User Acceptance in the Sharing Economy

An explanatory study of Transportation Network Companies in China based on UTAUT2
Acknowledgements

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Master Thesis in Informatics

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Authors: Yifan Chen and Wolfram Salmanian
Tutor: Dr. Asif Akram
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Abstract

For many years, research on user acceptance of different technologies has been one of the most important topics within the field of information systems. In markets with the sheer size and uniqueness of the Chinese mobile economy fostered rapid development of sharing economy firms. Transportation Network Companies (TNC) can be regarded as a context of the sharing economy that focuses on personal transportation. Intrigued by the immense success of TNC and notorious competition between TNC companies Uber and DiDi in China, we study why users are susceptible to TNC. In this study, user acceptance is defined as intention to use TNC and the actual use of TNC. This study aims to examine what factors affect user acceptance of TNC in China and to what extent. By this, the thesis aims to provide TNC with adequate recommendations for success. The state of the art user acceptance model UTAUT2 has been used in this research with an explanatory purpose and a deductive approach. The UTAUT2 model consists of factors related to user acceptance, such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value and Habit. These factors were individually tested with Simple Linear Regression to determine their influence on user acceptance. These calculations were executed upon quantitative data from an electronically distributed survey. Upon analysis of the findings, research and practical implications are provided such as managerial recommendations for how TNC can raise user acceptance and increase market share.
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1. Introduction

This chapter provides background about the study and explains motivation behind the research. It is presented with eight sections: background, problem discussion, research purpose, research problems, definition, delimitation, expected contribution and method.

1.1. Background

One of the significant research questions in the field of information systems is how researchers can accurately and correctly shed light on the user acceptance of information systems (Delone & Mclean, 1992). Understanding user acceptance has been an object of study for many years (Davis, Bagozzi & Warshaw, 1989; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis & Davis, 2003; Venkatesh, Thong & Xu, 2012) derived majorly from the field of psychology and sociology (Ajzen, 1985; Bandura, 1977; Drucker, 1954; Fishbein & Ajzen, 1975; Triandis, 1977). The willingness to use new technologies including the perception, expectation, intention to use and actual use behavior (Davis et al., 1989; Venkantesh et al., 2003) defines user acceptance. In recent decades, the research phenomenon of user acceptance has been scrutinized in large extent to understand the adoption of a variety of new technologies, services and innovations (Straub, Limayem & Karahanna-Evaristo, 1995; Anderson, Schwager & Kerns, 2006; Gupta, Dasgupta & Gupta, 2008). As technology evolved from early computer systems and continues to be developed to nowadays mobile devices and applications, new theories were elaborated correspondingly. The state-of-the-art model UTAUT2 was formulated in the context of mobile internet for this purpose (Venkatesh et al. 2012).

A considerable portion of the world population has been connected through mobile internet (eMarketer, 2016). This connectivity lead to innovation, revolutionizing the economy by enabling sharing (Belk, 2013). Access to shared human or physical resources and assets defines the “sharing” of this new sharing economy. The idea is based on the principle that it often is better to share than to own, to an extent that enable individuals and groups to make money from underused resources (PwC, 2015). Thus, physical assets are shared as services that are conducive for utilization. Successful examples of sharing economy businesses include Airbnb for accommodation-sharing, Republic Bike for bicycle-sharing and Uber for ride-sharing. The notorious Uber is considered as the most representational sharing economy company which also is namely transportation network company (TNC). Through a TNC
app passengers can estimate fares by selecting the destination and order the ride. The ride gets conducted by a nearby signed-up driver who accepts the ride. After the ride, the TNC app bills passengers, and pays the driver. These drivers are usually individual freelancers who carry out rides with their personal vehicle in order to profit financially. Passengers benefit from a possibly faster, cleaner and cheaper ride in newer cars with friendlier drivers (Edwards, 2014). Coming back to TNC holistically, these evolved differently in particular countries, especially China.

Mobile technology reshaped China’s society and economy. According to the Ministry of Industry and Information Technology of China (MIIT, 2017), Chinese mobile internet users have exceeded 1.1 billion people. Meanwhile, the transactions taking place on mobile payment have reached the quantity of 26 billion with approximate aggregate amount of 160 trillion yuan within last year based on the information provided by China’s central bank (The People’s Bank of China, 2017). Such numbers dwarf all other countries in the world. The technology industry is booming and its state-of-the-art innovations get adopted quickly. China’s government’s “Internet Plus” strategy is strongly supporting this development which strives to create an environment that is ambitiously “by China and for China”. Admittedly, a mobile revolution is happening. This mobile economy is highly competitive as numerous sharing economy firms try to dominate their own sector and willingly subsidize excessive money for gaining market share with their venture capitals. Such a big market has been attractive to international tech giants like Amazon, Facebook and Google, yet they all failed to take root in there (Isaac, 2016). However, Uber, carried the ambition of grounding in China fought a notorious war against local competitor DiDi in the TNC market. The immense valuation of these two companies and the billions they burnt emphasize how valuable the TNC market is and how fierce the competition is. At last, internationally successful Uber had to retreat and let DiDi dominate that market. As a result, Uber sold all assets in China including brand, data, and business to DiDi, and the two companies reached a strategic agreement, mutual holdings, become each other’s minority shareholder. But this expensive war also brings huge benefits, according to the China Internet Network Information Center (2017), Chinese TNC users has exceeded 1.68 million and is still growing in considerable speed. All these make us interested in why Chinese users are susceptible to sharing economy, and particularly TNC.
1.2. Problem Discussion

The struggle of Uber and DiDi’s story (see chapter 3.2) for success in the Chinese market is an example pertaining to user acceptance of TNC. Though we can read about figures of Chinese TNC users and rides, we had little idea about what the actual implications were behind the users who have actually used TNC. Previous research suggests that different technologies would have different factors affecting user acceptance (Anderson et al. 2006; Gupta et al. 2008; Straub et al., 1995; Van der Heijden, 2004), which infers that factors that influence the user acceptance of TNC might not be in line with other technologies. In this study, the user acceptance of TNC includes the intention to use and the actual use of both the TNC mobile applications and services to Chinese consumers. Being a novel and recent research phenomena, so far, there are barely research that have studied the user acceptance of TNC in China. Thus, the gap that this study aims to is the lack of research revealing the user acceptance of TNC in China. In addition, the sheer size and uniqueness of the Chinese mobile economy as well as the disruption (McGregor, Brown & Glöss, 2015) TNC make it an interesting case to investigate in.

1.3. Research Purpose

The research purpose of this study is to investigate the user acceptance of transportation network companies in China.

1.4. Research Questions

1. What are the factors and how do these factors influence the user acceptance of transportation network companies (TNC) in China?

2. How can transportation network companies (TNC) get successful in China?

1.5. Delimitations

We delimit this study to the following aspects. Firstly, this thesis will focus only on the factors of user’s acceptance in line with the UTAUT2 model. We will not take into consideration other factors’ potential influence on gaining user acceptance of TNC, like influence from technological know-how, because we are studying the problem from a business angle. Secondly, this study will only look into the TNC applications and services operating in the geographical area of China, as China has been the single largest sharing economy market in the world and will maintain that position in the foreseeable future. Every day the amount of rides generated from TNC in China are larger than the rest of the world put together. Thirdly, given the fact of the master thesis’ fixed deadline for collecting data and completing the
study, we will delimit the data collection time to about one month. This might as well be prolonged in pursuit of highly valid and accurate empirical findings, because of China’s large population base. Besides, this study is not an in-depth investigation of Chinese culture, though it is not entirely excluded as we linked it to our findings in the discussion.

1.6. Definitions

Sharing Economy: The sharing economy is based on the principle that it is often better to share than to own as well as to allow individuals and groups to make money from underused resources (PwC, 2015). One subdomain of the sharing economy is ride sharing that is investigated in this research.

Mobile application: A program that has been installed on a mobile device like a smartphone. Apps are distributed by the main mobile operating system vendors e.g. App Store for Apple products and Google Play Store for Android devices.

Transportation Network Company (TNC): This new term classifies peer-to-peer transportation based on a digital service. By allowing individuals to participate in this freelance activity with their own vehicle it differentiates clearly on the supply side from traditional taxi services (Connecticut General Assembly, 2015). Other terms like ‘ride sharing’ or ‘ride hailing’ are more general and include car rental services like e.g. Zipcar or pure car sharing provider Blablacar which are not part of this study. The term TNC is used in a legal context (AAMVA, 2017), by companies in that business (Uber, 2017), and is also adopted in academic use.

Information System (IS): Information System is an academic research pertain to the information technology and associated infrastructure which individuals and organizations use to produce data or information through certain processes (Jessup & Valacich, 2008).

User Acceptance: In this research, we define User Acceptance as being equal to technology acceptance and is a combined action of behavioral intention to use and actual use.

UTAUT2: Consumer acceptance and use of technology (UTAUT2) is a technology acceptance model formulated by Venkatesh et al. (2012) on the basis of Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT2 explained antecedents that
affect the user intentions to use information systems and the subsequent actual usage in a consumer context.

1.7. Expected Contribution

This research study is expected to contribute to the literature knowledge of application of UTAUT2 model in terms of the users’ acceptance of TNC in China. It investigates the significant factors that result in the behavioral intention to use and actual use of the TNC applications and services from users’ perspective. The results provide theoretical implications which can be used as basis for further research in different countries and different sectors within sharing economy, as well as practical implications which can in turn shed light on how TNC can succeed in gaining user acceptance and even market share in China. As a result, it could also help users, entrepreneurs, managers, as well as researchers within the field of sharing economy to better understand Chinese market before making foreign direct investment or setting up the start-up company in the country.
2. Frame of References

This chapter will first introduce the theoretical frame of sharing economy and TNC, then explain the main research phenomenon of user acceptance, and present a literature review of UTAUT2 model in order to develop hypotheses to fulfil the research purpose.

The data for the background reference was conducted through key word searches in libraries of AIS, Web in Science, ABI inform, Scopus, Google Scholar, Google and Jönköping University’s primo. Following key terms were used: Access Economy, Collaborative Economy, DiDi, Motivational Model, MPCu, Ride hailing, Ride sharing, Sharing Economy, TAM, Technology Acceptance Model, Theory of Planned Behavior, Theory of Reasoned Action, TNC, Transportation Network Company, Uber taxi, Uber, UTAUT and UTAUT2.

2.1. Sharing Economy

“Uber, the world’s largest taxi company, owns no vehicles. Facebook, the world’s most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world’s largest accommodation provider, owns no real estate. Something interesting is happening.” (Goodwin, 2015)

This frequently cited quote from Goodwin implies that there has been a major disruption through the sharing economy. The impact through sheer size and revolutionary business models has resulted in conflicts with local and national legislation (Hook, 2017). These conflicts result in frequent media headlines of sharing economies’ big players. Airbnb’s business model of letting private people rent out their apartments as tourist accommodations has raised concerns for being believed to contribute to the housing shortage and rent surge (Van der Zeh, 2016). Ride sharing giant Uber with a valuation of approximately 70 billion dollars constantly fights lawsuits for violating national regulations like i.e. taxi permits and drivers’ social security (Hook, 2017). PwC (2015) estimated that the sharing economy had revenues of $15 billion USD in 2014 and a possible revenue of approximately $335 billion in 2025.

For comprehension of these peer-to-peer (P2P) business models and holistically the sharing economy phenomenon, the following sections provides guidance. We explain by starting with the description of the sharing economy, proceed to taxonomy issues and eventually present the specific ride sharing industry that this relevant for this research paper.
Numerous definitions and synonyms of sharing economy exist like connected consumption (Schor, 2014), collaborative economy (Botsman & Rogers, 2010) and access-based economy (Belk, 2014). The OECD categorized the sharing economy into crowdsourcing, P2P sharing and selling. In general, the sharing economy is described by the OECD (2016) as matching supply and demand through P2P. A consensus of sharing economy’s definition hasn’t been reached yet (Codagnone & Martens, 2016). P2P was sub-divided into business-to-business (B2B), business-to-consumer (B2C) and consumer-to-consumer (C2C) transactions by Puschmann and Alt (2016). In the agricultural sector business-to-business (B2B) transactions have been used for decades. Business-to-consumer (B2C) transactions have found application in self-service laundries, libraries and for car rental. As a third sub-class of peer-to-peer (P2P) transactions, consumer-to-consumer (C2C) transactions have become popular in recent times. The idea was to enable a direct connection among consumers with the possibility of an access-based intermediary. As consumers can become producers, the line between businesses and consumers gets blurred (Puschmann & Alt, 2016). Benkler (2007) describes the sharing economy as a connectivity-enabled technological phenomenon by mobile devices. Codagnone & Martens (2016) claim that mobile technology to be the basis of the sharing economy, as it allows exchange of information, networking and economic scaling. Hamari, Sjöklind and Ukkonen (2015) define the sharing economy with four elements: Social commerce, online collaboration, consumer ideology and sharing online. Activities such as exchange of services, recirculation of goods, social connections, increased utilization and sharing of productive of assets are incorporated in the sharing economy (Codagnone & Martens, 2016). Sharing intangible and tangible assets on digital platforms shifts ownership of goods to access of goods (Bardhi & Eckhart, 2012; PwC, 2015).
Codagnone and Martens (2016) are classifying organizations into profit (commercial organizations) and non-profit models (true sharing grass-roots organizations). The second classification is between B2C and C2C. C2C includes that consumers can be producers. Within this classification cross are four groups: 1. Small non-profit oriented true sharing platforms like i.e. Couchsurfing. These platforms only have a small economic impact and are subject to none or little regulation. 2. Most sharing economy organizations are commercially oriented and make use of collaborative P2P platforms. This group is making a significant economic impact and is partly subject to strict regulations i.e. Uber, DiDi and Airbnb. 3. The empty set is not considered as sharing economy. Inside this group are profit oriented businesses engaging in philanthropy. 4. Commercial B2C represent Sharing economy connected to B2C, but with little to none difference from online B2C i.e. UCAR, Zipcar.

