Comparative Study of Uber and Regular Taxi Service Characteristics

PATRICK D. NISTAL
Undergraduate Student
Institute of Civil Engineering
University of the Philippines
Diliman, Quezon City 1101
E-mail: patnistal@yahoo.com
Tel: +63-9178951142

DR. JOSE REGIN F. REGIDOR
Professor
Institute of Civil Engineering
University of the Philippines
Diliman, Quezon City 1101
E-mail: jfregidor@up.edu.ph
Tel: +63-2-9288305

Abstract: Uber is a Transportation Network Company developed to connect passengers and drivers through a smartphone application. Despite the fact that Uber has grown and expanded internationally in the past 6 years, it faces legal and social issues more specifically an uproar among taxi drivers, operators, and groups due to the fact that it became the industry's disruptor. The main purpose of the study is to systematically differentiate Uber with the conventional taxi in terms of categories mainly classified under user perception. Uber is analyzed in comparison to existing ridesharing models. A user perception survey was conducted online as well as through actual interviews. The demographics, usage dynamics, service experience, and preferences of respondents were recorded. Descriptive statistics is mainly used in making simple summaries with the help of graphical representation. Inferential statistics is used mainly to determine if the sample means are statistically different. That is, answers by respondents who have not tried Uber and by respondents who have tried Uber are established as having significant differences. Ratings on multiple service aspects of Uber and the taxicab are also analyzed statistically. An analysis on the correlation of perceptions and demographics given by regular Uber users is also conducted. Study outcomes show that experiencing Uber creates a negative perception on the taxicab. Uber also has significantly higher user ratings for all service aspects including vehicle condition and driver performance. Uber users also have a better financial status than those who have not tried Uber yet. They also are more likely to belong to the workforce and have more cars, making people "want more rides rather than cars". The only visible problem of Uber is its surge pricing feature.

***Key words*:** Uber, Regular Taxi, Perceptions, Service Characteristics

1. INTRODUCTION

1.1 Background of the Study

Uber was founded by Travis Kalanick and Garret Camp at San Francisco back in 2009. Since then, Uber has become an international transportation network company, with operations at over than 58 countries and an estimated $62.5 billion valuation as of December 2015.

The main concept of Uber is creating a connection among passengers and drivers using their own private passenger vehicles by means of the internet. A Global Positioning System transmits the pick-up location of the driver. The passenger can see the location of the approaching vehicle, details of the driver and vehicle, and estimated time of arrival. Upon entering, the driver sets the official start of the ride and sets the official end upon reaching the destination. The application computes the fare as a function of time and distance.

The regular taxicab is a conventional mode of transportation. A passenger can access a taxicab by hailing, waiting in line at a taxi bay, or booking through phone call or application. Taxicabs have installed analog meters that computes the fare. The only method of payment in this mode is cash.

The recent year has shown the rapid growth of Uber and its establishment as a new mode of transport in Metro Manila. Its leverage on technology has since then became a trend in the global public transport industry. Uber initially mobilizes luxury sedans but now a famous low-cost variant called UberX caters to more drivers and the mass consumer base. With the help of good social media marketing and aggressive recruitment of drivers, Uber has expanded with such a rapid rate.

Uber brands itself as a ridesharing application at its emerging months, with drivers usually owning their own vehicles and having another full-time job. They drive around at their free time, making use of Uber's flexibility. As Uber expanded to the Philippies, its business model seemed to change, with most drivers not owning the vehicle, and working at Uber full-time.

1.2 Statement of the Problem

Despite the fact that Uber has been conducting operations in the Philippines for over a year, there is still a lack of parameters clearly defining it from the conventional taxi. These parameters can be classified into the business side and the service features of the company. Also, there is a lack of general categorization for the company. There is confusion to what mode of vehicular public transport it falls under, either under carpooling or ridesharing, or just a modification of the taxi.

1.3 Objectives of the Study

The main objective of the study is to conduct a perception analysis of Uber/Taxicab users and non-users. A basis of comparison of Uber versus the taxicab is the point of view of the commuting public. This way, a layout containing the advantages and disadvantages of one mode over the other as well as the demography and preferences of each mode's existing market can be created.

Another objective of the study is to classify Uber under a transportation model. There is much confusion as to how Uber is classified. No consensus has been made with regards to its nomenclature. The study aims to resolve this matter by defining related models, relating characteristics of Uber present in these models and determining if Uber is a composite model in itself.

1.4 Significance of the Study

As rapid technological advancements of transportation services begin to create a subvariety of transport modes, the study can serve as a systematic framework for revising or creating a new transportation classification. The proper classification is vital in creating policies and requirements for the legality of these new modes.

Also, the results of the user perception survey can be used in pinpointing aspects of the service that have low ratings, as well as give solutions to the most common problems encountered by riders.

1.5 Scope and Limitations

The study will conduct extensive physical research only on Uber Philippines. Any comparison made with Uber abroad will be based on journal references due to time and budget limitations. The study will not evaluate nor propose modifications on the Uber smartphone application, thus will only concentrate on the transportation service of the company.

