A Review on E-Hailing System in the City Centre Comparative Study Between Kota Kinabalu and Changsha City Centre

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Abstract- E-hailing is a new transportation pattern. In recent years, e-hailing has developed rapidly all over the world; it has dramatically changed the way people travel. This paper introduces the development situation of two cities—Kota Kinabalu (KK) in Malaysia and Changsha in China, and the current situation of local e-hailing. Grab and Didi, the most representative e-hailing companies in two cities, were selected. The advantages and disadvantages of e-hailing in the two towns are obtained by comparing its service provision, pricing system and security. At the same time, some suggestions are put forward for the development of e-hailing in Changsha and KK.

Indexed Terms- E-hailing, Kota Kinabalu, Changsha, Didi, Grab

I. INTRODUCTION

A. E-hailing

E-hailing is a term to describe booking rides and paying for car service through a smartphone app with a transportation network company (TNC) such as Uber, Grab or Didi. In recent years, e-hailing services have become popular around the world. This model relies on the widespread use of mobile devices, ie:smartphones, which connect private car owners with passengers through mobile phone software. It was welcomed by many people. The emergence of e-hailing has changed people's single way of travel; booking a car in advance and choosing a destination through mobile phone software has dramatically saved time and facilitated people's journey. This approach matches the mobility demand and the idle supply and reduces the cruising time, so e-hailing is considered a promising mode of transportation [1][2]. Cramer and Krueger compared the capacity utilisation rate of UberX and taxi drivers in several cities in the US. They concluded that the capacity utilization rate of UberX drivers is 30-50% higher than taxi drivers [3]. Yi et al. compared the consumption and emission of a traditional taxi business and ride-hailing mode and found that online ride-hailing mode has excellent advantages in reducing fuel consumption and emissions from air cruise [4].

B. Changsha City

Changsha is the capital of Hunan Province, China. As of the end of 2018, Changsha has a permanent population of 8.1547 million. The city's land area is 118.19 million square kilometres, of which the urban area is 556 square kilometres. Changsha city transportations are mainly cars, taxis, e-hailings, rail transportation and public transportation. Data show that in 2018, the average daily traffic volume of Changsha city was 2.202 million passengers, the average daily traffic volume of the subway was 677,000, and the average daily traffic volume of the taxi was 717,600 and the share of public transport trips reached 54.2 per cent [5].

C. Kota Kinabalu City

KK is the capital of Sabah state, Malaysia. By the end of 2017, KK has a population of about 553,900, with an average population of 1,573 people per square kilometre. KK is located in the coastal area of

northwest Borneo, facing the South China Sea and backed by Mount Kinabalu. It is a thriving fishing area of Sabah and Borneo, a famous tourist attraction, as well as an industrial and commercial area of eastern Malaysia. Tourism is an essential part of KK's economy.

According to the Malaysian Economic Monitoring Report released by the World Bank on June 2015, the public transport use rate in Kota Kinabalu is about 3-4%, and the primary mode of travel for residents is by car. According to the official report, by 2020, there will be 2.3 million registered vehicles in Sabah, of which about 60 per cent are in KK, with an average of two cars per person [6].

II. EXISTING SITUATION

A. E-hailing in Changsha

In 2014, e-hailing became popular in China, and Didi was the most popular e-hailing mobile phone application at that time. This year, Didi also entered Changsha. In June 2015, Uber, known as the originator of global taxi software, announced its arrival in Changsha. In August 2016, Didi acquired Uber's market in China, replacing Uber's market in Changsha. Therefore, Didi is basically in a dominant position in e-hailing service. Other e-hailing companies can only increase their market share through other businesses. In recent years, e-hailing has become more and more diversified in Changsha. Besides the regular e-hailing service, Didi also has launched a generation of driving services to help those who are drunk or are too tired to drive or unfit to drive. Some companies such as Lalamove and GoGoVan have also launched the e-hailing service model for cargo handling, and are very popular with the people.

In 2017, Didi published the data that the number of registered vehicles in Changsha was about 130,000, and the number of active vehicles was more than 20,000. The number of vehicle licenses was 981, and the number of drivers was 10,494.

In 2019, the total number of registered users in Changsha was about 500,000, and about 80,000 private cars are currently operated. With the urgent need for legalisation, privately-operated vehicles will gradually fade from the market, and Changsha will license approximately 12,000 cars that meet the legal requirements.

B. E-hailing in Kota Kinabalu

At present, Grab is the main e-hailing service in Kota Kinabalu and is also the e-hailing giant in Southeast Asia. In 2012, Grab was established in Malaysia and entered the Kota Kinabalu market in August 2016. In June of the same year, Uber also entered the Kota Kinabalu market.

With the emergence of Uber and Grab in Kota Kinabalu, the traditional taxi industry had a sharp decline in business [7]. In June 2017, the economic income of the traditional taxi industry in Kota Kinabalu fell by 70%.

