

User Requirements Analysis and Persona for Mobile Application Guide for Infrequent Flyers (MAGIF)

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Abstract: *This paper discusses about the user requirements analysis phase and user persona for Mobile Application Guide for Infrequent Flyers (MAGIF). Both groups of flight passengers, no matter frequent or infrequent have evaluated the types of services provided by the airlines differently based on other research done previously. Hence, there is a significant distinction between these two groups in terms of their perception towards airline's services thus, both groups need to be treated differently. Following that, MAGIF is going to be developed to cater towards those infrequent flyers. Before proceeding with the design and development processes, the requirement analysis phase was conducted to identify the content and user preferences for a mobile application. This study has utilized both qualitative and quantitative methods to acquire the list of requirements from the client and also the targeted users. As a result, the user requirements and user persona for MAGIF were identified.*

Keywords: *Infrequent flyers; frequent flyers; airport experience; flight experience; flight passenger*

I. INTRODUCTION

Flight passenger is defined as the airport customer who already purchased a ticket and is present there, at the airport terminal with the purpose of flying (Kirk, 2013). Meanwhile, according to a research done by Anne Graham and David Metz, the terminology of infrequent flyers is defined as air passengers who have not flown in a year prior to the survey conducted by these particular researchers (Graham & Metz, 2017). To be more precise, infrequent flyers are those who fly not more than once or at the bare minimum, only once in a year (Go & Kim, 2017). In another word, those passengers will only experience doing the process activities and discretionary activities while being at the airport, once annually. The process activities can be described as part of the passenger usual flow starting from the obligatory check-in, security screening, passport control to boarding a plane (Popovic et al., 2009).

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On the other hand, discretionary activities occur while passengers are moving between processing points for example activities that involve the non-aeronautical services provided by the airport such as shopping, eating or money withdrawals (Popovic et al., 2009). Being out of the loop for a year can result in passengers having troubles to navigate themselves at the airports and to adopt if there are changes to the rules and regulations that differ from one airline to another. Certain individuals might perceive flying as a stress-inducing activity and without proper forms of assistance at the airports or while flying on the airplane, these groups of people might have to pay extra fees for the overweight luggage or develop a condition called "fear of flying". In fact, for people who are suffering from this particular anxiety, this might be the reason why they fly less frequently (Vanden Bogaerde & De Raedt, 2012).

The recent debacle involving one of Samsung mobile device in 2017 has caused serious concerns towards luggage safety around the world. The updated rules in forbidding items that might cause harm should be notified to all types of passengers. This results in the need to find a method in delivering the updated information towards passengers in a prompt manner. The current use of the website in relaying crucial information is no longer considered as effective as before due to the increased ownership of mobile devices all around the world. According to the Malaysia Communications and Multimedia Commission (MCMC), mobile phone users grew from 68.7% in 2016 to 75.9% in 2017. With the upward increment by 7.2%, it is much more proficient to focus on developing mobile applications to cater towards customers' needs and demands. According to Airport Council International (ACI) guide book for digital transformation at the airport, a mobile application that focuses more on the customer will be able to provide personalized and varied e-services to suit the needs for different types of passengers. This in returns will allow them to prepare and enhance their airport experience as well as their consumption of airport services (ACI, 2017).

It will be beneficial for both the airlines and passengers if there is a virtual place or a channel that can transmit information effectively in a comprehensive manner to build stronger relationships between the two parties to keep up with how data are being transferred digitally these days. As of yet, there is still no application that provides a comprehensive set of information that infrequent flyers should

know while they are at the airport, while flying on the airplane as well as during post flights. Therefore, there is a need to develop the Mobile Application Guide for Infrequent Flyers (MAGIF). In order to do this, the user requirements analysis for MAGIF is necessary.

