

## Developing Amoi Tuk Tuk Service for Female Users Due to Safety Reasons

*Foo Li Ying and Noormaizatul Akmar Ishak*

Faculty of Applied and Human Sciences, Universiti Malaysia Perlis, Malaysia.

**Abstract:** Public transportation services are used widely by the world to reach their destination. AMOI Tuk Tuk is a new public transportation network company developed to connect passengers and driver through websites which are designed specialized for female only. The objectives of this proposed project are to solve the social problem that occur in Uber and Grabcar in Malaysia, it also focused on emphasize the solution for Islamic female and male could not stay in a car due to their Islamic Law. Besides, it also can increase the opportunity of female employment in Malaysia. Penang had been selected as the first trial cities in Malaysia due to Penang is one of the prosperity cities in Malaysia and the number of tourists is increasing year by year. The target audience of this proposed project are female who don't have own transport or driving license, woman travel alone or in group and old people. A user need analysis survey was conducted through a survey form for 60 respondents that consist of 30 drivers and 30 passengers who stay in or visit to Penang. Waterfall model is used to conduct the process of development in websites which is from requirement analysis on the detail of the websites, design of the websites, implementation included the implement on 10 principles of websites, verification by alpha test, and end with operation and maintenance. Moreover, the result of need analysis show that passengers and drivers' respondents agreed that the AMOI Tuk Tuk had meet the need of respondent and could reach the objectives that have been set.

**Keywords:** female users' safety, Uber, Grabcar, transportation, Waterfall Model, website design

### 1.0 INTRODUCTION

Public transportation is a cornerstone of a nation's economy. From cities to small towns, and everywhere in between, it provides transit for daily mobility and links between people and their jobs, education and entertainment. Thus, its availability and convenience define the quality and promotes positive perception of public transport services in place [1].

Uber transportation company was founded in San Francisco, CA which their launch the Uber mobile apps to fasten the speed of ordering a service and the trip can be submit easily [2]. The nearest driver at that area will bring their own car to fetch the passengers and drop them to the requested destination with navigation route by Uber apps. While the payment will be paid through online payment method. Uber company is also developing and investing in self-driving cars, presumably with the purpose of launching its own fleet of autonomous taxis that can bring riders to their destination without the need of human drivers [2].

Grabcar provides the same services as Uber provided but it started their service in Malaysia concentrated more on Klang Valley especially Bangsar, Mont Kiara and Hartamas areas. It also expands their services to Johor Bharu, Penang, Kota Kinabalu and Melaka [3].

Those transportation services have brought a lot of convenient to us but also along with some impact such as social problem. Most of the social problems are happen on female who unarmed and defenceless such as being rob or rape while using the transportation services [4].

This project is proposed to develop an AMOI Tuk Tuk which is a female online road transportation network company that operates in Penang because Penang is an important port of Malaysia and the country's third largest city after the capital Kuala Lumpur. It is the capital of second smallest state in Malaysia and renowned for its culture, food, and heritage. By developing and operating the AMOI Tuk Tuk websites, it allows people of locals and tourists to request car transportation services via the AMOI Tuk Tuk website when they are in Penang. It also allows drivers to earn extra income when they

**Corresponding Author:** Noormaizatul Akmar Ishak, Faculty of Applied and Human Sciences, Universiti Malaysia Perlis, Malaysia, email: maizatul@unimap.edu.my, no. phone: 019-5788363

fetch the passengers to requested destination. AMOI Tuk Tuk drivers use their own personal cars, although drivers can rent a car to drive with AMOI Tuk Tuk.

AMOI Tuk Tuk is planned to be a pioneer in the sharing economy and changes in Penang transportation industries as a result of the sharing economy. The differences between AMOI Tuk Tuk and Uber or Grabcar are AMOI Tuk Tuk is a transportation services that specific for female which the driver is female, and the passengers also for female only. It increases the passenger's mind at ease on their safety, and confident with our drivers due to the social problem happened on public transportation.

This proposed project tries to solve the problem of the precaution of safety that women feel more comfortable and confident toward female drivers compare to male drivers. Security consideration is the main issue that female is fear to public transportation services because most of the social crimes happen on taxi, Grabcar or Uber are targeted on women such as women being raped or robbed by male drivers due to their unarmed and defenceless (Provenzano, 2016). Besides, unrelated Muslim female and male are not allowed to stay in a car together according to their Islamic law to avoid they being accused wrongly and misunderstanding (Fatwa, 2005). Moreover, female who is a single parent that needs to support her family, and can drive a car, she can work as driver to earn extra income to cover her family daily expenses [2].

The objectives in AMOI Tuk Tuk transportation services are to solve the social problem of female that happen in Uber and Grabcar transportation services in Malaysia, to emphasizes the solution for Islamic female and male could not stay in a car due to their Islamic Law, and to increases the opportunity of female employment in Malaysia.

The scopes of AMOI Tuk Tuk transportation services in this proposed project are focused on female drivers and female passengers in Penang states only. The specification has to match with project requirement where female drivers must have five years driving experience and at least 22 years old. The project is focus on female passengers who are travelling alone, and could be accompany by boys who less than 15 years old, and old people who need to go praying or further diagnosis at hospital. This project is also specializing for the Islamic female who could not being alone with a male driver in a car according to their Islamic Laws.

## **2.0 LITERATURE REVIEW**

According to Uber Official websites, in 2008, the founder of Uber, Travis Kalanick and Garrett Camp were complaining about the trouble things that they had faced in their lives to find a taxi nearby to take them and their luggage when they were in emergency. Then, they had found a new idea to get ride easily which with a button click. They have to solve the problem that might appear when making the idea real. So, Garrett took the lead and went to play around with a couple of ideas they had, the prototyping several solutions and produced a mobile application that can widely use by others. Travis joined him after this and they started with their altering idea on 2009. In January 2010, they had holding some black cars in the city of New York to try the services out. They had expanded their services to San Francisco after their successful in New York city in couple of months [5].

With referring to the Grabcar Official websites, GrabTaxi or popularly known as Grabcar is one of the big startup success stories of Southeast Asia. Anthony Tan, the founded of Grabcar had start his services in Malaysia by 2012. The Grabcar application had available in 21 cities across Asia, and he had raised his funding to a total of US\$340 million. In the beginning, GrabTaxi was entirely self-funded by the Tan family while it had found a new funding by Vertex Ventures in April 2014 with some confusion arising over the sum raised. Lim Der Shing from Jungle Ventures had some interested on Grabtaxi and Tan family are still investing on the services, they need a profession VC on board for the credibility and discipline [6].

