A Study on the Structural Relations among Factors Influencing the Adoption Intention of Grab Ride-Hailing Service in Vietnam

Nguyen Thi Lan Ngoc[1], Ju-sik Park[2]

[1] Master Student of Department of Marketing – Business Administration, University of Ulsan Email address: lanngocnguyen2311@gmail.com

[2] Professor – Department of Marketing – Business Administration, University of Ulsan Email address: parkjsys@ulsan.ac.kr

A Study on the Structural Relations among Factors Influencing the Adoption Intention of Grab Ride-Hailing Service in Vietnam

베트남 그래브 승차 호출 서비스 채택의도에 영향을 미치는 요인들

Abstract

The ride-hailing service is considered as an exploding transportation mean throughout Vietnam. While most of citizens in big cities have accepted ride-hailing service, there are still a significant number of non-users in small and non-cities. Analyzing the factors that influence the adoption intention toward Grab ride-hailing service in Vietnam is especially critical to encourage the usage of this service. This paper proposes the structural framework based on the combination between the theory of perceived value, perceived risks and theory of innovation acceptance to predict the adoption intention of nonusers. The perceived value is measured by utilitarian benefits and hedonic benefits (perceived usefulness (PU) and perceived ease of use (PEOU) – the former, perceived enjoyment – the latter). The perceived risk is conceptualized by three variables: privacy risk, security risk, and performance risk. Subjective norms also support the adoption intention. The new variable automobile dependency is added to examine its positive impact on adoption intention. The data was collected in Vietnam, the respondents are non-users or indirect users of Grab ride-hailing service from small or non-cities. The result shows that perceived usefulness, perceived ease of use, perceived enjoyment, subjective norms directly affect perceived value, which directly affect the adoption intention. Additionally, perceived risk also significantly impacts the adoption intention and moderates the relationship between perceived value and adoption intention. Finally, the automobile dependency influences the adoption intention of Grab ride-hailing service.

Key words: ride-hailing service, perceived value, perceived risk, subjective norms, automobile dependency, technology adoption intention

요약

승차 호출 서비스는 베트남 전역에서 폭발적인 교통 수단으로 간주됩니다. 대도시의 대부분의승차 호출를 수락했지만 여전히 소규모 및 비도시에 많은 비 사용자가 있습니다. 이 서비스의 사용을 장려하기 위해서는 베트남에서그래브 승차 호출 서비스 대한 채택 의도에 영향을 미치는 요인을 분석하는 것이 특히 중요합니다. 본 논문은 비 이용자의 채택 의도를 예측하기 위해인지 된 가치 이론,인지 된 위험 및 혁신 수용 이론의 조합에 기반한 구조적 틀을 제안한다. 인지 된 가치는 실용적 혜택과 쾌락 적 혜택 (PU (지각 된 유용성) 및 PEOU (지각 된 사용 편의성) – 전자, 인지 된 즐거움 – 후자) 로 측정됩니다. 인지 된 위험은 개인 정보 위험, 보안 위험 및 성능 위험의 세 가지 변수로 개념화됩니다. 주관적 규범은 또한 채택 의도를 뒷받침합니다. 새로운 가변 자동차 의존도가 추가되어 채택 의도에 대한 긍정적 인 영향을 조사합니다. 데이터는 베트남에서 수집되었으며 응답자는 소규모 또는 비도시의그래브 승차 호출 서비스의 비 사용자 또는 간접 사용자입니다. 그 결과인지 된 유용성,인지 된 사용 편의성,인지 된 즐거움, 주관적 규범이인지 된 가치에 직접적인 영향을 미치며, 이는 채택 의도에 직접적인 영향을 미친다는 것을 보여줍니다. 또한 인식 된 위험은 채택 의도에 상당한 영향을 미치고 인식 된 가치와 채택 의도 간의 관계를 조절합니다. 마지막으로, 자동차 의존성은 그래브 승차 호출 서비스의 채택 의도에 영향을 미칩니다.

핵심어 : 승차 호출 서비스, 인지 된 가치, 인지 된 위험, 주관적 규범, 자동차 의존성, 기술 채택 의도

I. Introduction

Along with a growing level of motorization, motorcycle ownership, and use have been increasing rapidly in developing countries over the past decade (Tuan and Mateo-Babiano, 2013; Akaateba et al., 2014). Technological revolution gives rise of the appearance to the modern economic model, based on Internet connectivity, creating new business models. Ride-hailing service is one of the emerging business models in recent times. This form of service is developing in Vietnam and other countries in different speeds and levels. Some Western countries have operated online-enabled platforms for transportation and achieved great results. In developing countries in general and Vietnam in particular app-based transportation is no longer a new issue. However, the development of online-enabled transportation platforms in Vietnam is still facing many difficulties and obstacles.

The ride-hailing services become the new norm of Vietnamese who are living in big cities in Vietnam such as Hanoi, Hochiminh, … However, the usage percentage in other cities and provinces in Vietnam still counts a smaller segment in total usage number. In the report of ride-hailing services by location in Q2, 2020, in small cities and non-cities, non-paid options of transportation or traditional methods such as taxi call center or motorbike taxi account a huge number of local citizens. To be compared with the coverage of Grab service throughout Vietnam within 36 cities and provinces, the percentage of users from cities except for Hanoi, Hochiminh, Danang, Haiphong, and Nhatrang is insignificant. There are nonusers who are in small cities and non-cities. What are their motivations that cause the adoption intention toward the ride-hailing services in general and Grab service in particular? The research aims to analyze the perception of nonusers toward Grab ride-hailing service adoption intention.

This research is conducted in the aspect of the perception of consumers about the value which ride-hailing services could offer to consumers – perceived value. Perceived value is a factor influencing consumer decision making which is behavioral intention toward an innovation (Chen and Lin, 2015). In addition, we also apply theories to explain customers' behavioral intention of new technology, for instance, Diffusion of Innovations Theory (DIT), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and The Unified Theory of Acceptance and Use of Technology Model (UTAUT). The perceived ease of use and perceived usefulness are considered components as utilitarian benefits affecting consumers' perceived value and adoption intention toward tech bike services. Moreover, enjoyment as a hedonic benefit has positive influences on service quality (Dabholkar, 1996). So, the hedonic element also is included in the determinant set of factors influencing the perceived value. In other segments, for instance, banking or e-services, the perceived risk has a negative effect on the intention to try new technology, Ruyter et al. (2001). The construct of users' perceived risk is included privacy risk, security risk, and performance risk, which is supposed to influence users' perceived value. In addition, perceived risk is considered as the moderator of the relationship between the perceived value and adoption intention toward Grab ride-hailing service. Subjective norms and automobile dependency is needed to predict the intention toward the innovation of transportation in Vietnam.