II. OBJECTIVES OF THE STUDY

The main objective of this study is to create a Mobile Application Guide for Infrequent Flyers (MAGIF) and to achieve that, this study needs :

1. To conduct the user requirements analysis for MAGIF
2. To identify user preferences for MAGIF
3. To build a user persona for MAGIF

III. LITERATURE REVIEW

This section discusses about the conceptions and descriptions on requirement analysis, user persona, Flight passengers - Infrequent flyers and mobile applications for airlines and airports.

Requirement Analysis

Poorly specified user requirement is one of the most significant factors behind IT project failure. Requirement analysis is one of the major activities of requirement engineering (RE) process, which is an iterative process of discovering and analysing feasible features to produce a contracted set of complete and consistent requirements (Sharma & Pandey, 2018). A successful product or system requires a proper understanding of both user and organisational requirements. Thus, this study is aiming to integrate and balance the two in the specification process of MAGIF design and development.

User Persona

In the world of User Experience Design, a persona is not something that belongs to a person (Humphrey, 2017). Instead, personas are created by designers to act as "fictitious, specific and concrete representations of target users" (Pruitt & Adlin, 2010). Alan Cooper, who developed this conception of personas, explained that personas are not real people, but they are based on the behaviours and motivations of real people we have observed and represent them throughout the design process (Cooper, Riemann & Cronin, 2007).

Although persona is initially popularized as a tool for software developers, the technique has since been adopted in other fields, including marketing, business and design. The theory is that designers should think about personas as if they were real people, referring to their names, imaging conversations with them and advocating for their interests (Ward, 2010). In practice, personas are often based on readily available data, demographics or informal observations. With this, personas are supposed to encourage empathy and user-centered designs (Humphrey, 2017).

This study has created a Persona as a main user for MAGIF based on the user requirements findings. Details of the Persona are discussed in the Findings section.

Flight passengers - Infrequent flyers

Flight passengers are one of the stakeholders for airports which make these group of people crucial towards the airline and airport industry (Isa et al., 2016). When making

decisions about the rules of standard operation of the business at the airport as well as regarding the flight's regulations, passengers' welfare should be put as the top priority alongside the environment, business profits as well as other determining factors. Passengers wellbeing should be taken care of from the start of their journey at the airport, while they are flying on the airplane as well as the concluding experience of post-flight.

As mentioned before, infrequent flyers are flight takers who have flown once and not more in a year. On the other hand, frequent flyers are those who have flown twice or more annually (Go & Kim, 2017). However, it is important for airlines to acknowledge that frequent and infrequent flyers need to be served and treated differently as the perspective of one type of passengers differ to another. According to research done by Go Mijeong and Kim Insin in 2017, frequent and infrequent flyers appreciated different qualities of customer service by different degrees. For example, frequent flyers perceived the efforts by airlines to manage the negative customer-to-customer interaction (NCCI) which is defined as unpleasant behaviours from other customers that disrupt the customer's own experience, as an "attractive quality" that will lead to improvement towards customer satisfaction improvement (Huang & Wang, 2014 and Go & Kim, 2017). Meanwhile, the infrequent flyers evaluated the same attribute as "must-be quality" which were perceived as basic services (Go & Kim, 2017). In short, certain types of services provided the airlines can either be perceived as efforts that can change their perceptions towards the degree of satisfaction towards the airlines or those treatments can just be perceived as a compulsory act of services for all flights.

Frequent flyers who fly regularly usually are subscribed to the airline's loyalty program to obtain multiple benefits and cheaper fares. Despite that, it is a mistake for airlines to assume that loyal customers are always more profitable than one-time purchases by infrequent flyers. According to Lovecock and Wirtz, the value of loyal customers can be analyzed according to cost and revenue sides. Loyalty programs sometimes cost more because of the overall expenditure for rewards and the ongoing research to plan rewards towards customers to keep up with competitors. Apart from that, loyal customers may not spend more than one-timers hence, revenue does not necessarily increase always over time. Weber (2005) has identified significant differences by passengers' travel frequency in the importance of airline alliance benefits showing that infrequent travellers perceived "the ease of transfers between flights", "better assistance in case of problems," "respectful treatment by airline staff", and "consistently high service quality" as being more important compared to frequent travellers. Following those preceding researches, airlines shouldn't assume that one mobile application can cater for all categories of passengers as they have different demands and needs for the quality of customer service. In fact, more efforts should be put into actions in attracting not just for the loyalty programs but also for different types of passengers such as the infrequent flyers.

