Encouraging the Ridesharing in Beijing China

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Abstract: *Ridesharing companies and local taxis are competing with each other to maximize their market-share in Beijing China, and so far, the contemporary taxis, are having the upper hand. Thus, this research paper has explored the ridesharing service in Beijing China and how can they be further improved as an alternative transportation method. To achieve the objective, the author has focused on a different area, which is essential when suggesting measures for improvement.The objectives are to; understand why some people do not use ridesharing in Beijing China, understand the service quality of ridesharing and how can it be improved, analyse user-interface of these applications to understand how convenient they are to use, determine if the frameworks used in the ridesharing applications are best suited for Beijing China version. In this research paper, using SPSS the author has analysed the response of users of ride sharing. The paper further explains the comparison between different ride sharing service providers*

Keywords: *Ride sharing, Taxi service, transportation management, Beijing China*

I. Background and Introduction

Eric Schnidit, Google CEO, once said "mobile users are growing faster than all google internal prediction". Moreover, according to reports from 2018 Global Digital, more than 4 billion people have access to the internet. Percentages for mobile internet, social media and unique mobile applications users are on the rise. Removal of geographical boundaries, due to the advancement of technology, brings new business opportunities. For example, a book can reach all parts of the globe within seconds of its release. There are many sorts of business and professions benefiting from the advancement of the mobile phone and coverage of internet with faster and faster speed. However, none of them have benefited more than the profession that includes information technology and business such a business mobile application. A successful mobile application could now earn billions of dollars within a short period, especially when that application is related to real life comfort and convenience.

The first of its kind was found in March 2009 and has now become a multi-billion company. It started with the idea to provide cheaper and more convenient private transportation. It is now operating in 600 cities across the planet and has 15 million dollars' worth trips every day. Its biggest market is the United States with 41.8 million users in 2018 and has almost 70% of the market share in the US. Lyft is another company that provides its mobile application as a platform for people needing a ride to somewhere. It was launched in 2012 and had been closely following the footsteps of Uber. The reported revenue in the first half of 2018 was 909 million dollars. In May 2018, Lyft had 35% of market share in 2018 and those figures were expected to grow further (Fortune, 2019). Unlike its arch-rival Uber, Lyft only operates in 300 cities across the United States and Canada (Fortune, 2019).Both mobile applications, Uber and Lyft, provide similar services by mainly picking up from point A to dropping at point B. The drivers are also regular individuals and are not required to be profession drivers, other than having a driving license. These two companies are leading ridesharing companies in terms of the number of users and total revenue. They set the standards for other smaller companies to follow. This makes them ideal companies to be studied and analyse their application in order to determine if there is any further development possible to expand the ridesharing and, eventually, earn more money.

II. LITERATURE REVIEW

The sharing economy has many names such as Peer-to-Peer Economy (P2P Economy), Collaborative Economy and the Gig Economy, but its core idea does not change, which is that sole ownership of any product, service, or talent is shared with more than one person. Ridesharing is one of the examples of the sharing economy (Mankin, Rivas, and Jewell, 2017; Agussurja, Cheng and Lau, 2019; Banerjee and Johari, 2019). Ridesharing an ancient concept which exists for years but in the context of developments in technology, traveling through mobile-based applications, is a new concept. While the concept of the shared ride has existed for decades, the ubiquity of digital and mobile technology and habitation increases its usage and further benefits the society. Developments in the information and communications technology (ICT) has enabled real-time

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sharing of an individual's geographical details and provided the opportunity to implement ridesharing at an optimum level in the "sharing economy".

Ridesharing applications use GPS in the smartphones to track the location of the passenger and the driver and the destination. These applications use different algorithms to decide the time, pricing and the optimum path, which the driver should follow in order to reach the passenger's destination (Teubner and Flath, 2015; Lokhandwala and Cai, 2018; Cai et al., 2019). However, at that time, these companies did not have any legal approval as a business model and therefore, were also called application-based taxi service providers. In 2013, one ruling of California Public Utilities Commotion made the Transportation Network Company (TNC) model legal. All these ride-sharing applications are examples of TNC, which are also known as a mobility service provider (MSP). However, ride sharing is one of the commonly used terms in this regard (Hong et al., 2017; Stiglic et al., 2018).

