Comparative study of Uber and taxi in Kuala Lumpur

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Abstract. Transportation is a major factor in influencing our daily lives to become more efficient and productive. The taxi had become the favourite of people in choosing public transportation because it personally brings us to the exact location of our destination. Taxi has monopolized public transport from door to door for a long time ago until a company providing the same service known as the Grab entered the market recently. This study had been conducted to compare the services provided by taxi and Grab from the perception of their customers. This study can help service providers see which aspects they need to make improvements in the interests of both parties. The survey had been conducted at Kuala Lumpur because of the probability of taxi and Grab users are higher at a busier state as in the capital city. Descriptive statistics is mainly used in making simple summaries with the help of graphical representation. Mann Whitney U test had been used to compare the two service providers at each aspect which are accessibility, comfort of rides, safety and value for money. As a result, Grab has significantly higher user ratings than taxi for all aspects of services considered in the study.

1. Introduction
Transportation is a major factor in influencing our daily lives to become more efficient and productive. According to [1] an efficient transportation system plays as a big role in handling the daily necessities in the lives of the peoples. It includes access to services and amenities that are central to the lives of all citizens for example like employment, education, health, services, and even leisure.

Road transportation is transportation of people or goods by road and it plays an important role for most of the people to go to work, hanging out, and meeting families. People have owned themselves vehicles for examples like cars, motorcycles, and bicycles to ease them to be moving from a place to another. But some people might not afford to buy their own vehicle while there are also some that own their own vehicle but less preferred to drive on their own for reasons like to save energy and to avoid congestion. That is why there is public transport that is provided for example like bus, taxi, train, and others.

It has been said that “in the majority city around the globe, taxis are an important element in mobility, which plays a significant role in the transportation network. Surprisingly, taxi carries no less than 40% of passengers, more than all other major public transportation such as buses and trains” [3].

Nowadays, most of the taxicabs in Malaysia are from the national car manufacturers for example like Naza Citra, Iswara, Waja, Wira and Proton Saga. The service provides by the taxi are almost everywhere around the country at any time to ensure that people can spend their daily life more efficiently. Recently with the improvement of technology in the Smartphone application, a service that
is quite similar to the taxi is created through the mobile application which is the “Uber”. Uber is a Transportation Network Company developed to connect passengers and drivers through a Smartphone application. Drivers that have signed up to the Uber can earn money by transporting nearby passengers that make the request through the Uber application.

Uber is operating in about 570 cities around the world, for example, like in New York City, Washington DC, Olympia and many more. But in Malaysia, it only operates in 8 cities which is Ipoh, Johor Bahru, Kota Kinabalu, Kuala Lumpur, Kuantan, Kuching, Melaka, and Penang.

The differences between taxi and Uber in Malaysia are that taxis are operating at all over the cities in the country while Uber only operates in 8 cities. Also, the taxis fully comply with the transportation laws in the country, but the Uber does not. Suruhanjaya Pengangkutan Awam Darat (SPAD) is saying that the mobile app-based vehicle for hire service must fully comply with all transportation laws in the country, which it apparently does not at present [8].

The taxi had been dominant in transportation in most of the cities around the world. Most of the cities had put government regulations to the taxi industry to ensure the safety of the passengers, appropriate incomes of the drivers, stabilize prices and keep the quality of the services [11]. Because of this action, it had led to the creation of a taxi monopoly in some cities includes in Malaysia.

Therefore, taxi in Malaysia had been lack of competition thus it had made them be too comfortable while a poor service was provided to the users. It has been said that the Malaysia taxi drivers had been making problems like refusing to use taximeters, accepting only a certain destination, and use a cab that is poorly maintained [3]. There are also have been some issues regarding the bad attitude of the drivers towards the customers.

Now with the entrance of Uber to the transportation industry, it had made the taxi stop from monopolizing the industry. Also, it brings benefits to common people in Malaysia to earn more money especially currently when the cost of living is on the increase.

However, the quality of the service provided by Uber might also have some lacking in terms of public safety. For example, like the incident that was occurred at Kalamazoo, Michigan which an Uber driver had killed 6 people and wounded two others even though the driver had passed the Uber background check [6]. The incident had occurred because Uber is lacking in technology to ensure the safety of their customers.