Mobile applications for airlines and airports

In Malaysia, mobile phones remained as the most popular method for users to access the Internet (89.4%) making the country a mobile-oriented society (MCMC, 2017). Due to recent development in technology, traditional ways of business have been transformed radically following the current trend of faster information transmittal and the decrease of waiting time. Hence, airlines must also follow suit and combat issues regarding infrequent flyers with a problem-solving tool that is infused with technology. According to Business Insider (2016), 79% of airports around the world will offer Customer Relationship Management (CRM) tools through mobile applications by 2018.

This development also provides positive results for the airline as passengers will be alerted with updated notifications and might prefer to use the application to gain answers as it is less time consuming rather than physically walking towards the information kiosk and interact with the staff. Information can be transmitted through various means and yet again in this technological era, the one thing that people have in common with the person next to them is mobile phone ownership.

Currently, there is information, readily accessible through the websites and applications of airlines and airports in Malaysia which may be the guidelines for passengers. However, it is not comprehensive enough to cater for the requirement of infrequent flyers. Digital data services will benefit the passengers by optimizing the time spent at the airport and they will get access to relevant information regarding the airlines as well as the airport (ACI, 2017). In customizing the application to cater for infrequent flyers, this effort will certainly produce a positive enhancement towards the customer service satisfaction which will be beneficial for both customers and airlines.

IV. METHODS

This study has utilized both qualitative and quantitative methods to gather the data during requirement gathering which is through a face-to-face interview and an online survey. The interview was conducted specifically to collect an in-depth insight from the subject matter expert through a predefined set of interview questions. Meanwhile, the set of questions designed for the online survey were targeted to a pre-defined group which involved the technique of simple random sampling. The information collected from both of these methods are important to identify the content and user preferences for MAGIF.

Instruments

As for the instrument for the interview, a set of semi-structured interview questions was constructed as a guideline in conducting the interview session with the subject matter expert. In order to create the interview questions, a research on the background of the topics, background of the company, objectives, and goals of the interview was identified before constructing the interview questions.

As for the instrument of the survey, a set of closed-ended questionnaires was constructed to collect the data from the individuals by using the Google Form. The questions were drafted by including the information regarding on user

demographics, user experience at airport and flight, problems encountered during airport and flight experience and user preferences for the mobile application. The choices for the questionnaire's answers including the multiple choice, checkboxes and linear scale which consists of two selections for the answers whereby the respondent could choose either least preferred or most preferred answer.

Respondents

The first interview session is conducted with the Manager of Malaysia Airports Berhad at Sultan Abdul Halim Airport, Alor Setar, Kedah. He has 36 years of experience in the airport industry. It is then followed by another session with subject matter expert in customer service for the airline industry. She has worked as a Duty Supervisor for Customer Service department under Aerodarat Berhad, a subsidiary for Malaysia Airports Group (MAG) for two and a half years. Consent forms were signed by the interviewees before the sessions were conducted. For the survey, a random sampling technique is used to recruit 50 respondents, the potential users of the mobile application, for the purpose of data collection.

Data analysis method

The data from both methods need to be analyzed differently due to the difference in data collection techniques. For the online survey, the data is analyzed in a descriptive manner and for the interview, the re-reading and analyzing process is done to identify the pattern of the answers between the two interviews (Erlingsson & Brysiewicz, 2017).

V. FINDINGS

The main findings of this study are gathered from the conducted survey and interviews with the respondents.