After Uber's launch in 2009, the idea of ridesharing in mobile application-based taxi services was introduced and soon many other applications from all over the world were also introduced. The table below shows the prominent companies which offer these services in different countries.

Understanding the business and technical dynamics of Ride-sharing

Ride-sharing applications are a combination of business and information technology. Therefore, it is imperative to understand the business model of those companies and technical dynamics of their application. Before the technical explanation, it is important to describe the process of mobile application-based taxi services. Most of them follow the same process and has three steps, which are request, communication, and ride.A proper application and excellent customer experience today is not an option, it is a must for the companies, as one customer complaint can go viral and it can destroy complete image of the company regarding the services (Farooq, 2019; Farooq & Raju, 2019; Farooq, Raju, Khalil-ur-Rehman, Ahmed, & Ali, 2019). These companies have a core goal to provide professional level services. Gaining convivence and reliability is the core objective of passengers while using mobile application-based taxi service compared to conventional taxis services.

Generally, customer installs the application, selects a car and book a ride using the smart device. There can be more than one car in that area to entertain the request from the passenger. Different applications use different processes, which are explained in the following section. Other than assisting the passenger, the application also assists the driver by providing them direction using different technologies and frameworks. Once drivers reach the passenger's location, the customer is notified. The notification is sent using different messaging and communication tools. The final step of any ride-hailing is the ride. After the ride, the passengers can rate the driver and in some application like Uber, the driver also rates the passenger. The driver can decide not to accept passengers with low rating and vice versa.

Once the ride is completed, the ride data is saved in the database of companies to analyze the process further, ride track and provide the optimal solution to that customer and other customer using data analytics. The figure below shows the simple process of mobile application-based ridesharing. There can be several factors which are essential in understanding these mobile applications, below section in detail will examine the following aspects:

Pricing

Companies rely a lot on the pricing strategy, but most of the companies charge a similar amount. For instance, in the USA, both Uber and Lyft charge 1$, then both companies charge $1.5 per mole and around 0.24 cent per minute. In pricing, these mobile app-based taxi service providers sometimes use another strategy, which is called "Surging". Surging means whenever there is a high demand for a taxi in some area, the prices are increased. Surging can be the real difference between company pricing. The table below compares the surging of Uber and Lyft in the US.

III. Methodology

The research question of this project is to find out and suggest how to improve ridesharing services in Beijing China.In order to get a complete understanding of the topic, this research project collected both primary and secondary data. The secondary data was collected from scholarly articles, companies' websites and government websites. The primary data was collected through questionnaires, interviews and observation.

The research of primary data was divided into three parts. In the first part, the data was collected through the questionnaire. Through the questionnaire, data on service quality of ridesharing application was collected. In the second part, interviews were conducted to collect data on technical aspects of these mobile applications, and they need to be changed to better suit Beijing China people. Lastly, three trips were taken in both taxis and through a ridesharing application to experience them first hand and also observe their differences.

Questions and Collection of Results

They were contacted using different social media platforms such as Facebook and WhatsApp. Since it was a face-to-face interview, deciding the time for the interview was a very crucial part. Since the sample were of different professions and had different daily schedules, different timings were set. Since the respondents were working full time, they were interviewed in the evenings or at the weekends. All of the responses were written on a word file. This allowed the researcher to record their response completely and refers back to them in case of mishearing.

Observation

In order to get first-hand experience, observational data collection method was used. Two trips were taken in both local Beijing China taxi and through the ridesharing application of Uber. The intention of these trips was to take a closer look at the practical approach of these two transportation methods in term of time, cost and convenience.