The study concentrates on UberX since this mode is most closely related to the taxicab. In the study, the name "Uber" particularly pertains to UberX.

To avoid bias, postings of the user perception survey in social media platforms would be limited in public groups not related to Uber nor the taxicab. By the time of this study, Uber has operations also at Cebu, but this study will focus Uber in Metro Manila where it is more

established and has clearer competition with the taxicab. The most ethical way in asking questions is followed. Inquiry on the income class and willingness to pay surge is optional.

The user perception survey is conducted with an assumption that all respondents must have already trued riding a taxicab being it the more establisehed mode of transport. Separate analyses will be conducted on data of respondents who have tried or have never tried Uber. There are no limitations about the demography of the respondents.

Lastly, the results of this study cannot represent other TNC variants currently operating in Metro Manila like GrabCar and Grabtaxi. This is due to some reasons. One, Uber is the pioneer and the most widely known TNC variant worldwide. Aside for more abundant journal references, Uber's history is relevant because by the time competitors arise, Uber already started to establish itself thus the initial reaction of the taxicab market has already been recorded.

Regarding the user survey, uniformity is achieved when a specific brand is being evaluated. Grabcar and Uber also have some operational aspects as to which may result to a diversified perception. Some examples are different pricing schemes, number of registered drivers and mobile interface.

As for the case of Grabtaxi, the study focuses on private cars with no markings (name of operator, vehicle number etc.) both at the exterior and interior. This aesthetic difference is also evaluated in the study. Simultaneously, a separate study is conducted by other researchers at the UP Institute of Civil Engineering comparing Grabtaxi and Regular Taxi.

1.6 Conceptual Framework

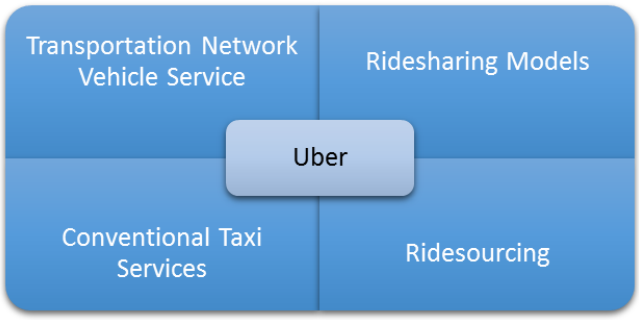

Figure 1. General Conceptual Framework

The study falls under the concept of Land Vehicular Public Transport- which only covers the use of cars. Under this concept, Uber is compared in relation to TNVS, Ridesharing, conventional taxi service, and ridesourcing.

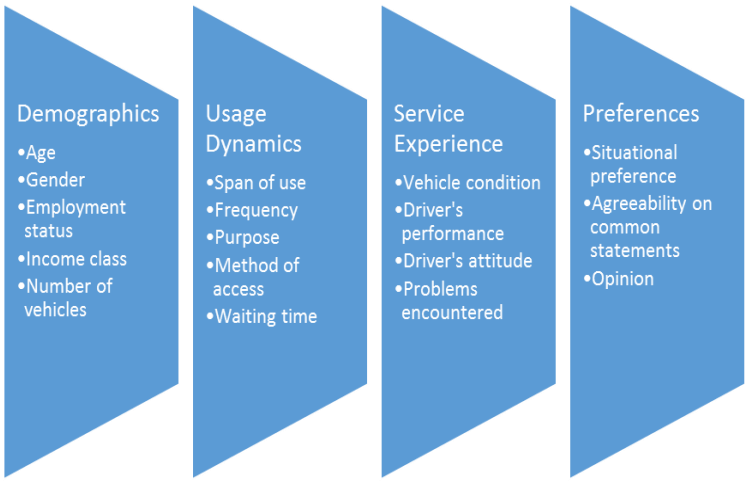

Figure 2. Categorical Classification of Uber and Taxicab

Four major information groups are collected by the user perception survey. Demographics refer to the socioeconomic background of the population. Usage dynamics refer to how, when, where and why respondents use Uber or the taxicab. Service experience pertain to how respondents give ratings among different aspects, including problems encountered. Preferences are relating to what transport mode respondents are more likely to use under different circumstances and their opinion on common statements generalizing Uber and the taxicab.

2. RELATED LITERATURE

Some social and economic consequences of Uber are (1) Reduction of search costs particularly on time, effort, and uncertainty of a passenger (2) Better overview of quality and prices, such as the rating system and the price estimation (3) Better utilization of assets that may result in consumer welfare and efficiency in transport services (Acevedo & Maciejewski, 2015).

Uber has emerged to be the leader of the "Sharing Economy". The sharing economy uses unmobilized assets and turns them into services (Lieberman et al., 2015). This sharing economy can mobilize the productivity of a million individuals. In the case of Uber, 'willing' drivers are matched with paying customers looking for rides, hence Uber is being labeled as a "ride-sharing" service by many. (Chen, Mislove, & Wilson, 2015)

Uber is well known to be the taxi industry's "disruptor". Whether people like it or not, Uber is starting to win the taxi passenger market. But once a taxicab company or group had a lock-in off all taxicabs in a given jurisdiction, it had little incentive to modernize or innovate its services. This is the case of Northern Virginia USA, where the Arlington Yellow Cab company has 455 out of 787 cabs. Jurisdictions also have rules preventing drivers to switch companies. By controlling the number of taxicabs in an area, the systems guarantees work and promises drivers with a living wage. The trade-off with a small wage is job security. These limitations ensured drivers that they have enough work to make a living (Liss, 2015).