There has been reported that female passengers were kidnapped and assaulted by Uber male drivers. An investigation by Buzzfeed and News found that the Uber company had been received five claims of rape and fewer than 170 claims of sexual assault directly related to their trips between December 2012 and August 2015 [4]. The cases that enhances this project is when Toxic Uber sued after driver allegedly tried to rape a passenger in car. According to Calburn [7], there are more than 30 sexual assaults by Uber drivers against Uber passengers have been reported to media in two past year. The cases had caused the feeling of anxious when using the services. While, a back-seat passenger who had rope with knife and put it on the taxi driver neck's, his accomplice in the front has been jailed for two and a half years [5].

According to CBS [8], the suspect robbed the victim at gunpoint and took his cash and a necklace and bracelet before fleeing in the vehicle. All of these cases are showing the dangerous of taxi driver and passengers from different gender, male is likely

target to rob or rape female who are defenseless compare to male. Moreover, those assault cases are not only happened in others country but also exist in Malaysia which is a female driver being assault by a male Pakistan passenger on December 27, 2016. The female driver is picking up her passenger, a male Pakistan from a place to destination in a short time. Then, the man tries to molest and touch her breast, and he repels to leave from her car before the female driver abandons her car, and go to report at police station about the incident [9].

Moreover, the Islamic females are not allowed to be alone in a car with a man who is not her mahram according to their Islamic laws. This is achieved by keeping one's senses and feelings from transgressing what Allah has prohibited and by avoiding being together with a member of the opposite sex in a secluded place (khulwa), and not travelling with a member of the opposite sex except for a necessity or a compelling need that reaches the degree of a

necessity. It remains permissible as long as one does not violate the legal sanctity in which case it becomes prohibited [10].

## 2.1 Waterfall Model

In developing a website, the Software Development Life Cycle (SDLC) model is popularly used [11]. This model is also called as Waterfall Model due to the way it falls down. This visual aspect is what affects people's perceptions of what it does and hence how it is implemented. The earliest paper which describes the waterfall is "Managing the Development of Large Software Systems" by Dr. Winston W. Royce published in 1970. However, he did not call it the waterfall model and he had several criticisms in using it if it was naively implemented. Instead he was championing the concepts of a sequence of development stages and crucially iterating back to previous stages as more evidence emerged during development [11].

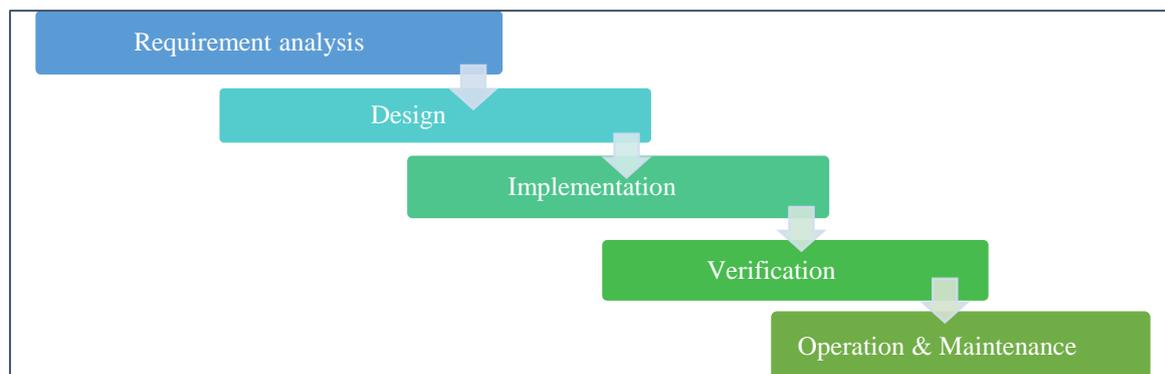


Diagram 1: Waterfall model introduced by Dr. Winston W. Royce,1970 (Sources: Gordiyenko, [12])

By using this Waterfall Model, a project is implementing step by step in accordance with the sequence that had been set which is requirement analysis, design, implementation, verification and operation and maintenance. The Waterfall Model is flexible and some phases can be intersected. Gordiyenko [12] says, there are five stages in waterfall model which are requirement analysis, design phase, implementation phase, verification phase and lastly operation and maintenance phase. Firstly, requirement analysis is important to document all requirements to the desired software. Sufficient time should dedicate to this phase, conducting extensive interviews with stakeholders. It is better to structure all incoming data, analyze them, consider all technical limitations that may arise on the client's side, and come out with a ready-to-follow specification to meet the client's needs. Another thing to consider is any constraints that may hinder the development process, such as client's time and budget constraints. Create a detailed problem vision document, specifying the problem

background, business goals and success criteria for the project, factors of business risk and description of the product end-user group.

Secondly, the next step is design phrase which involves the creation of a project scope document with mockups, or hand-drawn sketches, and a detailed software development specification. It should be mentioned that in some cases vision and scope documents can be presented as one Vision and Scope document. Thirdly, implementation phase is the creation of an interactive prototype that is actually the skeleton of the future application. Such prototype helps define the overall system architecture. This step involves little coding, like coding buttons and simple forms, just to give the client an idea how the final product will operate.

Fourthly, verification phase which once the product is developed, it should undergo a meticulous quality assurance and software verification to make sure that it solves the needs set forth during the

requirements study phase. The client should be involved in the acceptance testing and try using it exactly the way it will be used when implemented. Once the major code problems are fixed, the software can be deployed. For minor fixes, a simple bug tracking system can be used, so that the problems could be tackled during the maintenance phase. Lastly, the product is tested and deployed at

### 3.0 METHODOLOGY

This development project uses need analysis to determine the outcome of the project. Need analysis is the process of identifying and evaluating in a community or other defined population of people. The identification of needs is a process of describing problems of a target population and possible solutions to these problems [13].

#### 3.1 Research Design

The need analysis study has been conducted to know the public's views about this project as being suggested by Cooper and Kleinschmidt [13] because it is often used across many industries, such as software development, automobiles, consumer products and banking services. In need analysis, survey form was distributed to determine the opinion of female in Penang towards the new services among driver and passengers. There were two types of survey form which were targeted on drivers and passengers separately. The limitation of this project was focused on female who stay or visit Penang only because Penang is one of the cities in Malaysia with great tourist environments.