Data Analysis

For business component, data was collected from online on Google Forums. All the valid responses and data were downloaded in the.csv file format from Google Forums and was analysed with MS Excel. No data modification was done after the completion of data collection and during the analysis. Total of sixty valid questionnaires were completed by the respondents.

Respondent's Profile Analysis Using SPSS

		Percentage	Number
Gender	Male	50	30
	Female	50	30
Age (years)	25 or below	66.7	40
	26 to 45	13.3	8
	46 to 65	15	9
	65+	5	3
Profession	Student	58.3	35
	Employee	16.7	10
	Businessman	18.3	11
	Others (Athlete etc.)	6.6	4
Travelled before	Yes	83.3	50
	No	16.7	10
Travel frequency (for those who said "Yes" in the previous question)	Rarely	48	24
	Sometimes	38	19
	Frequently	14	7
	Daily	0	0

The respondent profile has four columns in total. The first two of the columns are the category of data, third columns are the percentage and the last column states the exact number of respondents for each category.

Overall, the sample population, in terms of gender was well balanced with both male and female have the same number of respondents. Respondents with age 25 consisted of 66.7% of the total population, making them dominate the age category. Students were also in a high percentage, 58.3 to be exact.

The respondents were categorized into two categories. The first category was of respondents who have never used any ridesharing applications before. They were ten respondents in this category. The second category was of respondents who have used ridesharing application like Uber in Beijing China to travel. They were a total of fifty respondents with varied experience of ride-sharing. Some of the respondents have only used it once or twice and others use it daily as primary means of travelling. In the category of those with travelling experience of ride-sharing, they were categorized according to their travel frequency. Most dominating of them was those who used ride-sharing applications "rarely", they consisted of 48% of the experienced travellers. The questionnaire was designed to focus on the business aspects of ride-sharing application by analysing their service quality. Questions were designed to collect data for three main aspects of ride-sharing applications, which are safety, convenience and price.

Category	Questions
Safety	Driver's skills, Vehicle condition,
Convenience	Time of arrival, Service during non-peak hours, public holidays, Severe weather conditions and at a faraway destination
Price	Compared with Beijing China taxis