Uber Philippines officially launched on February 11, 2014 and right away, the Land Transportation Franchising and Regulatory Board or LTFRB did not want it to operate without proper franchising. "We will contact them to stop them and they will be called to a public hearing and be issued a show-cause order," LTFRB chair Winston Ginez told InterAksyon.com. Not long has passed before the taxicab operators filed complaints against Uber for its 'colorum' operations around Metro Manila. By this time, Uber's service is limited to the Makati and Ortigas areas only (Nieves, 2014).

May 2015 marks as a historical month for Uber and app based transportation services in general after the Philippines became the first country to develop nationwide ride-hailing regulations, making it legal for companies such as Uber to operate anywhere in the country. According to Department of Transportation and Communications secretary Jun Abaya, "Technological innovation is a driver for progress in transportation where safer and more convenient communing options are offered to the public" (Alba, 2015).

3. METHODOLOGY

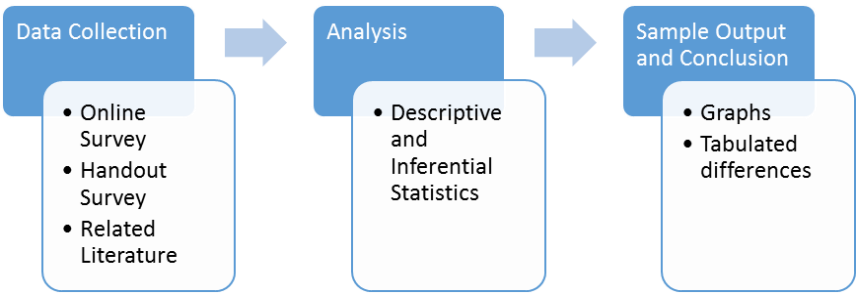

Figure 3. General Methodological Framework

3.1. Data Collection

For the user experience and perception part of the study, a public survey was conducted in two forms. One is by online means, posted in social media platforms (Facebook and Twitter). The other one is by physical means through handouts. Respondents input data on their demographics, ratings based on experience, preference, and thoughts on multiple ideas about Uber and the taxicab

3.2 Sampling

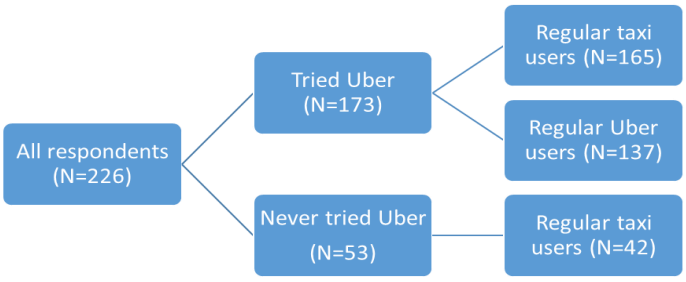

Figure 4. Survey Sampling Distribution

A total of 226 respondents answered the survey. This group is broken down into 2 major samples, respondents who have never tried Uber and respondents who have tried Uber. Respondents with a span of use of less than a month and a frequency of "rarely" and "1-3 times a month" are not considered as regular users. Those who also have a span of use of 1-4 months and a frequency of "rarely" are not considered.

3.3 Analysis

Descriptive statistics will be used on all survey items. Simple summaries and analysis through graphical representation will be made. Usually, the modal answer, spread, and central tendency is gathered and discussed. Ratios are also used, particularly in gender analysis.

The main role of inferential statistics is to determine whether two population means are statistically different or not. The main role of inferential statistics is comparing ratings given by respondents who never tried Uber versus those who have already tried Uber. Also, inferential statistics is used in comparing ratings given to the taxicab versus those given to Uber among different aspects of their service.

The inferential test for comparison used in this study is the T-test for two independent samples or the Student's T-test. The test determines a probability that two samples are the same with respect to a variable tested. This can also be performed even if the two samples do not have an equal number of data points. The null hypothesis of the T-test is "The difference between population means is 0", meaning, there is no significant difference between the 2 means. For this study, Minitab 15 is the software used in conducting T-test

The study assumed a confidence interval of 95%. In applied practice, confidence intervals are typically stated at the 95% confidence level. A P-value less than 0.05 (5% margin of error) means that we are more than 95% certain that the two sample means are different. Therefore we reject the null hypothesis.

3.4 Output and Conclusion

Results for the user perception survey will be presented through graphical form. Graphs of different respondent groups answering a similar question will be combined or presented side by side for easier comparison and application of descriptive statistics. Raw data composing of number of respondents per item of choice will be presented in tabular form. Results of the inferential statistics (T-test and tests for normality) will also be presented in this manner for easier access in checking which data sets are statistically different based from their respective tests.

