Profiling of Passengers by E-Hailing Services in Malaysia

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Abstract: Shared mobility is one of the unavoidable impacts of the Industrial Revolution 4.0. This mode of travel is rapidly spreading among the local road users. However, there is lack of study on the actual perception of share mobility concept in Malaysia. This study will analyze the actual opinion and perception of Malaysia people particularly the users of shared mobility services also aims to investigate the factors that influence the passengers towards the use of e-hailing services. The independent variables of this research are relative advantage, ease of use, trialability, social influence and safety of using e-hailing application. A survey was conducted among e-hailing users in Malaysia. With the use of a survey questionnaire, 271 targeted respondents provided valuable feedbacks. The survey consisted of two parts; the first part contained general questions about gender, age, ethnic, employment, state and preferred types of transportation between e-hailing and taxi. The second part was the major part of the questionnaire which consisted of relative advantage of e-hailing services, ease of using e-hailing services, trialability of e-hailing application, social influence and safety provided by e-hailing services. Therefore, the questionnaire was constructed according to those significant factors. The correlation analysis was used to identify the relationship between independent variables and dependent variable. From the results obtained, the linear regression showed that the relative advantage, ease of use, trialability, social influence and safety indicated a positive significant relationship with the factor that influences the passengers. Among the variables studied, the ease of use showed the most significant factor that influences the passengers to choose e-hailing services in Malaysia with Cronbach's Alpha of 0.874. In conclusion, this study shows some important information and provides benefits particularly to e-hailing services company to be more competitive in this industry by understanding the needs and concerns of passengers when they adopt the e-hailing services.

Keywords: E-Hailing, Public Transportation, Shared Mobility, Passengers

1.0 Introduction

Shared mobility is defined as transportation services and resources that are shared among users. Shared mobility includes public transit, taxis, bike sharing, cars haring either round-trip, one-way or peer-to-peer, ridesharing, i.e. non-commercial services such as carpooling and vanpooling, ride sourcing or ride-hailing, ride-splitting, scooter sharing and etc. Shared mobility has grown tremendously in recent years due to the issues on taxi stops, duration for waiting the taxi, taximeter, attitude of the drivers, cleanliness and comfort, and availability of taxis [1]. However, there is a hyper competition when Grab existed because it is a cloud-based mobile app technology dependent.

The Grab service delivery works when the riders send a trip request to the nearest Grab driver and the application will track the available Grab car to pick a rider. Only the location will be shown to the driver. However, the e-hailing services have affected the traditional taxis as users clearly prefer e-hailing more than the traditional taxi services with a major competitive challenge [2]. Despite the

Basically, e-hailing services provide these advantages to the users; 1) low price; 2) safe to travel; 3) costumer reviews; 4) comfortable and convenience and 5) easy to access. With the technological advancement and convenience of mobile apps, e-hailing services have been widely used [3].

Previously, individuals needed to hail taxis from the streets or book a taxi through phone call. Nowadays, they can book a ride using their mobile device as long as internet connection is available. It is crucial to assess the efficiency of e-hailing applications as they are still new to the market [4-5]. The efficiency of the system can be evaluated through user satisfaction as well as user perception. Thus, the objectives of this study are; 1) to investigate the type of transportation preferences among user in Malaysia; 2) to investigate the significant factors influencing user in adopting e-hailing services and 3) to assess the impact of shared mobility on the existing modes of mobility. The significant factors that influence user in adopting e-hailing services in their daily life were identified based on the independent variables namely price, safety, rating, comfort and convenience as well as accessibility [6].

2.0 Literature Rewiew

Shared mobility has become a significant element in cities of Malaysia. It is an unavoidable impact of Industrial Revolution 4.0. Shared mobility is the shared use of a motor vehicle, bicycle, or other low-speed transportation mode that allows users to obtain the short-term access to transportation on as needed basis [7]. In Malaysia, shared mobility is including public transit, carpooling, van pooling, bike sharing, ride sharing, ride sourcing or e-hailing services such as Uber and Grab. Its recent growth has been attributed to advances in technology, economic changes, and evolving social perspectives toward car ownership and urban living.

But nowadays, people take the car ownership is a vital in life. In contraction, when there are too many cars on the road, it will cause traffic jams and people also will be faced the risk of a road accident. Other than that, some of the people are aware with this situation and decided to use bike to go to certain destination while the motorcyclist will be faced the high risk of fatal injuries than a car passenger. This scenario also has advantages and disadvantages. This study takes a particular focus on activities of shared mobility in certain cities in Malaysia to determine the travel behaviour of users. There is broad array of modes with different use cases, business models, and travel behaviour impacts.