#### 3.2 The Modus Operandi of the AMOI Tuk Tuk Service

It is with good intention that AMOI Tuk Tuk service would reduce and control the percentages of social crime that happen on female when they use this service because it can prevent the rapist and robber from trying to rape or rob them in the car. Besides, female would feel more comfortable and confident with AMOI Tuk Tuk drivers, because they don't have to worry about their security and safety problem when traveling in our transportation services.

The AMOI Tuk Tuk websites requires their drivers and passengers to be acquaint in smart phone and they have to sign up and log in to the websites when they need the services or to get customer. AMOI Tuk Tuk 's pricing is cheaper to metered taxis, although all hiring and payment is handled exclusively through the website and not with the driver personally but AMOI Tuk Tuk prices are the premium that the customers pay for a cab service that is not only reliable, but also punctual and comfortable.

the client's server, it enters the operation and maintenance phase of the software development life cycle. Generally, it includes some minor bug fixes that are usually made during this phase. This model is suitable for small and trivial project and the phases of the model are clear and easy to use.

Passengers may rate their drivers, in turn, drivers may rate passengers too. A low rating of driver might influence other passengers' impression to her. If a driver rates a passenger at three stars or below, the rider will never be paired with that driver again. After the ride, customer and the driver have the right to review on each other's, so that others people will know the rating of the them, if the driver have a low rating, the next customer have the right to change their driver to others.

In the AMOI Tuk Tuk websites will show user the number of empty car available in her existing area when log in to the websites. Then the passengers have the right to choose which driver they want and the website will show the condition of the car to fasten the process of beckoned.

#### 3.3 Waterfall Design

The model of this research is Waterfall Model which is a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed fully before the next phase can begin. This type of software development model is basically used for the project which is small and there are no uncertain requirements such as this proposed project AMOI Tuk Tuk websites.

##### 3.3.1 The First Stage – Requirement Analysis

The requirement analysis was focused on female who visit and stay in Penang due to Penang is one of the prosperity cities in Malaysia and a great tourist environment. Besides, objectives of the project are to solve the social problem of female that happen in Uber and Grabcar transportation services in Malaysia. To emphasizes the solution for Islamic female and male could not stay in a car due to their Islamic Law. Moreover, to increase the opportunity of female employment in Malaysia.

##### 3.3.2 The Second Stage - Design

The design phase that described the layout and design of the AMOI Tuk Tuk website. This proposed project would use the template in Wix.com to develop and design the webpage. The themes of AMOI Tuk Tuk website is mainly on retro design which consists of retro car as background and match with pink colour layout. The homepage of the

website would have the logo and name of the project, services, about us, our clients, sign up, and book online. The process of developing the website

The logo of AMOI Tuk Tuk was designed at Adobe Photoshop and uploaded to the website at the middle and center of the webpage. The project name AMOI Tuk Tuk transportation service and the short description of the services later were added. The Facebook page, Instagram and Twitter of AMOI Tuk Tuk would also link to the webpage when clicking the icon. This was to let visitor easier to access our social media application. A guideline was written for visitors on how to use our services, signed up as passenger or driver to easier the process of the services, and then shared their current location to let the website traced their location and sent the nearest driver to customer, and they paid their fare through Pay Pal by following the amount that showed in website. The image gallery was designed by using 3D rotation to show the related images with the services.

The part of "About Us" was describing the aim of the websites and continue with our clients which was the project target audience, businesswoman, woman shopping or travel alone, woman with child and old people. Then, the process of uploaded the part of targeted location which was the mark up of Penang map to display to visitors the targeted location, and mainly George Town, and the UNESCO heritage areas since the project focused on Penang only. Then, the researchers set up the part for signing up as passengers and driver, where users could fill in their personal detail such as name, phone number, Email address, IC no. and home address. In the first interface of webpage was the license of services and the link of social media application which same as the homepage.

The second interfaces were book online when users need our services, they could book on the spot or prebook their trip with the service. They just had to choose either female driver (maximum 4 person) or female premier driver (maximum 7 person), then choose the date and time wanted. Then they might proceed to fill their personal detail if there were not sign up as passenger. After that, AMOI Tuk Tuk would arrange the nearest driver to fetch them, they just had to pay on Pay Pal when they reached their destination. There were unavailable for paying cash in the services.

### 3.3.3 The Third Stage – Implementation

This phase to ensure the websites of AMOI Tuk Tuk fulfilled the 10 principles of an effective websites. Firstly, the purpose of the websites was clearly

was started with search the image that related to the website's themes: retro and images of female driver and female passengers as gallery of website.

stated in the part of about us which explaining them aim of our services. Secondly, AMOI Tuk Tuk websites were well communicated with public because the information was state clearly in the webpage and showed users how to use our services with step by step. Thirdly, there are a lot of different typefaces are using in the websites but all of the typefaces are easy to see and read. Fourthly, the main colours of the websites is dark colour such as grey and blue colour, while the logo of AMOI Tuk Tuk are in pink because our target audience is female and most of the female like pink colour so this can attract their attention easily. Fifthly, there are many images in the websites to attract our audience due to images are more likely to attract people than words. Sixthly, websites give a clear navigation to audience how to book our services and how to be our driver. Seventhly, the websites design is grid-based layout such as the part of our clients, the images are arranged clearly in grid. Eighthly, F-based design are easier to see by user so the websites are arranging their important information in the upper and left side of the websites. Ninthly, the load time of the websites are less than one minutes included the images, user will not losr their patient when loading our webpage. At last, these websites was mobile friendly because it had two version of websites which was computer version and mobile version.

### 3.3.4 The Fourth Stage - Verification

The verification phase was verified by expert through an alpha test. The alpha test was a preliminary software field test carried out by a team of users in order to find bugs that were not found previously through other tests. The main purpose of alpha testing was to refine the software product by finding and fixing the bugs that were not discovered through previous tests [11]. In this website alpha test, a website expert had been interviewed regarding on the websites design, website function, websites principles.

### 3.3.5 The Fifth Stage - Operation and Maintenance

In this phase the website was already published to the public and as a result, the operation is important to make sure there is no complain about the services. If there are, the researchers would make improvement regarding to the complaint so that the service can operate smoothly and better in future. The preventive maintenance would be conducted to avoid when the system is down, and recover back the information.