4. CLASSIFICATION OF UBER

4.1 Uber as Ridesharing

Uber is closely related to *Organized Ridesharing* where Uber is a matching agency. A matching agency does not own any vehicles but instead finds car sharing offers and connects them with existing requests. In order for matching agencies to work, passengers need to see a surplus of available drivers and drivers need to see an abundance in demand.

Uber is not a form of ridesharing due to a number of reasons. First, traditional ridesharing is not a commercial service. It is where individuals share a ride with a common origin and destination. Passengers are more likely to have the same itinerary with the driver. Ridesharing's main purpose is to cut down travel costs. Uber's main purpose is profit.

4.2 Uber as Carpool

Any form of carpooling is also classified as ridesharing. Carpooling can either be family, employer-based, slugging, ride-matched, and real-time. Uber closely resembles that of a real-time carpool. Both use a phone or tablet-based application in real time but a real-time carpool only locates commuters along a common route. Same differences as those of ridesharing also applies. A driver can pick-up a ride request only when it is on his way. As for the case of Uber, a driver may pick-up a request anywhere within the bounds of the service.

4.3 Uber as a Transportation Network Company

A transportation network company is defined by the LTFRB Memorandum Circular 2015-15 as an:

"organization whether a corporation, partnership, or sole proprietor, that provides pre-arranged transportation service for compensation using internet-based technology application or digital platform technology to connect passengers with drivers using their own personal vehicles"

Unlike ride sharing and carpooling, a TNC has "entrepreneurial" drivers. Meaning, the main motive of a TNC driver is profit. TNCs also pick up passengers who are seeking one-way rides. Unlike some methods of carpooling where some passengers enjoy a two-way ride. In the United States, concerns have been circulating TNCs about drivers refusing to provide rides in disadvantaged areas, the requirement of a smartphone (meaning, lower income classes are excluded from the service), and the vehicles not required to be handicap accessible.

4.4 Uber as a Transportation Network Vehicle Service

A Transportation Network Vehicle Service or TNVS covers vehicles that provide pre-arranged transportation services using online based application to connect passengers with drivers using their own vehicles.

A TNVS is a classification used to define vehicles, not operators. Technically, it is wrong to say that Uber is a TNVS. Instead, Uber operates TNVS vehicles, and are required to register them with the LTFRB.

4.5 Uber as a Taxi Service

Both Uber and the taxi provide door to door service. Uber best resembles a taxicab in a pre-booked market. In a conventional pre-booked market, customers contact an operator or dispatch company through telephone. Unlike in a hail market, a pre-booked market gives customers the freedom to choose a preferred operator. This encourages operators to improve their service in order to attract loyal customers. A pre-booked market also gives true door-door service as customers dictate the pick-up location, a feature not possible by hailing a taxi by the street and by waiting in line at a taxibay.

5. PERCEPTION ANALYSIS OF UBER VS. THE TAXICAB

5.1 Demographics

Table 1. Respondents' age distribution

	Taxi Users	Taxi and Uber Users
Mean	24.2075	24.4971
Median	21	23
Mode	21	21
Std Dev	8.6366	6.1015

Survey respondents are on average 24 years old, with a modal age of 21. Majority of these respondents are females and are either college undergraduates or employees of private companies. Most respondents who never tried Uber are college undergraduates, but public and private employees mainly compose users who have tried Uber.

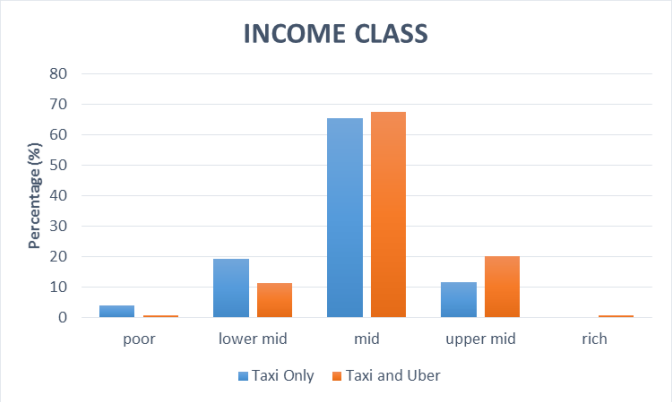

Figure 5. Income class distribution

Respondents are not given basis in annual income as they were asked about their income class, thus making the inquiry more of how they perceive their income class to be. Respondents mostly selected the middle class, but the upper middle class are composed more of users who have tried Uber while the lower middle class are composed more of users who never tried Uber.