Therefore, a study was conducted to see the quality of the services gave by taxi and Uber. Also, it was to see the perception of users towards taxi and Uber from different aspects like the accessibility, comfort of rides, safety of rides, and value for money.

This study will give an advantage to the taxi and Uber to see the lack of their services provided thus help them in making further action to improve their services. It might also help the SPAD in regulating and determining the requirement needed for the drivers to ensure public safety. The study was done for a period of six months from September 2016 until March 2017. The objectives of the study are:

• to identify which aspect is the most important for users in selecting door-to-door public transportation.

• to compare the services provided by Uber and taxi within each aspect from users’ perception.

Uber had only been operating in 8 cities in Malaysia while the services provided by taxi are almost in every city in the country. Since Kuala Lumpur is the capital city and the busiest city in Malaysia, therefore the study was conducted at Kuala Lumpur. The study was conducted only on those that had experience in the services provided by taxi or Uber for the purpose of gaining more accuracy).

2. Materials and Methods

The data obtained in this study is primary data because a public survey and online survey were conducted to see the perception of users toward taxi and Uber services.

The sampling method that had been used in the study is purposive sampling. The main purpose of using purposive sampling is because this study should focus on those who only use taxi and uber services. If they have never used the service, how would they want to respond to the questions they
asked? The sample for this study is 205 users which are 104 are the taxi users and 101 are the Uber users. The questionnaire consists of two-part; demographic profile and factors considered where all are 39 items. The scales used in the study are nominal and ordinal scale for demographic profile. The respondents were asked to evaluate each item in the factors on a 5-point Likert scale with values ranging from 1 (strongly disagree) to 5 (strongly agree) for the experience sections. For the data analysis, firstly, descriptive statistics were used on all survey items. A table was used to summary the profile of the respondents. The most important aspects for the entire users in selecting door-to-door public transportation is presented by graphical method.

Then, the reliability test was used to measure the reliability of a summated scale where several items are summed to form a total score. It is most commonly to use Cronbach’s alpha value to measure the reliability of the multiple Likert questions in a questionnaire. The level of Cronbach’s Alpha will be in the range of 0 to 1. When the value is more than or equal to 0.9, it will be excellent (high-stakes testing), between 0.7 and 0.9 is good (low-stakes testing), between 0.6 and 0.7 is acceptable, between 0.5 and 0.6 is poor, and if Cronbach’s Alpha is less than 0.5, it will be unacceptable for the reliability test [14].

The normality test is used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed. Also, it was used to determine what type of test suitable to be used for further analysis. The Kolmogorov-Smirnov test is used in this study because the sample size is more than 50.

Inferential statistics main role is to determine whether the two populations based on samples from both populations are statistically different or not. The main role is to compare the ratings overall given by respondents who had experienced with Uber services and taxi services. Also, inferential statistics used to compare the ratings given by Uber and taxi users within the aspect of their services like accessibility, comfort of rides, safety of rides, and value for money.

The test for comparison in this study has used the Mann Whitney U Test. The Mann-Whitney U test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. This test is the non-parametric test alternative to the t-test for independent samples, and it been selected since it is not appropriate to use the t-test for Likert scale data. It evaluates whether the ranks for two groups differ significantly. This test is selected to determine the probability that the two samples which are the taxi and Uber are the same with respect to an aspect tested. The null hypothesis of the Mann Whitney U Test is “There is no statistically significant difference between the 2 groups” meaning, there is no significant difference between Uber and Taxi.

3. Results and Discussion

3.1. Descriptive Analysis

Table 1 provide the information of the respondents’ profile. Based on the table, most respondent are female, age around 21-30 years old, and income for category others (students/unemployment). Figure 1 until Figure 2 represent the respondents’ profile for both taxi and Uber.

| Profile | Category | N  | Percentage (%) |
|---------|----------|----|----------------|
| Gender  | Male     | 90 | 43.9           |
|         | Female   | 115| 56.1           |
| Age     | 11 - 20  | 3  | 1.46           |
|         | 21 - 30  | 154| 75.12          |
|         | 31 - 40  | 33 | 16.1           |
Based on Figure 1, it is found that the female respondent had contributed more to this study for both services, the taxi and Uber.