#### 4.0 RESULTS & DISCUSSION

##### 4.1 Need Analysis

Need analysis study has been conducted in AMOI Tuk Tuk transportation services by using survey form. It was distributed to 30 female passengers and 30 female drivers who own cars in Penang. The profile of the respondents of the survey findings are: The data reveals that 30 of the drivers have their own car. Among 30 respondent, two respondents are under 21 years old, respondents are at the range 22-30 years old, nine respondents are at the range 31-40

years old, 13 respondents are at the range 40 years old and above. Besides, there are eight respondents are Malay, 15 respondents are Chinese, five respondents are Indian and the left two respondents are Others. From the survey form given, 3 respondents out of 30 respondents are having driving license 1-2 years only, while five respondents out of 30 respondents are having driving license from between 3-5 years and the rest of 22 respondent are having their driving license more than five years.

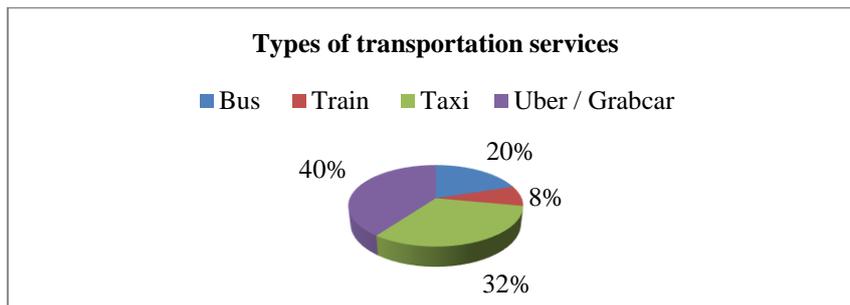


Figure 1: Type of transportation services used frequently

Figure 1 shows that 40% of the passenger respondents are regular customer of Uber and Grabcar while 32% of them are sitting taxi services more, 20% of them are sit bus more frequently and 8% of them are train. This data shows that Penang

female are more likely to sit Uber and Grabcar compared to other transportation services so it means that there are high probability AMOI Tuk Tuk could be successful in Penang.

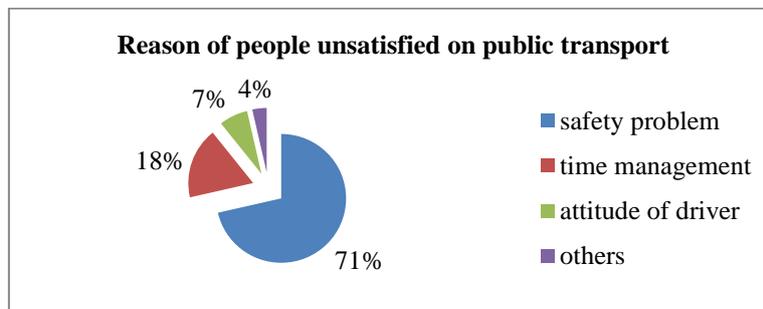


Figure 2: The reason of people unsatisfied public transportation services.

Figure 2 shows that there are 74% of them are unsatisfied with their public transportation experience and only 26% of them are satisfied with their public transportation experience. The safety problem is the main reason people unsatisfied with their public transport experience as much as 71% which is 22 respondents out of 30 respondents. Safety problem is the most threaten issues that causes them not dare to take public transport, and all of the respondents agree that AMOI Tuk Tuk can reduce social crime to public especially on female, and they do not have to afraid being rape by male.

From the survey form, 28 respondents out of 30 respondents are strongly agree AMOI Tuk Tuk service to start operates in Penang, and they are willing to become the researchers first batch of passengers, because they believe that AMOI Tuk Tuk can reduce the female that happen on Uber and Grabcar in Malaysia. In addition, seven respondents out of 30 respondents are Malay and they also agree that AMOI Tuk Tuk can solve their problem of female and male could not stay in a car due to Islamic Law, they also agree that AMOI Tuk Tuk provide a better choice for public that not only male driver but female driver do compete with them too.

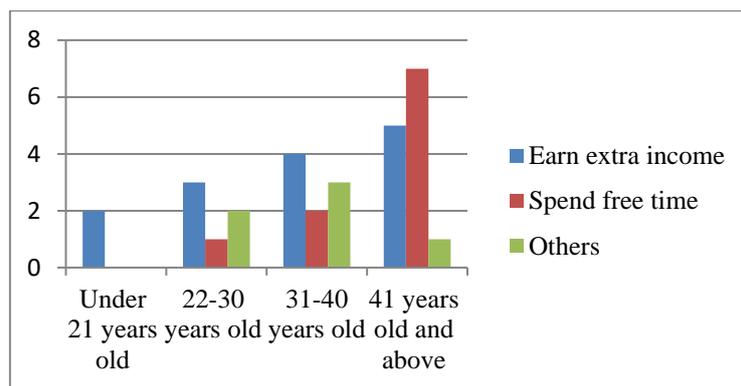


Figure 3: The reason of respondent becomes part time driver according the ages

Figure 3 shows that two of the respondents under 21 years old are more prone to earn extra income rather than spend free time and others reason. But, for the respondent 41 years old and above are prone to spend their free time which is 7 respondents out of 13 respondents in this age range, 5 respondents will likely to earn extra income and 1 respondent are

others reason that didn't state at the column. This show that people from different age range having different reason to be a part time driver instead of earn extra income. Even though their reasons are different but all of them are interesting to becomes a part time driver and also AMOI Tuk Tuk drivers.

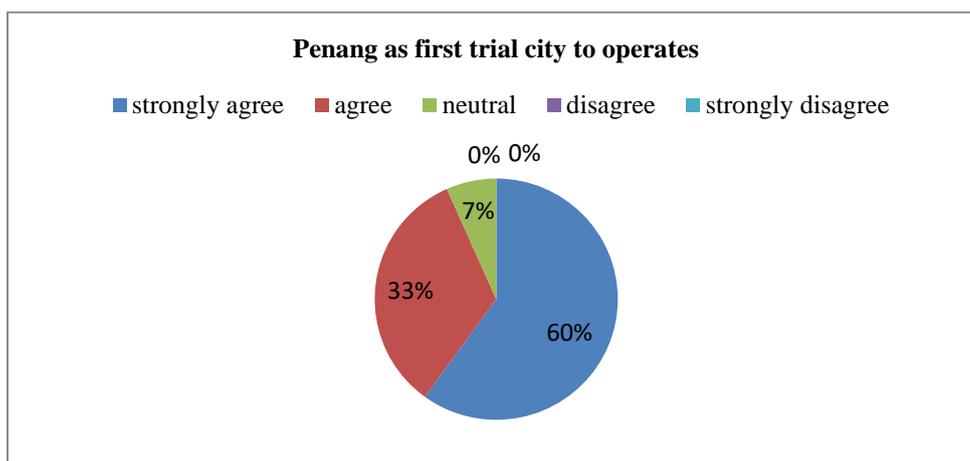


Figure 4: Opinion on chosen Penang as the first trial city to start operates AMOI Tuk Tuk

