

“How” and “What” Service Quality Influence Passenger’s Satisfaction in Grab, Ride-hailing Service, Malaysia

Choy Johnn Yee^{1*}, Mad Ithnin Salleh²

¹Faculty of Business and Finance, Universiti Tunku Abdul Rahman (Kampar Campus), 31900, Perak, Malaysia.

Email: choyjy@utar.edu.my

²Faculty of Management and Economics, Universiti Pendidikan Sultan Idris, 31900, Perak, Malaysia.

Email: mad.ithnin@fpe.upsi.edu.my

ABSTRACT

CORRESPONDING

AUTHOR (*):

Choy Johnn Yee

(choyjy@utar.edu.my)

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This research integrated the SERVQUAL model into European perspective of two-dimensional service quality concept focusing on “how” and “what” service quality influence the passenger satisfaction in Grab, ride-hailing services in Malaysia. A second-order model approach was developed to conceptualize the functional quality “how” dimension and outcome quality “what” dimension. Functional quality dimension is measured by the first-orders construct of assurance, empathy, responsiveness and reliability, while the Outcome quality dimension is measured by tangible, waiting time and valence. A non-probability judgmental sampling method via questionnaire was conducted and collect from 242 Grab-ride healing passenger in Malaysia. Partial least squares structural equation modelling (PLS-SEM) and Statistical Programmers for Social Science software (SPSS) were employed for data analysis. From the PLS-SEM measurement model analysis, all the construct reliability and validity are met and the structural model shows a substantial explanatory power and predictive accuracy for this study. The results show all the hypotheses were supported. Therefore, it validated the European perspective of understanding “how” and “what” service quality on passenger satisfaction in Grab, ride-hailing service in Malaysia. It further confirmed the service quality in ride-hailing service is multi-dimensional which both of the functional and outcome quality brings significant influence on passenger satisfaction. The model and result provide practical guideline and theoretical insight for service providers and researchers to understand how service should be delivered and what service outcome that passenger expected for future quality and strategy improvement in order to sustain and for long term success.

Contribution/Originality: This study serves to be the first few that study on how” and “what” service quality influence the passenger satisfaction of ride-hailing services in Malaysia. Beyond focusing on functional quality, the findings urge service providers

to consider the outcome quality of "what" service outcome the passenger expects from a ride-hailing service.

1. Introduction

In the latest National Transport Policy 2019-2030 published by [Ministry of Transport Malaysia \(2019\)](#) reported that the transportation industry is a vital contributor to the country's socioeconomic development. It contributed RM 48.8 billion to Malaysia's Gross Domestic Product. In addition, it was discovered that Malaysians spend at least 10% of their household income on transportation ([Ministry of Transport Malaysia, 2019](#)). It is difficult to picture a future without transportation. Everyone including individuals, companies, and government are all rely on transportation to obtain resources, and hence it demonstrating the importance of transportation. It is one of the primary strategic thrusts that the international community is focusing on to ensure the ease of public mobility ([Zakaria, Hussin, Batau, & Zakaria, 2010](#)). As described by [Ministry of Transport Malaysia \(2019\)](#), it is expected that the number of people using public transportation would rise from 31.2 million to 32.4 million in the year 2020. The country becomes more conducive to economic progress when the transportation infrastructure is effectively measured and connected. The transportation plays an important role in linking businesses with their stakeholders, as well as assisting individuals and families in connecting to household resources, leisure activities, and lifestyle activities. Apart from that, transportation also used to connect tourists to Malaysia. Without transportation, tourism of Malaysia cannot be established ([Yusoff, Ghazali, Mohamad, Hassan, Abdullah, Azmy & Azmi, 2021](#)).

Recent years, the introduction of innovative technologies has challenged, disrupted, and created opportunities in the transportation industry. According to [Ooi, Foo, Tan, Hew and Leong \(2020\)](#), people have a novel alternative to traditional taxi and public transportation service with the usage of mobile transportation applications. [Chia, Rohizan, Tee and Tajuddin \(2019\)](#) called this service as ride-hailing, where individual can conveniently reserve a transportation service through the use of mobile application. In Malaysia, beyond the traditional taxi service and public transportation service like bus and train, several ride-hailing services are offered such as MyCar, EzCab, EaziCar, Pickup2u, PicknGo and Grab. As described by [Indra and Ibrahim \(2017\)](#), the high motorization, heavy traffic congestion, parking issues have led to high demand in ride-hailing service. In Malaysia, there are 41 ride-healing service providers registered under the Land Public Transport Agency ([Tan, 2019](#)). Among these ride-hailing services, Grab is the most popular ride-hailing service and now Grab is merged with Uber in year 2018 and hence it becomes the largest and monopolizes the ride-hailing services in Malaysia.