Figure 2 shows that most of the users for both the taxi and Uber are from 21-30 years old. The taxi users contributed more compared to Uber for all age categories except for 21-30 years and 41-50 years old. There was no respondent from Uber users for 11-20 years and above 51 years old category while there is no respondent from taxi user for 41-50 years old.
Figure 3 shows that the highest respondents for the taxi are those with income around RM1000 - RM2499 monthly while for Uber are those unemployment or students. Uber has a lower number of respondents than a taxi for all income categories except for income category of RM4000 – RM5500 monthly.

There are four main factors considered by the respondents in choosing door-to-door public transportation; accessibility, comfort of ride, safety of ride and value for money. Each factors has three questions that had been asked to the users. The summary of the factors, no. of item and the percentage of users chosen in the study is provided in the Table 2.

| Factor         | No. of Item | N  | Percentage of respondents (%) |
|----------------|-------------|----|-------------------------------|
| Accessibility  | 3           | 45 | 22.0                          |
| Comfort        | 3           | 16 | 7.8                           |
| Safety         | 3           | 92 | 44.9                          |
| Value for money| 3           | 52 | 25.4                          |

Based on the Table 2, we can see that 44.9% of the respondents had thought that the most important aspect of selecting the service is the safety of the rides then followed by the value for money with 25.4% and the accessibility with 22% while lastly, only 7.8% had chosen the comfort of rides. Therefore, we can conclude that, for most of the users, the safety of ride is the most important aspect of selecting door-to-door public transportation.

3.2. Reliability Test
Reliability test was performed to investigate the reliability of the questionnaire distributed. The acceptable value of coefficient reliability is more than 0.60 with the higher values symbolizing higher reliability.
Table 3. Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| 0.964            | 0.965                                       | 12         |

From Table 3, we can see that the Cronbach’s alpha is 0.964, which indicates a high level of internal consistency of our scale with this specific sample. Then, we proceed with the comparison test using the Mann Whitney test.

3.3. Comparison Test
The comparison test using Mann Whitney test is used to fulfil the second objective of this study. The hypotheses statements for each aspect considered are:

\( H_{01} \): There is no difference for accessibility between Uber and taxi from users’ perception
\( H_{11} \): There is difference for accessibility between Uber and taxiusers’ perception

\( H_{02} \): There is no difference for comfort of rides between Uber and taxiusers’ perception
\( H_{12} \): There is difference for comfort of rides between Uber and taxiusers’ perception

\( H_{03} \): There is no difference for safety of rides between Uber and taxiusers’ perception
\( H_{13} \): There is difference for safety of rides between Uber and taxiusers’ perception

\( H_{04} \): There is no difference for value of money between Uber and taxiusers’ perception
\( H_{14} \): There is difference for value of money between Uber and taxiusers’ perception

\( H_{05} \): There is no difference for overall aspects between Uber and taxiusers’ perception
\( H_{15} \): There is difference for overall aspects between Uber and taxiusers’ perception

The results of the comparison test for each important aspect considered by users are shown in Table 4.

Table 4. Comparison test for each aspect considered between the taxi and Uber from users’ perception

| Factor      | Item                                                                 | Median of Uber | Median of Taxi | P-value |
|-------------|----------------------------------------------------------------------|----------------|----------------|---------|
| Accessibility| Easy to access when getting a ride                                   | 4              | 3              | 0.004   |
|             | Available for 24 hours                                               | 4              | 3              | 0.000   |
|             | Bring me to the exact location                                       | 4              | 4              | 0.047   |
| Comfort     | Interior is clean                                                     | 4              | 3              | 0.000   |
|             | Friendly and Courtesy driver                                         | 4              | 3              | 0.018   |
|             | Well maintained air-conditioned                                      | 4              | 3              | 0.018   |
Based on Table 4, we can say that all the p-value is less than the significant value of 0.05, these indicate that there is a different for the aspect of accessibility, comfort of ride, safety of ride and value for money. In order to determine which service is better from the users’ perception, then we did a comparison of the median for each aspect as shown in Table 4. For all aspect considered, the results show that the Uber was rated higher than taxi. It can be conclude that the services provided by Uber is better than the taxi from the users’ perception.

The overall comparison had been done and the results are shown in Table 5.