The research focuses on factors that impact consumers' intention to use ride-hailing services in Vietnam and which degree of perception of consumers toward the value those services provide them. Following that, management could imply into strategic plans to enrich the value offered to users to encourage non-users adopting Grab ride-hailing service.

II. Literature review

1. Ride-hailing services in small cities and non-cities in Vietnam

Ride-hailing services could be defined as a smartphone application that allows users to order a motorbike or car ride from professional or part-time drivers (Clewlow and Mishra, 2017). This application requires users' global positioning system (GPS) to track down the current locations of passengers and drivers. Passengers require a ride by using the app to entering their pick-up place and destination. Then, the app will suggest different riding plans with different conditions and fees. Ride-hailing services have brought a cutting-edge lifestyle to users.

These years, ride-hailing service have become more common throughout Vietnam. Ride-hailing service providers expand their sharing economy business models to small and non-cities in Vietnam. The appearance of ride-hailing services brings several advantages for Vietnam transportation. Users have more substitutes with even lower price for their trip. Previous time, the government regulation that allowed ride-hailing services could work only within 5 big cities restricted the development of ride-hailing services. Nowadays, the ride-hailing services could officially be accepted in other cities throughout Vietnam. Ride-hailing services have built the ecosystem which involves food delivery, parcel delivery, payment via e-pay, ... In small and non-cities, the ride-hailing services currently encourage the nonusers to adopt the services and use services as an ecosystem which is associated to their every inch of life.

2. Grab services

Grab is a technology company is established in Malaysia in 2012 (Cheong and Kash, 2014). Grab provides the ride-hailing services in Southeast Asian countries such as Malaysia, Indonesia, Philippines, and Vietnam, … Furthermore, Grab also makes delivery services available via its mobile app. Grab expanded to Philippines

(Calvin, 2014), Singapore, and Thailand in 2013 (Digital News Asia, 2013). Grab first launched its service to Hochiminh City, Vietnam in 2014 (Do Anh Minh, 2014). By 2015, Grab service was used throughout Vietnam. Even though there are many rivals in the tech-bike market, Grab reached many achievements and took over Uber's assets in Southeast Asian area in 2018 (Danielle Keeton-Olsen, 2018). Covid-19 pandemic delivers the crisis toward worldwide economy. However, it becomes both challenge and opportunity for Grab service. People under the lockdown situation and online services help them to adapt with the social distancing lifestyle. Delivery has become a new norm to citizens.

3. Perceived value

Perceived value which is the fundamental term in marketing field is illustrated as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Holbrook, 1999; Woodruff, 1997; Zeihaml, 1988). When customers consider to make decision to buy goods or services, they review the benefits they will receive and the cost they have to pay off. Perceived value is consisted of multiple aspects of value they are able to acquire. Thus, different constructs are applied to measure consumers' perceived value, such as qualitative and quantitative, objective and subjective, … (Schechter, 1984). Other researchers, Monroe (1990), Dodds et al. (1991), Naumann and Jackson (1999), defined perceived value equals the ratio of perceived benefits and perceived sacrifice. As in the study of Hallowell, in Croinin et al., (2000), perceived value is simplified as the ratio of perceived quality relative to the price.

Previous academic papers measured the perceived value by examine the perceived benefits which are made up of utilitarian benefits and hedonic benefits (Lim and Ang, 2008). Utilitarian benefits are defined as the utility of the offering, such as the efficiency and ease of use. Hedonic benefits focus on the enjoyment and fun can be acquired from goods or services.

4. Technology adoption intention

Theory of Reasoned Action (TRA) is the origin of Theory of Planned Behavior (TPB) (Ajzen & Fishbein, 1980). The theory explains human behavioral intention in various situation. Both TRA and TPB include key variables behavioral intention and subjective norms. Behavioral intention is people's readiness to perform behavior. Subjective norms are belief about surrounding people's judgement about the behavior. Subjective norms could be from the peer group or family members. TRA aforementioned that behavioral intention guides actual behavior. TPB is TRA adding perceived behavioral control (Ajzen, 1991). According to Ajzen (1991), perceived behavioral control is come from self-efficacy. In Badura's social cognitive theory (1997), people perform an act when they require a particular outcome.

Technology acceptance model (TAM) was the development of Theory of Reasoned Action (TRA) (Davis, 1989; Samaradiwakara & Gunawardena, 2014). Basic TAM model explains the users' acceptance of technology through two attributes: perceived usefulness (PU) and perceived ease of use (PEU). Perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). Ease of use is "the degree to which a person belief that using a particular system would be free of effort" (Davis, 1989). Moreover, the perceived usefulness also affects the perceived ease of use and mediate its effect (Davis, 1989). Most of researchers use TAM model to investigate the adoption of an innovation (Venkatesh et al., 2003). Weijters, Schillewaert, Rangarajan, and Falk (2005) found out that PU and PEO impact the consumers' attitude toward the innovation. Perea y Monsuwé, Dellaert, & Ruyter (2004) considered the enjoyment also affect consumers' behavior toward the adoption of innovation. Perceived risk is believed as a variable included in TAM model by Cox (1967). Consumer will produce the subjective thoughts of consequences based on anything that can be observed (Bettman, 1973). In consumer behavior study, perceived risk is consumers' judgement of negative consequences.

According to Chen (2017), The Unified Theory of Acceptance and Use of Technology Model 2 (UTAUT2) also includes facilitating conditions, hedonic motivation, price value, habit and perceived ease of use and usefulness. Wang (2010) stated that perceived value impact behavioral intention; however, perceived playfulness executes minor effects on behavioral intention.

5. Perceived risk

Consumers experience the uncertainty when they cannot predict the consequences of using a product or service (Cox and Rich, 1964). According Fishbein and Ajzen (1975), consumers are aware of the personal losses in the context of using SSTs. In many researches on the e-services, perceived risk is a precedent to estimate the consumer behavior in consumer decision-making process. Perceived risk possesses a role as an obstacle to participate in adoption intention (Jacoby and Kaplan, 1972; Featherman and Pavlou, 2003; Luo et al., 2010; Kim et al., 2008; Cheng and Huang, 2013; Thakur and Srivastava, 2014; Martins et al., 2014).

Sharing economy might expose consumers to more risks than the traditional transaction. In other research of Yang et al. (2015b), the security risk is added in the context of money transfer context. According to Cheng (2016) and Zhu et al. (2017), in China, the legal risks is also included into the ride-sharing service perceived risk. When

consumers involving in using transaction, the concern of personal property and performance of the service providers – safety or some compensation for the losses is measured to influence into the decision of adoption ride-hailing service (Zhu et al., 2017; Hwang and Griffiths, 2017). The perceived privacy risk is the possible damage or the use of personal information without persuasive reasons (Nyshadham, 2000; Gao et al., 2015). Private information is used for benefits that create the risk toward users, which is the main factors that users consider to hesitate to accept sharing economy or ride-hailing service in particular (Lee et al., 2018). The security risk is defined as the possibility of losing property during service usage or personal injury (Thakur and Srivastava, 2014 and Lee et al., 2016). Performance risk or functional risks is the concern of performance of ride-hailing service including the performance of driver and bike or car are used. The users of e-service have to take the perceived risk into account carefully (Hawapi et al., 2017; Birinci et al., 2018; Chang and Wang, 2018).