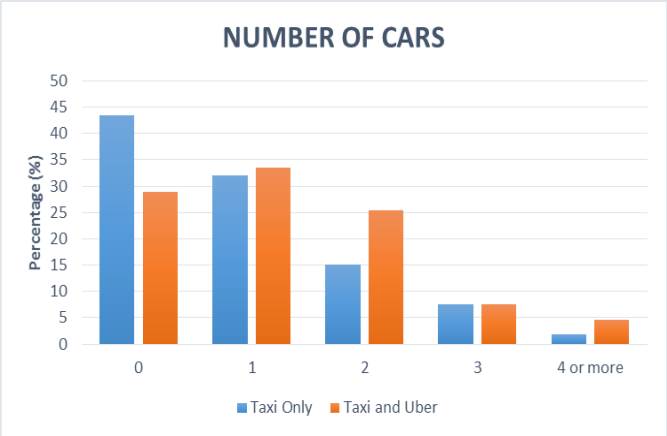

Figure 6. Number of cars

Respondents who have tried Uber have generally more cars than those who never tried Uber. Those who have never tried Uber are also more likely to not own any cars. As to who drivers their car, respondents who have not tried Uber are more likely to drive their car while those who have tried Uber are more likely to have a household member, friend, or personal driver to drive for them. As to motorcycles, most respondents do not own any but a slightly higher percentage of respondents who never tried Uber owned one or more.

5.2 Effect of Uber to Perceptions on the Taxicab

Table 2. Advantages of taxi over mass transportation

	MEAN – Never tried	MEAN – Tried Uber	P-VALUE	Null hypotheis
More convenient than mass transpo	4.286	3.91	0.014	reject
Available for 24 hours	4.238	3.933	0.072	fail to reject
Travel time is less than mass transpo	3.95	3.8	0.437	fail to reject
I can carry more luggage	4.38	4.1	0.125	fail to reject

Brings me exaclty to my destination	4.452	4.382	0.637	fail to reject

Experiencing Uber causes a negative perception on the taxicab. Statistically, users who have tried Uber still consider the taxicab's advantages over mass transportation. Although this is the case, those who have tried Uber gave a significantly less rating on the taxicab's convenience. For all ratings on different aspects of the taxicab's service, P values are less than 0.05, hence the mean ratings given by respondents who never tried Uber versus those who have tried Uber are statistically different.

Table 3. Sorted difference in mean user ratings

	Difference in Mean	**Null-hypothesies**
Driver does not demand for tip	0.9	Reject
Driver obeys traffic rules	0.85	Reject
Driver is courteous	0.843	Reject
Driver drives carefully	0.786	Reject
Interior is clean	0.764	Reject
Small change is available	0.72	Reject
Exterior is clean	0.707	Reject
Meter is sealed/runs properly	0.707	Reject
Driver is concentrated	0.539	Reject
Driver looks presentable	0.512	Reject
Vehicle is well air conditioned	0.502	Reject
Details of the driver and vehicle are well presented	0.429	Reject

For all aspects, the mean rating given by users who have tried Uber is higher than the mean rating given by users who never tried Uber. The aspects with the largest decline in mean ratings are driver related. Among those are the driver not asking for a tip, the driver obeying traffic rules, and the driver being courteous in order of decreasing rank. Those with the least decline in ratings are about the presentation of the driver and vehicle's details and about the air-conditioning of the vehicle. We can conclude that experiencing Uber makes a taxicab user give statistically lower service ratings.

5.3 Usage Dynamics of Uber vs. Taxicab

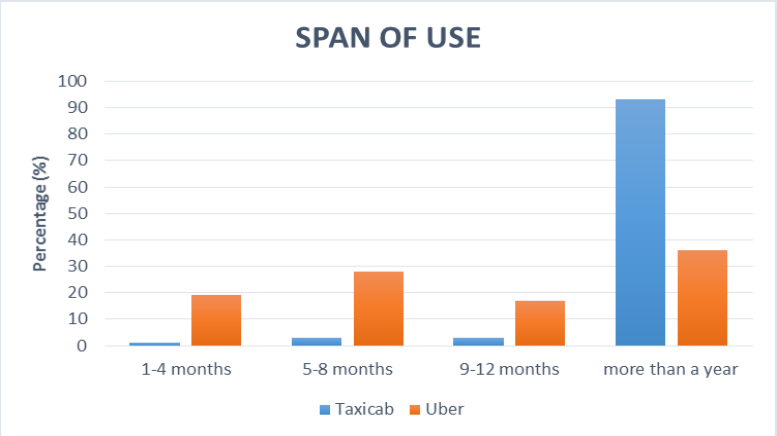

Figure 7. Span of use

Most respondents have already been riding the taxicab for more than a year, while there is an even distribution of respondents who have been riding for 1-4, 5-8, and 8-12 months. Respondents also use Uber more frequently. A respondent is more likely to pay for his own

taxicab ride while household members are more likely to pay for the Uber ride. The most common purpose of travelling by both Uber and the taxicab is due to personal matters (such as visiting family, friends, or birthday celebrations), next is attending events (concerts, festivals), then going home from school or work. Since Uber is more frequently used, more purposes are selected when travelling by Uber than by taxicab.