Figure 4 discloses 60% of the respondent strongly agree that Penang is the best place to starting AMOI Tuk Tuk transportation services, 33% of the respondent are agree and 2% of respondent are neutral. The reason Penang is best place to starting AMOI Tuk Tuk is due to the amount of tourist are increases year by year and this service can help tourist who do not have their own transport to reach their destination easily. Besides, none of the transportation services are focused on female and the amount of female citizen in Penang are as much as male citizen. The survey shows that the market place for female public transportation services are still available and the female have higher spending power than man.

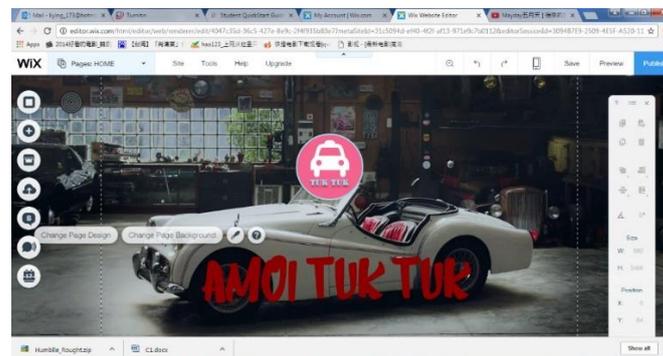
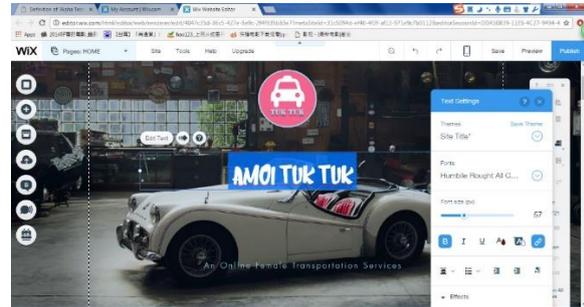
#### 4.2 Result of Alpha Test

Alpha test is a type of testing that is done on an application towards the end of a development

process when the product is almost in a usable state. This type of testing does not involve functional testing on the application. Instead, it is a user testing on the application in order to understand the user behavior and experience on the application [14].

The applied alpha test for this proposed project AMOI Tuk Tuk has been verified by a website expert on the design and development of AMOI Tuk Tuk websites. He says the logo is attracting due to its color but the services name is too simple which the font is change from Avenda to Humble Rought All Caps. He comments that the websites are great in design just there are some minor changes need to make for improvement, the logo of the AMOI Tuk Tuk are too simple and need to make it more interesting. Besides, the sign-up column needs to have clear direction for first time user how to sign

up as driver or passenger because people may confuse about this if they are no experience regarding this kind of services.

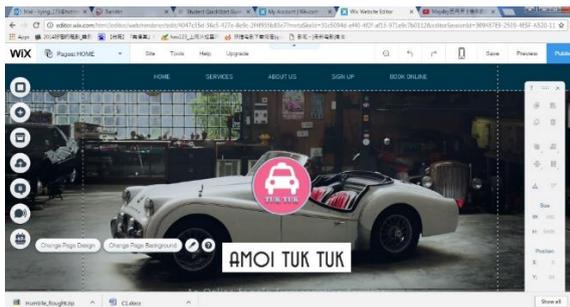


The part of booking online are invisible and could not be seen easily. Improvement are made according to his comment which the book online is moved out from menu and make a different column for it. Besides, the website expert said that the menu of the

websites was not suitable for the theme of websites, retro. It had to change to the menu design which match the theme of websites.

Before

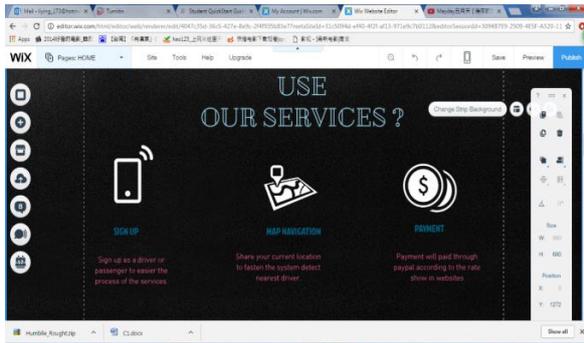
After



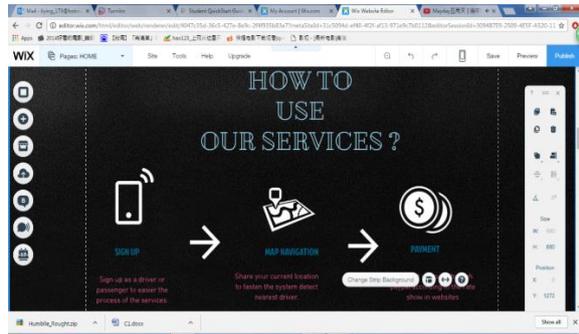
The next thing he mention in the alpha test is the information on how to use our services are not clear and people may confuse with the sequence when

using our services. Improvement has been done after the alpha test.

Before



After



The arrow of direction has insert to show the step of using our services which is from sign up as passengers or drivers, then share the current location to navigate the nearby drivers and lastly the payment will be paid through Pay Pal. Therefore, the images

in the gallery part need to change to images that related to Penang or female in Penang instead of oversea female in others country. Those images have replaced with Penang heritage map, female tourist with mural, Penang bridge and etc.