6. Subjective norm

Subjective norm is the perceived social pressure to behave in a particular way and the motivation to comply with others' views (Ajzen, 1991; O'Neal, 2007). Subjective norm in Theory of Planned Behavior is the belief about people opinions to agree or disagree of the behavior. Subjective norms can affect the degree of pressure when an individual engages in a behavior. As Rivis and Sheeran defined (2003), subjective norms are the significant judgement from people who are important to the individual is examined the adoption behavior (e.g. family, friends, colleagues, and others). Some previous studies measured the relation between subjective norms toward buying behavior. Tarkiainen and Sundqvist (2005) indicated that subjective norms significantly affect the attitude of buying organic food.

7. Automobile dependency

Automobile dependency or car dependency is widespread studied in transportation research and policy literature, there are few existing researches in marketing terms. The term "automobile dependency" is understood in different concepts by different scholars (Gorham, 2012; Lucas and Jones, 2009; Mo.Ve. Association, 2008). Automobile dependency or automobile oriented transportation is defined as the pattern that citizens prefer using the automobile vehicle than other alternatives (Victoria Transport Policy Institute, 2019). The dependency on motorbike and car make people feel difficult to complete their tasks and activities without using automobile transportation. In other words, a city that assumes motorcycles or cars as the primary vehicles for travels (non-work and work trips included), the automobile dependency is the lifestyle. In this paper, the definition of automobile dependency is the individual pattern or attitude when they consider which kinds of transportation to use for their trips.

According to Farrington et al. (1998), the automobile dependence has two sorts. The conscious dependence and the structural dependence, the first is the individual who depends on the automobiles could consider other kinds of transportation and the latter is the individual who relies on automobiles due to lack of suitable substitutes. The conscious dependence is the behavior of consumers to choose familiar transportation methods to them, while the structural dependence is caused by the contextual factors. This research considers the automobile dependency as an individual is likely to use automobile to accomplish their activities and they are not able to complete their trip without automobile transportation.

III. Hypothesis development

To explain and understand the non-users' adoption intention toward the new kind services supported by advanced technology, we apply above theories detailed in literature review to propose following hypothesis.

1. Perceived benefits and Perceived value

1.1. Perceived ease of use and Perceived usefulness (Utilitarian benefits)

As TAM model, the users' acceptance of technology is given an explanation through two attributes: perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989). TAM model explains that the adoption of new technology is affected by the perception of its benefits and ease of use. Perceived ease of use is the consumer belief of the effortless when using technology (Davis, 1989). Perceived ease of use refers to consumer belief of their ability of using new technologies. The perceived usefulness is the consumer belief of the importance of appliance of technology, Davis (1989). The usefulness is the belief of using technology help customers shorten waiting time and reducing cost they have to trade off (Rayle, 2016). Perceived usefulness, in other words, perceived benefits are the extend consumers believe their tasks or activities will be enhanced by applying new technologies. Naiwumbwe (2012) found the impact of perceived ease of use on perceived usefulness in case of the use of smartphone in fund transfer. When users feel the technological services easy to use, they will feel those bring more usefulness (Davis, 2000).

H1: Perceived Ease of Use has positive impact on Perceived Usefulness

Perceived ease of use is the customers' perception of effortlessness when they use ride-hailing services. If the barrier of new technology is simplified and overcome, the sacrifice of approaching services will be reduced. People have to pay their effort to accomplish the tasks or activities. However, effort is a finite resource which is spent based on the importance of the tasks and the involvement of the users (Radner and Rothschild, 1975). Perceived ease of use of ride-hailing services can be defined as the utilitarian benefits. When the nonusers first time involving in using Grab ride-hailing service, the ability to learn the operation of ride-hailing service application and to use the service with less of effort, which is the "ease" comes from the consciousness of the nonusers. If they feel freeing of difficulties when they adopt the new technology, they are likely to evaluate the ride-haling service brings them extra benefits, which increases the perceived value toward the service. An application that is easy to use will be easily accepted due to the more benefits it brings to the users. If using Grab ride-hailing service is paid by less effort, nonusers easily to accept it as a new transportation substitutes. Thus, the hypothesis can be depicted as:

H2: Perceived Ease of Use has positive impact on Perceived Value of Grab ride-hailing service

The belief of using a new technology will enhance the performance of individuals is regarded as perceived usefulness. Perceived usefulness is indicated by the advantages when using tech-bike like the convenience, reducing waiting time, saving time for traveling. It relates to job effectiveness, productivity of the technology to an individual's task. Perceived usefulness of ride-hailing services can be defined as the utilitarian benefits. The perceived usefulness is revealed as utilitarian benefits of effective communication alternatives in message service research (Kim et al, 2008). Utilitarian effect is the advantages of using SSTs such as saving time and cost in procedure (Heijden, 2004). Consumers use tech-bike to approach the destination in shorter time. Consumers know in advance the information of their choices. In this study, the perceived usefulness which is the advantages which help users save time to achieve their objectives, then the perception of value of the services will be strengthen. The perceived usefulness is involved in the perceived benefits of customers toward ride-hailing services. Yang, H., Yu, J., Zo, H., Choi, M., (2015) analyzing the perceived benefits which contain perceived usefulness have impact on consumers' perceived value of using wearable devices.

H3: Perceived Usefulness has positive impact on Perceived Value of Grab ride-hailing service

1.2. Perceived enjoyment and Perceived value (Hedonic benefits)

Perceived value can be accumulated by both utilitarian and hedonic value. Holbrook (1999) explained extrinsic value as functioning or utilitarian benefits and intrinsic value as the enjoyment. Perceived enjoyment is defined "the extent to which the activity of using the computer system is perceived to be personally enjoyable in its own right" (Davis et al., 1992). The feeling enjoyment or hedonic benefits is the joyfulness of using services, which is the motivation to potential behavior. Hence, this study investigates hedonic benefits in particularly is the enjoyment's influence on perceived value of using ride-hailing services. Perceived enjoyment is experimented as a benefit that influences the perceived value (Kim et al., 2007). The enjoyment during exploring the innovation adjoin the value to encourage user adopt the technology. According to Park and Chen (2017), adopting innovative IT products are influenced by the effect of joyfulness. Following hypothesis is proposed:

H4: Perceived Enjoyment has positive impact on Perceived Value of Grab ride-hailing service