Safety

In order to understand the safety of the passengers when they are travelling through any mobile application-based taxi, the respondents were asked to rate the driving skills of drivers they have travelled with and rate the condition of vehicles they travelled in. They were also asked to suggest measures to improve the safety of passengers. The results are shown below
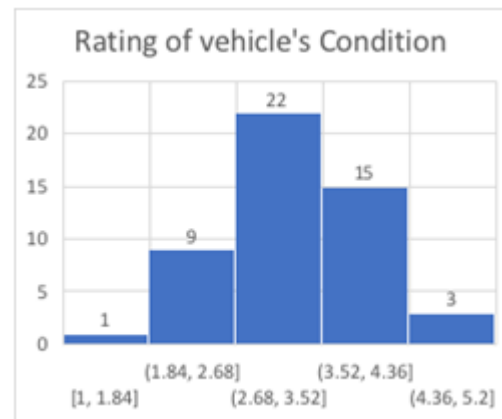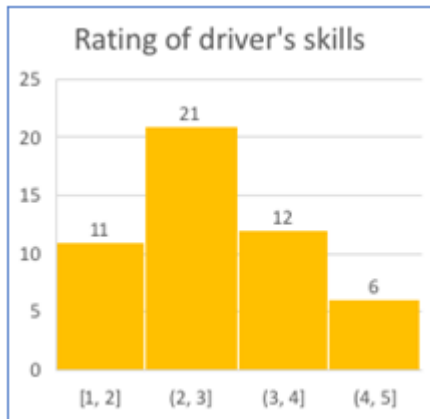
The average rating of driver's skills and vehicles condition were was 3.2 on and 3.2 the scale of 5 respectively. These ratings indicate a positive responsive from the respondent and reflects their satisfactory. But for an industry that wants to grow its customers and compete with Beijing China taxi, these ratings can be better. Also, the standard deviation was approximately for driver's skills and vehicles condition were 1.05 and 0.88 respectively, which indicates there was relatively less dispersion among respondents. However, when looked in details, it was found that the passengers that travel more often have given less rating to the drivers and those that travel less have rated drivers rather highly. The respondents were asked to choose from Rarely, Sometimes, Frequently. There were 7 "Frequent" travellers, 19 and 24 of them travelled "Sometimes" and "Rarely". The table below shows the average rating of each type of traveller.
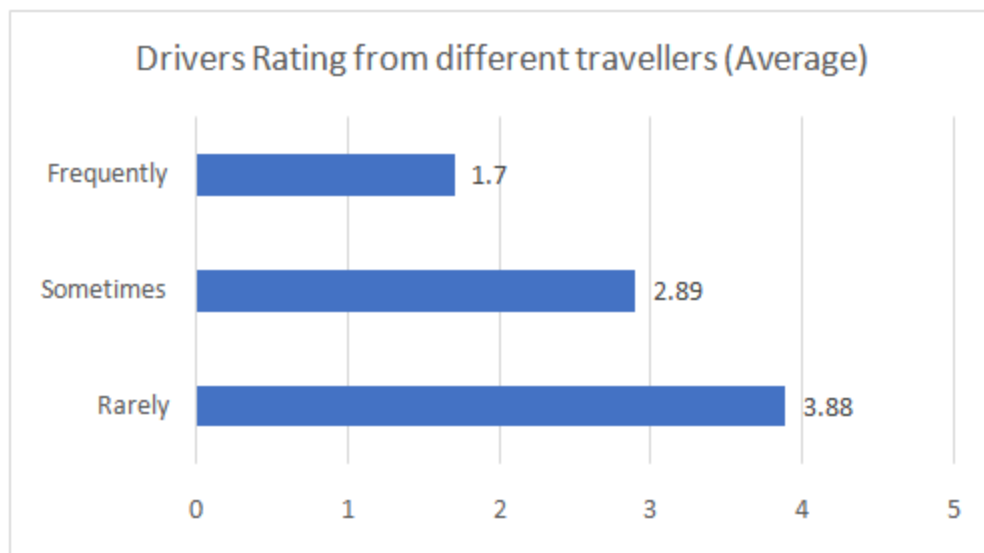
It is evident that with experience, the satisfaction of passengers with driver's skills falls. From a business perspective, it is not ideal to have customer's satisfaction level falling down continually, because at some stage they will stop using these applications and will look for some alternative ways of travelling. When asked about suggestions to improve driving skills in the ride-sharing industry, 14 respondents stated that there is need of a governing body, which will provide training to the new drivers, keep an eye on the driver's performance and the vehicle's condition and take disciplinary actions if needed. 3 of the respondents suggested that the driving skills of the vehicle owners should be tested before listing them on the applications and allowing them to be "drivers".

Eight of the respondents had a different response and said ridesharing companies should only use "self-driving cars" and reduce human interference. Self-driving car is no longer a new concept. Many automobile companies like Ford, together with companies that specialize in Artificial Intelligence, have successfully introduced driverless cars in few US states like California, Michigan, and Pennsylvania and planning to expand to other states as well. Ride-sharing tycoons are also focusing on that. Passengers in Los Angles who are hailing Lyft could ride one of these autonomous cars. They, together with a global auto parts company called "Aptiv", are testing these cars in developed Asian cities like Singapore. In 2019, Uber has managed to secure a huge amount of $1 billion for the same project of driverless cars from three Japanese investors: Softbank's Vision Fund, Toyota Denso. After these investments, the value of Uber's self-driving cars unit has reached $7.25 billion. In the previous years, Uber spent $230 million in 2016, 384 million in 2017 and 457 million on Advanced Technologies Group (ATG) which is their unit that leads the research for driverless cars (Griswold, 2019).