Grab, a ride-hailing service, is the first to be awarded the ISO 9001:2015 accreditation, indicating its high-quality management standards ([Grab, 2016](#)). Grab, the ride-hailing service can be seen as a product derived from sharing economy. Sharing economic is denoted by [Stephany \(2015\)](#) to shift from traditional ownership to share the underutilized product into profitable sharing model. In other word, sharing economy via Grab is through sharing a ride with another passenger. In this technology era, Grab ride-hailing service was introduced into Malaysia in year 2012 and aims to provide ease, convenient, safe and quality transportation service to public as well as create employment opportunities for drivers ([Kurniawati, Raj & Singh, 2021](#)). The transportation sector is a key driver of Malaysia socio-economic development, therefore

Grab, ride-hailing service aims to provide sustainable high-quality transportation infrastructure to improve the transportation sector. Nonetheless, [Ooi et al. \(2021\)](#) commented that the number of people who utilize ride-hailing services is still modest in Malaysia. The Grab's prominence as a ride-hailing service does not guarantee passenger satisfaction. [Wibawa, Anggadwita, Mardhotillah, Husin, Komara Putri, and Putri \(2022\)](#) and [Nathan \(2019\)](#) supported and commented that there are several quality flaws discovered from the Grab, ride-hailing services and impair the passenger satisfaction. A recent article by The ASEAN Post Team in 2019 claimed that various quality flaws have been discovered in the Grab ride-hailing service, including last-minute cancellations, no responsive response and schedule price skyrocketing ([Zulkiffli, Mahshar, Hashim, Annuar & Muhammad, 2020](#)).

As a result, capturing and understanding the passengers' feedback on the quality of Grab's ride-hailing service is critical since it provides opportunities for further improvement. Satisfaction is inextricably linked to the how a service is offered (functional quality) and the service outcome that is received (outcome quality) ([Chica-Olmo, Gachs-Sánchez & Lizarraga, 2018](#)). Despite the fact that outcome quality appears to be a crucial aspect of quality improvement for higher customer satisfaction, the outcome quality dimension is frequently missing from service quality measurement in the literatures ([Jain & Jain, 2015](#)). Given the consideration of the emerging of ride-hailing service industry as well as its significant contribution towards Malaysia's transportation sector, it motivates this research for further investigate the service quality dimensions of Grab, ride-hailing services in respect of outcome quality and functional quality and determine how this dimension contribute to improve the passenger satisfaction. With this, it intends to throw light on the impact of outcome and functional quality on the effect on passenger satisfaction in Grab, ride-hailing services. Theoretically, it adds to the current body of knowledge in the field of ride-hailing services while also providing valuable insight for policymakers, service providers, and competitors on identifying specific service quality flaws that do not meet passenger expectations and improving them to ensure high passenger satisfaction.

2. Literature Review

2.1. Passenger satisfaction

Customers or passengers are the foundation of any business. Identify, listen and understand the passenger perception and feedback provide valuable input for service quality improvement ([Indra & Ibrahim, 2017](#)). As defined by [Olawole \(2021\)](#), passenger satisfaction is achieved when the service meets the needs and expectations of the passengers. Additionally, [Nguyen-Phuoc, Su, Tran, Le and Johnson \(2020\)](#) also discovered that passenger satisfaction measures how satisfied passengers are with a service after the consumption of service. It is a comprehensive assessment of the service received based on the combination of cognitive based and psychological based elements as described by [Dabholkar, Thorpe, and Rentz \(1996\)](#). The actual service obtained by Grab drivers, the service process, and the service outcome are affecting cognitively based satisfaction. Psychological based elements, on the other hand, assess client satisfaction based on interactions and communication with Grab drivers during the journey.