From the beginning of the operation, Uber and Grab's business model in Kota Kinabalu and other parts of the country are facing legal issues and legal disputes, including the illegal activity of vehicles. In July 2017, the Malaysian government passed a bill in Parliament that allowed Grab and Uber drivers to operate using an "intermediary business license" to legalise the sharing of passengers [8]. In March 2018, Grab officially announced its acquisition of Uber in Southeast Asia, and Uber also announced that pulling out of the Southeast Asian market. As of October 2017, including Kota Kinabalu, Grab has more than 2 million registered drivers, and the Grab app has been downloaded to more than 68 million mobile devices. The number of rides has reached 1 billion, with an average of 3.5 million trips per day [9].

III. COMPARISON

A. Service provision

In Changsha, Didi has more options, including Didi bike, Didi Express, Didi Premier, Didi Taxi, Didi Designated Driving (to offer car owners convenient, professional and reliable driving services, freeing car owners by saving them time and efforts), Didi Hitch, Didi Bus, Didi Luxe. It can be known from the service offerings of Didi in Changsha that it contains not only essential passenger services but also provides non-carrier services, such as Didi Designated Driving. Didi Company has provided the

car service ranging from economical to luxurious met the need for different kind of passengers.

Grab, from the operating system of the software, offers 5 different types of services we can choose, including Justgrab (Find the nearest car or taxi, the fastest way to get a taxi or car), GrabCar, GrabTaxi, GrabCar (6-seater) and GrabCar (Mandarin).According to Grab's official website, we found that Grab also has luxury car service provided, but that service is not available in Kota Kinabalu. In commercial car service, Grab offers not only the 6-seater car but also the requirement that the drivers can speak Mandarin, which is specially designed for Chinese tourists and both designs better satisfied the needs of tourists.

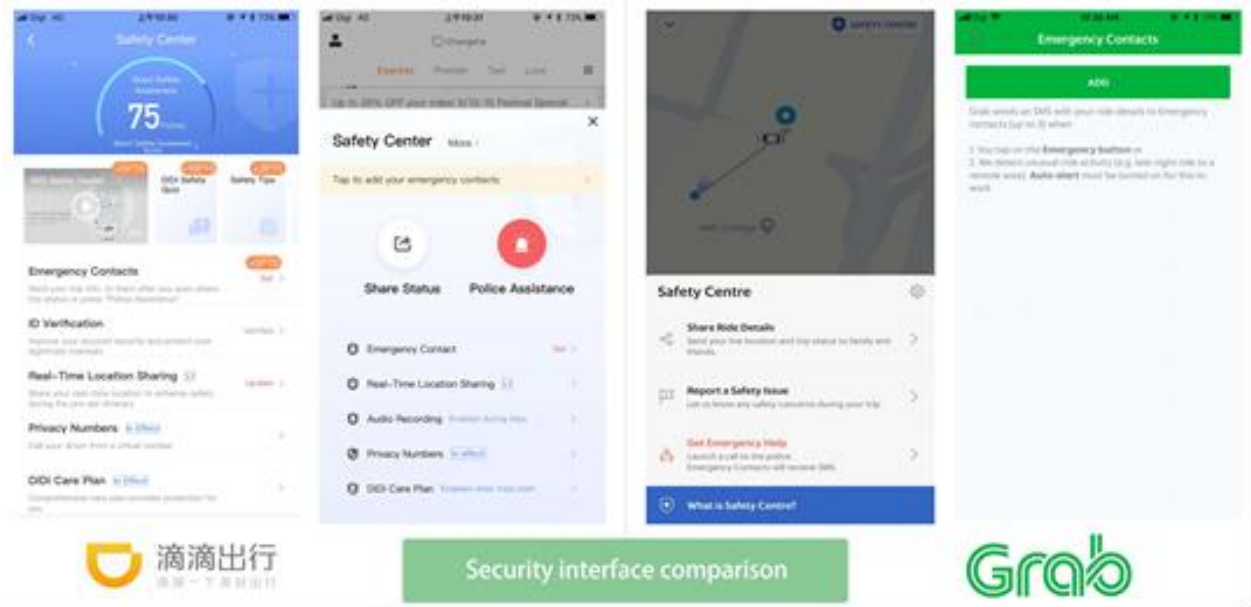

Fig.1 Security interface comparison

A. Pricing system

a) Didi pricing style(CNY)

Didi express car's pricing system consists of four parts:

Mileage fee (period of time）

00:00-07:00 2.3CNY/km

07:00-10:00 2.5CNY/km

16:00-19:00 2.3CNY/km

22:00-00:00 2.3CNY/km

the ordinary time:1.9CNY/km

b) Time fee

Didi Express costs 0.38CNY/min (Didi Luxe costs 3.6 times as much as Didi Express, Didi Premier costs 2.5 times as much as Didi Express).