2. Perceived value and Adoption intention

Perceived value is the difference between perceived benefits and sacrifice (Dodds et al., 1991). According to Schechter (1984), perceived value is conceptualized by qualitative and quantitative. Customers will evaluate the choices based on what they have to trade to get their needs or wants. Perceived value is the antecedent of consumer decision making process, which is confirmed in many previous researches. For instance, Kim (2013) confirmed the positive relationship between perceived value and mobile engagement intention in a study of mobile user engagement. The relationship is confirmed in other studies and different fields: blogging (Chen and Lin, 2015), the adoption of location-based services (Yu et.al, 2013). The enjoyment factor included in perceived value also indicate a positive influence on customer's intention to use products (Turel et al, 2010). This study focuses on the positive impact of perceived benefits on customers' perceived value, which will affect the behavior intention, especially, the behavioral intention of ride-hailing services. Consumers' perception of great value when they use the technological services instead of tradition services will form the intention to adopt the innovation. Thus, we suppose:

H5: The Perceived Value will positively affect Adoption Intention toward Grab ride-hailing service

3. Perceived risk and Adoption intention

Perceived risk is defined as the degree of uncertainty about a service of consumers (Dowling and Staelin, 1994). Research of B. Snoj, A. Pisnik Korda, and D. Mumel (2004) showed that perceived risk including financially, functional risks, technical aspects of risks and social risks. Consumers experience the uncertainty when they cannot predict the consequences of using a product or service (Cox and Rich, 1964). According Fishbein and Ajzen (1975), consumers are aware of the personal losses in the context of using technology. The adoption of new technology may let consumers experience the technological risk relating to the security of personal information, etc. Moreover, ride-hailing service is the utilization technology firstly without communication, that also increases consumers perception of risk. Previous studied investigated perceived risk as a factor that affects intention to buy (Ha and Stoel 2009), intention to use (Yoon 2011), and behavioral intention (Cheng and Chu 2013; Park and Blenkinsopp 2009).

3.1. Privacy risk and Adoption intention

The Internet-based transaction have to utilize users' information to customize and improve the customer experiences, which might pose the threat to user privacy (Lee et al, 2018). Ride-hailing service is built by the algorithm of user' allocation of transportation and the requirement of transportation. Therefore, all parties who join it the ride-hailing service like passengers, drivers, and service providers have to reveal their personal information. Especially, passengers who are nonusers – new to the sharing economy – should consider to share their profiles, geolocation data, and bank card information (if they use pay by card instead of cash on delivery). Those kinds of risks related to the willing to adopt the technology of nonusers (Hong, 2017). The nonusers who live in small or con-cities are familiar with the traditional transportation, such as their own bike or car. If they want to choose other transportations, they easily choose traditional taxis, or motorbike taxis who they get used to with them. Thus, the exposing of information to strangers pose the uncertainty, which reduce the users' perceived value of Grab ride-hailing service. The following hypothesis is proposed:

H6: Privacy risk has negative impact on Adoption Intention of Grab ride-hailing service

3.2. Security risk and Adoption intention

While considering using ride-hailing services, consumers might have the perception of the harm to their property or personal safety, which is mentioned as the security risk in the studies of Thakur and Srivastava (2014) and Lee et al. (2016). Car-sharing or ride-hailing service without face-to-face communication or previous contact can lead to the risk of property or personal injury. Lee et al. (2018) researched the security risk can decrease the willingness to join in the sharing economy. The fear of consumers before ride-hailing acceptance due to the awareness of security incidents could happen such as robbery, rape, or even murder. Security refer to the perceived risk because the ride-hailing service requires the physical interaction after booking through a smart device. The drivers have to provide their license to drive a vehicle for services. However, consumers always hesitate the certainty of information of drivers. The occurrence of those incidents has made nonusers less willing to adopting the technology. In an overall, the security risk consisted of property and the personal safety are supposed negatively affect the nonusers' perceived value. The following hypothesis is stated:

H7: Security risk has negative impact on Adoption Intention of Grab ride-hailing service

3.3. Performance risk and Adoption intention

According to Luo et al. (2010), Martins et al. (2014), Yang et al., (2015a), Park and Tussyadiah (2017), perceived performance risk makes strong impact on consumer adoption intention. The users expect the performance based on their personal perception and also based on the advertisement. Consumers consider whether ride-hailing service can deliver what user expected or not. The drivers are not totally professional drivers who are familiar with all the routes or have lots of experiences. Hence, their performance is not assured as the well-trained drivers. Passengers might not experience good trip with less trained drivers. Therefore, they will consider when making decision using Grab ride-hailing service. The performance of the transportation used to give a ride for passengers is also reviewed as perceived risk. Drivers can register their own bike or car to use for provider Grab ride-hailing service. Considering their bike or car after long time using cannot provide comfortable trip for users, passengers will hesitate to adopting ride-hailing service when they are uncertainty of the performance of the bike or car used. We supposed the hypothesis:

H8: Performance risk has negative impact on Adoption Intention of Grab ride-hailing service

3.4. The moderating effect of Perceived risk

The findings from Chiu et al. (2014) have shown the relationship between perceived value and adoption intention may be adjusted by the influence of perceived risk in online shopping context. Other studies also indicated the moderating role of perceived risk in the purchase of environment-friendly products (Lai-Ming Tam,

2012; Chang and Tseng, 2013; Chiu et al., 2014; Kwok et al., 2015; Wu et al., 2015). When people perceive the positive value from the adopting new technology, they can consider the risk factors that involved in the decision-making. Hence, the perceived risk might decrease the influence of value perception toward adoption intention of Grab ride-hailing service. Following this, we proposed the moderator effect of perceived risk:

H9a: Privacy risk negatively moderates the relationship between perceived value and adoption intention of Grab ride-hailing service.

H9b: Security risk negatively moderates the relationship between perceived value and adoption intention of Grab ride-hailing service.

H9c: Performance risk negatively moderates the relationship between perceived value and adoption intention of Grab ride-hailing service.

4. Subjective norms

Subjective norm was defined in the TRA by Ajzen and Fishbein (1977). Venkatesh and Davis (2000) extended the Technology Acceptance Model by including subjective norm to explain users' behavioral intention. Consumers as human being is affected by others, for instance, their families, co-workers, friends, … People take others' recommendation due to the advantages of those suggestion or they perceive the act as the way they should act to appropriate within their social network. In this study, subjective norms affect the perceived value of users when they use technology. They can be considered belong to the "modern" social network when they use technology. It causes the immediately behavioral intention without the mediator perceived value. Using a new technology can be seen more prestige in their social network or have higher social status (Rogers, 1995). The finding of Sarker and Well (2003) explained the perception of using mobile technology since mobile technology is a novel thing, hence using it helps to upgrade themselves.