2.1 Public Transportation Service

This service including the bus, train (e.g.,Kereta Api Tanah Melayu, monorail, and commuters). In Peninsular Malaysia, the stage bus annual ridership for 2014 stood at 68 million for areas other than Kuala Lumpur, and 155 million for Kuala Lumpur alone [8]. This represents about 70% of stage bus ridership in Malaysia. Rail or train services in Malaysia are including KTM commuters, LRT line, Monorail line, and Mass Rapid Transit Line (MRT). Rail usage is also the fastest growing among all modes of urban public transportation according to ridership data from rail operators. According Land

Public Transport Commission daily ridership for urban rail services rose 8.5% to 631,988 commuters in 2015 from 557,921 in 2011 [8].

2.2 Carpooling

Carpooling or car sharing concept is including the taxis and e-hailing services (e.g., Grab and Uber). They are pooling based on the region of their destination. Taxis station commonly nearby to the bus station because the passengers will use the taxis to go to the specific area. The buses cannot reach the specific location as it used as long distance vehicle from a city to another city. E-hailing services can be reach through mobile devices [9]. Users will install an e-hailing application and use it when need. Since, their mobile phone was equipped with GPS, the driver will get close to the passenger easily and the passenger no need to go to a specific station to get the service (e.g., taxis station). E-hailing service are highly used by the young generation and not to the older people impacted to digital divide.

2.3 Bike Sharing

A bicycle-sharing system, public bicycle system or bike-share scheme is a service in which bicycles are made available for shared use to individuals on a short-term basis for a price of free [10]. Many bike share systems allow people to borrow a bike from a station and return it at another station belonging to the same system. The bikes equipped with special lock. Users will install a bike application on their mobile phone. To unlock the bike, a user needs to scan a code on the lock. The user returns the bike by placing it at the system station and scan the code again to lock the bike. This mode of shared mobility is new in Malaysia. It is commonly use in a wide area of a place (e.g., in a university campus or colleges and recreational park). For example, Melaka bike share in Melaka city.

3.0 Methodology

A survey was conducted among locals in Malaysia to investigate the factors influencing the use of e-hailing services. The survey was conducted through the questionnaire distributed among the targeted respondents through Google Form. The survey consisted of two parts; the first part contained general questions about gender, age, ethnic, occupation, state and transportation prefer to travel less than 50 km. The second part consisted several questions that required the respondents to rate. In previous literature, most studies show that the passengers' satisfaction is influenced by price, safety, rating, comfort and convenience as well as accessibility.

Each respondent was asked to rate each question in part 2 using a Likert Scale on five levels from 1 as "Strongly Disagree" to 5 for "Strongly Agree". Since it was impossible to conduct the surveys to all locals, sampling is necessary to obtain as a representative proportion of all passengers' [11].

The results obtained from Google form were edited for completeness and consistency. The questionnaire and the Google form results were coded for statistical analysis. Data were cleaned, coded and properly analyzed to obtain a reliable report [12]. The Statistical Package for Social Science (SPSS) was used to analyze and interpret the collected data accordingly.

Tables and charts were used to summarize the responses for further analysis and facilitate comparison. Analysis was done for the demographics, relative advantages, ease of use, trialability, social influence and safety information.

4.0 Results & Discussion

The Statistical Package for Social Science (SPSS) was used in this study to analyze and interpret the collected data. A descriptive analysis was employed for respondent's profile, and the significance level on the relationship between independent and dependent variables was determined.

Table 1: Demographic Profile

Variable	Frequency(n)	Percentage (%)
Gender		
Male	134	49.4
Female	137	50.6
Age		
18-28	219	43.4
29-39	259	51.3
40-50	11	2.2
Above 50	16	3.2
Ethnic		
Malay	252	93
Chinese	10	3.7
Indian	4	1.5
Others	5	1.8
State		
Johor	149	55
Kedah	11	4.1
Kelantan	6	2.2
Kuala Lumpur	4	1.5
Melaka	5	1.8
Negeri Sembilan	13	4.8
Pahang	6	2.2
Penang	24	8.9
Perak	11	4.1
Perlis	4	1.5
Sabah	2	1.5
Sarawak	21	0.7
Selangor	11	7.7
Terengganu		4.1
Occupation		
Employed	109	40.2
Student	162	59.8
Transportation preferred to travel less than 50 km		
E-hailing (Grab Jom Rides, My Car, Riding Pink, FRENZT and etc)	264	97.4
Taxi	7	2.6

Based on **Table 1**, the total respondents involved in this study were 271 and both genders participated in this survey where 134 were male respondents (49.4%) and 137 were female respondents (50.6%). These data indicated that the female frequency was slightly higher than male who liked to use the ride-sharing services. Respondents were categorized into five age groups; the majority of respondents' ages were between 18 to 28 years old (80.8%), the second age group of respondents was 29 to 39 years old with 9.2%, the third age group of respondents was 40 to 50 years old (4.1%) and the last age group of respondents was above 50 years old with 5.9%. The highest respondents that used the e-hailing services were from 18 to 28 years old while the lowest was between 40 to 50 years old. The results was conclude majority of using the e-hailling dominant on age 18 to 28 years.

