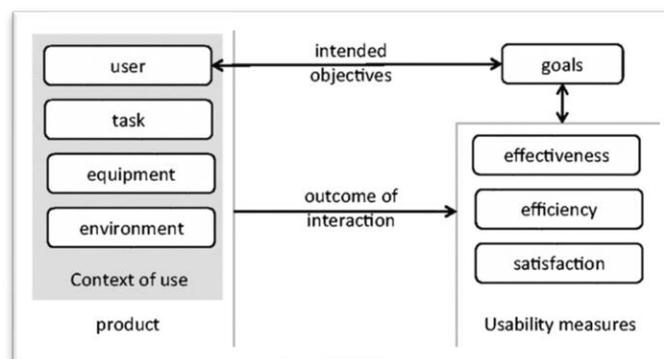


Figure 1: The ISO9241 usability definition framework.



Figure 2: Interface usability calculation

2.1 Interface Usability Analysis

1. Firstly, design a grid/ panel on the interface (as shown above)
2. The box must be divided equally and of the same size
3. Next measure the Horizontal by Vertical boxes to get the total amount of boxes in the interface.
4. As an example; 11 Horizontal boxes by 18 vertical boxes = Total 198 boxes
5. To measure the percentage of the visit intensity button, count the vertical box by the
Horizontal box = $11 \times 3 = 33$ box
6. Following this equation, $33 / 198$ (total box) $\times 100 = 16.7\%$ space used from total 100

2.2 Usability analysis on existing Interfaces.

Before starting the design of the user interface, a study on usability analysis on existing interfaces should be implemented to collect data that works for users and as a guideline to build ideas into the new designated interface. Usability analysis can determine possible usability problems but the mistakes are not indications of bad designs or incompetencies. Though even smaller problems regarding usability issues are worth emphasizing and need to be fixed promptly (Jacob Nielsen, 2002). In one of his studies, Mohd Firdaus Kamaruzaman (2016) stated that the existing interfaces chosen should be based on the similarity of intent and function of the application before making a reference to the construction of interfaces (Muhamad Fairus Kamaruzaman, 2016). As pointed out by Lewis (1993), this step is important because a good UI depends on how frequent users run the system as opposed to how often they run systems they are already familiar with (Lewis & Rieman, 1993).

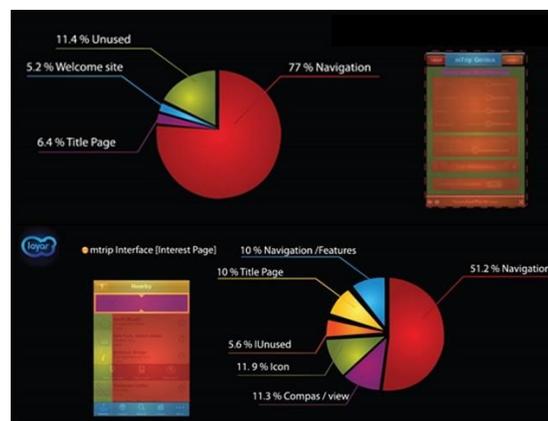


Figure 3: Example Interface usability analysis

2.3 Comparative of Usability analysis finding

After the interface for the existing application's usability analysis is completed, the researcher will gather the interface usability data including for navigation, unused space, and how much space were allocated for buttons or icons in the existing application. This is to practically gather data for reference before the user interface design process take part. The chart below explains how the navigation menu should be given more priority when designing the interface design. Hence, the button and icon space menus are also important elements in the process. This allows the researcher to suggest an interface design guide using the data from the usability analysis findings.

Application	Navigation	Title page	Unused space	Button icon	Operation System	Background image	Logo	Welcome site
mtip main page	10%	3.4%	18.7%	38.8%	0%	25%	3.4%	0%
Mtip settings page	77%	6.4%	11.4%	0%	0%	0%	0%	2.2%
Google	81.2%	10%	5.2%	11.2%	11.2%	0%	0%	0%
YELP	87.7	8.7%	0.1%	0%	2.8%	0%	0%	0%
TOTAL	231.2%	29.2%	38.7%	50.7%	13.2%	25%	3.4%	2.2%
Result/avg	88.875%	7.375%	5.175%	12.675%	3.475%	6.25%	1.6%	2.6%

Figure 4: Usability Analysis finding

2.4 Screen Flow Research

Before the researcher proceeds to the design process, a research on on-screen flow of an existing application should be implemented. This is important in order to gather the weaknesses and the strength of certain existing applications and where should the researcher improvise according to the research objective. The researcher should select a similar existing application, then experience the application from main page and explore all pages and subpages in that application. At the same time, the researcher should grab all data such as screen title of each pages and see how the application works or the screen flow arrangement.