c) Long-distance fee

When the mileage exceeds a certain number of miles, there will be an extended journey fee. The official rate for long-distance travel is 1.00 yuan per kilometre after the distance exceeds 15.0 kilometres.

d) Peak fee

In rush hours when passengers are waiting for a car, Didi will increase the price of the order to facilitate the transaction and encourage the drivers to receive the order faster. The fare will be paid to the driver, and the fare will be capped.

e) Grab pricing method

Grab's pricing is not an inflated price, although it also changes the initial pricing based on the congestion situation, the number of nearby vehicles, and whether it is in peak period. However, the price of this trip has already been calibrated when the order for the Grab is

confirmed irrespective of time and distance of the journey, it will be settled at the given initial price. At this point, the Grab and Didi have a more significant difference.

Table 1 Comparison of Driver and Vehicle Recruitment Requirements

	Grab	Didi
DRIVER REQUIREMENT		
Age	21-70	Male : 21-60 Female : 21-55
Driving age	≥2	≥3
E-hailing driver's license	E-Hailing PSV Licence	Ride-hailing driver's license
Health	Must Medical Check-up	/
Behavior	/	No violent criminal record No traffic crime, dangerous driving record No drug use record No driving record after drinking
VEHICLE REQUIREMENT		
Vehicle age	<10(Puspakom car inspection if your car older > 3)	<8
Vehicle standard	/	Vehicle price and vehicle wheelbase are not lower than local taxi standards
GPS and emergency equipment	/	The vehicle needs to install a satellite positioning device with recording function, emergency alarm device
Miles	/	<600000km
Vehicle permit	E-Hailing Vehicle Permit	Ride-hailing vehicle transport permit
Environmental protection requirements	/	Vehicle emissions comply with government-defined vehicle pollutant emission standards
Insurance	Grab has a daily insurance payment available	Operating vehicle related insurance

B. Security

a) Security protection on the operating system

Figure 1 shows a comparison of the security features of Didi and Grab software. In terms of software operation, Didi includes Emergency Contacts, ID Verification, Real-Time Location Sharing, Privacy Numbers, Didi Care Plan, Emergency button (if you press the button, your phone will dial to the local police immediately, and your Emergency Contacts group member can also get the message) and voice recording system. Although, Grab also contains essential and similar features, such as Emergency Contacts, Real-Time Location Sharing, Emergency button. However, Didi users must be authenticated by real-name and have a voice recording system during the service while Grab does not need real identity information. Didi can provide more information to the police in the emergency, and Didi is somewhat safer and more secure. But due to Didi requiring real-name authentication, thus Didi is not available to foreign tourists without Chinese identity card.

b) In the recruitment of drivers

Table 1 shows a comparison of Didi's and Grab's requirements for drivers and vehicle. It can be seen from Table 1 that even the most economical Didi express has relatively high requirements for drivers and cars. Didi Premier and Didi Luxe in the Didi service are more demanding on drivers and vehicle requirement. The main reason for this is that in KK, Grab is primarily aimed at tourists, meeting their needs to get passengers safely to their destination. In Changsha, public transportation is developed, and the price of the taxi is not much different from the amount charged by Didi, so Didi needs to improve its quality to attract customers continuously.

IV. DISCUSSION

By comparing Didi and Grab on service provision, pricing system, security, etc., we can see the development of the city and the needs of residents have a significant impact on the development of local e-hailing; different parts of the e-hailing have different local characteristics. Since KK is a tourist city, Grab in KK is geared to the needs of the main group of passengers ie: tourists. Although Grab provides Mandarin service for tourists and launches six-seat cars services, its main business scope is focused on basic passenger service with a relatively single service type. In Changsha, the proportion of tourism economic development is not large; hence Didi service groups are mainly residents. Currently, Didi in Changsha have diversified services provided and in addition to meeting essential passenger services, it also needs to meet the needs of different groups, such as business reception, cargo handling and many more. Therefore, Didi provides a wide range of services and different levels of cars for us to choose.

V. RECOMMENDATION

According to the above comparative analysis, we put forward the following suggestions for both cities' e-hailing service, to improve the e-hailing service with regards to safety and convenience:

1. For KK, a tourist city, the comfort and safety of tourists are essential. It is proposed to raise the requirements for Grab drivers and vehicles and to adopt real-name authentication (which includes ID Verification and tourist passport information) to obtain more accurate passenger information. This not only effectively guarantees the passenger comfort, but also lets visitors have a better experience, and at the same time can effectively ensure the safety of passengers and drivers.

2. In Changsha, Didi should optimise its real-name registration and language provision to offer ride-hailing services to foreign tourists. In terms of pricing, due to the floating pricing style, passengers may be incurred more fees due to the different quality of drivers. In this case, it suggests that improved pricing and provides more effective supervision.

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