H10: Subjective norm has positive impact on Perceived Value of Grab ride-hailing service

H11: Subjective norm has positive impact on Adoption Intention toward Grab ride-hailing service

5. Automobile dependency

A car dependent person is whose life demands only car and who cannot imagine their trip using any other transportations (Ray Brindle, 2003). Zang (2006) and Turcotte (2008) described that automobile dependence is using automobile is the only choice as the available travel mode. Other researchers could focus on the high usage of automobile comparing with other transportation alternatives. When people favor to use automobile because of their choice or there are non-existent options, this is the dependence on automobile usage. The motorcycle and car using play an undeniable role in people's lives. Especially in small or non-cities, there are not various kinds of transportation can be alternatives for motorcycles or cars. Therefore, the car dependency in small cities and non-cities is expected higher than other places. The automobile dependence become lifestyle of citizens where they cannot fulfill their tasks without motorcycles or cars. In small or non-cities, passengers who do not involve in the public transport or there are no other reasonable alternatives can choose ride-hailing services which offer others transportation way using motorbike or cars, this is suitable to the automobile dependency trend in small or non-cities in Vietnam. Therefore, automobile dependency influences the adoption intention of ride-hailing services in general or Grab ride-hailing service in particular. Nonusers who live in small and no-cities is expected to have automobile dependency would have higher adoption intention toward ride-hailing service. Following the above explanation, we supposed that:

H12: Car dependency has positive impact on Adoption Intention toward Grab ride-hailing service

IV. Methodology

1. Measurement development

The research is carried out online through survey gathered from participants who are mostly from small and non-cities in Vietnam. Most of them are nonusers of Grab ride-hailing service. The perceived benefits are measured via utilitarian benefits including perceived ease of use and perceived usefulness, while hedonic benefits including perceived enjoyment. The measurement items of perceived ease of use were modified from the study of Nguyen-Phuoc, D. Q., Su, D. N., Tran, P. T. K., Le, D.-T. T., & Johnson, L. W. (2020) (e.g., "Interaction with ride-hailing service does not require a lot of mental effort"). Four items for measuring perceived usefulness were adapted from, F. D. Davis, R. P. Bagozzi, and P. R. Warshaw (1989), V. Venkatesh and H. Bala (2008), Lu & Wang et al., (2020) (e.g., "Ride-hailing service is very useful to my daily travel in general". Perceived enjoyment was measured using three items from H.-W. Kim, H. C. Chan, and S. Gupta (2007), V. Venkatesh and H. Bala (2008), Lu & Wang et al. (2020) (e.g., "The process of using ride-hailing service is pleasant"). The perceived risks are constructed by privacy risk, security risk, and performance risk. The measurement scale of those perceived risks was adapted from Featherman and

Pavlou (2003), Malhotra et al. (2004) and Lee et al. (2016) (e.g., "I am afraid that ride-hailing services collect too much my personal information"). There are initially 4 measurement items of subjective norms were adapted from V. Venkatesh and H. Bala (2008), H. Yang, J. Yu, H. Zo, and M. Choi (2016), and Lu & Wang et al. (2020) (e.g., "My family members/friends/colleagues recommend me to use ride-hailing service"). The measurement items for automobile dependency were adapted from Acheampong, R. A., Siiba, A., Okyere, D. K., & Tuffour, J. P. (2020) (e.g., "I have no appropriate alternatives to driving"). The measurement scale was developed based on some existing measurements of perceived value from V. A. Zeithaml (1988), Lu & Wang et al. (2020) (e.g., "Using ride-hailing service is beneficial compare with my effort"). Measurement scales of adoption intention were modified from the research of Lu & Wang et al. (2020) (e.g., "I intend to use ride-hailing services"). This research is measured by using the five-point Likert scale with 5=strongly agree and 1=strongly disagree. SPSS and AMOS 25 were used to analyze the data.

2. Data collection

The survey received 255 respondents from 18-45 years old both males and females throughout Vietnam (both big cities, small cities, and non-cities). Almost of them are employees (at company, school, public office, …). However, only 207 questionnaires are usable and will be used for further analysis. In term of gender, the proportion of female is almost twice as much as male (61.5% vs. 38.5%). Over 50% of respondents were people between the age of 30 and 45. Most respondents are employees, which is account for 53.1%. The majority of respondents are who have income from 5.000.000vnd (218$) to 10.000.000vnd (434), they account for about 55.9% in total. Only 15.4% of the population of respondents come from big cities such as Hanoi, Hochiminh, …. The rest of respondents live in small or non-cities (84.6%). Due to the familiar to technology, especially Grab ride-hailing services in big cities, the primary objectives of this research to study the adoption intention of users in small and non-cities. Therefore, the demographic is suitable to conduct the factor analysis.

V. Data analysis and results

Cronbach's Alpha coefficient > 0.6, so the scale meets the standard. At the same time, the observed variables have high variable-total correlation coefficients greater than 0.3, so the variables meet the requirements for reliability (except PR4 is deleted). All variables are good reliability. Therefore, the result of the questionnaires is suitable for the next step data analysis. After running KMO and Bartlett's Test, the KMO =.824 is greater than 0.5 and sig = .000 less than 0.05. Therefore, the data is appropriate to be utilized. Factor analysis was performed according to principal components with Varimax rotation. The results showed that 33 observed variables were grouped into 10 groups (PR4 was deleted). The Initial Eigenvalues of 10 factors are > = 1. Hence, those are included in the model. Value of cumulative variance extracted = 82.326% > 50%, which prove the suitability of model EFA.

Table 1. Cross-loadings analysis

	Component										C	E	% CV
	SR	SN	PU	PR	PFR	AI	PV	PE	PEU	AD			
SR2	.924	-.011	.005	.182	.106	-.058	.040	-.022	.024	.066	.927	8.559	25.937
SR3	.912	.017	-.011	.106	.184	-.009	.024	-.027	-.025	.023			
SR1	.884	.029	-.035	.159	.164	-.154	-.002	.002	.005	.025			
SR4	.713	.047	-.047	.247	.352	-.084	-.087	.046	-.059	.040			
SN1	.014	.829	.130	.102	.101	.215	.173	.139	.075	.124	.890	5.795	43.497
SN2	-.009	.817	.085	.033	.003	.277	.178	.166	.138	.159			
SN3	.109	.777	.125	.129	-.006	.177	.258	.226	.116	.016			
SN4	-.026	.657	.093	-.056	-.116	.044	.195	.321	.192	.216			
PU2	.001	.131	.877	-.022	-.043	.115	.067	-.014	.072	.056	.881	2.738	51.793
PU4	.014	.073	.859	.043	-.083	.110	.082	.161	.139	.027			
PU1	-.103	-.001	.821	.018	.062	-.019	.181	-.047	-.150	-.019			
PU3	.011	.139	.819	-.050	-.199	-.032	.062	.092	.125	.115			
PR2	.220	.074	.015	.936	.141	-.011	.066	.024	.006	.099	.974	2.111	58.190