[Oliver \(1980\)](#) further explains that passenger satisfaction is reflected from the disconfirmation theory of customer expectation. When a passenger is satisfied and

delighted with the service, it leads to a positive consequence such as repeat usage, positive word of mouth or loyalty, however when the service does not fulfil their expectations, it leads to negative outcomes such as complaints and discontinuation of use. Additionally, the greater level of satisfaction from users is positively related to the profitability of the service organization (Mapunda, 2021). Among the contributor for passenger satisfaction, handful of past studies recognized the impact of service quality and its importance in determining the passenger satisfaction (Indra & Ibrahim, 2017; Alonso et al., 2018; Chia et al., 2019).

2.2. Perceived Service Quality

Continuous monitoring of ride-hailing services like Grab is critical, therefore many previous studies have highlighted the need of gauging passengers' perceptions of service quality in order to meet the growing demand for satisfaction. For instance, Sam, Hamidu, and Daniels (2018) urged service providers to look into the service quality dimension from the perspective of customers in order to gain a better understanding of the needs and expectations of customers and to ensure continual quality improvement. Additionally, Olawole (2021) discovers that the service quality assessment is viewed as the performance audit on how successful the ride-hailing services are in meeting the organization's objectives.

According to Parasuraman, Zeithaml, and Berry (1985), service quality occurs when the services are exceeded or meet with the customers' expectation. In the other hand, service quality as defined by Zeithaml (1987) as the customers' assessment of total service performance and superiority. Nevertheless, each industry has its own service process and uniqueness. Service quality is subjective, illusive, and abstract due to its intangible nature, making it difficult to offer a comprehensive and uniform measurement (Kang & James, 2004; Wu & Ko, 2013). Among the service quality measurement, SERVQUAL proposed by Parasuraman, Zeithaml, and Berry (1988) and the Grönroos's Two-Dimensional model (Grönroos, 1984) appears to be the most prominent assessment tools.

2.3. SERVQUAL

SERVQUAL is originated and proposed by Parasuraman, Zeithaml, and Berry (1985) consists of total 22 measurement items with five main dimensions of service quality aspects which are:

- i. Assurance: the ability to increase service confidence and trust;
- ii. Empathy: ability to show care to the customers and pay extra attention to them;
- iii. Responsiveness: ability to assist customers and give prompt service;
- iv. Reliability: ability to deliver on promises in a timely and correct manner;
- v. Tangible: the physical appearance of tangible asset and personnel.

The SERVQUAL instrument has been frequently used in marketing literature since then. As reported by Buttle (1994) and Wan Rashid and Jusoff (2009), several advantages arose from the SERVQUAL concept, resulting in its widespread popularity and recognition. The advantages included:

- i. SERVQUAL provides standard measurement items which can be easily understand by customers and service providers.
- ii. SERVQUAL has been proven to work in a variety of service industries.

- iii. SERVQUAL provides parsimonious instrument to assess the service quality dimension

Similarly, in the transportation literatures, the SERVQUAL scale was emerging as a measurement tool for determining perceived service quality. For example, [Kokku, Ahmed and Prince \(2011\)](#) adopted the SERVQUAL scale to measure the perceived service quality of public transportation in Secunderabad and Hyderabad, India from the commuter perspective. The findings found that SERVQUAL provides solid fundamental in measuring the service quality. Nevertheless, each industry has its own, unique set of service characteristic and process. The authors recommend the future research should adapt the SERVQUAL with considerable modification to match the scope of study.

Additionally, [Indra and Ibrahim \(2017\)](#) examining the service quality elements in the ride-hailing services in Malaysia by adapting the SERVQUAL scale measurement proposed by [Parasuraman, Zeithaml, and Berry \(1985\)](#). The result shows that tangible, reliability, price, promotion and coupon redemption and comfort are the important factors to significant affect the customer satisfaction in ride-healing services. Consistent advice also raises by the authors, urging the future research to modify the SERVQUAL model to gain more comprehensive insight in understand the service quality in ride-healing services and how it related with customer satisfaction.