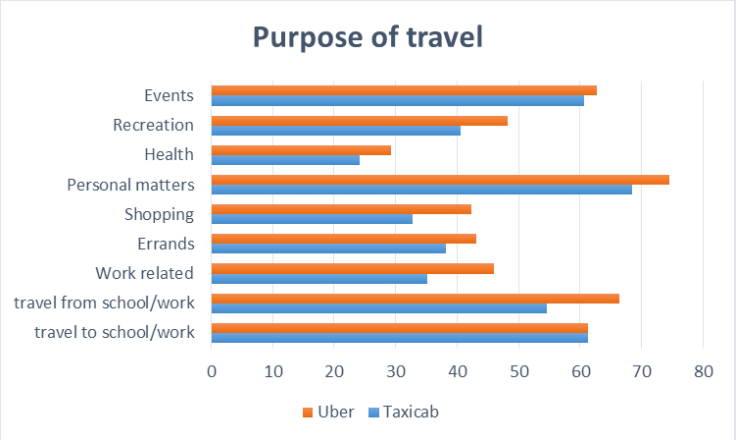

Figure 8. Purpose of travel

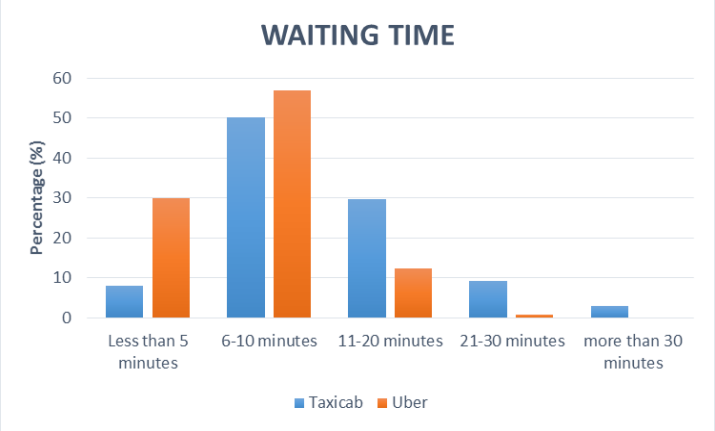

Figure 9. Waiting time

Shorter waiting times are also evident on booking Uber rides. Most selected a waiting time of 10 minutes or less when waiting for their Uber ride while more respondents have selected waiting times of 11-30 minutes and 30 minutes or more while waiting for a taxi to pass by. In spite of advances in techonology, more than 90% of respondents still hail a moving taxicab by the street, while half book through smartphone application. There were no respondents who book a taxicab through phone. The most common booking method among respondents is through another person's smartphone, while through own smartphone using mobile data at second place. Less than 5% of respondents book an Uber ride through a laptop or computer.

5.4 Service Experience on the Taxicab vs. Uber

Table 4. Advantages of taxi and Uber over mass transportation

	MEAN - Taxi	MEAN - Uber	PVALUE	Null Hypothesis
More convenient than mass transpo	3.91	4.679	0	reject
Available for 24 hours	3.933	4.453	0	reject

	MEAN - Taxi	MEAN - Uber	PVALUE	Null Hypothesis
Travel time is less than mass transpo	3.8	4.372	0	reject
I can carry more luggage	4.1	4.445	0.002	reject
Brings me exaclty to my destination	4.382	4.818	0	reject

Uber also has a statistically higher mean rating than the taxicab on all respective aspects of the service. In fact, Uber's lowest mean rating of 4.139 is still higher than the taxicab's highest mean rating of 3.19, hence all of the P-values are approximately equal to zero. Among all aspects of the taxicab's service, the presentation of the driver and vehicle's details has the highest mean rating, followed by the concentration of the driver, and the authenticity of the analog meter.

Table 5. Sorted taxi and Uber mean ratings

TAXI DATA	MEAN	UBER DATA	MEAN
Details of the driver and vehicle are well presented	3.19	Exterior is clean	4.869
Driver is concentrated	3.08	Interior is clean	4.861
Meter is sealed/runs properly	3.079	Vehicle is well air conditioned	4.781
Exterior is clean	3.055	Driver does not demand for tip	4.766
Driver looks presentable	2.964	Driver looks presentable	4.686
Interior is clean	2.879	Driver is courteous	4.686
Vehicle is well air conditioned	2.879	Details of the driver and vehicle are well presented	4.65
Driver obeys traffic rules	2.84	Driver drives carefully	4.518
Driver is courteous	2.752	Driver obeys traffic rules	4.474
Driver drives carefully	2.69	Small change is available	4.321
Driver does not demand for tip	2.22	Driver is concentrated	4.139
Small change is available	2.09		

Aspects of the taxicab with the lowest rating are driver related, with the ability to provide small change at the lowest, followed by the driver not asking for tips, then by the driver driving carefully. In the case of Uber, the aspects with the highest mean ratings are vehicle related, with the cleanliness of the exterior at first, cleanliness of the interior at second, and air conditioning of the vehicle at third. This shows the effectiveness of Uber's regulations on the age of the vehicle and the rating system where passengers can rate their overall ride. Aspects of Uber with the lowest rating is the concentration of the driver, followed by availability of small change, then the ability of the driver to obey traffic rules. Aspects with the largest difference in mean ratings between Uber and the taxicab are the driver not demanding for a tip, availability of small change, and cleanliness of the interior in decreasing rank.