(Conadagnone & Martens, 2016)

While the mentioned authors holistically had a similar idea of what the sharing economy is, the U.S. Department of Commerce has proposed a significantly different classification. It claims that the terms sharing or collaborative economy only apply for platforms that provide services in a non-commercial manner. A new term named ‘Digital Matching Firms’ is suggested. Digital Matching Firms need to have the following characteristics: First, they need to be built on an IT system like a website or on app for P2P connectivity. Second, a user based rating system is necessary for quality control. Third, suppliers of services or goods on these platforms have flexible working hours and need to work with their own assets necessary for executing the service. By these limitations rental (self-) services and P2P platforms without transaction service like craigslist also get excluded out of the definition (Tells, 2016).
Owyang, Ramey and Zubairy (2013), spokesmen and industry analysts of the sharing economy, provide a concise categorization for the market aspects, that act as enablers and lead to the growth of the sharing economy. Below these aspects are combined with items from various authors.

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Items</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Society</td>
<td>Urbanization</td>
<td>Bardhi &amp; Eckhardt (2012); Kathan, Matzler &amp; Veider (2016)</td>
</tr>
<tr>
<td></td>
<td>Longing for community</td>
<td>Bardhi &amp; Eckhardt (2012); Marton, Constantiou, &amp; Lagoudakos (2017)</td>
</tr>
<tr>
<td></td>
<td>Sustainability shift</td>
<td>Puschmann &amp; Alt (2016); Botsman &amp; Rogers (2011)</td>
</tr>
<tr>
<td></td>
<td>Preference of temporary usage over ownership</td>
<td>Kathan &amp; Matzler (2015); Puschmann &amp; Alt (2016); Rifkin (2014); PwC (2015)</td>
</tr>
<tr>
<td>Economy</td>
<td>Utilizing unused resources and reducing idling times</td>
<td>Benkler (2004); Codagnone &amp; Martens (2016); Willing, Brandt, &amp; Neumann (2016).</td>
</tr>
<tr>
<td></td>
<td>Venture capital availability</td>
<td>Owyang et al. (2013); Schor (2016); Cohen &amp; Sundararajan (2015)</td>
</tr>
<tr>
<td></td>
<td>Freelancing (C2C)</td>
<td>Pushmann &amp; Alt (2016); Sundararajan (2014); Tells (2016)</td>
</tr>
<tr>
<td>Technology</td>
<td>Connectivity via mobile devices</td>
<td>Benkler (2007); Avital et al. (2015)</td>
</tr>
<tr>
<td></td>
<td>Digital platforms</td>
<td>Tells (2016); Andersson, Hjalmarssson, &amp; Avital (2013)</td>
</tr>
<tr>
<td></td>
<td>Cost efficient scaling</td>
<td>Codagnone &amp; Martens (2016); Cohen &amp; Kietzmann (2014)</td>
</tr>
</tbody>
</table>

*Table 1. Enablers of the sharing economy*

Although various definitions of the sharing economy exist, with variance in terms of scope, they share similar ideas about the mechanics of the phenomenon. Consumers become producers, cut middlemen and are supported and scaled by IT.
2.1.1. Transportation Network Companies (TNC)

A major industry of the sharing economy is transportation network companies (TNC), specializing on personal transportation. The possibility of ordering a cab conveniently over an app or freelancing as a cab driver found appeal in society. Regulation of this new and rapidly growing phenomenon was eventually accomplished by defining that specific ride sharing business as TNC. The new term appeared in legislation in 2013 and widely adopted (AAMVA, 2017). Definition of TNC according to legislation is as follows: “The bill defines a “transportation network company” as an [...] organization that provides prearranged transportation services by means of a digital network or app that connects passengers to TNC drivers providing TNC services. The definition does not include taxicab or for-hire vehicle owner” (Connecticut General Assembly, 2015). This definition clearly differentiates taxi drivers from TNC drivers, with the latter having ownership over their vehicle and letting consumers preselect the pickup location and destination.

TNC can be categorized as profit-oriented C2C platforms in the previous model of the European Commission (Figure 1). Sharing Economy businesses success relies strongly on network effects (Frenken & Schor, 2017; Choudary, Parker & Alstyne, 2016). For TNC the following model (Figure 2) can be used to demonstrate the reinforcing loop of its network effects. Demand leads to more drivers signing up, letting TNC software optimize and expand the area of coverage. This higher density of drivers leads to even shorter waiting times, increasing demand, as the TNC gets more attractive to customers. This also leads to lower idle times of drivers and possibly lower prices, which also stimulate demand (Chen, n.d.; Fang, Huang & Wierman, 2017; Gurley, 2014).

![Figure 2. TNC Network Effects. Inspired by a tweet from tech entrepreneur David Sacks (2014), which also was reused by Andrew Chen (n.d.), head of rider growth at Uber](image-url)
2.2. **User Acceptance**

Based on the willingness of a person in using a new technology according to his or her perception, expectation and intention of the actual behavior, user acceptance and evaluation can be obtained. (Davis et al. 1989; Venkatesh et al. 2003, Straub, 1995). User acceptance research plays a major role within the area of information system research and is linked to technology, innovation, services, mobile commerce, e-services, social network sites and wearable technology development (Carlsson, Carlsson, Hyvonen, Puhakainen & Walden, 2006; Alkhunaizan, and Love, 2012; Al Imarah, Zwain & Al-Hakim, 2013; Gao, Li and Luo, 2015; Herrero, Martin & Salmones, 2017). Having the same explanatory ability on perception and emotion, user acceptance is defined as the same as technology acceptance, because it enables people to use a mobile app, digital service or other form of technological product. Therefore, user acceptance (of technology) is identical with technology acceptance.

Previous studies on user acceptance were performed on elements from psychology and sociology (Ajzen, 1985; Bandura, 1977; Drucker, 1954; Fishbein & Ajzen, 1975; Triandis, 1977). Of all the studied elements and constructs behavioral intention is considered the most significant and consistent one. Numerous studies have validated the direct influence of behavioral intention on actual technology use within information systems (Ajzen, 1991; Compeau and Higgins, 1995a, 1995b; Davis et al. 1989; Taylor & Todd. 1995; Venkatesh et al. 2003). Use of technology is also known by Jasperson, Carter & Zmud (2005) as technology adoption and by Saga & Zmud (1994) as technology implementation. Prediction of the acceptance of information technology systems was examined by Straub, Limayem & Karahanna-Evaristo (1995) through usage of IT. Use of technology was operationalized and conceptualized to users’ cognitive absorption into the system (Argawal & Karahanna, 2000), breadth of use (Saga & Zmud, 1994), extent of use (Venkatesh & Davis, 2000) and variety of use (Igbarai, Zinatelli, Cragg & Cavaye, 1997; Thong, 1999).

For this research paper, actual use and intention to use TNC are not differentiated, as the study is performed on users with previous TNC experience. Both constructs have shown a positive relationship in numerous user acceptance researches (table 2 in chapter 2.3.9). TNC is not a new or upcoming industry of the sharing economy in China, having faced widespread adoption and availability throughout the country several years ago. In addition, users of this study are defined to be equal to consumers, as they are paying and rating the TNC drivers.
2.3. Information System Acceptance Models

The term of Information systems initially appeared in the 1980s, depicted as a pyramid to illustrate the hierarchical and systematic relation of positions within an organization (Laudon & Laudon, 1988). Nowadays, information system has become an academic research pertaining to information technology and associated infrastructure which individuals and organizations use to produce data or information through a certain of processes (Jessup & Valacich, 2008). Understanding a user’s intention or willingness to use (aka. acceptance) an information system or technology, as well as feedback after actual use, is crucial for researchers and practitioners who wish to successfully implement and obtain the diffusing effect. Two important researchers in the field of technology acceptance study are Davis and Venkatesh et which respectively developed two theories that have significant impact on the field of information system acceptance research. This study will use consumer acceptance and use of technology model (UTAUT2) from Venkatesh et al. (2012) to shed light on the factors that influence the user’s intention to use and actual use of TNC. The UTAUT2 is upgraded from Unified Theory of Acceptance and Use of Technology (UTAUT) by incorporating three new independent factors which through successful testing specifically in context of mobile application technology (Venkatesh et al. 2012). The UTAUT was proposed in the back of eight prominent researches regarding information technology acceptance, including Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), The model of PC utilization (MPCU), Innovation Diffusion Theory (IDT), Motivational Model (MM), Social Cognitive Theory (SCT) and Combined TAM and TPB (C-TAM-TPB) (Venkatesh et al. 2003). Although some among those theories are originally developed mostly in sociology or psychology rather than focusing on study of individual’s intention and behavior within field of information technology. Nevertheless, there are some researches somewhat transformed the original theory to adapt to information technology context and made great contribution on applying and extending the theory. Therefore, this study will briefly introduce aforementioned eight relevant theories and UTAUT per se in a historically evolving order to examine respective focal point in terms of processes and factors within. We believe that by reviewing the strength and drawbacks of those theories will lead to a better understanding the theoretical foundation of UTAUT2, as well as the practical implications. In addition, research using UTAUT and UTAUT2 to study user’s intention and use of technology in certain cases have also been reviewed as it might be instrumental to this study.
2.3.1. Theory of Reasoned Action (TRA)

As early as 1975, Fishbein and Ajzen (1975) proposed the Theory of Reasoned Action (TRA) built upon social psychology which had become one of the most fundamental and significant theories of human behavior. Davis et al. (1989) tried to apply TRA into technology acceptance research to examine the consistency of former theory’s implication in the field of information technology. The result was in line with other behavior studies in different contexts. In other words, TRA directly contributed to the progress of technology adoption research and the construction of TAM. Based on TRA, the actual behavior of a person is affected by a person’s behavioral intention. However, a person’s behavioral intention is subject to two factors, attitude towards individual’s behavior and subjective norm. Attitude toward behavior is defined as a person’s positive or negative feelings (evaluative affect) about performing the certain behavior (Fishbein & Ajzen, 1975). Subjective norm is defined as the person’s perception that important people related to him have opinion upon whether he should perform the behavior or not in dilemma. (Fishbein & Ajzen, 1975).

![Figure 3: The Theory of Reasoned Action modeled after Fishbein and Ajzen (1975)](image)

2.3.2. Theory of Planned Behavior (TPB)

By extending the ten years’ precedent model of TRA, Ajzen (1985) developed the theory of planned behavior through adding the factor of perceived behavioral control. It turned out to be very successful due to the TRA’s deficiency in terms of its restrictions to cover behavior over which individuals have only limited volitional control (Ajzen, 1991). Because of richer understanding on the use behavior than TRA, TPB now has been widely applied to understand the acceptance and use of technology. Factors in TPB are behavioral attitude, subjective norm and perceived behavioral control. The former two are directed inherited from TRA, however the latter refers to the perceived ease or difficulty of performing the behavior (Ajzen, 1991).
2.3.3. Technology Acceptance Model (TAM)

The technology acceptance model was proposed by Davis (1989), with the goal to explain the primary factors for acceptance and rejection of new technology in the information technology field. Davis (1989) tested TAM in a workplace environment and found factors of perceived usefulness and perceived ease of use directly influencing the attitude of employees towards use of a new technology, and furthermore, the behavioral intention to actual use. The factors of TAM and their relationships are shown in the Figure 5. The theory has been widely supported as fundamental research for usage behavior of technology. Nearly ten years later, collaborated with Venkatesh (2000), TAM2 was proposed by extending the model to add more factors like subjective norm. Due to factors overlapping with the other aforementioned acceptance models, TAM2 is not discussed in this section.

2.3.4. Model of PC Utilization (MPCU)

The model of PC utilization is derived from the theory of interpersonal behavior by Triandis (1977). Proposed in the same year with SCT, it is an important competitor theory in social psychology to TRA and TPB. Triandis (1977) suggested that intentions and habits are direct antecedents of behavior and both are further affected by factors such as norms, roles, emotions, attitude etc. Thompson, Higgins and Howell (1991) applied theory of
interpersonal behavior in the field of information technology by using the model to investigate personal computer utilization. Thompson found that the theory is much adaptive in exploring acceptance and use of information technology. However, the focus in MPCU is on exploring the usage behavior rather than the intention. Factors influencing utilization of PC is shown in figure 6. They are job-fit, complexity, long-term consequences, affect towards use, social factors and facilitating conditions.

![Diagram of PC Utilization Model from Thompson et al. (1991)](image)

**Figure 6. The Model of PC Utilization from Thompson et al. (1991)**

2.3.5. Innovation Diffusion Theory (IDT)

Derived from sociology, Innovation Diffusion Theory was proposed by Rogers (1983) to study a wide range of innovations. Generally, innovation is defined as something that is perceived as new for an individual or a social system. Within the information technology field, Moore and Benbasat (1991) applied the factors of IDT from Rogers and advanced the knowledge of individual technology acceptance. Factors that are included in IDT are relative advantage, ease of use, image visibility compatibility, results demonstrability and voluntariness of use. According to Moore and Benbasat, diffusion of Innovation theory has been an overall instrument to “investigate how perceptions affect individuals’ actual use of information technology as well as other innovations” (Moore & Benbasat, 1991, p. 210).

2.3.6. Motivational Model (MM)

More than half century ago, Drucker (1954) proposed a theory that considered motivation as a dynamic psychological process which, while under certain external environmental factors, can lead to an actual behavior. Later, a number of significant research has endorsed the motivation theory from all kinds of study fields in order to explain behavior in specific
contexts. In the information technology field, Davis et al. (1992), based on prior constructs in TAM research, applied extrinsic motivation and intrinsic motivation as factors to advance the knowledge of new technology acceptance and use. Davis used these factors on intention to use and usage of computers and business software respectively in workplaces to test the theory and found positive results. The extrinsic motivation refers to the perception that individuals would like to engage in an activity because it is believed that doing so would be helpful in reaching valued outcomes that are different from the activity itself, such as better-quality job performance, monetary reward, or promotions (Davis et al, 1992). The Intrinsic Motivation refers to the perception that individuals would like to engage in an activity for no apparent reinforcement other than the process of performing the activity as such (Davis et al, 1992).