Although SERVQUAL has been widely used to assess service quality, it has also been criticized in a number of ways. SERVQUAL has been criticized for focusing primarily on the service process function. [Grönroos \(1984\)](#) commented that the assessment of service quality should be comprehensively focus on both functional and outcome quality. Functional service quality refers to how a service is offered to clients, whereas outcome quality refers to what the customers received as a result of the service. This statement is supported by [Rust and Oliver \(1994\)](#), [Kang \(2006\)](#) and [Jain and Jain \(2015\)](#) where the authors argue that focusing on functional and outcome service quality provides a more complete picture and stronger predictive validity in assessing service quality. As such, SERVQUAL seem like ignore the outcome quality dimension in the study.

Apart from that, SERVQUAL also criticized as focus only one dimensional in assessing the service quality. [Rossiter \(2002\)](#), [Kang \(2006\)](#), [Nunkoo, Teerroovengadum, Thomas and Leonard \(2017\)](#) commented that the service quality should be in multidimensional perspective and validated the contribution of understanding service quality in second-order model provides more parsimonious and yield better fit and result in capturing the service quality as compared to the original SERVQUAL.

In response to the above criticisms, this study therefore integrates the SERVQUAL model with the suggestion of [Grönroos \(1984\)](#) to examine the Grab, ride-hailing services into two-dimensional service quality model to assess the service quality in outcome quality dimension and functional quality dimension. The perceived service quality is then conceptualized as second-order model measured by outcome quality dimension and functional quality dimension.

2.4. Functional quality dimension

According to [Kang and James \(2004\)](#), the functional quality captures the service delivery process and focuses on "how" the service is provided to the client. [Faizan, Kashif, Rupam](#)

and Jeon (2017) urged that functional quality attributes to the overall perceived service quality and subsequently contribute to customer satisfaction. In ride-hailing services, functional quality dimension emphasizes on the driver's behaviour, attitude and interact with passenger during the service process. According to Chica-Olmo, Gachs-Sánchez and Lizarraga (2018), the contribution of the functional quality factor to service quality and customer happiness is important. It lets the service organization and providers to identify the essential elements which passenger wants and needs during the service delivery process to further enhance the interaction and behaviour of driver. The significant relationship between functional quality and consumer satisfaction can be spotted in numerous of studies of Fatima, Malik, and Shabbir (2018), Chia et al. (2019), Olawole (2021) and Ocampo et al. (2021). Hence, it is hypothesis that:

H1: Functional quality dimension has a significant influence on passenger satisfaction in Grab, ride-hailing service.

Additionally, Choy (2013) suggested the functional quality dimensions to include the assurance, empathy, responsiveness, and reliability. Hence, the assurance, empathy, responsiveness, reliability and tangible will serve as the first-order constructs to measure the functional quality dimension in this study.

2.4.1. Assurance

Olawole (2021) defined the assurance as the driver's knowledge and competence to increase the service trust and confidence in the Grab ride-healing services. The driver's knowledge and skills serve to instill a sense of security in the passenger, allowing them to feel safe and confident that the Grab ride-hailing services will deliver them to their requested destination on time. When the sense of security and assurance is strong, it leads to passenger's satisfaction. In the past study of Yao and Ding (2011) found that assurance has the greatest impact of service quality dimension in influencing the satisfaction of taxi users. It demonstrates the relevance of a driver's knowledge, skill, and competence in enhancing the passenger's sense of security, trust, and safety during the service delivery process. Additionally, Chia et al. (2019) measure the impact of service quality on the satisfaction of ride-hailing service in Malaysia. The empirical findings reported that the assurance is the significant factor influencing the customer satisfaction in ride-hailing service. When the driver is able to provide assured service such as trustworthy, pick up and send the passenger to the destination on time and safely, it increases their satisfaction. Hence, it is hypothesis that:

H1a: Assurance has a significant influence on passenger satisfaction in Grab, ride-hailing service.