Interview

Answers from the two interviewees vary in terms of the main content that needs to be highlighted for MAGIF. They mainly emphasized on how the passengers' behavior as the main issue or the root cause of the possible problems they might encounter at the airport. Thus, the application needs to highlight on enhancing the awareness of ethical and good behaviours that need to be practiced by flight passengers at all times. An application that can successfully achieve this will be substantial not just for the infrequent flight passengers but also the frequent ones. On the other hand, the second interviewee primarily focused on the passengers' perspective in terms of the rights that they ought to know as flight passengers and airline customers. This is to educate the passengers on how to travel smartly and to ease their flight experience. Both insights are valuable for the content of the application and will be used to identify the functional requirements for MAGIF.

Survey

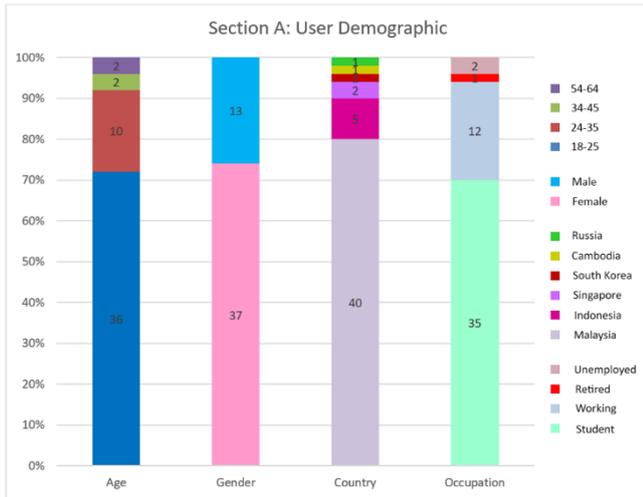


Fig. 1 Demographic of the respondents

Figure 1 shows the demographics of the respondents. The age group ranges from 18 to 24 years old shows the highest number of respondents with 36 (72%) responses. It is then followed by 10 (20%) respondents from 25 to 34 years old, 2 (4%) of them in 34 to 45 years old and 2 (4%) of them in 54 to 65 years old. 37 (74%) of the respondents were female and 13 (26%) were male. Most of the respondents were from Malaysia, 40 (80%), 5 (10%) respondents were from Indonesia, 2 (4%) were from Singapore while for South Korea, Cambodia and Russia, only 1 (2%) respondent came from each of the countries respectively. For the occupation category, majority of the respondents were students with 35 (70%) of them being one. 12 (24%) respondents have already worked while 2 (4%) of them were unemployed and only 1 (2%) of them is retired.

Problems Encountered During Airport and Flight Experience

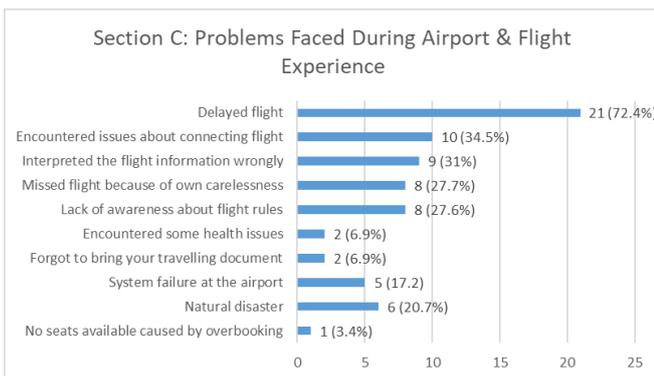


Fig. 2 Problems faced by the respondents during airport and flight experience

Based on Figure 2, majority of the respondents commonly encountered issues regarding flight delays as 21 (72.4%) of them have chosen “Delayed Flight” as the answer, followed by issues about connecting flight, 10 (34.5%), 8 (27.6%) of them have interpreted the flight information wrongly, 16 (55.2%) of the respondents have missed their flights because of own carelessness and lack of awareness about flight rules respectively, 6 (20.7%) of the respondents have encountered natural disaster nearby the airport causing delayed or cancelled flight and 5 (17.2%) of

them had come across a system failure at the airport, 2 (6.9%) of them encountered some health issues and 1 (3.4%) of them forgot to bring travelling document and lastly, 1 (3.4%) of them has stated their own experience whereby no seats were available for this respondent due to overbooking.