Before



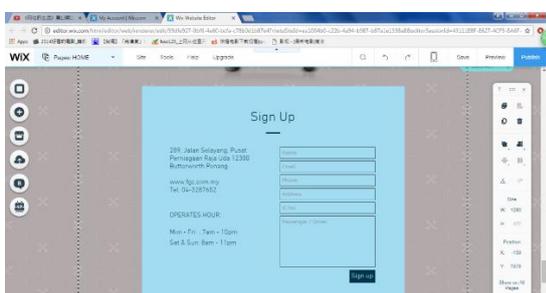
After



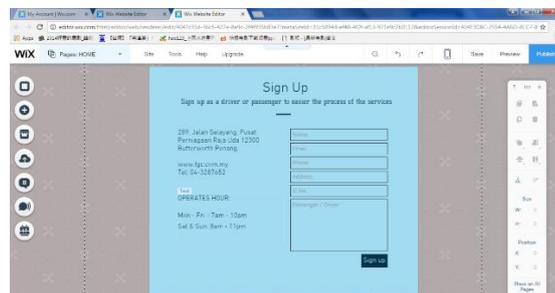
Moreover, the website expert does provide feedback about the sign up did not mention well about the reason of sign up. First attempt user will confuse

with sign up and book online because users may don't have experience on online transportation services.

Before



After



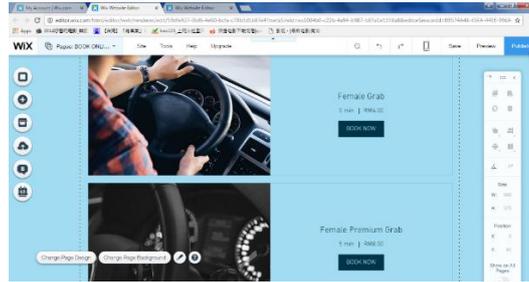
After the explanation for sign up which it can easier the process of the services can help people more understand the reason of signing up as passenger or drivers. Besides, the design of the grab online

interfaces require improvement from some aspect which is do not match with the themes retro and female, the images and background show in booking column are not attracting to people.

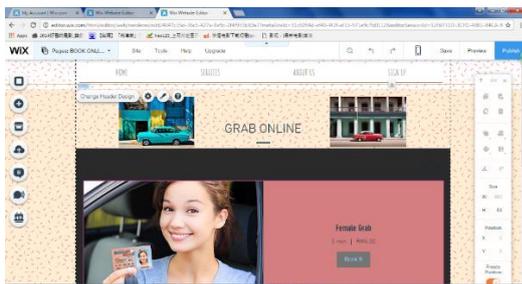
Before



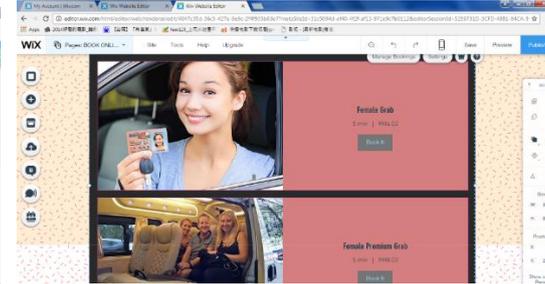
After



Before



After



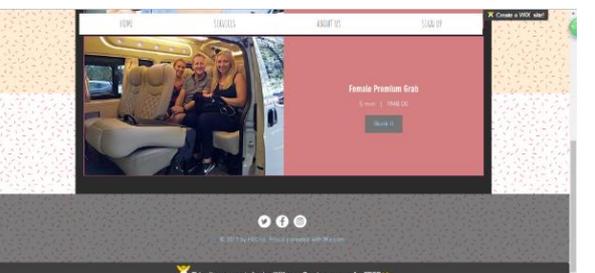
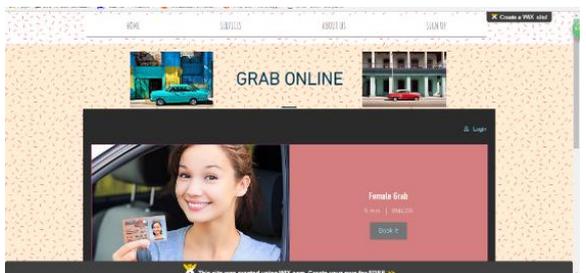
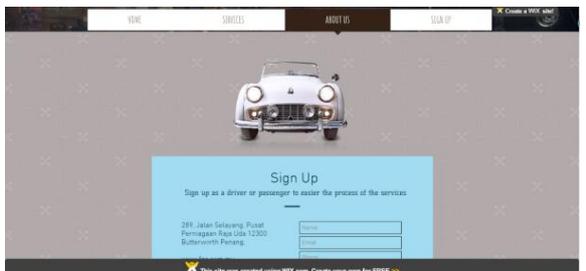
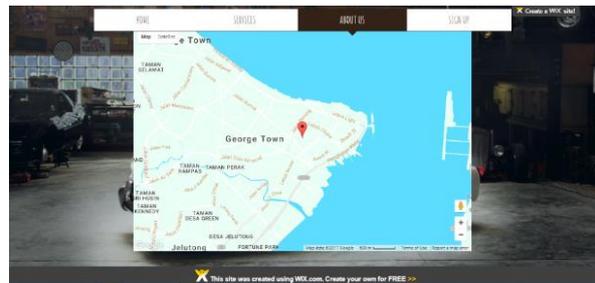
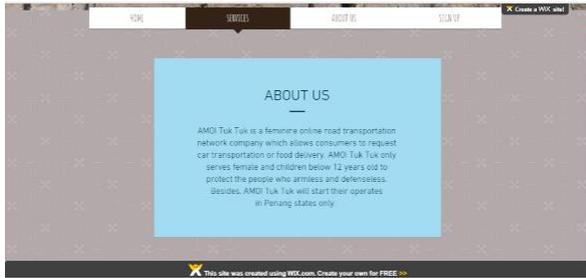
The background had changes to red confetti due to the background before are too simple and could not attract attention of others. The images of booking column had changes to female who holding her license which can bring a message to passengers the driver of our services is holding legal license and

have driving experience more than 5 years. The Female premium grab is the focus for people desirous for MPV, so the images is showing a group of females sit on an MPV. All of the changes are to make user more understand and clear about our services.