### Table 5. Comparison test for overall between the taxi and Uber from users’ perception

| Aspect               | Median of Uber | Median of Taxi | p-value |
|----------------------|----------------|----------------|---------|
| Accessibility        | 4              | 4              | <.000   |
| Comfort Of Rides     | 4              | 3              | <.000   |
| Safety Of Rides      | 4              | 3              | <.000   |
| Value For Money      | 4              | 3              | <.000   |
| Overall              | 4              | 3              | <.000   |

The results show that the p-value for each aspect is very small, so it can be concluded that there is a different for the overall aspects of choosing door-to-door service provided by the taxi and Uber. In order to determine which service is better, then we did a comparison of the median score for both services. The median scores for Uber are higher than taxi for all of the aspects except in “Accessibility” where both has 4 median score. But for overall of the services, Uber score higher than taxi which Uber had 4 median score while taxi had 3 median score. Thus we can say that Uber was rated higher than taxi for overall of the services and conclude that Uber had given better services than taxi overall from users’ perception.

### 4. Conclusion

In conclusion, most of the respondents in Kuala Lumpur had said that the most important aspect for them in selecting door-to-door public transportation like a taxi or Uber had been regarding the safety of ride. Therefore, the service providers might want to focus more on maintaining the quality of their services in terms of safety.

Then, it had been found that Uber had provided better services than a taxi in terms of comfort, the safety of rides and value for money from users’ perception in Kuala Lumpur. This might have
occurred since Uber had only been operating just a few years when the taxi had been operating for a long time. Therefore, most of the car used by Uber is fresher and newer when compare to taxi which might influence the users’ perception. Lastly, it has been proved that the overall services given by Uber are better than a taxi from the users’ perception.

By March 2018, Grab has integrated Uber’s ridesharing in the region into Grab’s existing multimodal transportation and fintech platform. With the combined business, Grab drives towards becoming the #1 online-to-offline (O2O) mobile platform in Southeast Asia. Grab has extend its leadership as the most cost-efficient Southeast Asian platform, as it takes over Uber’s operations and assets in Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. As part of the acquisition, Uber will take a 27.5% stake in Grab (https://www.grab.com/my/press/business/grab-merges-with-uber-in-sea/, 2018).

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References
[1] Anokye, M. (2013). Application of Queuing Theory to Vehicular Traffic at Signalized Intersection in. American International Journal of Contemporary Research, 1.
[2] Chieh, C. J. (2013). i Six Sigma. Retrieved June 28, 2017, from iSixSigma: https://www.isixsigma.com/tools-templates/hypothesis-testing/making-sense-two-sample-t-test/
[3] Fahmi, A. (2016). The Taxi Review: Malaysia Content. Mediterranean Journal of Social Sciences, 1.
[4] Ikhlas F. Zamzami, N. A. (2016). Investigating User’s Opinion on Factors Influencing the Usage of New Mobile Services. International Journal of Advanced Research, 1-4.
[5] Judd Cramer, A. B. (2016). Disruptive Change in the Taxi Business: The Case of Uber. National Bureau of Economic Research.
[6] Kiplinger, L. (2016, February 21). USA TODAY. Kalamazoo shooting: A look at Uber background checks.
[7] Laerd Statistics. (2013). Retrieved June 20, 2017, from Independent t-test using SPSS Statistics: https://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php
[8] Lim, A. (2014, August 28). paultan.org. Retrieved April 20, 2017, from paultan.org: https://paultan.org/2014/08/28/uber-needs-comply-local-transportation-laws/
[9] McGregor, M. (2016). Disrupting the cab: uber, ridesharing and the taxi industry. Peer Production, 1.
[10] NISTAL, P. D. (2016). Comparative Study of Uber and Taxi Characteristics. 1-14.
[11] Rahel, S. (2016). Economics of the Taxi Industry: An Uber Shake-up. Wyoming Scholars Repository, 2-5.
[12] Reporters, F. (2014, August 30). SPAD bent on protecting taxi monopoly. Retrieved April 22, 2017, from FMT News: http://www.freemalaysiatoday.com/category/nation/2014/08/30/spad-bent-on-protecting-taxi-monopoly/
[13] Smith, S. (2013, April , 8). qualtrics. Retrieved April 26, 2017, from qualtrics: https://www.qualtrics.com/blog/determining-sample-size
[14] Tavakol, M & Dennick, R. (2011). Making Sense of Cronbach’s Alpha. International Journal of Medical Education. 2:53-55 Editorial.
[15] Uber. (n.d.). Retrieved April 20, 2017, from Uber Estimate: https://uberestimator.com/country/malaysia