PR3	.204	.035	-.016	.927	.129	-.021	.061	.005	.026	.136			
PR1	.212	.071	-.006	.917	.136	-.080	.056	-.033	.048	.140			
PFR2	.199	-.023	-.094	.151	.891	-.086	-.069	.000	-.039	.042	.916	1.746	63.482
PFR1	.267	-.034	-.060	.120	.865	-.094	-.108	-.031	-.025	.061			
PFR3	.211	.063	-.084	.112	.858	-.074	-.003	.006	.006	.056			
AI2	-.158	.202	.090	-.095	-.111	.846	.162	.226	.140	.090	.942	1.605	68.346
AI1	-.058	.213	.102	-.070	-.160	.844	.148	.182	.139	.108			
AI3	-.160	.284	.003	.021	-.061	.804	.221	.231	.164	.080			
PV1	.007	.224	.188	.068	-.093	.173	.832	.120	-.043	.123	.971	1.287	72.245
PV3	-.053	.245	.103	.073	-.056	.124	.828	.112	.150	.232			
PV2	.036	.248	.173	.054	-.072	.199	.818	.142	.050	.179			
PE2	.017	.233	.103	-.084	.013	.240	.125	.814	.142	.141	.876	1.218	75.934
PE3	-.037	.261	.119	-.014	.000	.145	.023	.811	.225	.164			
PE1	.008	.184	-.029	.090	-.016	.218	.231	.760	.158	-.054			
PEU3	.072	.255	.070	-.014	.081	.194	.071	-.017	.760	-.102	.721	1.084	79.220
PEU2	.028	.154	.043	-.011	-.074	.131	.120	.308	.757	-.024			
PEU1	-.158	.007	.069	.116	-.080	.055	-.058	.272	.716	.213			
AD2	.028	.076	.086	.152	.049	.027	.130	.158	-.059	.823	.757	1.025	82.326
AD3	.064	.357	.042	.130	.070	.042	.158	-.121	.144	.703			
AD1	.103	.076	.053	.154	.090	.280	.304	.214	.006	.670			

Note: C, Crobach's Alpha; E, Eigenvalues; %CV, % of Cummulative Varriance

Table 2 shows P-value of coefficients between PEU and PU, SN and PV, SN and AI have P-value = ***<.05. Therefore; PEU significantly affects to PU, SN significantly effects on PV, and SN significantly effects on AI. The variable PU significant positively affect to PV (P-value = .003). The variable, AD, significantly impacts on AI with P-value = .041. PV also significant affect AI (P-value = .041). The other variables, PR, SR, PFR, significant negatively influence on AI (P-value of PR, SR, PFR are .048, .015, .047 respectively). Nevertheless, PEU, PE not significantly impact on PV (P-value=.398, .183 in respectively). Thus, from SEM analysis, we could approve H1, H3, H5, H6, H7, H8, and H10. Moreover, we could reject H2, H4. The moderating effect of each perceived risk was analyzed by SPSS Hierarchical Method and Mean Centering technique in SPSS. Privacy and security risk moderate the effect of perceived value on adoption intention positively.

Table 2. Weights of paths

			Estimate	S.E.	C.R.	P
PU	<---	PEU	.436	.126	3.468	***
PV	<---	PEU	-.140	.165	-.845	.398
PV	<---	PU	.222	.076	2.922	.003
PV	<---	PE	.126	.095	1.332	.183
PV	<---	SN	.559	.092	6.070	***
AI	<---	PR	-.074	.038	-1.981	.048
AI	<---	SR	-.102	.042	-2.437	.015
AI	<---	PFR	-.080	.041	-1.987	.047
AI	<---	SN	.417	.088	4.742	***
AI	<---	AD	.159	.078	2.045	.041
AI	<---	PV	.143	.070	2.045	.041

Note: perceived ease of use (PEU), perceived usefulness (PU), perceived enjoyment (PE), privacy risk (PR), security risk (SR), performance risk (PFR), subjective norms (SN), automobile dependency (AD), perceived value (PV), and adoption intention (AI).

There are 12 hypotheses are analyzed, 9 of 12 hypotheses were approved completely. However, there are a hypothesis was approved partially. While PR and SR can moderate relationship between PV and AI, PFR cannot moderate it. However, the moderating effect is positive effect. There is a significant path between PEO and PU. There are significant paths between PU and PV. There are significant paths between PR, SR, PFR, and AI and a significant path between PV and AI. The path between SN and PV or AI also were approved. There is a significant path between AD and AI. There are non-significant paths among PEU, PE, and PV.

Table 3. Results

Hypothesis	Result	P-value
H1. PEU→PU	Approved	***
H2. PEU→ PV	Rejected	.398
H3. PU→ PV	Approved	.003
H4. PE→ PV	Rejected	.183
H5. PV→ AI	Approved	.041
H6. PR→ AI	Approved	.048
H7. SR→ AI	Approved	.015
H8. PFR→ AI	Approved	.047
H9a. The moderating effect of PR	Rejected	.001
H9b. The moderating effect of SR	Rejected	.010
H9c. The moderating effect of PFR	Rejected	.362
H10. SN→ PV	Approved	***
H11.SN→ AI	Approved	***
H12.AD→ AI	Approved	.041

VI. Discussion

This research had analyzed the factors that could influence the adoption intention of users toward Grab ride-hailing service. The factors were supposed are perceived ease of use, perceived usefulness, perceived enjoyment, perceived value, subjective norms, automobile dependency, and adoption intention. The theory of technology acceptance, perceived value, and perceived risk were applied to propose hypotheses and construct model. This research tested the directly paths among variables and also the moderating effect of perceived risk to the relation between perceived value and adoption intention.

The results illustrate the effect of perceived ease of use on perceived usefulness is identical with the model of technology acceptation or TAM model (Davis, 1989; Samaradiwakara & Gunawardena, 2014). The perceived ease of use has the positive effect on the perceived usefulness. When users feel free of effort, they would attain more usefulness from the ride-hailing services. The perceived usefulness affects significantly to perceived value. Users perceive the benefits of ride-hailing services would increase their perception of value to the service.

The perceived risk in this study includes privacy risk, security risk, and performance risk. All sorts of perceived risk influence vehemently the adoption intention of users toward Grab ride-hailing service. Firstly, the expected respondents are mostly from small and non-cities, they are not familiar with technology in general and ride-hailing services in particularly. Therefore, they have perception about risk which might be supposed when using ride-

hailing service. People who are utilizing the traditional transportation might believe that the new technological service would bring them uncertainty about personal information, safety, and performance during their trip.