For the ethnic component, the majority of respondents were Malay with 252 respondents (93%); the second group was Chinese with 10 respondents (3.7%), and followed by others excluding Malay, Chinese and Indian with 5 respondents (1.8%) and respondents from Indian ethnic was the lowest at only 4 people or 1.5%. This indicated that most of the respondents that used the e-hailing services were Malay.

While for the states, the majority of the Malaysian respondents were from Johor represented by 149 people or 55.0% from the respondents. Penang was the second place with 24 people (8.9%) and Selangor was the third state with 21 people or 7.7%. It was then followed by Negeri Sembilan (13 people or 4.8%) and there were 3 states that shared the same frequency as well as percentage namely Kedah, Perak and Terengganu. Those states have 11 respondents or 4.1%. Kelantan and Pahang also showed the same number of frequency and percentage (6 respondents or 2.2%). Besides Johor, Penang and Selangor, Melaka was the only state where the data were not the same as other states which was accounted for 5 respondents or 1.8%. Similarly, Kuala Lumpur, Perlis and Sabah also shared the same result where the number of respondents was 4 or 1.5%, while the least state that used e-hailing services was Sarawak where the frequency was only 2 people or 0.7%. It was the total of respondens from Sarawak was the lowest among the other states.

As can be seen in the table, occupation has been divided into 2 categories; student and employed. The data showed that most of the respondents were students with 162 respondents or 59.8% and followed by employed locals with 109 respondents (40.2%). The results significantly indicated that the e-hailing services became a favourite transportation channel among students where are the hiegst respondents category.

According to Table 1, the majority of the respondents preferred e-hailing to travel less than 50 km with 264 respondents or 97.4%, the respondents who preferred taxi to travel less than 50 km was only 7 respondent people or 2.6%. It is showed the majority of e-hailling passenger preffer to short treveller.

3.1 Relative Advantage

Table 2 shows data related to relative advantage in using the e-hailing services. Majority of respondents agreed with the advantages provided by the services.

Table 2: Relative advantage in using e-hailing services

	Frequency (n)	Percent (%)	Ranking
Convenient	146	53.8	1
Fits with needs	144	53.1	2
Reach destination faster	139	51.3	3
Find grab quickly	137	50.1	4
Useful	134	49.4	5
Complement to lifestyle	134	49.4	5

Based on **Table 2**, convenient was ranked as first because most of the respondents agreed that it enables them to quickly find an available grab nearby and reach their destination faster than other transport services. They also agreed that the e-hailing application is useful to them, fits well with their needs and complementary service to their lifestyle without having problem adjusting to the use of such services.

3.2 Ease of use

Table 3 and **Figure 1** shows data obtained for ease of use from respondents. Most of them agreed with the items under ease of use category.

Table 3: Ease of use of e-hailing services

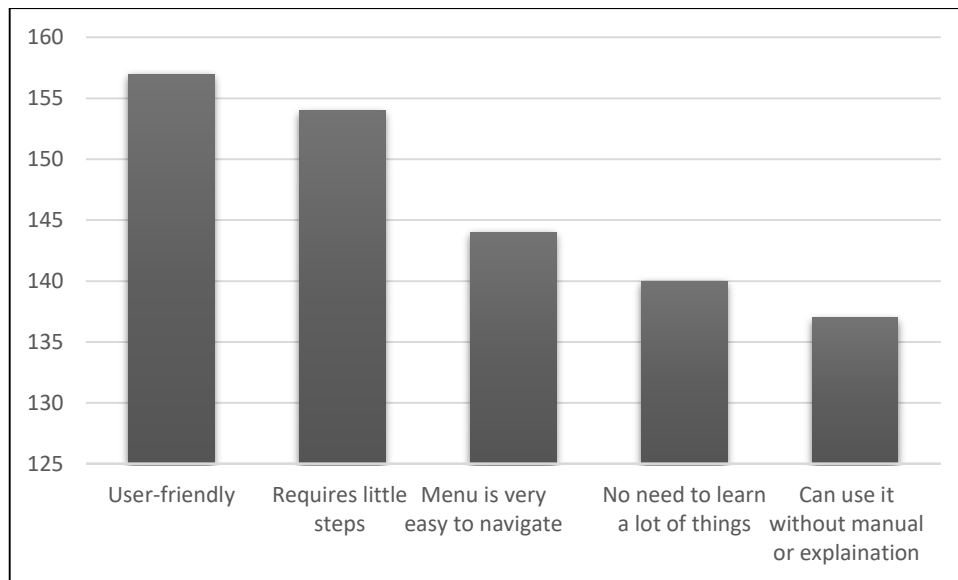|	Frequency (n)	Percent (%)	Ranking
User-friendly	157	57.9	1
Requires little steps	154	56.8	2
Menu is very easy to navigate	144	53.1	3
No need to learn a	140	51.7	4
lot of things	137	50.6	5