2.3.7. Social Cognitive Theory (SCT)

Proposed two years after the advent of TRA, Bandura’s (1977) social cognitive theory is considered one of most significant theories of human behavior and had been widely adopted. Not until Compeau and Higgins (1995a) extended SCT on the research of computer utilization in Canada to study individual’s belief to use technology, was SCT applied in the study field of information technology. Factors that had been tested to exert a significant influence on using technology in the SCT are outcome expectations – performance, outcome expectations – personal, self-efficacy, affect and anxiety. The relationship among the five factors is shown in figure 7, which evidently leads toward usage. Outcome expectations refers to related result on both personal and working aspect of the behavior. Self-efficacy refers judgement of one’s ability to use a technology to accomplish a particular job or task (Compeau and Higgins 1995b). Affect refers to a person’s preference for a specific behavior. Anxiety means that anxious reactions is triggered when it comes to acting a behavior.

![Figure 7. The extension of Social Cognitive Theory from Compeau and Higgins (1995)](image-url)
2.3.8. Combined TAM & TPB (C-TAM-TPB)

The combined TAM and TPB model (C-TAM-TPB) was proposed by Taylor and Todd (1995). At first, the authors compared TAM and TPB to evaluate which model is better in terms of predicting use of information technology. After a twelve-week longitudinal study on users from a computer resource center, the author concluded that both TAM and TPB had equal importance in understanding the behavioral intention and actual use. Replacing the factor ‘attitude towards using’ from TRA with ‘perceived usefulness’ and ‘perceived ease of use’ from TAM, C-TAM-TPB was created as below (see figure 8). The integrated model is believed to offer more explanatory power together than each model independently and offer significant improvement based on each model (Dishaw & Strong, 1999).

![Figure 8. The Combined TAM & TPB from Taylor & Todd (1995)](image_url)

2.3.9. Unified Theory of Acceptance and Use of Technology (UTAUT)

The unified theory of acceptance and use of technology was proposed by Venkatesh et al (2003) for the purpose of creating a unified perspective toward the user acceptance in information technology context. The UTAUT was synthesized from eight prior significant theories mentioned upon regarding behavioral intention and user behavior. Due to the overlapping theoretical interpretation of the factors inevitably existed in previous research, such as subjective norm in TPB, TRA, C-TAM-TPB and even TAM2, social factors in MPCU, Venkatesh found it necessary to integrate those similar factors to form a comprehensive new model. This idea was endorsed and acknowledged by many researchers (Davis et al. 1989, 1992; Thompson et al, 1991; Moore & Benbasat, 1991; Plouffe, Hulland and Vandenbosch., 2001; Compeau & Higgins 1995b; Taylor and Todd 1995). The resulting UTAUT model is described below, consists of four core factors which influence behavioral intention and technology use. The factors are performance expectancy, effort expectancy, social influence and facilitating conditions. In addition, those factors are mediated by moderators like gender, age, experience and voluntariness of use (Venkatesh et al., 2003).
The UTAUT was tested in a workplace IT environment and acknowledged by managers as a useful tool to evaluate the acceptant possibility of implementing a new technology in an organization. It also facilitates in predicting the specific factors that might influence the implementation of a new technology, that is to say, appropriate functionality can be accurately developed in favor of actual needs through the application of UTAUT.

**Performance Expectancy**

The definition of performance expectancy is the “*degree to which a person believes that using the system will help him or her to achieve gains in working performance*” (Venkatesh, 2003, p. 447). Prior researches proposed five constructs in respective models which are terminologically equivalent with and extracted to construct performance expectancy. They are “perceived usefulness” in TAM (Davis, 1989; Davis et al., 1989), “extrinsic motivation” in MM (Davis, Bagozzi & Warshaw, 1992), “job-fit” in MPCU (Thompson et al., 1991), “relative advantage” in IDT (Moore and Benbasat, 1991), “outcome expectations” in SCT (Compeau and Higgins, 1995; Compeau et al., 1999). Actual explanation of performance expectancy reflecting in the workplace could be depending on whether job or tasks will be solved faster and easier or total output of the work is increased both on quality and quantity by using the system.

**Effort Expectancy**

The definition of effort expectancy is the “*degree of ease related with the use of the system*” (Venkatesh, 2003, p. 450). Prior research models provided three constructs which are used to contribute to construction of effort expectancy in UTAUT. They are “perceived ease of use” in TAM (Davis 1989; Davis et al, 1989, “complexity” in MPCU (Thompson et al. 1991), “ease of use” in IDT (Moore & Benbasat 1991). Actual explanation of effort expectancy mirroring on the reality situation could be the easiness the person feels less trouble and take less time when learning or operating the system.

**Social Influence**

The definition of social influence is the “*degree to which a person perceives that significant others believe he or she should use the new system*” (Venkatesh et al. 2003, p. 451). Many researchers found out that social influence, in spite of different terms used in their research, has significant relationship with behavioral intention. It contains prior factors such as “subjective norm” in TRA, TAM2, TPB and C-TAM-TPB (Ajzen, 1991; Davis et al., 1989; Fishbein & Azjen, 1975; Taylor & Todd, 1995), “social factors” in MPCU (Thompson et al, 1991), and “image”
in IDT (Moore & Benbasat 1991). In other words, social influence means that using the system would bring you superiority among all the colleagues in the workplace or the people which you prone to having respect thinks that it is necessary for you to do so.

**Facilitating Conditions**

The definition of facilitating conditions is “the degree to which a person believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh, et al. 2003, p. 453). Like the aforementioned three factors, facilitating conditions also was built upon findings from prior researches – “perceived behavioral control” in TPB and C-TAM-TPB (Fishbein & Ajzen, 1985; Taylor and Todd 1995), “facilitating conditions” in MPCU (Thompson et al, 1991) and “compatibility” in IDT (Moore & Benbasat 1991). Facilitating conditions means that, in general, external resources including instruction knowledge or a group of stand-by assistants is perceived available for a person when using the system.

![Figure 9. The Unified Theory of Acceptance and Use of Technology from Venkatesh, et al. (2003)](image)

2.3.10. Consumer Acceptance and Use of Information Technology (UTAUT2)

Nine years after the launch of the UTAUT model, along with the rapid development in information system field, there is an increasing need for UTAUT to enlarge its theoretical capacities and functionalities to address the new technology accordingly. Hence, based on the prior model, Venkatesh et al. (2012) proposed an extension of UTAUT, labelled UTAUT2, to particularly study the acceptance and use of technology in a mobile application context from a consumer perspective. UTAUT2 added hedonic motivation, price value and habit as additional factors believing to have direct or indirect impact on behavioral intention.
and use behavior. Hedonic motivation, also known as perceived enjoyment, is found to have significant influence on technology usage according to a variety of prior information system acceptance research (Venkatesh et al., 2012). Price value is important because consumers, unlike employees, have to undertake the cost of buying information system or technology by themselves. The situation is often on the contrary in a workplace. Regarding habit, the aim to take it in as factor is to reinforce the generalizability of UTAUT2. The UTAUT2 (see figure 10) factors are moderated by age, gender and experiences. Besides, the prior moderator voluntariness of use in UTAUT is discarded by establishing a new link between facilitating conditions and behavioral intention. In a nutshell, compared to UTAUT, UTAUT2 has evidently more explanatory power on behavioral intention and technology usage as UTAUT2 not only inherited the main structure from UTAUT, but also added new factors and relationships. Due to its expansibility, future research can extend the UTAUT2 in different countries, age group or technologies (Venkatesh et al., 2012).

**Hedonic Motivation**
The term hedonic originates from the word hedonism which was used to represent the doctrine that “pleasure or happiness is the chief good in life” (Merriam & Webster, 2003). Hedonic motivation was conceptualized often as perceived enjoyment in prior researches. In accordance with the definition, Van der Heijden (2004) deemed that perceived enjoyment centers on intrinsic motivation are as well important determinants of behavioral intention for using a hedonic information system. Therefore, perceived enjoyment can be considered as a vital role in predicting user acceptance. In addition, Thong, Hong and Tam (2006) testified the user’s perceived enjoyment has a significant influence on users’ satisfaction toward IT and even further affect the users’ intention to use IT in terms of the various users’ needs.

**Price Value**
When UTAUT was firstly developed, Venkatesh et al. (2003) did not take into consideration users’ perception toward the cost of a technology, as the context is situated in workplace scenarios and usually the organizational employees tend to be quite insensitive to the monetary cost. Bearing that in mind, Venkatesh et al. (2012, p. 161) incorporated price value as a factor in UTAUT2 and testified price value indeed had a significant influence on behavioral intention when “the benefits of using a technology are perceived to be greater than the monetary cost”. IT services providers or developers should take into consideration what the most valuable point in the system is providing for customers.
Habit

Habit is defined as a repetitive behavioral pattern that takes place automatically beyond the pale of the conscious awareness (Triandis, 1977). Previous research suggested two types of understanding of habit in information system field. On one hand, Kim, Malhotra and Narasimhan (2005, p. 419) referred habit equivalently to automaticity and is in consistent with the term of “habitual goal directed consumer behavior” and “goal-dependent automaticity” from prior IS researches (Jasperson et al., 2005; Bagozzi & Dholakia, 1999; Bargh & Barndollar, 1996). On the other hand, Limayem et al. (2007, p. 705) defined habit as the “degree to which people tend to perform behaviors automatically”. Although it looks similar in both conceptualizations, two authors had put the factor of habit into different practice. Kim and Malhotra (2005) considered habit as prior behavior and thus found that habit is a significant antecedent for technology use. However, Limayem et al. (2007, p. 707) measured habit as the “extent to which a person believes the behavior to be automatic”. Subsequently, such measurement of habit has also demonstrated that there is a positive relationship between habit and technology use as well as habit and behavioral intention (Limayem et al. 2007). As a result, both conceptualization and operationalization of habit are cooperating in predicting behavioral intention and use of technology. Therefore, habit was incorporated as a determinant into UTAUT2. Additionally, Venkatesh et al. (2012) suggested that, in the consumer context, habit plays a significant role on personal technology use especially under the circumstances which is miscellaneous and ever-changing.
Figure 10. The Consumer Acceptance and Use of Technology from Venkatesh et al. (2012)

Since UTAUT was highly appreciated in IS field, many researchers begun to adopt UTAUT and UTAUT2 to investigate user acceptance worldwide. Table 2 summarizes some of this research. For instance, Anderson et al. (2006) applied UTAUT to identify the drivers and moderator of user acceptance of tablets in advance education context. Their findings confirmed performance expectancy (PE) as the most important driver for tablet acceptance. However, effort expectancy (EE) and social influence (SI) were not significant and facilitating condition (FC) was not even measurably significant. Similarly, Carlsson et al. (2006) applied UTAUT to investigate the user acceptance of mobile devices in Finland, and found that PE and EE were significant except for SI and FC. In addition, in terms of user acceptance of information and communication technology and services in e-government settings in India, Gupta et al. (2008) found that PE, EE, SI and FC were all positive factors of technology use. There are also several studies applied UTAUT2 in researching user acceptance of mobile payment and banking. Alalwan et al. (2017) found that PE, EE, hedonic motivation (HM) and price value (PV) were crucial factors in affecting mobile bank in Jordan. This result is in line with the findings of Baptista and Oliveira (2015) which conducted in wide range of Arica countries. Besides, UTAUT2 is used as main theoretical model to study a variety of new technologies or services in many countries like Portugal, China, Spain, Malaysia etc. (Fortes et al. 2016; Gao et al. 2015; Herrero et al. 2017; Wong et al. 2014).
### Table 2. User acceptance literature which used UTAUT/UTAUT2

<table>
<thead>
<tr>
<th>Articles</th>
<th>Region</th>
<th>Model</th>
<th>Methods</th>
<th>Study object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alalwan, Dwivedi &amp; Rana (2017)</td>
<td>Jordan</td>
<td>UTAUT2</td>
<td>Survey questionnaire, structural equation modelling</td>
<td>User acceptance of mobile banking</td>
</tr>
<tr>
<td>Al Imarah et al. (2013)</td>
<td>Iraq</td>
<td>UTAUT</td>
<td>Survey questionnaire, structural equation modelling</td>
<td>User acceptance of E-services</td>
</tr>
<tr>
<td>Anderson et al. (2006)</td>
<td>USA</td>
<td>UTAUT</td>
<td>Email survey, partial least squares regression</td>
<td>User acceptance of tablet PC</td>
</tr>
<tr>
<td>Carlsson et al. (2006)</td>
<td>Finland</td>
<td>UTAUT</td>
<td>Survey questionnaire, linear regression analysis</td>
<td>User acceptance of mobile devices/services</td>
</tr>
<tr>
<td>Fortes, Moreira &amp; Saraiva (2016)</td>
<td>Portugal</td>
<td>UTAUT2</td>
<td>Survey questionnaire, partial least square, structural equation modelling</td>
<td>User acceptance of online gambling services</td>
</tr>
<tr>
<td>Gupta et al. (2008)</td>
<td>India</td>
<td>UTAUT</td>
<td>Survey questionnaire, factor analysis, regression analysis</td>
<td>Governmental adoption of Information and Communication Technologies</td>
</tr>
<tr>
<td>Herrero et al. (2017)</td>
<td>Spain</td>
<td>UTAUT2</td>
<td>Survey questionnaire, structural equation modelling</td>
<td>User acceptance of social network sites</td>
</tr>
<tr>
<td>Keller (2007)</td>
<td>Sweden, Norway, Lithuania</td>
<td>UTAUT, UTAUT2</td>
<td>Survey questionnaire, conceptual-analytical research, meta-analysis, case studies</td>
<td>Acceptance of virtual learning environments</td>
</tr>
<tr>
<td>Salim (2012)</td>
<td>Egypt</td>
<td>UTAUT</td>
<td>Survey questionnaire, Pearson correlation</td>
<td>User acceptance of Facebook</td>
</tr>
<tr>
<td>Wong, Tan, Loke &amp; Ooi (2014)</td>
<td>Malaysia</td>
<td>UTAUT2</td>
<td>Survey questionnaire, partial least square, structural equation modelling</td>
<td>User acceptance of mobile TV</td>
</tr>
</tbody>
</table>