Subjective norms directly affect the perceived value and the adoption intention significantly. The users are affected by others who are important to them. People consider others suggestion about new lifestyle with using the technological invention.

Automobile dependency also impact positively on the adoption intention of Grab ride-hailing service. Vietnamese people rely strongly on the motorbikes or cars as transportation for daily life. Especially, in small or non-cities, there are not many alternatives for transportation. Thus, they could choose ride-hailing service which also provide a trip by motorcycles or cars. As the result, the automobile dependency affects the adoption intention of Grab ride-hailing service.

Nevertheless, perceived ease of use, and perceived enjoyment not significantly affect customers' perceived value. The respondents whose age averagely from 30 to 45 years old, they might feel difficult when first time approach the technological invention. It is also explanation to insignificant relationship between perceived ease of use and perceived value. Citizens who from small or non-cities have other traditional methods to acquire taxis or motorbike taxis by calling to some centers for booking vehicles. Hence, they might feel difficult with Grab. The booking service are carried out via mobile application which respondents are afraid of wrong bookings. Perceived enjoyment also insignificantly affects perceived value. They could not imagine whether the trip would be enjoyable or booking a trip via application would be exciting or not.

The uncertainty about the personal information and physical attack will impact their intention of using the ride-hailing service. In spite of that, the moderating effect of performance risk are not significant. If people perceive the value of the service, they will use it, regardless of the uncertainty. However, all the moderating effects are positive, that is not the negative moderating effect on the relationship of perceived value and adoption intention. People could minimize the risk to adopt the new technology if they consider the significant value offering to them.

6.1. Implications

In terms of theoretical implications, the research considered perceived risks that negative affect the adoption intention. The perceived risk includes privacy risk, security risk, and performance risk, which are analyzed in this study to provide multi aspects of perceived risk when considering its effect to the adoption intention. This reflects the characteristics of Vietnamese citizens, especially in small or non-cities. They are not familiar with those ride-hailing services. The study tested the moderating effect of perceived risks on the relationship between the perceived value and adoption intention is positive effect. Therefore, the perceived value vehemently impacts the adoption intention regardless of perceived risk. The new variable automobile dependency was also added to be able to describe the lifestyle characteristics. It can be considered in developing countries' small cities where lack of alternatives and the citizens depend on automobile for transportation.

Of managerial implications, the study investigated the adoption intention of non-users from small and non-cities in Vietnam. The findings from this study can propose some directions for the managers of ride-hailing services. They should consider the perceived risk of non-users when they have never approached the new method of transportation service via mobile application. The announcement of collected information, features that ensure the safety of the trip should be published and acknowledged. Thus, people could be more believable about the application and the services. They should control the performance or any circumstances that could happen to customers to convince them to overcome the risk perception. Companies who offer the service should have excellent service recovery which might encourage them to use the new service. They should focus on marketing the innovation features and benefits on different medias to encourage consumers change to using service. The mobile application also an obstacle to people who are not familiar to technology. Hence, the research and development department should improve the method to approaching the services.

6.2. Limitations and further research

The study also has some limitations. The survey is mostly conducted through author's friends and family members' friends in author's hometown, not all cities in Vietnam. Therefore, the research should collect information from other cities throughout Vietnam to achieve the data set more representative of the entire society. There are other types of risk should be investigated to better understanding the obstacles of technological service providers. This research focused on who never use the service and not directly use the application to get the service to analyze the adoption intention. Thus, there might be the influential difference between who never use and who already use the service through other's booking for them. The expectation and perception would be differed by experiences of the service. The future researches should consider two types of respondents to conduct different survey for them to get the perspectives from both.

Appendix A

Construct	Item	Measurement	Reference
Perceived ease of use	PEU1	Interaction with ride-hailing service does not require a lot of mental effort	Nguyen-Phuoc, D. Q., Su, D. N., Tran, P. T. K., Le, D.-T. T., & Johnson, L. W. (2020)
	PEU2	Ride-hailing service is flexible to interact with	
	PEU3	Learning to use ride-hailing service is easy for me	
Perceived usefulness	PU1	Ride-hailing service is very useful to my travel in general	F. D. Davis, R. P. Bagozzi, and P. R. Warshaw (1989), V. Venkatesh and H. Bala (2008), Lu & Wang et al., (2020)
	PU2	Ride-hailing service is convenient to my travel	
	PU3	Ride-hailing service can improve the quality of my travel	
	PU4	Ride-hailing service can save my time	
Perceived enjoyment	PE1	The process of using ride-hailing service is pleasant	H.-W. Kim, H. C. Chan, and S. Gupta (2007), V. Venkatesh and H. Bala (2008), Lu & Wang et al. (2020)
	PE2	Using ride-hailing service is enjoyable	
	PE3	Using ride-hailing service does not bore me	
Privacy risk	PR1	I am afraid that ride-hailing services collect too much my personal information	Featherman and Pavlou (2003), Malhotra et al. (2004) and Lee et al. (2016)
	PR2	I am afraid that ride-hailing services disclose my personal information	
	PR3	I am afraid that sharing my personal information would lead to many uncertainties	
	PR4	It would be a potential threat to my privacy disclosing personal information	
Security risk	SR1	I am afraid that ride-hailing would be insecure	Featherman and Pavlou (2003) and Lee et al. (2016)
	SR2	I am afraid that ride-hailing would be unsafe	
	SR3	I am afraid that ride-hailing would create risk of physical harms	
	SR4	I am afraid that ride-hailing would not ensure my property	
Performance risk	PFR1	I am afraid the performance of trip not as I expect	Featherman and Pavlou (2003) and Yang et al. (2015a)
	PFR2	I am afraid that the service would not perform well	
	PFR3	I am afraid that the service might cause problems to my trip	
Subjective norms	SN1	My family members/friends/colleagues recommend me to use ride-hailing service	V. Venkatesh and H. Bala (2008), H. Yang, J. Yu, H. Zo, and M. Choi (2016), and Lu & Wang et al. (2020)
	SN2	My social network has support me use ride-hailing service	
	SN3	Using ride-hailing service shows the modern lifestyle	
	SN4	Using ride-hailing service makes me feel special	
Automobile dependency	AD1	I have no appropriate alternatives to driving	Acheampong, R. A., Siiba, A., Okyere, D. K., & Tuffour, J. P. (2020)
	AD2	It is impossible for me to use public transportation	
	AD3	I prefer use automobile to other transportation	
Perceived value	PV1	Using ride-hailing service is beneficial compare with my effort	V. A. Zeithaml (1988), Lu & Wang et al. (2020)
	PV2	Using ride-hailing service is worth to me	
	PV3	Using ride-hailing service gives me good value	
Adoption intention	AI1	I intend to use ride-hailing services	Lu & Wang et al. (2020)
	AI2	I would like to use ride-hailing services	
	AI3	I will recommend others to use ride-hailing services	