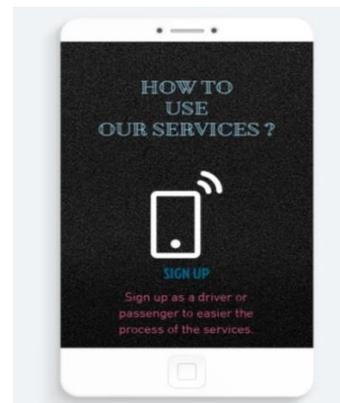
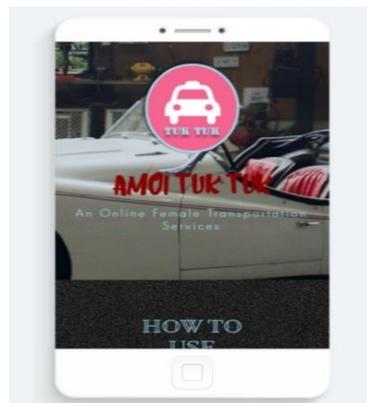
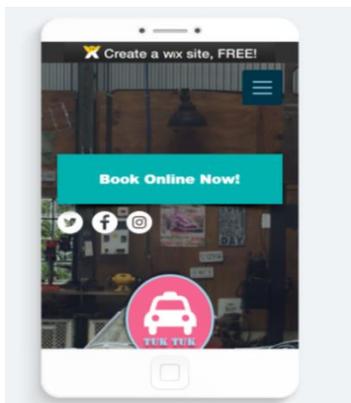
#### 4.3 Final Design of Websites – The Desktop version and The Mobile Version