### 2.4. Hypotheses Development

In the settings of TNC, performance expectancy (PE) could be considered as working performance, since hailing a TNC car can save time effort and monetary cost, whether it is going to work or needed by work, individuals can be exempted from the trouble of waiting for the normal taxi or searching for a parking space. That increases the efficiency of working performance. Therefore, in light of Venkatesh et al. (2012),

\[ H1: \text{PE positively influence the Chinese user's acceptance (UA) of TNC.} \]

In the settings of TNC, effort expectancy (EE) could reflect on the degree of ease or struggle individuals perceiving upon using the TNC apps to hail a car and complete the itinerary by
paying for the bill when arrived. It includes the user’s learning or operating processes about TNC apps in terms of whether it needs users to have a certain degree of knowledge preliminarily or users can learn by itself to proceed. In a nutshell, EE does not make a difference for IT savvy but could be a barrier for rookies. Therefore, in light of Venkatesh et al. (2012),

\[ H2: \text{EE positively influence the Chinese user’s acceptance of TNC.} \]

In the settings of TNC, social influence (SI) reflects on that individuals seem to be inclined or concerned to the information and thoughts of their reference group (i.e. parents, relatives, friends and colleagues) in determining to use TNC apps and services. This is very interesting, giving the fact that the Chinese Confucianism culture puts high rate regarding the respect of the elders and superiors. For instance, in workplace, suggestions and thoughts from managers could stand for unquestioning obedience from subordinates. Such influences surely have the ability to influence an individual’s intention to use TNC apps and services. Therefore, in light of Venkatesh et al. (2012),

\[ H3: \text{SI positively influence the Chinese user’s acceptance of TNC.} \]

In the settings of TNC, facilitating conditions (FC) exist in a form of compulsory resources that are requisite for individuals to use TNC apps and services successfully and effectively. Provided with missing requirements such as mobile phones, mobile network, Wi-Fi or payment methods, TNC is disabled anyhow. In addition, a group of user support available in charge of technical problems and a rich instruction on how to use the TNC apps to finish a complete itinerary are both part of facilitating conditions. Therefore, in light of Venkatesh et al. (2012),

\[ H4: \text{FC positively influence the Chinese user’s acceptance of TNC.} \]

In the settings of TNC, hedonic motivation (HM) can be regarded as a perception of joy, entertainment, delight and pleasure that is offered to individuals when using the TNC apps and services. For example, UberX’s car icon would become a sculling boat and UberBlack an icon of yacht in terms of price level. This novel change gave individuals pleasantly surprised moods and is believed to have a positive upshot on user acceptance. Therefore, in light of Venkatesh et al. (2012),

\[ H5: \text{HM positively influence the Chinese user’s acceptance of TNC.} \]

In the settings of TNC, price value (PV) could be the fact that the TNC services is rational estimated for the individuals. Generally, TNC charges noticeably lower than local taxi fare and in most situations, have a clear and better car conditions as the car is owned by the private drivers. Therefore, the level of benefits and values perceived by users in using the
TNC services is raised, as well as user's intention to use TNC. Consequently, in light of Venkatesh et al. (2012),

\[ H_6: PV \text{ positively influence the Chinese user's acceptance of TNC.} \]

In the settings of TNC, habit could reflect on customers using TNC apps and services constantly in daily lives. Because TNC convenience can lead users to raise dependence on TNC. With further increasing dependence, users can be even addicted to TNC as main choice for transportation. Therefore, in light of Venkatesh et al. (2012),

\[ H_7: \text{Habit positively influence the Chinese user's acceptance of TNC.} \]

Figure 11. The proposed model for research
3. Methods

This chapter introduces the research setting and the method chosen in this study. The quantitative research method, the data collection method and the questionnaire design method are presented.

3.1. TNC in China

Little research has been done on providing information about TNC in China. The popularity of this sharing economy context as well as the leading companies are quite new, resulting in the need to rely partly on websites and news articles for this research. In the following section, prominent TNC that had significant presence in China are presented separately manner. Subsequently the struggle of the two leading actors is described.

Uber

In 2009 Travis Kalanick and Garrett Camp, both successful startup entrepreneurs, started UberCab. The original idea was to provide a premium taxi service. In 2011 UberCab’s app launched and started its services in its hometown San Francisco. The name UberCab was shortened in the same year to Uber, coming from the German word “über”, which means above, to demonstrate the brand’s superiority. Uber also received Venture Capital funding of approximately $40 million USD. Uber started providing its services in major cities in the United States and began an international expansion starting in Paris, France. In 2012 Uber X released as a low-cost P2P taxi service. Individuals with cars could sign-up after a background check and start working on the Uber platform. In 2013, Uber’s valuation reached billions and started expanding to Africa and India. 2014, now with a valuation of $17 billion USD, Uber expanded its functions with UberPOOL. UberPOOL is a carpooling service within the app, letting passengers with similar routes share costs by driving together. By letting users schedule rides ahead, Uber shortened waiting times (Alba, 2016). As of March 2017, Uber’s valuation was at approximately $70 billion USD, making it the most valuable startup to date. It operates currently in 598 cities (uber.com, 2017). Uber is notorious for making regular news headlines. Among them is Uber’s struggle with legality, social security status of drivers, leaks, grey balling, technology infringements, protests by taxi drivers etc. Uber’s portfolio is broad including cargo, helicopter transportation, food delivery as well as research in autonomous driving (McAlone, 2015).
DiDi

DiDi Chuxing, formerly DiDi Kuaidi, was a result of the merge between DiDi Dache and Kuaidi Dache. DiDi is the current TNC market leader in China. Wirtz and Tang (2016) describe DiDi as a “deep-pocketed dominant player reaping the network-dividends of having drivers and customers hooked on to its product early.” With the service ‘Hitch’ DiDi created an affordable alternative for mass transit. Hitch is a DiDi carpooling service in which vehicle owners can transport nearby passengers with similar routes. Hitch differs from DiDi’s main service as it is non-profit driven and lets the driver have control of his routes. Hitch serves to reach an even larger user base for DiDi’s multiple services (Wirtz & Tang, 2016). DiDi is the only TNC that is backed by all three Chinese tech giants: Alibaba, Baidu and Tencent. Notably is also the China Investment Corporation as DiDi’s backer. This fund is believed to be tightly knit to Chinese legislation which legalized DiDi’s business model (Wirtz & Tang, 2016). As of May 2017, DiDi has a valuation of 50 billion USD, after having gathered the largest technology company funding round ever with 5.5 billion USD (Chen, 2017).

Other competitors

UCAR with a market share of 7.8% in 2016 (Culpan, 2016) is the third notable player in the ride sharing market in China. UCAR is not a TNC. It rents out vehicle and hires drivers pursuing a B2C business model (Langner, 2016). UCAR’s bet was hoping for the chance that TNC get outlawed in China (Langner, 2016). With the legalization of TNC in China that chance dissolved and the strong market domination and price-cutting by competitors Uber and DiDi with 12.5% and 80% respectively made it even more difficult for UCAR (Langner, 2016). UCAR is backed financially by Alibaba, Warburg Pincus and UnionPay. Recently UCAR was valued at $5.95 billion USD (Lee, 2017).

Yidao is an even smaller TNC which focuses on premium services and is backed by technology company LeEco. It is rumored to be in financial troubles and has a current market share of only 3.6% as of March 2017 (Tao, 2017).

Uber’s Waterloo against Rival DiDi

In 2015, a UCLA professor wrote an article named “Will China be Uber’s Waterloo?”, predicting the failure of Uber in China (Tang, 2015). One year later his prediction became a reality. Let’s investigate how it all started: DiDi and Uber had different approaches in acquiring drivers for the supply side of their platforms. DiDi focused on existing taxi drivers.
The Chinese startup actively pursued to convince a lot of existing taxi drivers to use their app. Financial incentives of $700 million USD in the years 2013 to 2014 were provided. These actions were very effective to gain a large user base. Uber instead aimed to disrupt the existing taxi business by recruiting private car owners. (Wirtz & Tang, 2016).

**Uber**

![Timeline of Uber China and DiDi](image)

In 2014 Uber entered the Chinese market. It aimed to develop into Uber’s prime market with its exponential user base growth. Strategically, Travis Kalanick makes a partnership with Chinese internet indexing giant Baidu. The alliance provided additional funding as well as access to Baidu’s maps and search engine (McAlone, 2015). In the struggle against DiDi Uber raised another $1.2 billion USD of Venture Capital during end of 2015. DiDi Kuaidi, local market leader, responded by raising $3 billion USD (Carsten, 2015).

Despite subsidizing billions of USD and establishing local partnerships, Uber couldn’t compete against the local competitor DiDi. As a result, Uber sold all assets in China including brand, data, and business to DiDi, and the two companies reached a strategic agreement, mutual holdings, become each other’s minority shareholders, and most importantly, ended in an expensive price war. The sale of ‘Uber China’ to DiDi granted Uber a 20% stake in DiDi and a 1-billion-dollar investment from DiDi into Uber (Isaac, 2016). DiDi has a current market share of 94.6% as of March 2017 (Tao, 2017).

**3.2. Research Approach**

According to Saunders et al. (2009), there are three types of research purposes – exploratory research, descriptive research and explanatory research. An exploratory research intends to find “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson, 2002, p. 59). This is usually used to study new phenomenal or barely known topics due to such topics are normally difficult to be studied in a structured way. Then researchers
can use descriptive or explanatory research to study the research phenomenon further (Malhotra, Birks & Will, 2012). A descriptive research is often used to delineate features of certain chosen population or social phenomenon being studied (Saunders et al., 2009). The goal of a descriptive research is to “portray an accurate profile of persons, events or situations” (Robson, 2002, p. 59). However, lack in ability to address questions like “how”, “when” or “why” the features of study object took place is a characteristic for descriptive researches. Instead, the questions like “what” are answered in most instances. Since descriptive researches seldom provide a satisfactory explanatory level, hence it is recommended for researchers to carry out an explanatory research to study a phenomenon broader and more in-depth (Blumberg et al., 2011). Explanatory research is termed as an attempt to examine cause and effect relationships, meaning that researchers want to explain what is going on between dependent and independent variables which have been formed on the basis of prior researches (Saunders et al. 2009). In another word, explanatory research looks into how things come across and react in order to investigate the factors why something happens (Neuman & Kreuger, 2003). This is done by firstly proposing hypotheses as well as defining dependent and independent variables, and finding empirical data then subsequently testing on statistical tools. Adams and Schvaneveldt (1991) deemed that the focus of explanatory research is flexible, because it was broad at the very beginning, then gradually becoming narrower in the process of research so that help to study a research phenomenon as precisely as possible. The research purpose of this study is to investigate the cause and effect relationships between UTAUT2 factors and user acceptance of TNC in China. This is the characteristic of somewhat descriptive and explanatory study. Since the research purpose is clear, and the hypotheses were developed according to elaborately chosen theory, deductive approach is justified to use in this research (Saunders et al., 2009).

Deductive approach represents “what we would think of as scientific research” (Saunders et al., 2009, p. 124), meaning that deductive approach is rigorous in developing and testing a theory, unbiased in presenting and anticipating the phenomena and controllable in predicting the occurrence (Collis & Hussey, 2003). A significant feature of deductive approach is the ability to draw conclusions from deductive reasoning which is by firstly developing a set of hypotheses from general theoretical frame and then subsequently testing the hypotheses to achieve a specific theory. Saunders et al. (2009, p. 124) explicitly explained the steps of deductive approach in a research will be following as:
“…1. Deducing a hypothesis (a testable proposition about the relationship between two or more concepts or variables) from the theory;
2. Expressing the hypothesis in operational terms (that is, indicating exactly how the concepts or variables are to be measured), which propose a relationship between two specific concepts or variables;
3. Testing this operational hypothesis (this will involve one or more of the strategies);
4. Examining the specific outcome of the inquiry (it will either tend to confirm the theory or indicate the need for its modification);
5. If necessary, modifying the theory in the light of the findings……”

The model used in this research, UTAUT2, have been widely applied in research and a variety of hypotheses have been proposed and tested in the past. We choose UTAUT2 as a referential theory because both practical and theoretical implications that UTAUT2 provided is suitable for TNC case. As a next step, we developed seven hypotheses respectively matching on with UTAUT2’s powerful factors. Although the research that have used UTAUT2 to apply in the case of TNC are extremely few, it does not change the fact that clear hypotheses can be theorized and tested. Expectantly, by carrying out a deductive approach, we aim to understand the casual relationship between UTAUT2 factors and user acceptance of TNC.

We also use a highly-structured methodology to help replication to ensure reliability, which is explained in chapter 3.5 and 3.6. Moreover, the factors within this deductive approach is operationalized into easily understandable questionnaire items in order to reflect the facts in a quantitative way and a goal of certain quantity of samples is set for the purpose of achieving generalization.

Within the context of deductive approach, the survey strategy is often applied (Saunders et al. 2009) and thus becomes what we use. We find that the survey strategy is suitable for this research due to the following reasons based on Saunders et al. (2009). Firstly, the survey strategy is cost-effective in collecting a large amount of data from a population through distributing on-line questionnaire via social media sites of mobile internet. It is fairly easy to compare results after data collection. In addition, the survey strategy enables us to straightforwardly run the quantitative data on statistics software like SPSS so that we can investigate the casual relationship between UTAUT2 factors and user acceptance as
independent and dependent variables. Furthermore, applying a survey strategy in this research could help us produce generalized findings that can be reflected on population and area of whole country. The research approach processes can be seen in figure 13.

![Research approach illustration](image)

**Figure 13. Research approach illustration**

### 3.3. Data Collection Method

#### 3.3.1. Primary Data

For this research, a primary data collection was conducted through a questionnaire. The empirical data is essential for this paper’s research approach. Questionnaires are data collection techniques in which respondents are asked the same questions in a fixed order (deVaus, 2002). Questionnaires are conducted for explanatory and descriptive research to gather samples for executing a quantitative analysis (Saunders et al., 2009).