2.4.2. Empathy

According to Parasuraman, Zeithaml, and Berry (1985), empathy measures the ability of showing care and providing special attention to understand the needs of customers. Additionally, Ocampo et al. (2021) stresses empathy also has crucial features such as flexible operating hours, accessible pick-up or drop-off sites, and a vast geographic coverage. Similarly, empathy is viewed as the important enablers to enhance the satisfaction in ride-hailing services. Such assumption is evidenced in the studies of Olawole (2021) and Chia et al. (2019). In the research conducted by Olawole (2021) found that the empathy is significantly predicts the customer satisfaction in the

perception of commuters in Nigeria. It is believed that when driver possess caring attitude, communicate regularly with customers to understand their needs to provide services to ease the passengers, it increases the empathy aspect of functional quality dimension and significantly improve the passenger satisfaction. Furthermore, consistent findings also observed in this study of [Chia et al. \(2019\)](#). From the empirical result in [Chia et al. \(2019\)](#), it demonstrates that when a ride-hailing service driver prioritises the passenger's best interests, understands their needs and requirements, and provides services that are convenient for the passenger, it leads to greater impact on the empathy aspect of service quality. From this, it creates a connection with the passenger, and provides services that are close to their expectations, which contributes to their satisfaction. Hence, the relationship between empathy and passenger's satisfaction is hypothesis as follows:

H1b: Empathy has a significant influence on passenger satisfaction in Grab, ride-hailing service.

2.4.3. Responsiveness

Responsiveness defined as the keenness of driver to assist and provide prompt service to the customers ([Zakaria et al., 2010](#)). In terms of responsiveness, the Grab, ride-hailing service driver must display sincerity and responsiveness in their services, such as providing a timely schedule, keeping passengers informed, and responding to their inquiries or even complaints. Hence, the responsiveness often found to be significant enablers in service industry. [Sam, Hamidu, and Daniels \(2018\)](#) reported the responsiveness as the key factor to service quality in public transportation, Kumasi metropolis. From 103 usable responses received from passengers, it shows that the promptness of service provided (responsiveness) bring significant and positive impact on passenger satisfaction. As a result, the service provider should be committed to responding quickly to service requests, being available to assist passengers at all times, and keeping them informed about the current service status. Furthermore, [Fatima, Malik, and Shabbir \(2018\)](#) supported that importance of responsiveness in improving the customer satisfaction. The authors found that if the service provider fails to demonstrate the responsiveness element during the service process, it may hinder the customer satisfaction. Importantly, when dealing with customers' request or even complaints, service providers which are the Grab drivers must be accountable, responsive, intelligent, and calm. The attitude and communication skill can be serving as the enablers of the responsive element in service quality ([Brown & Lavella, 2021](#)). Responsiveness, with its significant contribution to passenger satisfaction, it is therefore formulating the following hypothesis:

H1c: Responsiveness has a significant influence on passenger satisfaction in Grab, ride-hailing service.

2.4.4. Reliability

[Indra and Ibrahim \(2017\)](#) view the reliability as the measurement of ability to provide service with consistent, reliable and accurately. This is agreed by [Sam, Hamidu, and Daniels \(2018\)](#), where the authors describe reliability as the degree to perform promised services precisely and without error. Numerous of past studies confirmed the significant impact of reliability towards customer's satisfaction in various industries. For example, [Meesala and Pual \(2016\)](#) found that reliability bring significant impact on

consumer satisfaction in healthcare industry. From 180 surveys collected, the aspects of reliability, such as timely service delivery, correctness of records or information, communication regarding the timeliness of the service process, and promptness of service, are seen as key factors for customers in determining satisfaction levels. Besides, [Faizan et al. \(2017\)](#) investigate the effect of technical and functional service quality dimension on customer satisfaction in hotel industry. The empirical result validated and confirmed the significant effect of reliability in functional quality to enhance the customer satisfaction. The findings urged the service organization to train and motivate the service providers to ensure they offer the services as promised and accurately. Similar findings also reported in [Chia et al. \(2019\)](#), where the result shows that the reliability is highly correlated with the customer satisfaction in the ride-hailing service. To improve service quality and increase customer satisfaction, Grab should train and encourage the ride-hailing drivers to have a trustworthy attitude in order to provide the service accurately at the first time. Hence, the hypothesis for reliability and passenger satisfaction is formed as follows:

H1d: Reliability has a significant influence on passenger satisfaction in Grab, ride-hailing service.