Figure 1: Ease of use of e-hailing service

From the results, ranking number 1 was achieved by user-friendly. Since it is a user-friendly app, the respondents do not need to learn a lot of things before they could use the e-hailing application as it requires only little steps. The e-hailing application menu is also very easy to navigate facilitating the users to use it without manual or explanation from the service provider.

3.3 Trialability

Results for trialability based on respondents' feedbacks are summarized in **Table 4**. All items under trialability were agreed by the respondents.

Table 4: Trialability to use e-hailing services

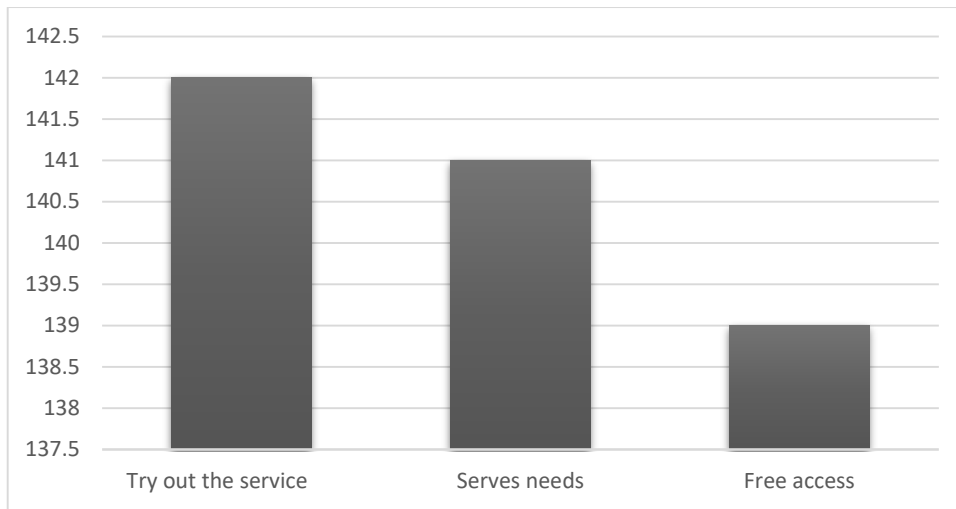|	Frequency (n)	Percent (%)	Ranking
Try out the service	142	52.4	1
Serves needs	141	52	2
Free access	139	51.3	3

Figure 2: Trialability to use e-hailing services

Results from **Table 4** and **Figure 2** indicated that the item of try out the service has the highest frequency since most of the respondents agreed with this type of trialability to use e-hailing app. When there is a trialability with free access, the users could make decision and convince that e-hailing really serves their needs.

3.4 Social Influence

Items of social influence are summarized in **Table 5** and **Figure 3**. From the respondents' feedbacks, majority of them agreed with the items under social influence to use e-hailing services.