![Questionnaire types from Saunders et al. (2009)](image)

**Figure 14. Questionnaire types from Saunders et al. (2009)**

Specifically, in this research a self-administered Internet-mediated questionnaire was used. As implied this type of questionnaire is administered electronically and filled out by respondents. Online questionnaires excel at cost efficiency, scalability and immediate results (Saunders et al., 2009). A traditional survey from Sweden to China and back would have
meant high costs, a significant time delay and a difficulty to let potential respondents to use self-selection.

A popular survey tool among academics is google forms, which is highly capable and free to use. Unfortunately google services are blocked in China, making it difficult to reach Chinese respondents. Other commonly tools like SurveyMonkey require a paid subscription for full accessibility of the data and data export options. Same goes for FormTools. The university provided Swedish esmaker tool seemed inconvenient and outdated in our perception. We came along Microsoft Forms which offers full functionality and compatibility through free .xls exports and modern mobile responsive form pages, which is important as most web users currently use mobile devices. As mentioned, it was crucial for our survey tool to be accessible in China. The accessibility of Microsoft Forms was tested with a Pilot Test.

3.3.2. Sampling Strategy

![Sample of a population](image)

*Figure 15. Sample of a population according to Saunders et al. (2009, p.211)*

Sampling is the principle of choosing respondents of a population that are relevant for the study. Large target populations make it problematic to perform a census on all members (cases or elements according to Saunders et al., 2009) of a population, so instead a small selection of the target population is used to make presumptions on the statistical population (Proctor, 2003). The advantages of performing sampling are that it reduces data collection costs and timeframe, increases research efficiency, data accuracy while making large target populations manageable (Brown, 2006). The target population is defined by people in China in this research. The frame for sampling consists of TNC users in China. Large sampling sizes reduce sampling errors and the sampling size depends on the sampling method and expected response rate (Malhotra et al., 2012). In this research, a non-probability voluntary self-selection sampling was conducted. Self-selection means in this study that the survey was distributed through Chinese social media networks. People in China who have used TNC and are interested in participating become respondents. This sampling method was chosen, as it was convenient, accessible and attracts relevant respondents. A sample population of
around 200 respondents was aimed for and the data collection was limited to a timeframe of less than one month.

![Sampling techniques adapted from Saunders et al. (2009, p.213)](image)

3.3.3. Secondary Data

Secondary data was conducted for gathering information about the context and research method. Key word searches were conducted for gathering adequate literature sources section within libraries of AIS, Web in Science, ABI inform, Scopus, Google Scholar, Google and Jönköping University’s primo. The following key terms were used: Bivariate Analysis, DiDi, Reliability, Ride hailing, Ride sharing, Saunders, Structural Equation Modeling, TNC, Transportation Network Company, Uber taxi, Uber, UCAR, Validity, Yidao. For the quantitative research literature from renowned authors like Saunders et al. is used.

3.4. Questionnaire Design

3.4.1. Factors

The initial questionnaire was strongly based on the questionnaire items that Venkatesh et al. (2012), the authors of UTAUT2, provide in their theory for each factor. The questions were adapted to the context of TNC in China, shifting them holistically towards mobile apps and transportation. For deeper understanding and a more valuable discussion, the questions under each construct were diversified. The questions are presented in table 3. Instead of repeatedly asking the same or similar question in four or five different ways like Venkatesh et al. did we diversified them to gather additional knowledge while still maintaining his reliability by repeatedly asking similar questions. Survey Items according to Venkatesh et al. (2012) adapted to TNC in China. An example for that would be: “Do famous people influence your decision to use TNC?”. We came up with this question as e.g. Korean popstars are known to be very influential on consumer behavior in Asia (Lee & Nornes, 2015). With this assumption, we intended to test if it had also an influence on Chinese TNC consumers.
The first pilot test resulted in denouncement of this theory; having distorting impact on social influence. This distortion was solved by adding an additional less polarizing question under the factor of social influence.

<table>
<thead>
<tr>
<th>Performance Expectancy</th>
<th>Hedonic Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I perceive that TNC are helpful in my life.</td>
<td>I enjoy ordering a ride over the TNC apps.</td>
</tr>
<tr>
<td>I perceive that TNC enable me quick transportation.</td>
<td>I enjoy taking a ride on TNC cars.</td>
</tr>
<tr>
<td>I perceive that TNC improve my life efficiency.</td>
<td>I perceive that TNC drivers in general are talkative or easygoing persons.</td>
</tr>
<tr>
<td>I perceive that TNC arrival time is acceptable.</td>
<td>I like the gimmicks organized by TNC (for festival activity or promotional campaign).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effort Expectancy</th>
<th>Social Influence</th>
<th>Facilitating Conditions</th>
<th>Price Value</th>
<th>Habit</th>
<th>User Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my opinion, figuring out how to use TNC apps is not difficult.</td>
<td>I tend to use the TNC that my friends or families use.</td>
<td>TNC apps on my smartphone is running smoothly.</td>
<td>I perceive that TNC have a fair pricing.</td>
<td>Using TNC has been a habit of mine.</td>
<td>TNC has been part of my life.</td>
</tr>
<tr>
<td>I generally understand how TNC work.</td>
<td>I perceive that by using TNC raises my prestige or image.</td>
<td>I'm aware that the instruction information about how to use TNC is accessible for me.</td>
<td>I perceive that TNC provide acceptable value.</td>
<td>I have to use TNC.</td>
<td>Now I use TNC frequently.</td>
</tr>
<tr>
<td>I perceive that TNC apps are convenient and easy to use.</td>
<td>Famous people could influence my decision to choose TNC.</td>
<td>I perceive that to have the requirements (e.g. ID, credit card, Alipay) for signing up on the TNC apps is not a difficulty.</td>
<td>I believe that I can save money by using TNC as transportation.</td>
<td>I'm addicted to use TNC.</td>
<td>I think I will continue to use TNC.</td>
</tr>
<tr>
<td>I perceive that it is easy to sign up on TNC.</td>
<td>People who cares about me could influence my intention to use TNC.</td>
<td>I'm aware that the customer support of TNC is available for me.</td>
<td>I perceive that TNC have a high CP (cost performance).</td>
<td>Using TNC is my priority trip mode.</td>
<td>In future, I pursue to use TNC frequently.</td>
</tr>
<tr>
<td>I perceive that it is easy for me to contact the TNC drivers and vice versa.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I perceive that it is convenient and easy to pay for the ride.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 3. Questionnaire Items*
3.4.2. Scales

In this questionnaire, nominal scales are used to collect respondents’ information in terms of age group, gender, occupation, location and TNC apps which respondents have used and currently are using. On the other hand, ordinal scales are used to measure the questionnaire items which derived from UTAUT2 factors. A widely-used example of ordinal scale is the Likert scale which rank the ordinal data from totally disagree to totally agree. In order to ensure respondents to make a clear standpoint toward the questions, we decide to apply a six point Likert scale on questionnaire to prevent respondents from irresponsible answering with a middle ambiguous option. These ordinal scales are also classified by Saunders et al. (2009) as rating questions.

<table>
<thead>
<tr>
<th>I totally disagree</th>
<th>I disagree</th>
<th>I slightly disagree</th>
<th>I slightly agree</th>
<th>I agree</th>
<th>I totally agree</th>
</tr>
</thead>
</table>

*Table 4. Six point Likert scale according to Saunders et al. (2009)*

3.4.3. Pilot Test

On March 26th, 2017, a pilot test was conducted. The purpose of the pilot test was to gather potentially valuable feedback for improving the questionnaire. The feedback was intended to include information about the perceived length of the survey and the understanding or misunderstanding of certain questions so these can be reformulated in a clear and comprehensible way. In addition, it was also important to test if Chinese users could access the survey on Microsoft web services. For this purpose, several access testing web services exist, in which we got full access to the survey from Chinese from distributed servers. Peers of our Chinese friend also successfully accessed the survey successfully from mainland China. Among the respondents were Chinese students from Jönköping University and the mentioned peers of one of the authors. A lot of beneficial feedback was received to clarify the meaning of several questions. The pilot test respondents in general perceived the test as a bit too long. However, there was no option to cut the questionnaire further down without losing reliability and validity of the constructs.

3.4.4. Final Questionnaire

The initial test was distributed on March 28th, 2017 strategically over multiple popular WeChat and QQ groups. WeChat is a dominant messaging app in China and has penetrated into daily life of huge amount of people (Tu, 2016). QQ, however, is the antecedent messaging software of WeChat. The surveys were closed on April 18th, 2017 as the deadline for completion of the method section came closer and sufficient responses have been
gathered. The huge population of China and their intense social media use made it convenient to gather many responses. By the end of the survey distribution 361 responses were recorded.

<table>
<thead>
<tr>
<th>Pilot Test</th>
<th>Improvements</th>
<th>Questionnaire start</th>
<th>Questionnaire closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 26th, 2017</td>
<td>March 27th-28th, 2017</td>
<td>March 28th, 2017</td>
<td>April 18th, 2017</td>
</tr>
</tbody>
</table>

*Table 5. Questionnaire Timeline*

### 3.5. Quantitative Data Analysis

Through the survey tool Microsoft Forms (mentioned under 3.3.1.) data was collected and exported as a dataset. Datasets can be large and complex, making it ideal to use statistical software to process the information. Popular statistical software among researchers include open-source R and proprietary Stata, SPSS and the open-source statistical programming language R (Turner & Lambert, 2014). Furthermore, dedicated packages, scripts and extensions are available to improve the workflow. In this study, SPSS (Statistical Package for Social Sciences) is used due to capability of the software, convenience of the GUI (Graphical User Interface), accessibility through our university and our familiarity with the software.

Description and explanation of phenomena can be acquired through manipulation of conducted numerical data (Babbie, 2010). Conducted data needs to be reviewed to check for plenitude and authenticity e.g. when some respondent answer all questions with the same neutral middle rating selection, implying he or she did not read the questions, this answer should be removed. The questionnaire in this study has solved these two issues by forcing the respondents to answer all questions (plenitude) and not allowing a middle solution with the six option Likert scale (authenticity). Non-numerical data is quantified to numerical form within the statistical processing software; in this study SPSS.

Several types of variables exist. Univariate with one variable e.g. occupation, and bivariate with two variables, e.g. occupation and social influence and multivariate with various variables e.g. occupation, social influence, gender and habit. As univariate analysis cannot analyze relationships between multiple variables, it is improper for this research design. Therefore, in this study bivariate analysis was selected, as we want to interpret the relationship of single factors one by one to user acceptance, e.g. social influence on user
acceptance, performance expectancy to user acceptance etc. The results have potential for comparisons and conclusions such as generalizations to a larger population.

3.5.1. Descriptive Analysis

We decided to use descriptive statistics to shed light on items within questionnaire on the basis of distribution and range from respondents as well as using as a supporting tool for the analysis of certain characteristics of respondents with respect to age, gender, occupation etc.

3.5.2. Reliability Analysis

To analyze the reliability of this quantitative study, the Cronbach’s alpha was used. Cronbach’s alpha is an examination tool to test internal consistency which tells us how closely related of responses is to the items in terms of rating scale in the questionnaires (UCLA, 2012). In the reliability analysis, the coefficient α is calculated by SPSS and in comparison with a measurement standard. According to George and Mallery (2003), if the α value is equal or greater than 0.9 which means an excellent reliability. If the α value is in between 0.7 to 0.8 and 0.8 to 0.9 which means an acceptable and good reliability respectively which is also where majority of researches ended up. However, if the α value is less than 0.5, then the reliability is unacceptable.

3.5.3. Bivariate Analysis

Bivariate analysis investigates the empirical interfacility of two variables (Babbie, 2009). The independent variable predicts the independent variable by regression e.g. logic, probit or simple regression. Statistical analysis techniques like Simple Linear Regression, Pearson, Spearman, Partial Least Squares and Structural Equation Modeling (SEM) and Confirmatory Factor Analysis (CFA) have been used by academic researchers to study multivariate relationships through the UTAUT framework (Attuquayefio & Addo, 2014). Regression is used for prediction of variables, i.e. if x is changed, y will have a certain value. While Pearson is ideal for linear relationships between interval scaled data, Spearman excels at monotonic relationships among ordinal scaled data. CFA and SEM are more complex analyses, focusing on interrelationships among variables, i.e. how strong Effort Expectancy is related to Social Influence.

In this study, Spearman’s ranked correlation coefficient was used as it is ideal for the ordinal data from the employed Likert scale. To check for possible interrelations between the factors like i.e. a similarity of effort expectancy and facilitating conditions, a matrix with the
correlations between the factors was created. A correlation coefficient higher than 0.7 results in a need for a factor analysis or a combination of two factors (Nunnally & Bernstein, 1994). Then the simple linear regression is used to test the relationship between each independent variable (UTAUT2 factors) and dependent variable user acceptance. The standardized coefficient beta value is the indicator reflecting the strength of the relationship ranging from –1 to 1. If beta value is 1, it means there is a perfect positive alignment of the independent and dependent variables and vice versa. If beta value is 0, it means that there is no alignment at all. The coefficient of determination $R^2$ is measured to explain how much dependent variable can be explained by independent variable, ranging from 0 to 1.

3.6. Credibility of the study

The credibility of this study was ensured by operationalization of two criterions - the reliability and the validity.

3.6.1. Reliability

According to Saunders et al. (2009), reliability represents the extent to which certain consistent results will be generated again when similar data collection techniques are conducted at else place and or by else researchers. Replicable is of the essence on this point. To bear that in mind, we try to be as transparent as possible to explain how the data is collected, processed and analyzed as well as the research approach which exerted on this study to ensure reliability. Malhotra et al., (2012) pointed out that reliable study should be free from random errors. The random errors could come out from either “subject or participant error” or “subject or participant bias” to compromise reliability of the study (Robson, 2002). In order to mitigate the random errors, Cronbach’s alpha was applied to analyze the level of internal consistency among the questionnaire items which reflecting on factors of the proposed UTAUT2 model. Additionally, respondents were asked to answer questionnaire items mandatorily to achieve data integrity.