Table. 1 Comparison of the frequent and infrequent flyers who had encountered problems during airport and flight experience and preferred method used to solve the problems

	Frequency	
	Frequent Flyer, 20(40%)	Infrequent Flyer, 8 (16%)
Airport guidance		
Mobile Applications	6	4
Signage	15	7
Information Kiosk	8	6
Airport Personnel	9	5
Friends	0	1
Mode	15	7
Problems faced during airport and flight experience		
Delayed flight	16	5
Encountered issues about connecting flight	6	4
Missed flight because of own carelessness	6	2
Lack of awareness about flight rules	5	3
Encountered some health issues	2	0
Forgot to bring travelling documents	1	0
Interpreted the flight information wrongly	4	4
System failure at the airport	2	3
Natural disaster	5	1
Mode	16	5
Preferred method to solve the problem		
Use information kiosk	2	0
Asking the staff at information center	13	7
Use airport or airline mobile applications	2	1
Perform internet search	2	0
Ask nearby people	1	0
Mode	13	7

Table 1 shows results for respondents who have encountered problems at the airport. Only 28 (44%) respondents answered yes and it is obvious that both frequent and infrequent flyers who had encountered problems during airport and flight experience shared the same results for the highest frequency on questions airport guidance, problems faced

during airport and flight experience and preferred method to solve the problem. For the question what guided the respondents at the airport, the highest frequency is signage whereby it is chosen by 15 (30%) of the frequent flyers and 7 (14%) of the infrequent flyers, then the highest frequency for the question problems faced during airport and flight experience is issues about delayed flight whereby 16 (32%) of the frequent flyers and 5 (10%) of the infrequent flyers had chosen it, and the most preferred method to solve the encountered problems, the highest frequency is by asking the staff at information center whereby 13 (26%) of the frequent flyers and 7 (14%) of the infrequent flyers selected it. Therefore, for frequent and infrequent flyers, both groups also shared the same results for the highest frequency and thus, can be concluded that most of them were having a problem on the delayed flight issues and both frequent and infrequent flyers will ask the help from the staffs. Besides, in order to help the staffs in assisting the flight passengers, this mobile application could help in providing a detailed guideline for a smooth airport and flight experience as the content for this mobile application will be created based on the main needs and requirements from the respondents.

User Preferences

Table. 2 Matrix table of the OS platform of the respondents that currently used and preferred OS

	Android User	iOS User	Total
Prefer Android	33 (66%)	3 (6%)	36
Prefer iOS	2 (4%)	12 (24%)	14
Total	35	15	50

According to the matrix table in Table 2, the number of respondents who were using Android mobile devices and preferred Android as the platform for MAGIF is the highest whereby 33 (66%) of them have chosen the same platform. However, the rest of the Android users, 3 (6%) of them preferred to implement the iOS platform in mobile application compared to the Android platform. For the iOS users, 12 (24%) of them have chosen the same platform to be implemented in the mobile application while 3 (6%) of the iOS user preferred using Android platform for the mobile application.

Table. 3 The preferred language for mobile application chosen by the respondents

Preferred Language	Frequency (%)
English	38(76%)
Malay	10(20%)
English and Malay	1(2%)
Other	1(2%)
Total	50

The number of the respondents who preferred the English language to be implemented in the mobile application according to result in Table 3 is 38 (76%) of them which is also the most preferred language amongst other languages. For the Malay language scored the second highest which is 10 (20%) of the respondents had selected it while for both

English and Malay languages and other languages scored the lowest whereby only 1 (2%) of them had chosen each of them respectively.