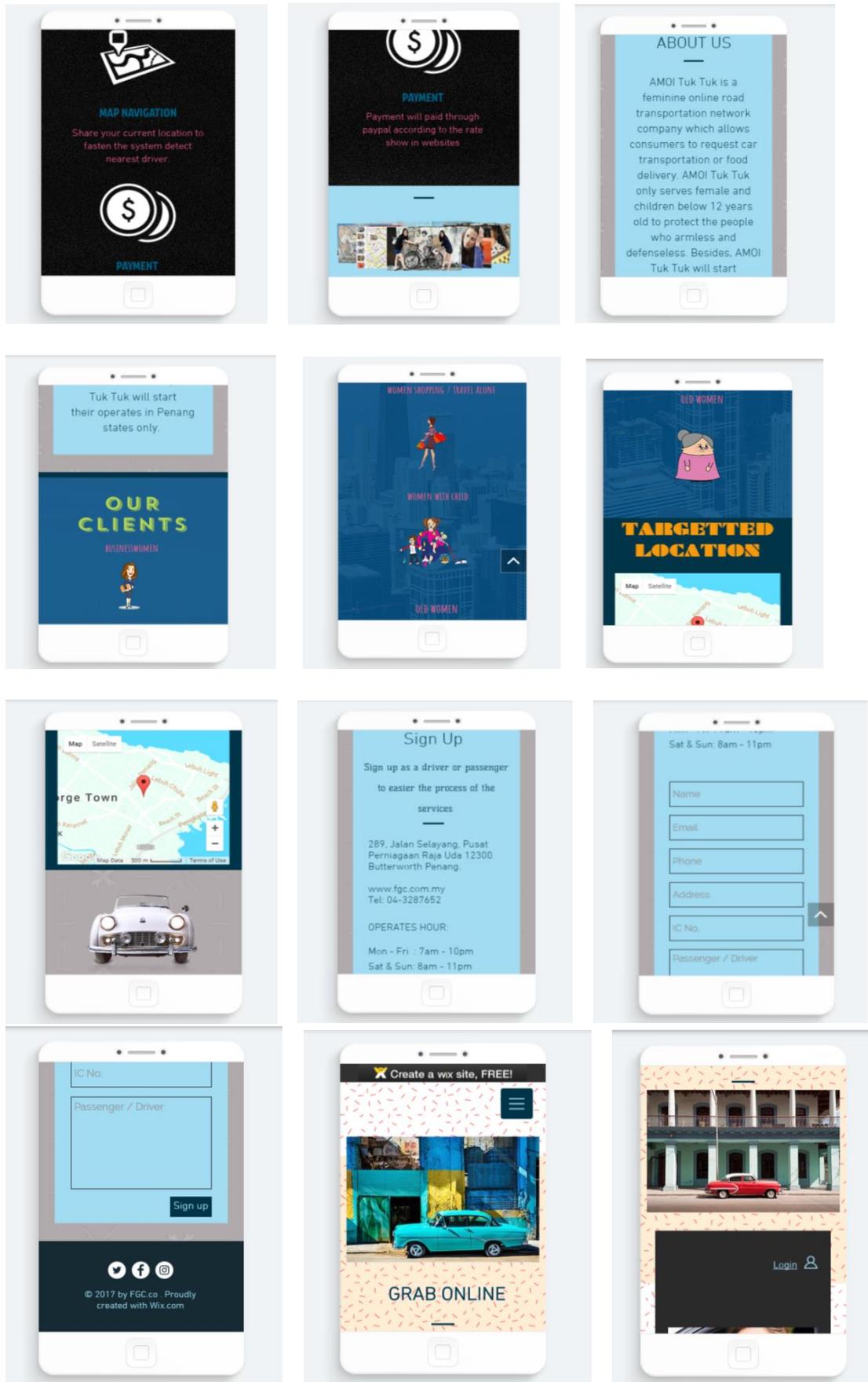
##### The Desktop Version

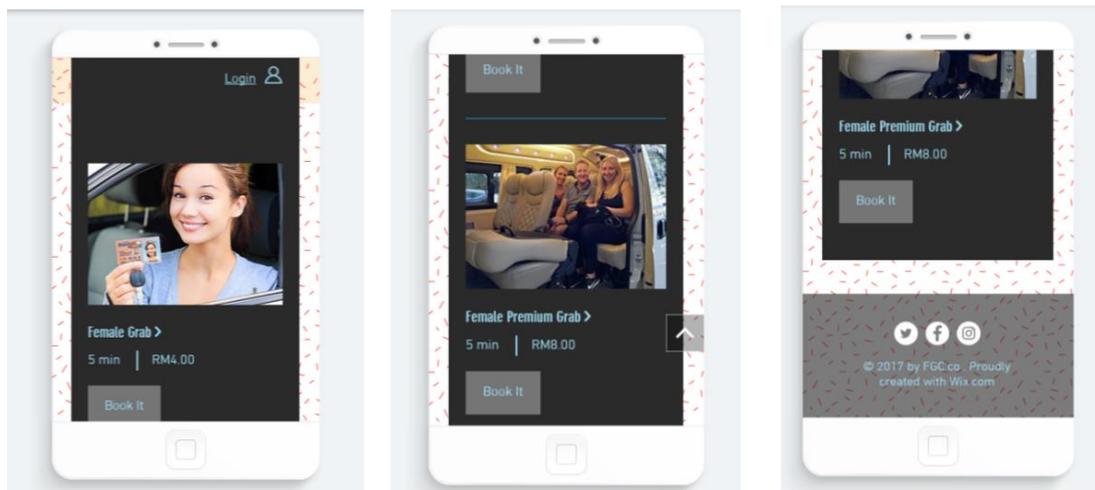




The Web-based Mobile Version







## 5.0 CONCLUSIONS

### 5.1 Conclusion

Transportation services move people or freight from one location to another. These services are a near necessity for successful operations of businesses and governments. Efficient transportation systems contribute to businesses fulfilling purchase orders in a timely fashion [15]. AMOI Tuk Tuk transportation services is a the public transportation network company developed to connect passengers and driver through websites which are designed specialized for female only. Due to the increases of social problem on female in Malaysia when sitting Uber and Grabcar, this proposed project had design for female to reduce the social problem that always targeted on them. Besides, the issue of Islamic female could not stay in a car with male according to their Islamic Law enhances the needs of Islamic female towards AMOI Tuk Tuk transportation services.

The launching of AMOI Tuk Tuk will increase the opportunity of female employment in Malaysia

### 5.2 Recommendation

The project is limited to Penang city only, and as the founder of the project, the researchers hope that the future researchers might expand this project to all the cities in Malaysia or over the world to give them the opportunities for every people over the world to benefit the transportation services. The input from the need analysis conducted shows that the services has potential to launch in a real time and I hope that the next researcher can implement it in real. Moreover, the next researcher can in-depth study on websites design and interfaces because the websites used in this project is using Wix.com to complete it, while I hope that next researcher can develop it in real websites. In future, the next researcher can

because they can work as AMOI Tuk Tuk driver's. The waterfall model by Dr. Winston W. Royce had been fully explaining the process of development in websites is from requirement analysis on the detail of the websites, design of the websites, implementation included the implement on 10 principles of websites, verification by alpha test, and end with operation and maintenance. The proposed project leads to several conclusion. First, the result of need analysis are positive which is all the 60 respondent all agree with the objectives of the proposed project, they admit that this proposed project has meet their need. Second, the result of alpha test which the expert in websites design and development had provide positive comment towards AMOI Tuk Tuk websites. He said that the websites could lend a hand to Penang female from crime, comply with Islamic Law, the services could bring impact to Penang society and economics due to the services have increase the opportunity of employ in Penang. Lastly, the proposed project AMOI Tuk Tuk transportation services gain a positive result from targeted audience which is female citizen or tourist in Penang.

design a mobile application for AMOI Tuk Tuk online transportation services and launch in App store or Google play to let people install in their phone, this can easier the process of services and enlarge the market place worldwide. Besides, next researcher can provide multiple services to public instead of female grab car, we also can provide other services such as motor grab, parcel delivery services or unisex grab car.

## REFERENCES

- [1] Azmi, A. A. and Nor Fanim, M. A. (2012). Transforming the Land Public Transport System in Malaysia. *Journeys*, 1(May), 30-35.

- [2] Freischlad (2015). Three years, \$340 funding , millions of users : GrabTaxi's Anthony Tan reflect on the journey. Tech in Asia. Retrieved on April 16, 2017 <https://www.techinasia.com/3-years-4-funding-rounds-grabtaxisanthony-tan-reflects-journey>
- [3] GrabCar (2017). About Grabcar. Retrieved on April 13, 2017 on Grab : <https://www.grab.com/my/car/>
- [4] Provenzano, B. (2016). Uber driver arrested for kidnapping and assaulting blacked out female passenger in DC. The AOL. Retrieved on April 12,2017 from <https://www.aol.com/article/news/2016/10/30/uber-driverarrested-for-kidnapping-and-assaulting-blacked-out-f/21594973/>
- [5] Statt, N, (2019). Uber's first ever safety report discloses 3,045 sexual assaults and nine murders in the US last year. Accessed from <https://www.theverge.com/2019/12/5/20997939/uber-safety-report-2018-sexual-assault-ride-hailing-platform-stats> on 2 February 2020.
- [6] Charoen, D. (2015). Grabtaxi: A Taxi Revolution in Thailand. *International Journal of Management and Applied Science*, 1(9), 154-157.
- [7] Calburn, T. (2017). Toxic uber sued after driver allegedly tried to rape passenger in car. The Register. Retrieved on April 12, 2017 on <https://www.theregister.co.uk/2017/02/24/uber-sued-over-alleged-assault/>
- [8] CBS (2017). San Francisco Taxi Friver Robs Passenger At Gunpoint. CBS SFBayArea. Retrieves on April 16, 2017 on cbslocal <http://sanfrancisco.cbslocal.com/2017/01/17/taxi-driver-robs-passenger-atgunpoint/>
- [9] Bernama. (2017). GrabCar driver removed from system following sexual assault report. Retrieved on April 15, 2019 on <https://www.nst.com.my/news/nation/2017/06/248272/grabcar-driver-removed-system-following-sexual-assault-report>
- [10] Fatwa (2017). A woman being alone in a car with a man. Dar Al-Ifta Al-Missriyyah. Retrieved on April 10, 2017 on dar-alifta : <http://eng.daralifta.org/foreign/ViewFatwa.aspx?ID=3692>
- [11] Leskela, T. (2018). Developing A Customer Account Control System For A Small Business. Access from [https://www.theseus.fi/bitstream/handle/10024/146743/Leskela\\_Timo.pdf?sequence=1&isAllowed=y](https://www.theseus.fi/bitstream/handle/10024/146743/Leskela_Timo.pdf?sequence=1&isAllowed=y) on 10 October, 2020.
- [12] Gordiyenko, S. (2014). Software Development Life Cycle (SDLC).The Waterfall Model. Retrieved on April 14, 2017 on <https://xbsoftware.com/blog/softwaredevelopment-life-cycle-waterfall-model/>
- [13] Cooper, R. G. & E. J. Kleinschmidt. (1986). An Investigation Into The New Product Process: Steps, Deficiencies, and Impact, 3(2), 71-85.
- [14] The Economics Times. (2017). "Definition of Alpha Testing.". Retrieved on May 5, 2017 from <http://economictimes.indiatimes.com/definition/alphatesting>
- [15] Encyclopedia.com (2017). "Transportation Industry." International Encyclopedia of the Social Sciences. Retrieved May 13, 2017 from Encyclopedia.com: <http://www.encyclopedia.com/social-sciences/applied-and-social-sciences-magazines/transportation-industry>