3.6.2. Validity

Validity is the other criterion in pursuit of the credibility in this study. According to Saunders et al. (2009, p. 157), validity describes “whether the findings are really about what they appear to be about”. That is, validity is the extent to which the data collection methods can precisely measure the purpose and the degree to which the findings of the research are what they claim to be. Validity is normally measured as content validity, criterion validity, and construct validity (Malhotra et al., 2012). Content validity was our highest concern, specifically, the
content validity of questionnaire items. In this study, the content validity was strengthened by pilot test and important literature reference. During the pilot test, the questionnaire was initially written in English and then translated to Chinese in order to facilitate the respondents to understand and fill. Then afterward we translated the questionnaire back in English again to ensure content validity in dealing with wording gaps that might be taken place in the process of translation. Furthermore, the items in the questionnaire are considerably referred from prior items which Venkatesh et al (2012) used to test factors in UTAUT2 model and also which have been practiced in other researches before (Alalwan et al. 2017; Gupta et al. 2008; Carlsson et al. 2006) to undertake the content validity.
4. Empirical Findings

Empirical findings of this research consist of testing the reliability, eventually pursuing with descriptive statistics and the test of the hypothesis.

4.1. Descriptive Statistics

To get an oversight over the quality and distribution of respondents and therefor the generalizability, a descriptive analysis was conducted. The descriptive analysis contains gender, age, geographical and occupational distribution to validate that the data is diverse and therefor generalizable. The number of respondents is 361 which all required to answer all the questions for completion of the survey (n=361).

![TNC Experience](image)

In the description attached to the link that was distributed, we listed as a requirement TNC experience. By that, 100% of the respondents were familiar with TNC usage and no answers had to be abandoned. 67.59% (244 out of 361) of the respondents have used DiDi, 50.41% Yidao, 38.23% Uber and 15.24% have used other smaller TNC. The average respondent had an experience with (Σ619:361=) 1.71 TNC.
The gender distribution within the study was quite equal, showing a slight majority of female respondents (58% female vs. 39% male). This correlates with studies that proofed women to be generally more active on social media than their male counterparts (Greenwood, Perrin & Duggan, 2016).

Figure 18. Gender Distribution

Figure 19. Age Distribution
The age distribution figure shows a strong majority of 25 to 30-year-old respondents. This could be explained by the strong affiliation of the millennial generation towards technology, using TNC as a frequent mode of transportation and engaging heavily in social media (and hence responding to our survey). Fewer are in the age groups of 18 to 25 and 30 to 45-year-olds with almost none over 45 and under 18-year-olds. We assume that under 18-year-olds are still transported by their parents or use public transportation like school buses. Additionally, there might be financial and legal limitations like i.e. ID and credit card for registration on a TNC. 18 to 25-year-olds might also be partially students, living on university campus and having limited financial resources, using less TNC. Over 30 year olds might have already their own car and over 45-year-olds might be less sophisticated with mobile technology. The majority, 25 to 30-year-olds are often in the beginning of their career, needing a lot of transportation, having the affection to mobile technology as a millennial generation, while not having a car yet.

Among occupation of respondents there was an equally strong majority of self-employed persons and employees (each 44%), while students and unemployed were underrepresented. An assumption is that the latter chose more economic ways (i.e. bus) for transportation due to budget constraints and therefore not being too familiar with TNC.
The respondents were from approximately 43 different cities across 18 provinces in China as shown in figure 19. Major responses were gathered from the countries center cities like Beijing the capital in the North, Chengdu in the West, Shanghai in the East and Guangzhou in the South. Having these responses from different parts of the country with a sheer amount of cities grants the study a diverse sample.

4.2. Reliability Results

As shown below, PE, EE, SI, FC, HM and Habit ended up higher than 0.7 in Cronbach’s alpha test, which means the reliability of those factors are acceptable. As for the PV and UA, which even though ended up respectively in 0.694 and 0.669, because the values are very close to 0.7, we consider them are still acceptable in reliability.
Table 6. Cronbach’s alpha of the factors

4.3. Hypotheses Test Results

4.3.1. Factors

The factor Performance Expectancy ended up in average mean score of 4.01 and standard deviation of 0.975 which was consisted of 4 individual items. By looking into subdivided items of SI, we can see the mean score and standard deviation distributed as following. “I perceive that TNC are helpful in my life” (mean 4.14, standard deviation 1.24), “I perceive that TNC enable me quick transportation” (mean 4.02, standard deviation 1.26), “I perceive that TNC improve my life efficiency” (mean 4.01, standard deviation 1.36), “I perceive that TNC arrival time is acceptable” (mean 3.88, standard deviation 1.31).

Table 7. Item results of PE
The factor Effort Expectancy was empirically demonstrated to have average mean score of 3.96 and standard deviation of 0.913. This factor was comprised of 6 individual items. Specifically, items are distributed as following, “In my opinion, figuring out how to use TNC apps is not difficult” (mean 4.06, standard deviation 1.34), “I generally understand how TNC work” (mean 3.84, standard deviation 1.41), “I perceive that TNC apps are convenient and easy to use” (mean 4.05, standard deviation 1.34), “I perceive that it is easy to sign up on TNC” (mean 3.95, standard deviation 1.37), “I perceive that it is easy for me to contact the TNC drivers and vice versa” (mean 3.89, standard deviation 1.39) “I perceive that it is convenient and easy to pay for the ride” (mean 4.01, standard deviation 1.33).

The factor Social Influence ended up in average mean score of 3.82 and standard deviation of 1.057 which were calculated from 4 individual items. Looking into subdivided items of SI, we can see the mean score and standard deviation distributed as following. “I tend to use the TNC that my friends or families use” (mean 3.96, standard deviation 1.44), “I perceive that by using TNC raises my prestige or image” (mean 3.68, standard deviation 1.43), “Famous people could influence my decision to choose TNC” (mean 3.72, standard deviation 1.43), “People who cares about me could influence my intention to use TNC” (mean 3.92, standard deviation 1.39).

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>In my opinion, figuring out how to use TNC apps is not difficult.</td>
<td>15</td>
<td>4.2</td>
<td>48</td>
<td>13.3</td>
<td>40</td>
<td>11.1</td>
<td>97</td>
<td>26.9</td>
</tr>
<tr>
<td>I generally understand how TNC work.</td>
<td>28</td>
<td>7.8</td>
<td>40</td>
<td>11.1</td>
<td>70</td>
<td>19.4</td>
<td>83</td>
<td>23.0</td>
</tr>
<tr>
<td>I perceive that TNC apps are convenient and easy to use.</td>
<td>18</td>
<td>5</td>
<td>35</td>
<td>9.7</td>
<td>59</td>
<td>16.3</td>
<td>92</td>
<td>25.5</td>
</tr>
<tr>
<td>I perceive that it is easy to sign up on TNC.</td>
<td>23</td>
<td>6.4</td>
<td>36</td>
<td>10.0</td>
<td>61</td>
<td>16.9</td>
<td>97</td>
<td>26.9</td>
</tr>
<tr>
<td>I perceive that it is easy for me to contact the TNC drivers and vice versa.</td>
<td>21</td>
<td>5.8</td>
<td>50</td>
<td>13.9</td>
<td>53</td>
<td>14.7</td>
<td>100</td>
<td>27.7</td>
</tr>
<tr>
<td>I perceive that it is convenient and easy to pay for the ride.</td>
<td>17</td>
<td>4.7</td>
<td>43</td>
<td>11.9</td>
<td>54</td>
<td>15.0</td>
<td>87</td>
<td>24.1</td>
</tr>
</tbody>
</table>

Table 8. Item results of EE
### Table 9. Item results of SI

The empirical result of factor Facilitating Conditions obtained average mean score of 3.91 and standard deviation of 1.01 which were comprised from 4 individual items. Specifically, the items respective mean and standard deviation scores are following with, “TNC apps on my smartphone is running smoothly” (mean 4.01, standard deviation 1.27), “I’m aware that the instruction information about how to use TNC is accessible for me” (mean 3.84, standard deviation 1.42). “I perceive that to have the requirements (e.g. ID, credit card, Alipay) for signing up on the TNC apps is not a difficulty” (mean 3.97, standard deviation 1.34), “I’m aware that the customer support of TNC is available for me” (mean 3.81, standard deviation 1.43).

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>I tend to use the TNC that my friends or families use.</td>
<td>24</td>
<td>6.6</td>
<td>46</td>
<td>12.7</td>
<td>55</td>
<td>15.2</td>
<td>75</td>
<td>20.8</td>
</tr>
<tr>
<td>I perceive that by using TNC raises my prestige or image.</td>
<td>34</td>
<td>9.4</td>
<td>48</td>
<td>13.3</td>
<td>74</td>
<td>20.5</td>
<td>72</td>
<td>19.9</td>
</tr>
<tr>
<td>Famous people could influence my decision to choose TNC.</td>
<td>28</td>
<td>7.8</td>
<td>56</td>
<td>15.5</td>
<td>67</td>
<td>18.6</td>
<td>81</td>
<td>22.4</td>
</tr>
<tr>
<td>People who cares about me could influence my intention to use TNC.</td>
<td>23</td>
<td>6.4</td>
<td>44</td>
<td>11.9</td>
<td>59</td>
<td>16.3</td>
<td>88</td>
<td>24.4</td>
</tr>
</tbody>
</table>

| Questionnaire Items | Strongly Disagree | Disagree | Slightly Disagree | Slightly Agree | Agree | Strongly Agree | Mean | Std. Deviation |
|---------------------|-------------------|----------|-------------------|---------------|-------|----------------|------|               |
|                      | 1 | 2 | 3 | 4 | 5 | 6               |      |               |
|                      | N | % | N | % | N | % | N | % | N | % | N | % |
| TNC apps on my smartphone is running smoothly. | 13 | 3.6 | 38 | 10.5 | 63 | 17.5 | 98 | 27.1 | 116 | 32.1 | 33 | 9.1 | 4.01 | 1.269 |
| I’m aware that the instruction information about how to use TNC is accessible for me. | 28 | 7.8 | 44 | 12.2 | 60 | 16.6 | 93 | 25.8 | 98 | 27.1 | 38 | 10.5 | 3.84 | 1.423 |
| I perceive that to have the requirements (e.g. ID, credit card, Alipay) for signing up on the | 15 | 4.2 | 46 | 12.7 | 62 | 17.2 | 92 | 25.5 | 105 | 29.1 | 41 | 11.4 | 3.97 | 1.343 |
TNC apps is not a difficulty. I'm aware that the customer support of TNC is available for me.

Table 10. Item results of FC

The factor Hedonic Motivation was empirically demonstrated to have average mean score of 3.89 and standard deviation of 0.906. This factor was comprised of 5 individual items. Specifically, items are distributed as following, “I enjoy ordering a ride over the TNC apps” (mean 3.99, standard deviation 1.30), “I enjoy taking a ride on TNC cars” (mean 3.95, standard deviation 1.31), “I perceive that TNC drivers in general are talkative or easygoing persons” (mean 3.77, standard deviation 1.29), “I like the gimmicks organized by TNC (for festival activity or promotional campaign)” (mean 3.74, standard deviation 1.40), “I like to get surprised by what kind of vehicle model (e.g. Toyota or Tesla) it will be” (mean 4.00, standard deviation 1.33).

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy ordering a ride over the TNC apps.</td>
<td>15</td>
<td>4.2%</td>
<td>44</td>
<td>12.2%</td>
<td>56</td>
<td>15.5%</td>
<td>89</td>
<td>24.7%</td>
</tr>
<tr>
<td>I enjoy taking a ride on TNC cars.</td>
<td>14</td>
<td>3.9%</td>
<td>49</td>
<td>13.6%</td>
<td>53</td>
<td>14.7%</td>
<td>106</td>
<td>29.4%</td>
</tr>
<tr>
<td>I perceive that TNC drivers in general are talkative or easygoing persons.</td>
<td>16</td>
<td>4.4%</td>
<td>53</td>
<td>14.7%</td>
<td>72</td>
<td>19.9%</td>
<td>103</td>
<td>28.5%</td>
</tr>
<tr>
<td>I like the gimmicks organized by TNC (for festival activity or promotional campaign).</td>
<td>26</td>
<td>7.2%</td>
<td>54</td>
<td>15.0%</td>
<td>66</td>
<td>18.3%</td>
<td>90</td>
<td>24.9%</td>
</tr>
<tr>
<td>I like to get surprised by what kind of vehicle model (e.g. Toyota or Tesla) it will be.</td>
<td>10</td>
<td>2.8%</td>
<td>53</td>
<td>14.7%</td>
<td>55</td>
<td>15.2%</td>
<td>98</td>
<td>27.1%</td>
</tr>
</tbody>
</table>

Table 11. Item results of HM

The empirical result of factor Price Value obtained average mean score of 3.91 and standard deviation of 0.941 which were comprised from 4 individual items. Specifically, the items respective mean and standard deviation scores are following with, “I perceive that TNC have
a fair pricing” (mean 3.95, standard deviation 1.31), “I perceive that TNC provide acceptable value” (mean 4.00, standard deviation 1.32), “I believe that I can save money by using TNC as transportation” (mean 3.88, standard deviation 1.28), “I perceive that TNC have a high CP (cost performance)” (mean 3.92, standard deviation 1.30).