Complete hybrid autonomy is still in the development stages, but with such hefty investments and research, it can be expected to produce a very favourable result for the ridesharing industry in Beijing China and around the world as issues like driver' skills and vehicles conditions would be eliminated.

Convenience

One of the most important features of transportation, other than safety, is the convenience of travelling. Especially, in a city like Beijing China where many transportation methods are available to suit passenger's need to travel fast or cheap. In order to understand how convenience it is for Beijing China people to travel through ride-sharing applications, questions were designed related to the waiting time, service during non-peak hours, public holidays, and severe weather conditions and at faraway places.
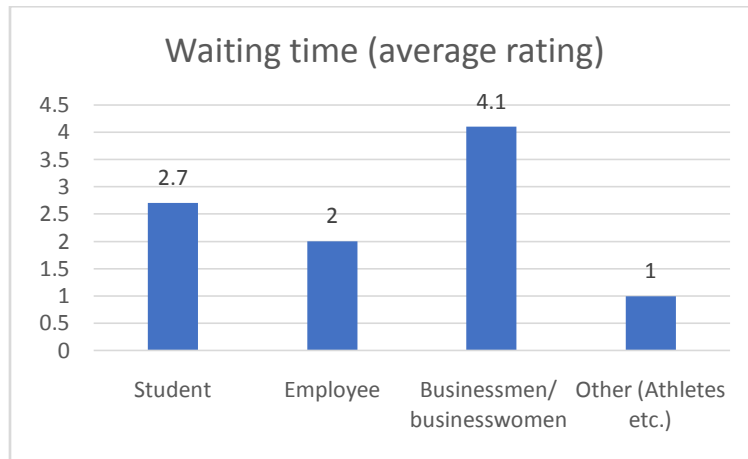
Waiting time
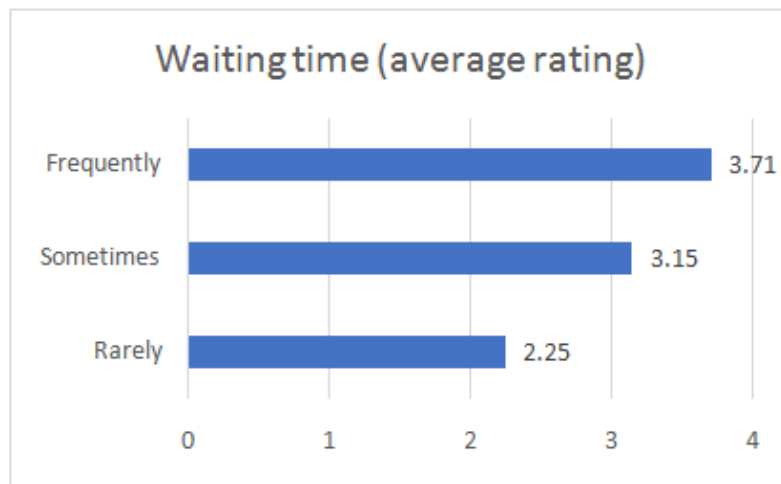
Minimum roadside waiting time is one of the main features of ridesharing applications as the ride is pre-booked. Furthermore, these ridesharing applications are competing with 18,138 local Beijing China taxis. Therefore, they should keep the waiting time minimum once the ride has been booked. However, when asked if the waiting time was reasonable, the average rating was 2.8 only, which is less than half on the scale of 5.

The standard deviation of waiting time was 1.3, which indicates that different groups of respondents have rated the "waiting time" differently. The satisfaction increases with the travel frequency of travel. People that do not have much experience of the ridesharing or tend to travel "rarely" have given the lowest average rating and those that travel more have given higher rating among the sample population. The table below shows the average rating of "waiting time" from respondents of different travel routines.