2.5. Outcome quality dimension

Faizen et al. (2017) advised the service organization and providers not to overlook the contribution of outcome quality in the perceived service quality. Outcome quality also known as technical quality, it is measuring the service outcome ([Grönroos, 1984](#)). After the service is performed, the outcome quality measure is what the clients have received. Although handful of literatures focus the functional service quality elements, [Arne and Bart \(2014\)](#) study evident that technical quality yield better impact towards the consumer satisfaction as compared to functional quality. Additionally, [Faizan et al. \(2017\)](#) and [Kang \(2006\)](#) argue that there is a need to research the impact of outcome quality on consumer satisfaction because the body of literature on the subject is limited. Hence, it motives this study to investigate the relationship between outcome quality dimension and passenger satisfaction in ride-hailing services and the hypothesis is form as follows:

H2: Outcome quality dimension has a significant influence on passenger satisfaction in Grab, ride-hailing service.

Consistent with the past studies of [Dabholkar, Thorpe and Rentz \(1996\)](#) and [Brady and Cronin \(2001\)](#), this study propose three elements to serve as the first-order constructs to conceptualized the outcome quality which are tangible, waiting time, and valence and measure its impact towards passenger satisfaction.

2.5.1 Tangible

According to [Chica-Olmo, Gachs-Sánchez and Lizarraga \(2018\)](#), tangible is the outcome quality dimensions which focusing on the physical quality of the tangible assets such as the cleanliness of the vehicle and equipment as well as the attire of the driver. In the research of [Indra and Ibrahim \(2017\)](#), the tangible is found to significantly influence the satisfaction of customers. It is further supported by the consistent findings reported by [Chia et al. \(2019\)](#) and [Shaaban and Kim \(2016\)](#). The findings show that passengers value the cleanliness of the interior vehicle, the vehicle's lifespan, the equipment, and the

appearance of the drivers when evaluating ride-hailing services. Based on the discussion from the above studies, therefore the hypothesis is formed as follow:

H2a: Tangible has a significant influence on passenger satisfaction in Grab, ride-hailing service

2.5.2. Waiting time

According to [Brady and Cronin \(2001\)](#), the amount of time that customers wait for a service is referred to as waiting time. Waiting is a time cost. As described by [Hui, Tse and Zhou \(2006\)](#), consumer's satisfaction is influenced by the amount of time they wait. This is because waiting time can lead to negative consequences for passengers, such as being late for a meeting and missing out on an opportunity, or being harassed or robbed while waiting for services ([Brown & LaValle, 2021](#)). Due to excessive waiting periods, customers may be unsatisfied or and feel frustrated and subsequently lead to loss of customer. Therefore, [Ting, Huang, Lin and Pan \(2019\)](#) further urged the service providers to effectively control the waiting time and management it with sincere to avoid the dissatisfaction among the passengers. Therefore, the hypothesis for waiting time and satisfaction of passenger is as follows:

H2b: Waiting time has a significant influence on passenger satisfaction in Grab, ride-hailing service.