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I perceive that TNC have a fair pricing.</td>
<td>20 5.5</td>
<td>29 8.0</td>
<td>76 21.1</td>
<td>95 26.3</td>
<td>107 29.6</td>
<td>34 9.4</td>
<td>3.95</td>
<td>1.306</td>
</tr>
<tr>
<td>I perceive that TNC provide acceptable value.</td>
<td>19 5.3</td>
<td>36 10.0</td>
<td>55 15.2</td>
<td>103 28.5</td>
<td>111 30.7</td>
<td>37 10.2</td>
<td>4.00</td>
<td>1.322</td>
</tr>
<tr>
<td>I believe that I can save money by using TNC as transportation.</td>
<td>17 4.7</td>
<td>36 10.0</td>
<td>78 21.6</td>
<td>102 28.3</td>
<td>97 26.9</td>
<td>31 8.6</td>
<td>3.88</td>
<td>1.281</td>
</tr>
<tr>
<td>I perceive that TNC have a high CP (cost performance).</td>
<td>17 4.7</td>
<td>39 10.8</td>
<td>63 17.5</td>
<td>116 32.1</td>
<td>88 24.4</td>
<td>38 10.5</td>
<td>3.92</td>
<td>1.302</td>
</tr>
</tbody>
</table>

Table 12. Item results of PV

The factor Habit has been shown to have average mean score of 3.79 and standard deviation of 1.042. The factor was comprised with 4 individual items. The specific items scores are listed as following, “Using TNC has been a habit of mine (mean 3.90, standard deviation 1.36)”, “I have to use TNC (mean 3.89, standard deviation 1.43)”, “I’m addicted to use TNC (mean 3.60, standard deviation 1.40)”, “Using TNC is my priority trip mode (mean 3.78, standard deviation 1.42)”.

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using TNC has been a habit of mine.</td>
<td>24 6.6</td>
<td>41 11.4</td>
<td>55 15.2</td>
<td>100 27.7</td>
<td>110 30.5</td>
<td>31 8.6</td>
<td>3.90</td>
<td>1.359</td>
</tr>
<tr>
<td>I have to use TNC</td>
<td>22 6.1</td>
<td>46 12.7</td>
<td>71 19.7</td>
<td>79 21.9</td>
<td>95 26.3</td>
<td>48 13.3</td>
<td>3.89</td>
<td>1.430</td>
</tr>
<tr>
<td>I’m addicted to use TNC.</td>
<td>30 8.3</td>
<td>54 15.0</td>
<td>83 23.0</td>
<td>86 23.8</td>
<td>78 21.6</td>
<td>30 8.3</td>
<td>3.60</td>
<td>1.405</td>
</tr>
<tr>
<td>Using TNC is my priority trip mode.</td>
<td>21 5.8</td>
<td>65 18.0</td>
<td>54 15.0</td>
<td>91 25.2</td>
<td>93 25.8</td>
<td>37 10.2</td>
<td>3.78</td>
<td>1.420</td>
</tr>
</tbody>
</table>

Table 13. Item results of Habit
User Acceptance generally has been shown to have average mean score of 3.96 and standard deviation of 0.950. The factor was comprised with 4 individual items. The specific items scores are listed as following. “TNC has been part of my life (mean 3.79, standard deviation 1.43)”, “Now I use TNC frequently (mean 3.91, standard deviation 1.41)”, “I think I will continue to use TNC (mean 4.07, standard deviation 1.27)”, “In future, I pursue to use TNC frequently (mean 4.08, standard deviation 1.24).

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNC has been part of my life.</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>28</td>
<td>7.8</td>
<td>53</td>
<td>14.7</td>
<td>56</td>
<td>15.5</td>
<td>87</td>
<td>24.1</td>
</tr>
<tr>
<td>Now I use TNC frequently.</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>23</td>
<td>6.4</td>
<td>44</td>
<td>12.2</td>
<td>63</td>
<td>17.5</td>
<td>86</td>
<td>23.8</td>
</tr>
<tr>
<td>I think I will continue to use TNC.</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>11</td>
<td>3</td>
<td>41</td>
<td>11.4</td>
<td>51</td>
<td>14.1</td>
<td>106</td>
<td>29.4</td>
</tr>
<tr>
<td>In future, I pursue to use TNC frequently.</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>11</td>
<td>3</td>
<td>32</td>
<td>8.9</td>
<td>65</td>
<td>18.0</td>
<td>101</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Table 14. Item results of UA

4.3.2. Correlation of Factors
The Spearman correlation coefficient are always occurred between −1 and 1, it is similar with Pearson correlation coefficient in terms of values of two variables. However, Pearson correlation coefficient focuses on measuring the strength of the liner relationship, the Spearman correlation coefficient on the other hand highlights monotonic relationship. That is, whether the relationship is linear or not. We think it is necessary to examine the potential possibility of existing interrelations between factors like EE and FC. If the result of Spearman correlation coefficient between any two factors shown a high monotone function of the other, then there is a need for factor analysis or combination of two factors. As a result, we can see from table 15 that only few reached an intermediately high value, such as PE and EE in 0.688, EE and FC in 0.666, EE and HM in 0.632, SI and HM in 0.639, FC and HM in 0.632, HM and PV in 0.633. Because these numbers are all under the defined critical point 0.7, we consider all factors are independent and positively affect UA. The correlation analysis has paved the way for further regression analysis to test the strength of relationships among proposed hypotheses.
### Table 15. Spearman's correlation coefficient between factors

<table>
<thead>
<tr>
<th></th>
<th>PE</th>
<th>EE</th>
<th>SI</th>
<th>FC</th>
<th>HM</th>
<th>PV</th>
<th>Habit</th>
<th>UA</th>
</tr>
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<tr>
<td><strong>N=361</strong></td>
<td></td>
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<tr>
<td><strong>PE</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Correlation Coefficient</td>
<td>1</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>EE</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.688**</td>
<td>1.000</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SI</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.492**</td>
<td>.531**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FC</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.608**</td>
<td>.666**</td>
<td>.591**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HM</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.563**</td>
<td>.632**</td>
<td>.639**</td>
<td>.632**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PV</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.532**</td>
<td>.522**</td>
<td>.587**</td>
<td>.557**</td>
<td>.633**</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Habit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.449**</td>
<td>.495**</td>
<td>.578**</td>
<td>.557**</td>
<td>.599**</td>
<td>.574**</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td><strong>UA</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.483**</td>
<td>.474**</td>
<td>.465**</td>
<td>.536**</td>
<td>.602**</td>
<td>.542**</td>
<td>.564**</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.</td>
</tr>
</tbody>
</table>

4.3.3. Relationships between Factors and UA

The simple linear regression between each factor to user acceptance has been conducted. We use standardized coefficient beta to examine the strength of the relationship and the R square to check how much of the independent variables i.e. UTAUT2 factors can determine the
dependent variable i.e. user acceptance. The result of the regression analysis is shown as figure 22. The regression equation can have variance that in need of testing in order to confirm that the beta value is not within the variance and thus can be confirmed as significant. So as to test for the significance and whether the null hypotheses could be rejected, T-tests were used in this research.

![Figure 22. Result of regression analysis](image)

Hypothesis 1 has Beta-value of 0.473, at significance level of 0.001, which attests that PE is a moderately positive interpreter of the dependent variable UA. Therefore, H1 is accepted. Using t-test to authenticate, a null hypothesis is created as below.

- **H1**: PE does not influence the Chinese user's acceptance (UA) of TNC
- **H1** : PE positively influence the Chinese user’s acceptance (UA) of TNC

The T-value is 10.159, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the H1 can be rejected at the significance level of 0.05 for H1.
Table 16. Regression result of PE

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjust R²</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2.115</td>
<td>.187</td>
<td>11.313</td>
<td>.000</td>
</tr>
<tr>
<td>PE</td>
<td>.473</td>
<td>.223</td>
<td>.22</td>
<td>1</td>
<td>.460</td>
<td>.045</td>
<td>.473</td>
<td>10.159</td>
</tr>
</tbody>
</table>

Hypothesis 2 has Beta-value of 0.458 at significance level of 0.001 which attests that EE is a moderately positive interpreter of the dependent variable UA. Therefore, H2 is accepted.

Using t-test to authenticate, a null hypothesis is created as below.

\[ H_2^0 : EE \text{ does not influence the Chinese user’s acceptance (UA) of TNC} \]

\[ H_2^1 : EE \text{ positively influence the Chinese user’s acceptance (UA) of TNC} \]

T-value is 9.77, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the \( H_2^0 \) can be rejected at the significance level of 0.05 for H2.

Table 17. Regression result of EE

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjust R²</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.071</td>
<td>.199</td>
<td>10.432</td>
<td>.000</td>
</tr>
</tbody>
</table>

Hypothesis 3 has Beta-value of 0.464 at significance level of 0.001, which attests that SI is a moderately positive interpreter of the dependent variable UA. Therefore, H3 is accepted.

Using t-test to authenticate, a null hypothesis is created as below.

\[ H_3^0 : SI \text{ does not influence the Chinese user’s acceptance (UA) of TNC} \]

\[ H_3^1 : SI \text{ positively influence the Chinese user’s acceptance (UA) of TNC} \]

It can be seen that the T-value is 9.937 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the \( H_3^0 \) can be rejected at the significance level of 0.05 for H3.

Table 18. Regression result of SI

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjust R²</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.365</td>
<td>.167</td>
<td>14.197</td>
<td>.000</td>
</tr>
<tr>
<td>SI</td>
<td>.464</td>
<td>.216</td>
<td>.214</td>
<td>1</td>
<td>.418</td>
<td>.042</td>
<td>.464</td>
<td>9.937</td>
</tr>
</tbody>
</table>

Hypothesis 4 has Beta-value of 0.526 at significance level of 0.001 which attests that SI is a moderately positive interpreter of the dependent variable UA. Therefore, H4 is accepted.

Using t-test to verify, a null hypothesis is created as below.

\[ H_4^0 : FC \text{ does not influence the Chinese user’s acceptance (UA) of TNC} \]
H4\textsuperscript{'}: FC positively influence the Chinese user's acceptance (UA) of TNC

It can be seen that the T-value is 11.704 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the H4\textsuperscript{0} can be rejected at the significance level of 0.05 for H4.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R\textsuperscript{2}</th>
<th>Adjust R\textsuperscript{2}</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>FC</td>
<td>.526</td>
<td>.276</td>
<td>.274</td>
<td>1</td>
<td>.494</td>
<td>.042</td>
<td>.526</td>
<td>11.704</td>
</tr>
</tbody>
</table>

*Table 19. Regression result of FC*

Hypothesis 5 has Beta-value of 0.617 at significance level of 0.001 which attests that HM is a moderately positive interpreter of the dependent variable UA. Therefore, H5 is accepted.

Using t-test to authenticate, a null hypothesis is created as below.

H5\textsuperscript{0}: HM does not influence the Chinese user's acceptance (UA) of TNC

H5\textsuperscript{'}: HM positively influence the Chinese user's acceptance (UA) of TNC

The T-value is 14.863, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the H5\textsuperscript{0} can be rejected at the significance level of 0.05 for H5.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R\textsuperscript{2}</th>
<th>Adjust R\textsuperscript{2}</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>HM</td>
<td>.617</td>
<td>.381</td>
<td>.379</td>
<td>1</td>
<td>.647</td>
<td>.044</td>
<td>.617</td>
<td>14.863</td>
</tr>
</tbody>
</table>

*Table 20. Regression result of HM*

Hypothesis 6 has Beta-value of 0.548 at significance level of 0.001 which attests that PV is a moderately positive interpreter of the dependent variable UA. Therefore, H6 is accepted.

Using t-test to authenticate, a null hypothesis is created as below.

H6\textsuperscript{0}: PV does not influence the Chinese user's acceptance (UA) of TNC

H6\textsuperscript{'}: PV positively influence the Chinese user's acceptance (UA) of TNC

The T-value is 12.408, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the H6\textsuperscript{0} can be rejected at the significance level of 0.05 for H6.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R\textsuperscript{2}</th>
<th>Adjust R\textsuperscript{2}</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>.548</td>
<td>.300</td>
<td>.298</td>
<td>1</td>
<td>.553</td>
<td>.045</td>
<td>.548</td>
<td>12.408</td>
</tr>
</tbody>
</table>

*Table 21. Regression result of PV*
Hypothesis 7 has Beta-value of 0.567 at significance level of 0.001 which attests that Habit is a moderately positive interpreter of the dependent variable UA. Therefore, H7 is accepted. Using t-test to authenticate, a null hypothesis is created as below.

\[ H_{70}^p: \text{Habit does not influence the Chinese user's acceptance (UA) of TNC} \]

\[ H_{71}^p: \text{Habit positively influence the Chinese user's acceptance (UA) of TNC} \]

It can be seen that the T-value is 13.038 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the \( H_{70}^p \) can be rejected at the significance level of 0.05 for H7.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjust R²</th>
<th>Df</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.001</td>
<td>.156</td>
<td>12.833</td>
<td>.000</td>
</tr>
<tr>
<td>Habit</td>
<td>.567</td>
<td>.321</td>
<td>.319</td>
<td>1</td>
<td>.517</td>
<td>.040</td>
<td>.567</td>
<td>13.038</td>
</tr>
</tbody>
</table>

*Table 22. Regression result of Habit*
5. Discussion

The purpose of this study was to investigate how user acceptance is affected within the sharing economy industry TNC. In order to comply with this purpose, we explored different factors and their influence on UA in Sharing Economy. Our empirical findings have shown the following results as discussed in the later parts of this section.

5.1. Implications for Research

To explore the influential factors of TNC on user acceptance in China, following implications based upon empirical findings and existing literature on user acceptance are elaborated:

Based on empirical findings, it can be drawn that Performance Expectancy plays an intermediately positive role in Chinese user acceptance of TNC. Performance Expectancy indicates that “what one can achieve in working performance depends on whether he believe the application of system will help him” (Venkatesh, 2003). Among the factor, the efficiency of transportation and everything it brings about, is elucidative. TNC usage can improve the life efficacy. It is proven, that such results equal the conceptualization of prior researches (Davis, 1989; Davis et al, 1989; Davis et al, 1992; Thompson et al, 1991; Moore and Benbasat, 1991; Compeau and Higgins, 1995; Compeau et al, 1999). The productivity makes TNC stand in line with sharing economy’s key component to provide access without need for ownership, (Bardhi & Eckhardt, 2012); in this case, referring to a car.