Table 6. Sorted difference in mean ratings

	MEAN DIFFERENCE
Driver does not demand for tip	2.546

Small change is available	2.231
Interior is clean	1.982
Driver is courteous	1.934
Vehicle is air conditioned	1.902
Driver drives carefully	1.828
Exterior is clean	1.814
Driver looks presentable	1.722
Driver obeys traffic rules	1.634
Details of the driver and vehicle are well presented	1.46
Driver is concentrated	1.059
Meter is sealed/runs properly	-

All respondents have reported that they had a bad experience in riding a taxicab while 36% of respondents have not yet had a bad experience in using Uber. The most common problems in riding a taxicab are about the driving refusing the trip, either because the destination is out of his way, or there is heavy traffic along the way. Other common problems are the driver refusing to use the meter, instead asking for "kontrata", and the air-conditioning being too weak. The most common problem in using Uber is related to the booking process. First is that the smartphone application crashed, second is that the respondent cannot access a vehicle for more than an hour, and third is that the vehicle did not arrive.

Table 7. Overall ratings

	MEAN - TAXI	**MEAN - UBER**	**PVALUE**	**Null hypotheis**
COMFORT	3.412	4.847	0	reject
SAFETY	3.079	4.818	0	reject
VALUE FOR MONEY	2.891	4.241	0	reject
OVERALL	**3**	**4.613**	**0**	**reject**

Respondents also gave statistically higher overall ratings to Uber. Among the three overall aspects of comfort, safety, and value, comfort is given the highest mean rating for both Uber and the taxicab, safety is in second, and value is in last. Respondents have given an overall mean taxicab rating of 3 over 5 and an overall mean Uber rating of 4.613 over 5.

5.5 Preferences and Comments

Respondents are also asked about their preferred mode of transport based on certain situations. These situations simulate extremes in weather (raining outside), passenger condition (lot of baggage), time (2:00 am in the morning), and pedestrian traffic or demand (crowded event, rush hour). For almost all situations, the leading choice is travel by Uber. Only during rush hour is the situation where more respondents are undecided that those who chose Uber. Uber's surge pricing feature must be considered in this situation. The situations where there is most bias to Uber is during wee hours (it is 2:00 am) and when the respondent does not know the directions to his destination.

Table 8. Sorted mean agreeability on common statements

STATEMENT	**MEAN**	**EQUIVALENT**
Uber is sustainable for 20 years	3.92	Agree
Uber and the taxicab can coexist	3.88	Agree

Uber cars are more environment friendly	3.82	Agree
Younger generations choose Uber; older ones choose taxi	3.69	Agree
Taxi drivers know metro manila more than Uber driver	3.27	Undecided - Agree
I feel unsafe when my driver uses his phone	2.85	Undecided - Disagree

The agreeability of respondents on common statements is also tested. Among all statements, respondents mostly agree that Uber is sustainable for the next 20 years. This implies that respondents generally have a positive outlook on the long term impact of Uber's service. Respondents also agreed that Uber and the taxicab can coexist. Some common statements have an average numerical equivalent for being undecided. One of these statements is that taxi drivers know Metro Manila more than Uber drivers. Also, respondents are undecided on the statement "I feel unsafe when my driver uses his phone", which is a concern for safety.

5.6 Correlation on the Perceptions of Regular Uber users

Correlating the demography of regular Uber users show that more college undergraduates and private employees have been using Uber for less than a year while private employees have been using Uber for more than a year. Private users are also use Uber more frequenly, pay for their own rides, and also have longer waiting times unlike college undergraduates. Therefore, those who use Uber for a long time also use Uber frequently. In the case of gender, males more likely pay for their own rides while females tend to have a household member pay for them. Males also give higher ratings to the driver's performance while females give higher ratings to the driver's attitude.

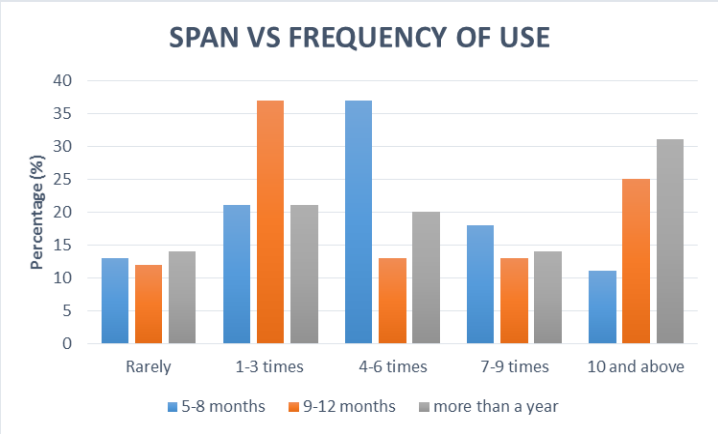

Figure 10. Span vs. frequency of use

Respondents who strongly agreed that Uber is more convenient than mass transportation were analyzed based on how they consider more specific advantages of Uber over mass transportation. Based on the mean, the advantage with the highest ratings is Uber's ability to bring the user exactly to his destination. Second is the availability of Uber for 24 hours.