Table 5: Social influence to use e-hailing services

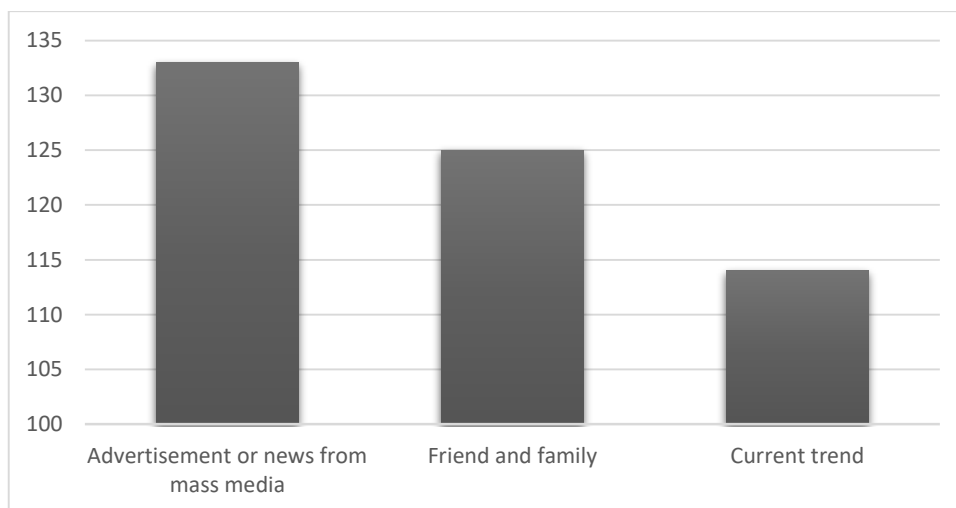|	Frequency (n)	Percent (%)	Ranking
Advertisement or news from mass media	133	49.1	1
Friend and family	125	46.1	2
Current trend	114	42.1	3

Figure 3: Social influence to use e-hailing services

Results showed that the social influence to use e-hailing services among users with high frequency was the advertisement or news from mass, followed by current trend and friend and family.

3.5 Safety

Table 6 shows the data obtained for safety provided by e-hailing services. Majority of respondents agreed with the items under this category.

Table 6: Safety provided by e-hailing

	Frequency (n)	Percent (%)	Ranking
Declare location via message, email or social network	127	46.9	1
Booking transparency information	126	46.5	2
Historic journeys	119	43.9	3

Based on Table 6, most of the respondents agreed with the safety provided by e-hailing. The safety of users can be ensured as the services have booking transparency information and historic journey. Besides, users also can declare their location via message, e-mail or social network.

3.6   Reliability Test

Reliability analysis was carried out in this study as shown in **Table 7** for a total number of 271 respondents.

Table 7: Reliability analysis between dependent and independent variables

Variable	Cronbach's Alpha
Relative advantage (RA)	0.855
Ease of use (EU)	0.874
rialability (T)	0.851
Social influence (SI)	0.824
Safety (S)	0.845

The Cronbach's alpha values for all the variables ranged from 0.824 to 0.874, indicating a good internal consistency and reliability of overall items in the questionnaire. In addition, the results obtained were found to be at acceptable level where all the values were more than 0.7 [13].

Table 8 shows the level of agreement between independent variable and dependent variables. The mean for relative advantage was 3.960 with standard deviation of 0.754. Besides that, the mean for the ease of use variable was 3.863 with standard deviation of 0.712. The mean for trialability was 3.807 with standard deviation of 0.716. For social influence, the mean obtained was 3.602 with 0.790 of standard deviation. Lastly, the mean for safety was 3.892 and its standard deviation was 0.843. The result indicated that the level of agreement for all variables was agreed.

Table 8: The level of agreement between independent variable and dependent variables

Variable (average)	Mean	Standard Deviation	Level of Agreement
Relative advantage (RA)	3.863	0.712	Agree
Ease of use (EU)	3.96	0.754	Agree
Trialability (T)	3.807	0.716	Agree
Social influence (SI)	3.602	0.79	Agree
Safety (S)	3.892	0.843	Agree

3.7 Correlation Analysis

The correlation analysis in **Table 9** showed that relative advantage (RA) and ease of use (EU) have a strong relationship with the degree of determination of 0.762. This result clearly showed that factor related to the ease of use produced significantly high degree of determination. The relationship between the ease of use (EU) and trialability (T) exhibited the degree of determination of 0.711. However, the relationship between trialability (T) and social influence (SI) with fare was marginally low at 0.528. This variables from the correlation analysis was significant and achieved the degree of determination analysis where the both variables influenced of the overall performance of this study.

Table 9: Correlation among variables

Variable	RA	EU	T	SI	S
Relative advantage (RA)	1	0.762	0.692	0.54	0.652
Ease of use (EU)		1	0.711	0.542	0.69
Trialability (T)			1	0.528	0.697
Social influence (SI)				1	0.579
Safety (S)					1

4.0 Conclusion

Based on the results of this study, it can be concluded that the transportation preference among users in Malaysia is the e-hailing services such as Grab and Uber. Through likert scale analysis on the factors influencing the users in adopting e-hailing services, all variables showed satisfactory results. Apparently, all the variables have influenced the selection to use e-hailing services with the highest results recorded by comfort level. Hence, this study proves that the e-hailing services are more technological advanced than the taxi services. If the taxi services do not overcome this matter, the service will be no longer exist.

Acknowledgment

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