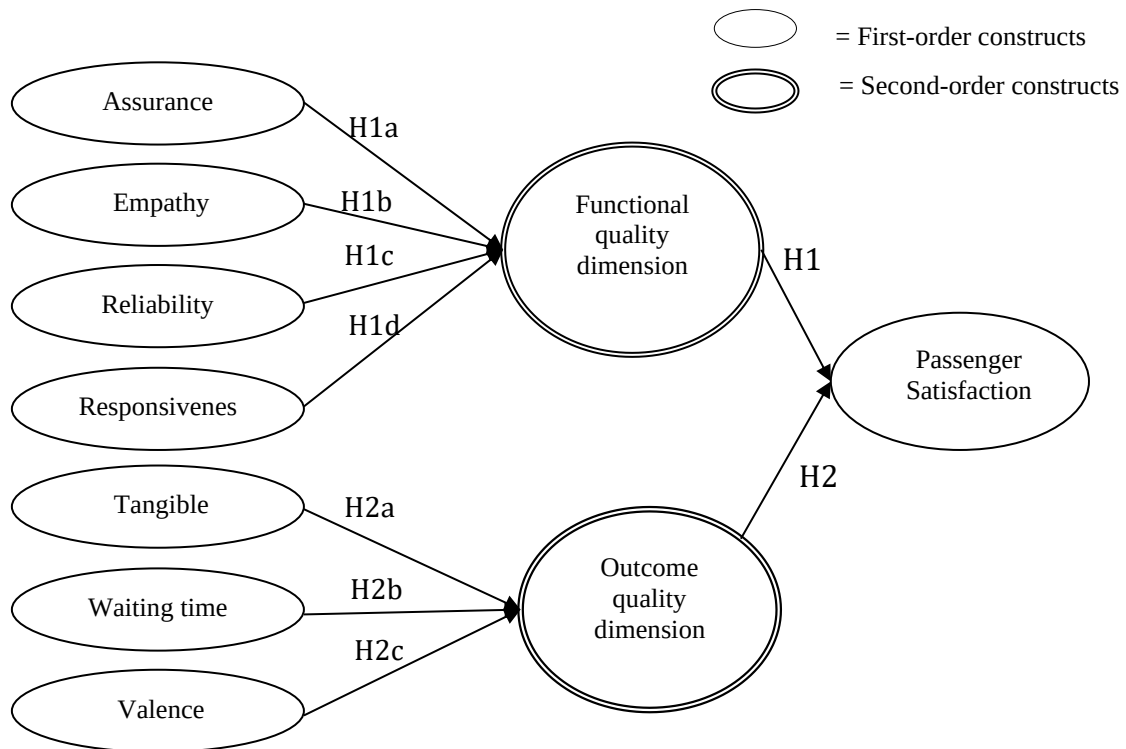
2.5.3. Valence

According to [Jose and Laura \(2010\)](#), valence refers to the individual's emotion experience or factors that influence whether one's think the service outcome is excellent or terrible, regardless of how they feel about the rest of the experience. Furthermore, Marcel and Rik (2004) pointed that pleasant valence causes customers to feel good in the service outcome and leads to higher levels of satisfaction. Negative valence, on the other side, causes negative emotion in the service and leads to dissatisfaction. Seeing the importance of valence in service quality aspect and has significant influence on satisfaction, [Brady, Voorhees, Cronin and Bourdeau \(2006\)](#) on the hand, highlighted that it is difficult to measure valence as it is uncontrollable by service organization or provider. Terrible traffic or bad weather might be one of the valence attributes of a ride-hailing service. With the discussion above, the hypothesis is formulated as follows:

H2c: Valence has a significant influence on passenger satisfaction in Grab, ride-hailing service

[Figure 1](#) below present the conceptual model and path relations between the functional and outcome quality dimension and passenger satisfaction. Align with the past studies in the earlier discussion, functional quality dimension was abstracted as second-order model which measured by first-order factors of assurance, empathy, responsiveness and reliability. In the other hand, outcome quality dimension was act as second-order model which its first-order factor which are tangible, waiting time and valence.

Figure 1: Conceptual Model



3. Methodology

Self-administrated questionnaire survey was collected from Grab, ride-hailing users Grab, ride-hailing users who are experienced, and thus able to offer important insight on the service quality assessment. The questionnaires were distributed to the 250 Grab users around Selangor, Wilayah Persekutuan Kuala Lumpur, Johor, Penang, and Perak, through non-probability judgmental sampling method. Initial to collect the feedback, the respondents were asked if they have any experience in Grab, ride-hailing service to ensure they are experience and able provide input in the survey. Out from 250 questionnaires distributed, 242 usable questionnaires were employed in this study.

3.1. Measurement of constructs

The questionnaire survey comprises of two parts which are the demographic details on the respondents and second part is for all the first-order constructs proposed in the model. The items used for the first-order constructs for outcome quality dimension and functional quality dimension as well as the passenger satisfaction are adopted from the past studies, total 12 items were used to measure the outcome quality dimension, which included 5 items in tangible, 4 items in waiting time and 3 items used for valence. In the other hand, function quality aspect with 4 items measuring for each factor of assurance, empathy, reliability and responsiveness for functional quality dimension and lastly 4 items were used to measure the passenger satisfaction in Grab, ride-healing service. All these items are measured by using likert scale ranged from 1, strongly disagree to 5, strongly agree. Later, the research model presented in Figure 1 to assess the impact of outcome quality dimension and functional quality dimension, on passenger service quality was evaluated using the partial least squares structural equation modelling (PLS-SEM) approach in Smart-PLS 3.0.

4. Data Analysis

4.1. Demographic Profile

Statistical Programmers for Social Science (SPSS) was used to perform the descriptive analysis on the demographic profile of the Grab, ride-hailing service users. Table 1 reveals all the demographic details on the target respondents for this study. Majority Grab, ride-hailing users in this study are female, aged within 26 to 35 years old. This age group indicates majority of the Grab users are in the Generation Y. A large number of them are single and employed with monthly income of RM 3001- RM 5000.