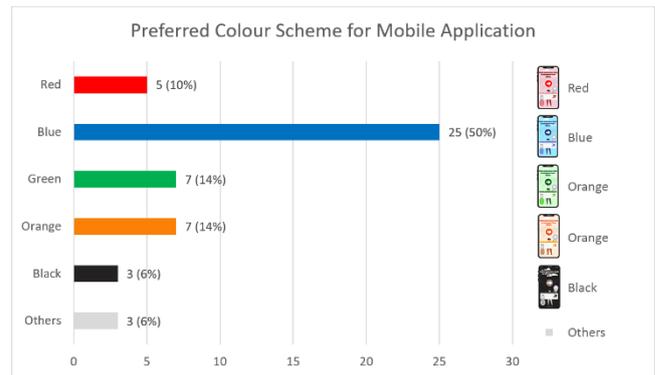


Fig. 3 Preferred colour scheme to be applied in the mobile application

As for the result for the most preferred colour scheme in Figure 2, the blue colour scheme placed the highest whereby 25 (50%) of them had chosen it as their answers. The second highest was shared by two colour schemes, green and orange, as 7 (14%) of them had chosen them as their most preferred colour scheme option. Meanwhile, the red colour scheme was chosen by 5 (10%) of them, followed by the lowest score which was shared by the black and other colour schemes whereby only 3 (6%) of them had selected each of the colour schemes respectively.

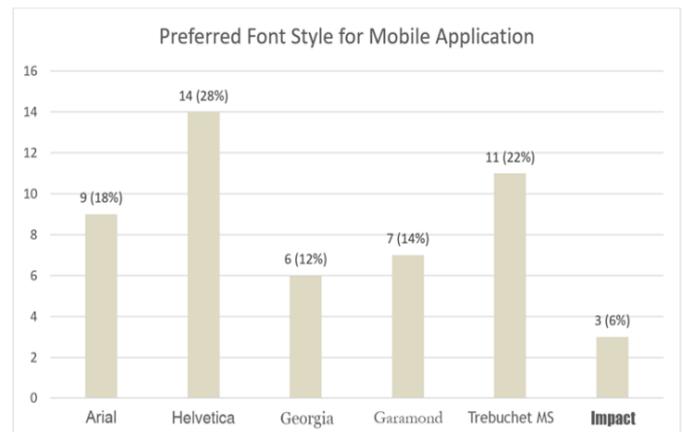


Fig. 4 The preferred font style to be implemented in the mobile application.

According to the result of the most preferred font style in Figure 4, the respondents who preferred font style Helvetica to be used in the mobile application is 14 (28%) of them which is the highest number amongst other font styles. It is then followed by Trebuchet MS font style whereby 11 (22%) of them had chosen it, 9 (18%) of them preferred Arial font style, Garamond font style had selected by 7 (14%) of them, 6 (12%) of them preferred Georgia font style and last but not least, Impact font style scored the lowest whereby only 3 (6%) of the respondents had chosen it.



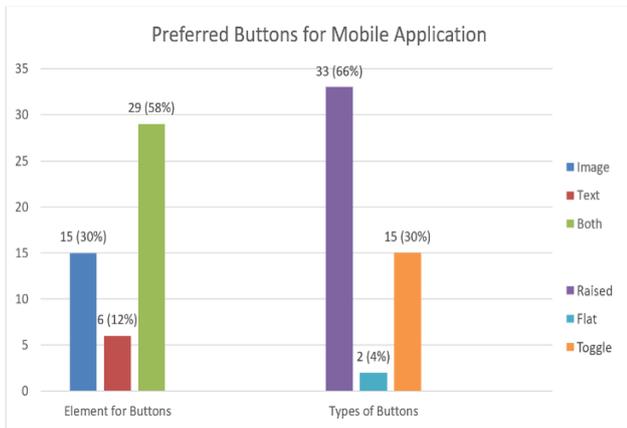


Fig. 5 The preferred buttons to be applied in the mobile application

Based on Figure 5, for the preferred buttons elements, buttons with both image and text elements scored the highest whereby 29 (58%) of the respondents selected it, then followed by image element for buttons which is 15 (30%) of them preferred it and only 6 (12%) of them preferred text element for buttons to be used in the mobile application. Besides, the most preferred type of buttons to be implemented in the mobile application is raised button whereby 33 (66%) of them had chosen it. The second most preferred type of button is toggle button whereby 15 (30%) of them selected it then followed by the least preferred button which flat button whereby only 2 (4%) of them preferred it.