Reference

"MyTeksi launches GrabTaxi in Bangkok and Singapore". Digital News Asia. 21 October 2013. Retrieved 20 March 2015.
Acheampong, R. A., Siiba, A., Okyere, D. K., & Tuffour, J. P. (2020). Mobility-on-demand: An empirical study of internet-based ride-hailing adoption factors, travel characteristics and mode substitution effects. Transportation Research Part C: Emerging Technologies, 115, 102638
Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. Psychological Bulletin, 84(5), 888–918.
Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.
Ajzen, The theory of planned behavior, Organizational Behavior and Human Decision Processes 50 (2) (1991) 179–211.
Akaateba, M. A., Amoh-Gyimah, R., & Yakubu, I. (2014). A cross-sectional observational study of helmet use among motorcyclists in Wa, Ghana. Accident Analysis & Prevention, 64, 18–22.
Bettman, J. R. (1973). Perceived risk and its components: A model and empirical test. Journal of Marketing Research, 10(2), 184–190.
Brindle, R. (September 2003) Kicking the habit (Part1): some musings on the meaning of 'Car Dependence', Road & Transport Research, 12(3), p.71.
Calvin (13 July 2014). "GrabTaxi officially launched in the Philippines". Pinoy Tech Blog. Retrieved 19 March 2015.
Chang, E.-C., & Tseng, Y.-F. (2013). Research note: E-store image, perceived value and perceived risk. Journal of Business Research, 66(7), 864–870.
Chen S-C, Lin C-P. The impact of customer experience and perceived value on sustainable social relationship in blogs: An empirical study Technological Forecasting and Social Change 2015
Cheng, H.-H., & Huang, S.-W. (2013). Exploring antecedents and consequence of online group-buying intention: An extended perspective on theory of planned behavior. International Journal of Information Management, 33(1), 185–198.
Cheng, P.-Y., & Chu, M.-C. (2013). Behavioral factors affecting students' intentions to enroll in business ethics courses: A comparison of the theory of planned behavior and social cognitive theory using self-identity as a moderator. Journal of Business Ethics, 1–12.
Cheong, Kash (30 April 2014). "GrabTaxi: Currently the most prominent third-party taxi app in the region". The Straits Times. Archived from the original on 8 December 2014. Retrieved 17 April 2015.
Chiu, C.-M., Wang, E. T. G., Fang, Y.-H., & Huang, H.-Y. (2012). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. Information Systems Journal, 24(1), 85–114.
Clewlow, R.R., Mishra, G.S., 2017. Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States. Institute of Transportation Studies, University of California, United States.
Cox, D. F. (1967). Risk taking and information handling in consumer behavior. Boston: Harvard University Press.
Cox, D. F., & Rich, S. U. (1964). Perceived Risk and Consumer Decision-Making: The Case of Telephone Shopping. Journal of Marketing Research, 1(4), 32.
Dabholkar, P. A., Thorpe, D. I., & Rentz, J. O. (1996). A measure of service quality for retail stores: Scale development and validation. Journal of the Academy of Marketing Science, 24(1), 3–16.
Danielle Keeton-Olsen (26 March 2018). "Grab Officially Takes Control Of Uber's Southeast Asia Operations". Forbes. Retrieved 20 December 2018.
de Ruyter, K., Moorman, L., & Lemmink, J. (2001). Antecedents of commitment and trust in customer–supplier relationships in high technology markets. Industrial Marketing Management, 30(3), 271–286.
Do, Anh-Minh (26 February 2014). "MGrabTaxi enters Vietnam, intensifying the battle for mobile taxi booking apps". Tech in Asia. Retrieved 20 March 2015.
Dodds, W.B., Monroe, K.B. and Grewal, D. (1991), "Effects of price, brand, and store information on buyers' product evaluations", Journal of Marketing Research, Vol. 28 No. 3, pp. 307-319.
Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. International Journal of Human-Computer Studies, 59(4), 451–474.
Ha, S., & Stoel, L. (2009). Consumer e-shopping acceptance: Antecedents in a technology acceptance model. Journal of Business Research, 62(5), 565–571.
Holbrook MB. Consumer value: a framework for analysis and research. Psychology Press; 1999.
J. Y. Chen, "Thrown under the bus and outrunning it! the logic of DiDi and taxi drivers' labour and activism in the on-demand economy," New Media & Society, vol. 9, pp. 1–21, 2017.
Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. Decision Support Systems, 44(2), 544–564.

Lai-Ming Tam, J. (2012), "The moderating role of perceived risk in loyalty intentions: an investigation in a service context", Marketing Intelligence & Planning, Vol. 30 No. 1, pp. 33-52.
longitudinal field studies. Management Science, 46(2), 186–204.
Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. International Journal of Information Management, 34(1), 1–13.
Naiwumbwe, M. (2012). Perceived ease of use, perceived usefulness, behavioral intention to use, and acceptance of mobile money transfer services. Unpublished master's dissertation. Makerere University, Kampala, Uganda.
Park, H., Blenkinsopp, J. (2009) Whistleblowing as Planned Behavior – A Survey of South Korean Police Officers. J Bus Ethics 85, 545–556
Rogers EM. Diffusion of innovations. 4th ed. New York, NY: Free Press; 1995.
Roy Radner and Michael Rothschild, (1975), On the allocation of effort, Journal of Economic Theory, 10, (3), 358-376
Schechter, M. (1984). Imbedding estimates involving new norms and applications. Bulletin of the American Mathematical Society, 11(1), 163–167.
Snoj, B., Pisnik Korda, A., & Mumel, D. (2004). The relationships among perceived quality, perceived risk and perceived product value. Journal of Product & Brand Management, 13(3), 156–167.
Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. Internet Research, 24(3), 369–392.
Tuan, V.A., Mateo-Babiano, I.B., 2013. Motorcycle taxi service in Vietnam–its socio- economic impacts and policy considerations. J. East. Asia Soc. Transport. Stud. 10, 13–28.
Turel, O., Serenko, A. and Bontis, N. (2010), “User acceptance of hedonic digital artifacts: a theory of consumption values perspective”, Information & Management, Vol. 47 No. 1, pp. 53-59.
Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model
Yang, H., Yu, J., Zo, H., & Choi, M. (2016). User acceptance of wearable devices: An extended perspective of perceived value. Telematics and Informatics, 33(2), 256–269.
Yoon, C. (2011). Theory of planned behavior and ethics theory in digital piracy: An integrated model. Journal of Business Ethics, 100(3), 405–417.
Yu, J., Zo, H., Kee Choi, M., & P. Ciganek, A. (2013). User acceptance of location-based social networking services. Online Information Review, 37(5), 711–730.