As an influential factor, Effort Expectancy has intermediately and positively contributed to user acceptance of TNC in China. Venkatesh (2003) defined effort expectancy as the “degree of ease related with the use of the system”. Based on our findings, it is confirmed that TNC users have a general understanding of the way that TNC work and believe that the holistic process of TNC use is convenient. By the same definition, the findings confirm several previous researches (Davis 1989; Davis et al, 1989, Thompson et al. 1991, Moore and Benbasat 1991). According to the findings, it is validated that connectivity (Benkler, 2007; Avital et al. 2015) through mobile devices making the convenient usage services of sharing economy’s platforms possible (Andersson et al., 2013).
As hypothesized, Social Influence imposes an intermediately positive impact on user acceptance of TNC in China. People define the social influence as the “to what extent a person thinks that it is significant to apply the new system” (Venkatesh et al. 2003). This indicates that suggestions and opinions from their reference group greatly influence Chinese TNC users (i.e. families, friends, co-workers) when deciding whether or which TNC should be chosen. This result of SI is equivalent with the findings witnessed or defined in prior researches (e.g. Ajzen, 1991; Davis et al. 1989; Fishbein & Azjen, 1975; Taylor & Todd 1995; Thompson et al, 1991; Moore & Benbasat, 1991). The aligns has been influenced by the community with previous sharing economy items (Bardhi & Eckhardt, 2012; Marton et al., 2017).

An intermediately positive influence on user acceptance of TNC in China was indicated in the empirical result of factor Facilitating Conditions. In light of the definition as “the degree to which a person believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh, et al. 2003), the facilitating conditions indicate that the success of TNC cannot be separated from the existence of certain facilities, resources, skills and even infrastructures. This result of FC is not contradictory to the findings from previous researches (Fishbein & Ajzen, 1985; Taylor and Todd 1995; Thompson et al, 1991; Moore & Benbasat 1991). Facilitating conditions function as an essential condition to sharing economy and described as digital platforms in literature (Tells, 2016; Andersson et al., 2013).

It is empirically proved that the factor Hedonic Motivation has imposed a positive impact on Chinese users’ acceptance. To elaborate, the strength of the relationship is stronger, being slightly above intermediate. Brown and Venkatesh (2005) defined hedonic motivation as “the fun or pleasure derived from using a technology”. Compared to findings of prior research (Merriam & Webster, 2003; Van der Heijden, 2004; Thong et al. 2006), it can be understood that Chinese users increase their acceptance of TNC and can receive joy, entertainment and pleasurable feelings from the acceptance of TNC.

Price Value imposes a significantly intermediate positive effect on user acceptance of TNC in China, following Hedonic Motivation. This indicates that Chinese TNC users carefully evaluate monetary differences between transportation providers. This finding differs from Venkatesh's (2003) first version of UTAUT, in which he claimed that employees pay no attention to money. In the second version of UTAUT (Venkatesh, 2012), Price Value was
noted as a factor, considered to imposing significant influence on User Acceptance, similar to this studies’ findings. Price value is connected to existing sharing economy studies, in which it plays a role as usage of idle resources decreases prices e.g. Benkler (2004), Codagnone & Martens (2016) and Willing et al. (2016).

User Acceptance is greatly influenced by the factor Habit with an intermediately positive connection. As we can see, the majority of Chinese users prioritize TNC. When it comes to different conceptualizations and operationalizations of habit in information system field, we are liable to believe that habit in this research is manifested as “habitual goal directed consumer behavior” or “goal-dependent automaticity” by Kim et al. (2005). According to Bargh et al. (2001), the conscious behavior is c divided into two categories, namely, the mental representation such as why, what, and how like goals and interconnections among these goals. The Habit and automaticity perspective (Aarts & Dijksterhuis, 2000; Verplanken et al. 1998) is characterized by it.

5.2. Implications for Practice

In regard to our research question on how TNC can achieve success in China the following recommendations are given:

Originating from empirical findings, it is believed, that the waiting time for TNC is acceptable. Based on context of TNC in China, it can be recommended that the reason why TNC is successful is the competitive advantage: it shortens these waiting times through additional functions including scheduling rides ahead or better driver coverage and saturation with network effects from larger market shares. In addition, some technological solutions, such as algorithms, are used for better distributions of drivers together with the use of specific navigation software to circumvent traffic jams increases success of TNC in China and should be given more attention to investigate in further optimization of waiting time reduction.

TNC users pay attention to convenience. Based on this finding, TNC should prioritize simplicity and accessibility. It is advisable to enable a quick registration process for new users so that registration can be finalized within few steps and by using a minimum of information. In addition, it should be confirmed that payments can be executed through all available channels in a quick and secure manner like i.e. cash, QR-code, NFC, credit cards and Alipay.
From the user perspective, the app should be of similar structure of as likewise apps to reduce the learning curve. A communication channel with passengers is suggested to be implemented, so that passengers and drivers can find each other on crowded places.

Chinese cultural influence over the entire society is responsible for reason why Social Influence playing a positive role in this case. In Chinese culture, family is very important and its related philosophy was incorporated into historical progress in terms of various social relations in China, including relationship of parents to children, husbands to wives, governors to civilians, elder to younger brothers and among friends. Therefore, word-of-mouth plays an important role in the user acceptance of TNC. As for TNC, it is advisable to build a strong positive social image and to engage through influencers.

Chinese TNC users pays attention to Facilitating Conditions. Indeed, as a sophisticated information system, it is required that in terms of the nature of TNC, users should be able to access the services easily and safely through internet access via 4G network or Wi-Fi, smartphones, telephone, TNC applications and the most indispensable, the payment methods, which can be achieved either by credit card applications or mobile payment applications like Alipay or WeChat wallet in China. It is reported that channels for customer services are not enough for Uber in China, causing complaints from users; both drivers and passengers. Customers’ problems with TNC often need to be resolved within a short period of time, but Uber customers can only report their encountered troubles through E-mail or the feedback section, which generally is too inconvenient. On the other side, DiDi provides 24/7 telephone hotlines support respectively for drivers and passengers which significantly outweigh that of Uber (DiDichuxing.com, 2017), being perhaps responsible for the win on market share domination against Uber.

There is some change that TNC in China should consider: to improve the humor of their mobile applications as well as the recreation in the process of the ride; to make the customer feel excited and happy, when they are escaping for a little while from the noisy environment. With this new technology providing a novelty seeking and uniqueness, intrinsic motivation has been playing a leading and significant role in the use of TNC for customers. (Brown and Venkatesh, 2005; van der Heijden, 2004). Therefore, TNC, as an emerging technology and invention, can meet Chinese users’ requirement for modernity and recreation.
TNC users are looking for chance to get high value with low prices. Subsidizing prices enables the possibility of conquering a higher market share and therefore better user acceptance in TNC, which is similar to what DiDi and Uber did. It can be explained by a comparison with alternative transportation i.e. taxis, subway, bus or own car, that using TNC for work-related transportation has strong price competitiveness. This indicates that normally TNC users prefer economic transportation services providing acceptable value while allowing to save money at the same time. User numbers and frequency of use can increase with subscription models, in which a fixed monthly fee is used in exchange for discounted rides price value. In addition, benefits from a lock-in effect of users and an higher frequency of application can be expected for TNC.

After using the TNC for a long time, users could form the same set of mental representations and establish knowledge structure, and finally, users will use TNC even without second thought. Thus, it is suggested that the management of TNC should focus on change management, especially when releasing new updates, that could potentially affect behavioral patterns of their users. By these means, the quality of services of TNC will be improved and meanwhile customers’ habitual inertia can be developed. Considering that TNC itself are not mature, TNC must cement the user foundation in the long term. In addition, arguably, the formation of habit could also be largely affected by previous behavior, we suggest future research the use of more moderators to measure habit.
6. Conclusion

Digitalization and mobile connectivity have created new business models such as the sharing economy. China has become the largest sharing economy market and TNC its largest industry. This new digitally-enabled industry has experienced disruption and drastic shifts of market share among its contenders such as Uber and Didi. The study’s purpose was to find out about the success factors of TNC in China for comprehension of its forces and development. This topic hasn’t been researched yet academically in-depth. The user acceptance, that was needed to be investigated in, was analyzed with the modern UTAUT2 framework, which itself is a combination of various previous user acceptance models. A self-selection sample of 361 respondents from 43 cities across 18 Chinese provinces of was gathered through an online survey for a quantitative analysis through simple linear regression. As a result, it was found, that all seven factors of UTAUT2 such as performance expectancy, effort expectancy, social influence, hedonic motivation, price value and habit are influencing user acceptance intermediately positive. After analyzing the findings both practical and research implications are presented, especially managerial recommendations about raising market share and user acceptance of TNC in China. This paper represents the first user acceptance study on TNC through application of UTAUT2.

The diverse sample of representative respondents grants this study a high quality for generalization. It should be kept in mind, that for a population as big as China’s, a larger sample may be recommended for more accurate depictions. Further empirical findings can be gathered with more complex statistical analysis tools like i.e. partial least squares. Even UTAUT2, being already a sophisticated framework, is still developing and will be improved and extended even more over time.

Factors like trust and privacy are recommended to be included in further studies on UTAUT2, as both are expected to make an impact on user acceptance for certain users. These privacy-concerned users with a unique status in the community that value data ethics and safety make an interest topic of study. Current evolvement of TNC to cover further industries such as food delivery, car sharing and carpooling could indicate with further studies the performance of UTAUT2 factors within various industries. Replications of this study are also recommended among different countries and cultures to get insight of i.e. the
influence of culture or industries on the UTAUT2 factors. Furthermore, a longitudinal study could be considered to investigate in the change of user acceptance of TNC over time.
References


Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. Journal of Business Research, 67(8), 1595-1600.


Kathan, W., Matzler, K., & Veider, V. (2016). The sharing economy: Your business model’s friend or foe?. *Business Horizons*, 59(6), 663-672.


Appendices

Appendix I.

Mobile view of the questionnaire in Chinese on the left and on the right an English translation. We would like to annotate that the Chinese word for the term TNC is self-explanatory and common in Chinese language and doesn’t require further elaboration. All the Questionnaire items can be found under chapter 3.4.1.
Appendix II.

Complete questionnaire translated to English (desktop view)

Survey about User Acceptance of Transportation Network Companies (TNCs) in China

1. I perceive that TNCs are helpful in my life.
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

2. I perceive that TNCs enable me quick transportation.
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree
3. I perceive that TNCs improve my life efficiency.*
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree

4. I perceive that TNCs arrival time is acceptable.*
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree

5. In my opinion, figuring out how to use TNC apps is not difficult.*
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree
6. I generally understand how TNCs work.*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

7. I perceive that TNC apps are convenient and easy to use.*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

8. I perceive that it is easy to sign up on TNCs.*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree
9. I perceive that it is easy for me to contact the TNCs drivers and vice versa. *
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

10. I perceive that it is convenient and easy to pay for the ride. *
    - I totally disagree
    - I disagree
    - I slightly disagree
    - I slightly agree
    - I agree
    - I totally agree

11. I tend to use the TNC that my friends or families use. **
    - I totally disagree
    - I disagree
    - I slightly disagree
    - I slightly agree
    - I agree
    - I totally agree
12. I perceive that by using TNCs raises my prestige or image.
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

13. Famous people could influence my decision to choose TNCs.
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

14. People who cares about me could influence my intention to use TNC.
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree
15. TNC apps on my smartphone is running smoothly. *
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree

16. I’m aware that the instruction information about how to use TNCs is accessible for me. *
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree

17. I perceive that to have the requirements (e.g. ID, credit card, Alipay) for signing up on the TNC apps is not a difficulty. *
   ○ I totally disagree
   ○ I disagree
   ○ I slightly disagree
   ○ I slightly agree
   ○ I agree
   ○ I totally agree
18. I'm aware that the customer support of TNCs is available for me. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

19. I enjoy ordering a ride over the TNC apps. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

20. I enjoy taking a ride on TNC cars. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree
21. I perceive that TNC drivers in general are talkative or easygoing persons. *
   - [ ] I totally disagree
   - [ ] I disagree
   - [ ] I slightly disagree
   - [ ] I slightly agree
   - [ ] I agree
   - [ ] I totally agree

22. I like the gimmicks organized by TNCs (for festival activity or promotional campaign). *
   - [ ] I totally disagree
   - [ ] I disagree
   - [ ] I slightly disagree
   - [ ] I slightly agree
   - [ ] I agree
   - [ ] I totally agree

23. I like to get surprised by what kind of vehicle model (e.g., Toyota or Tesla) it will be. *
   - [ ] I totally disagree
   - [ ] I disagree
   - [ ] I slightly disagree
   - [ ] I slightly agree
   - [ ] I agree
   - [ ] I totally agree
24. I perceive that TNCs have a fair pricing. 
- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

25. I perceive that TNCs provide acceptable value. 
- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

26. I believe that I can save money by using TNCs as transportation. 
- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree
27. I perceive that TNCs have a high CP (cost performance).*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

28. Using TNC has been a habit of mine.*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

29. I have to use TNC.*
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree
30. I’m addicted to use TNC.  
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

31. Using TNC is my priority trip mode.  
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree

32. TNC has been part of my life.  
   - I totally disagree
   - I disagree
   - I slightly disagree
   - I slightly agree
   - I agree
   - I totally agree
33. Now I use TNC frequently. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

34. I think I will continue to use TNC. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree

35. In future, I pursue to use TNC frequently. *

- I totally disagree
- I disagree
- I slightly disagree
- I slightly agree
- I agree
- I totally agree
36. Please tell us which TNCs you have used. *
   - Didi
   - Uber
   - Yidao
   - Others

37. Please tell us which TNCs you use most frequently. *
   - Didi
   - Uber
   - Yidao
   - Others

38. Your gender *
   - Male
   - Female
   - Prefer not to say

39. Your age *
   - Under 16
   - 18 to 25
   - 25 to 30
   - 30 to 45
   - Above 45
40. Your occupation *

- Student
- Employee
- Freelance
- Unemployed
- Other

41. Your location *

- 其他