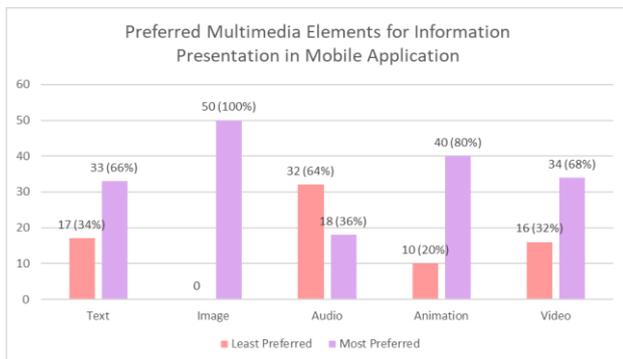


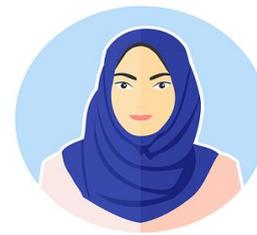
Fig. 6 The preferred multimedia elements to be implemented for information presentation in mobile application

According to Figure 6, the highest score for the most preferred multimedia elements to be used in the mobile application is the image element whereby all of the 50 (100%) respondents chose it. It is then followed by the second most preferred multimedia element which is animation element whereby 40 (80%) of them selected it, 34 (64%) of the respondents chose video element as third most preferred, 33 (66%) of them selected text element as fourth most preferred and last but not least, the highest score for the least preferred for multimedia element to be implemented in mobile application is audio element whereby 32 (64%) of them think audio element is the least important.

User Persona

Based on the analyzed data, a user primary persona was created.

Huda | Primary Persona



Profile Attributes
 Age: 22
 Gender: Female
 Career: Student
 Nationality: Malaysia

Profile: Huda is an infrequent flyer who has flown for less than once in a year and usually fly in economy class. She usually uses signage to guide her at the airport. The ultimate problem she has faced is regarding her flight delays and normally, to solve any issues at the airport, she will directly go to the information counter and ask the staffs there.

Huda currently uses iOS mobile device and would prefer to continue using it. She prefers English as the orientation language for the application and is fond of the colour blue. Apart from that, graphics and animations are her most preferred elements to be used in representing information.

Frustrations:

- Delayed flights
- Issues about connecting flights
- Interpreted flight information wrongly
- Own carelessness and lack of awareness resulting in various issues
- Unavoidable natural disaster nearby the airport causing delays and cancellation

Goals: Huda wants to gain knowledge on suggested ways to prevent mistakes that are caused by her own carelessness. For example, if she misses her flight, what she should do next. She also wants to get familiarize with the process at the airport especially in regard to connecting flights to avoid any unwanted issues that might happen.

Motivation: Huda wants to be able to know how she can travel smartly. She wants to gain more knowledge on how to handle unexpected issues she might encounter while being at the airport or on the flights. She wants to be a passenger that exhibit good behaviours by abiding all the rules and regulations and the value of punctuality while being one.

VI. CONCLUSION

To conclude, based on the analysis of gathered data from the two interviews and 50 respondents, it is conclusive that a mobile application dedicated to enhancing flight experience for flight takers will indeed be beneficial in the long term. Especially, based on the input from the airport manager himself, the application needs to highlight in creating awareness of the passengers' behaviour. Based on the second interview, mobile application is certainly the platform to be targeted based on the advancement of technology and



internet that have encouraged the higher rate of mobile phone ownership. Persona created based on the input of users' preferences from the survey will be beneficial during the design and development of the application later. This is because it is better to know the preferences of targeted users beforehand in order to create a product that will accurately match the user's preferences based on the correct and precise list of requirements formulated based on the analyzed data. The requirement analysis phase would certainly help in making this study to be time and cost efficient.

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