This is a strong indication that the passengers, as they gain more experience and understanding of mobile-application based taxi services, tends to understand the reason for cabs taking their time to arrive. It can be due to the fact that there was traffic on the way or simply they were just too far away from the passenger's locations. Also, it shows that drivers are very consistent with their time of arrival. Furthermore, of all the respondents, "businessmen/ businesswomen" have rated the time of arrival particularly high. Please find the table below. One of the leading ridesharing applications in Beijing China is Uber and they put special efforts to target businessmen/businesswomen. The table below shows that they have been very successful in doing that, but respondents from other professions are not as satisfied.

Waiting time (average rating)

[Bar chart showing average ratings: Student 2.7, Employee 2, Businessmen/businesswomen 4.1, Other (Athletes etc.) 1]

Non-peak hours and Public holidays

The average rating of the service during non-peak hours was 2.84 with standard deviation of 0.89, which is not that impressive given then that these ridesharing applications are trying to increase their customers in a city, which already has a good transportation system because of MTR, taxis, public buses like KMB and mini buses.
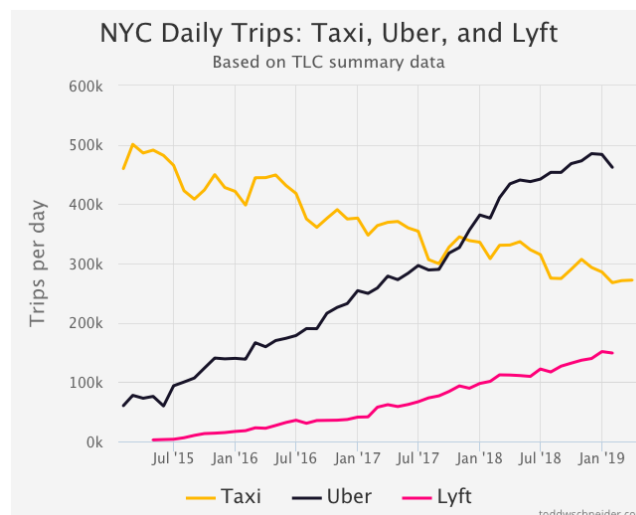
The adaptability of a transportation system can be understood during the public holidays as there is no specific peak time. The ridesharing cabs seem to be doing well in Beijing China as the average rating and the standard deviation of their service during public holidays was 3.36 and 0.77 respectively. One of the reasons for that can those drivers also has a day off and many of them are trying to utilize their free time to earn more.

The data shows a huge contradiction in terms of the service quality during non-peak hours and public holidays. The reason for that cans the demand for rides. Drivers does not earn much by working during non-peaks hours, hence the service quality is dropped. During the observation, the one of the drivers said that he was only working during the evenings of working days as to maximize his profit. He also said that his average hourly earnings during the week are more than his average hourly earnings during public holidays.

Faraway places and Severe weather conditions

The average rating of the service of ride-sharing companies in faraway places and in severe weather conditions was 2.80 and 2.81 respectively. Other transportation systems do not focus on providing their services in these areas due to low demand. However, since ridesharing is always pre-booked, they can increase their market share and profit margin. However, the safety of the passenger as well as the driver can still be an issue. The respondents felt there should be more cars available for hire. When asked for suggestions to improve, 10 respondents said that there should be more cars for hire. More cars mean that the passengers can choose that are nearby and save their time.

Furthermore, they could increase the profit margins when the driver is willing to work in severe weather conditions or at places that are not in downtown areas. the number of trips taken by taxis and for-hire vehicles:

NYC Daily Trips: Taxi, Uber, and Lyft
Based on TLC summary data

[Line chart showing Trips per day (0k to 600k) from Jul '15 to Jan '19 for Taxi, Uber, and Lyft]