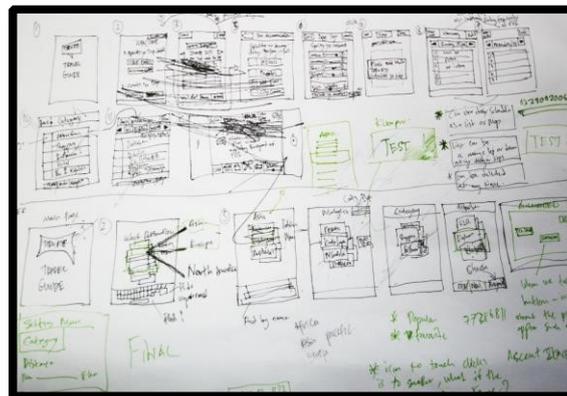


Figure 5: Research on Screen flow of existing application



Figure 6: Example on Screen flow from existing application

The figure above is an example of a screen flow from an existing application. This is what the researcher will do to study the weakness and strength of the existing application. From this

study the researcher can find out the best feature to add to the new application that will be developed for this research.

2.5 Designing the Application



Figure 7: Interface Rough sketches

Before start designing the interface design, the researcher is required to roughly sketch the screen flow design to develop initial ideas on the content of the application. This step is to ensure the application contents are accurate before adding it into the application.

2.6 Colour Suggestion

Deciding colour for screen and interface design is crucial. The researcher referred to a colour combination website at www.colourcombos.com as a guide to get an overview of suitable colour combinations for the interface design.



Figure 8: Colour combination chart by colour combos

Using colour combos, there are options to generate and choose multiple combinations of colours before start designing the application. Colour combos allow for the selection of significant colours to create a template for the interface by choosing what colour to apply and which locations the colour should be placed at. At the colour combos website, we can also make a 'text colour testing' in order to know what colour is suitable to be used for the text in this colour combinations.

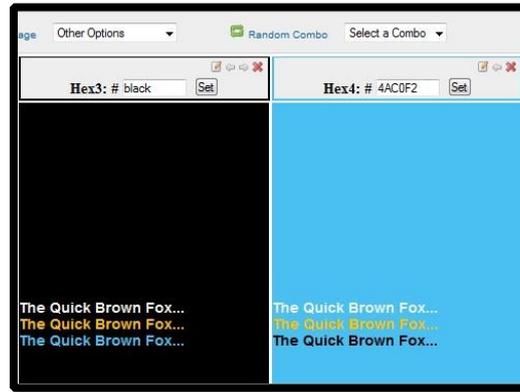


Figure 9: Text colour testing [www.colourcombos.com]

With all the data and input that were gathered in the earlier stage of this research, the next step is to start designing the interface design. The outcome from the screen flow research will be referred to as a guideline in the making process. The first screen for this application requires the design of a splash page or an introduction page that will pop up a few seconds before the user is brought into the application site. At this splash page there's a logo of the application and a short montage. This page will be designed using simple typography with minimum usage of images.

Users will enter the 'language selection' page. This may require users to select a language that they want to use while using this application. There are several selections of languages that can be chosen such as Malay, English, France, Japan and Chinese. This page requires users to scroll up or down in order to see the options of languages that are provided in this application. The title page has been placed at the top of the page to make it easier for users to know the current page they are on.

At the next page users will enter the destination selection. Here, users need to enter or select their destination such as Asia, Europe or other regions. At this point, the menu used is still the scrolling menu used for the previous page. The next page is to select the country. Users will enter the options page. Here, users can choose either to use the Map guide or the augmented reality guide option.

2.7 Flash Actions Scripts for Menu and Link

After all design process for the pre-test are completed, this design will be linked to Adobe Flash software so that all the pages can be linked. This is also done because the coding for the software uses Flash Action Scripts 3.0. This is to make sure the design and navigation such as scrolling menu, button menus and video files are working and properly connected before it can be tested by the users.

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