Table 9. Uber's convenience based on advantages over mass transport

	Perfect Score	**Mean**
Available for 24 hours	66%	4.545
Travel time is less	68%	4.525
Can carry more luggage	75%	4.535
Brings user to the exact destination	95%	4.888

6. CONCLUSION

Uber operates with mostly the same dynamics as the taxicab, but makes its users feel like they have a personal driver in the safety of their own vehicle. Uber markets people with good purchasing power, among common users have multiple cars and are in the workforce. This makes the statement "people don't want cars, they want rides applicable in the Philippines. The survey concludes that Uber has better services and creates a negative perception on the taxicab. Uber has an edge in safety through effective information dissemination, convenience through technological advancements in booking and GPS, and comfort through newer cars and performance conscious drivers. The only clear disadvantage of Uber is its surge pricing feature. Aside from that, commuters have embraced Uber. Assuming both modes have the same price and sercice, most users will still prefer Uber.

7. RECOMMENDATIONS

Taxi drivers can get away with their rude antics due to a weak feedback system. LTFRB's existing hotline postings is inefficient as commuters find it inconvenient to call or text a representative. A smartphone application may be created as a collaboration of the government and taxi operators which enables riders to rate their drivers and report problems. Incentives can be given to riders who frequently use the application and to drivers with good feedback. A recommendation for Uber is to create more transparency with their surge price. This way, riders understand that a specific algorithm is followed resulting to their increased fare. It creates more trust between the company and its market

A supplement of the study can come at a form of inquiry on the operations side of Uber. This includes interviews with drivers and the Uber main office. Data gathered from the supplemental study can be used to verify the results of the user perception survey.

REFERENCES

Aarhaug, J., Skollerud, K. (2013) Taxi: different solutions in different segments. **41st European Transport Conference**, Frankfurt, Germany, 30 September- 2 October 2013

Alba, D. (2015) The Philippines just made Uber legal everywhere. Wired Mgazine. Retrieved from www.wired.com

Azevedo, F. and Maciejewski, M. (2015) Social, economic and legal consequences of Uber and similar transportation network companies (TNCs). Retrieved from www.europarl.europa.eu/studies

Caprette, D. (1997) Student's T-test (For Independent Samples), Rice University, Texas, United States

Chokkattu, J. and Crook, J. (2014) A brief history of Uber. Retrieved from www.techcrunch.com

Dela Paz, C. (2015) Taxis beware: gov't introduces 4 new transport categories. Retrieved from www.rappler.com

Dong, J., Filipovic, C., Leis, J., Petersen, E., Shrikhande, A. and Surdashan, R. (2014) Uber: driving change in transportation. The Fletcher School, Tufts University, Boston, United States

Furuhata, M., Dessouky, M., Ordónez, F., Brunet, M. Wang, X. and Koenig, S. (2013) Ridesharing: the state-of-the-art and future decisions. Transportation Research Part B Methodological, 28-46

Gamil, J. (2015) LTFRB sets workshop on Uber controversy. Retrieved from www.inquirer.net

Hyder, Y. (2014) Uber's evolution from San Francisco to international disruption. Retrieved from www.tc.umn.edu

Kruglak, H., Moore, J. and Mata-Toledo, R. (1998) Descriptive and inferential statistics, **Schaum's Outline of Theory and Problems of Basic Mathematics with Applications to Science and Technology**, The McGraw-Hill Companies Inc, United States

Liss, J. (2015) Uber the job destroyer. The Nation Newspaper, New York, United States. 16-21

Newcomer, E. (2015) Uber raises funding at $62.5 billion valuation. Wired Magazine. Retrieved from www.bloomberg.com

Nieves, J. (2014) From launch to sting: Uber's controversial history in the PH. Retrieved from www.unbox.ph

Rayle, L., Shaheen, S., Chan, N., Dal, D. and Cervero, R. (2014) Ap-based, on-demand ride services: comparing taxi and ridesourcing trips and user characteristics in San Francisco. University of California Transportation Center, University of California, Berkeley, United States
Rogers, B. (2015) The social costs of Uber. James E. Beasley School of Law, Temple University, Philadelphia, United States

Salanova, J.M., Estrada, M., Aifadoupoulou, G. and Mitsakis, E. (2011) A review of the modeling of taxi services, **Procedia Social and Behavioral Sciences, Vol. 20**, 150-161

Saponaro, M.A. (2013) Economic regulation in the taxicab industry: a case study of Iowa City, Iowa. University of Iowa, Iowa City, United States

Sauler, E. (2014) Driver of private car using Uber app nabbled in LTFRB sting. Retrieved from www.inquirer.net

See Uber Protests From Around the World (2014) Time Magazine. Retrieved from www.time.com

Shaheen, S. (2014) Introduction to ridesharing: overview of definitions and setting the stage. **ACT International Conference**, University of California, Berkeley, 5 August 2014

The Sharing Economy (2015) Consumer intelligence series. Retrieved from www.pwc.com/CISsharing

Yu, R. (2016) Beijing official blames traffic on popular ride-hailing apps. Retrieved from www.wsj.com