toddwschneider.com

In April 2016, the most recent data shows yellow taxis provided 60,000 fewer trips per day in January 2016 compared to one year earlier, while Uber provided 70,000 more trips per day over the same time horizon. The summary reports also include the total number of vehicles dispatched by each service:
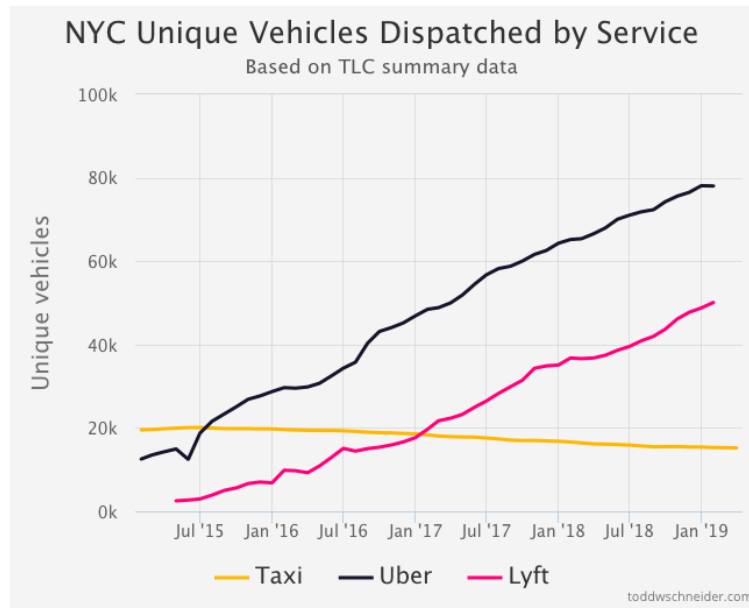
Price
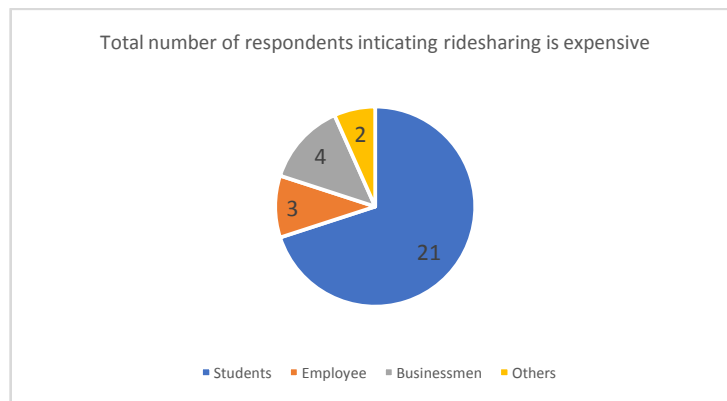
Price is one of the main important balances that can decide the success or the failure of a ridesharing platform. Customer's cost, driver's income and companies profit need to be in good balance as each of these three components can affect the overall success. Most importantly, If the prices are too high for passengers, they will simply use other means of transportation such as taxis. In that case, the drivers will not earn much as there will simply be not enough passengers and the ridesharing industry will not able to survive.

Therefore, most of the ridesharing companies claim to provide cheaper service than local taxis but when compared with the contemporary taxi in Beijing China, 30 of respondents out of 50 said that ridesharing is "quite expensive" and the rest all felt that the pricing is relatively "reasonable". Among those 30 respondents that felt that ridesharing was charging high, majority of them were students. Please refer to pie chart below. Surprisingly, none of the respondents stated that ridesharing was "cheaper" than taxis in Beijing China. If the ridesharing companies want to increase their market share, they will have to provide their services at a cheaper then taxi. During the observation, it was found that Uber was still comparatively expensive than local Beijing China Taxi. Please see the table below.

Trip Number	Pick up point	Destination	Distance	Cost (HK$)	
				Uber	Taxi
1	Kai Take Cruise Terminal	King Funk Street, San Po Kong	7.83 KM	75.28	60
2	Middle Road, Tsim Sha Tsui	Kai Tak Cruise Terminal	9.88 KM	131.62	113

The respondents suggested that ridesharing applications should reduce their travelling charges. In fact, a total of 9 respondents felt that current prices of ride-sharing application are simply too high and should be reduced. Further 3 respondents even suggested the "student discount". The discount should really make the students travel more often as 70% of students felt that it was expensive.

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