Table 1: Descriptive analysis of Grab, ride-hailing users

	Total	Percentage
Used both Taxi and Grab Car Service		
Yes	242	100
Age		
15 – 25 years old	85	35.1
26 – 35 years old	131	54.1
36 – 45 years old	22	9.1
46 – 55 years old	4	1.7
Gender		
Female	125	51.7
Male	117	48.3
Marital Status		
Single	171	70.7
Married	71	29.3
Employment Status		
Employed	154	63.6
Self-employed / Started own business	64	26.4
Student	22	9.1
Other: Unemployed	2	0.9
Monthly Gross Personal Income / Monthly Pocket Money		
Below RM1000	21	8.7
RM1000 – RM3000	77	31.8
RM3001 – RM5000	105	43.4
RM5001 – RM7000	29	12
Above RM7000	10	4.1

4.2. Statistical analysis

PLS-SEM was employed to analyses the path relations stated in research model presented in Figure 1. The PLS-SEM analysis appears to be suitable for this study for several reasons. First, the research model proposed (Figure 1) consists of first-order and second-order constructs, PLS-SEM is suggested as pertinent to employed (Hair, Matthews, Matthews, & Sarstedt, 2017). Additionally, Wong (2013) and Gregor (2006) stated that PLS-SEM consists of explanation and prediction-oriented nature. It helps to identify and predict the important factors for the study and raise valuable insight for marketing recommendation to improve the practice. From the supporting reason above, PLS-SEM is fit for this study to further analyses the path relationship between outcome quality dimension and technical outcome quality dimensions on satisfaction for Grab, ride-hailing services.

4.2.1. Measurement Model Analysis

The first analysis required for PLS-SEM is the assessment of measurement model. Construct reliability and validity are required to examine in the measurement model analysis. For construct reliability, the [Jöreskog's \(1971\)](#) composite reliability (CR) helps to confirm the internal consistency reliability which focus on the consistency and reliability of the items. From the result of CR presented in [Table 2](#), it shows that all the first-order constructs proposed as well as the second-order constructs of outcome quality and functional quality dimension have the CR value above 0.70, which ranged from 0.803 to 0.902. From the suggested threshold by [Hair, Risher, Sarstedt and Ringle \(2019\)](#) the CR range exceed 0.70, the construct reliability is achieved.

Table 2: Construct reliability: Composite Reliability (CR)

Composite Reliability	
First-order factors	
Assurance	0.803
Empathy	0.826
Reliability	0.835
Responsiveness	0.838
Tangible	0.807
Waiting Time	0.887
Valence	0.865
Passenger satisfaction	0.902
Second-order factors	
Functional quality dimension	0.829
Outcome quality dimension	0.839

After confirming the construct reliability, there are two construct validity assessments are required which are the investigation in convergent validity and discriminant validity. As described by [Wong \(2013\)](#), convergent validity relates to the degree to which the prescribed scale is related to the construct. Average variance extracted (AVE) is employed to examine the convergent validity as suggested by [Hair et al. \(2019\)](#). When the AVE value exceeds 0.50, it shows more than half of the variance of indicator is explained in the construct. [Table 3](#) presented the AVE results for convergent validity in this study. The AVE value for all the service quality dimensions which are Tangible, Waiting time, Valence, Assurance, Empathy, Reliability, Responsiveness, and passenger satisfaction as well as the second-order model of outcome quality and functional quality dimensions are exceeding the 0.50 suggested threshold. Therefore, it is confirmed that the convergent validity is met in this study.

Table 3: Convergent Validity: Average variance extracted (AVE)

AVE	
First-order factors	
Assurance	0.512
Empathy	0.615
Reliability	0.627
Responsiveness	0.634
Tangible	0.586
Waiting Time	0.723
Valence	0.682
Passenger satisfaction	0.754
Second-order factors	

Functional quality dimension	0.555
Outcome quality dimension	0.640

Discriminant validity is the second validity test for this study. In contrast to convergent validity, discriminant validity focusses on the degree to which items actually differing from one another variable (Hair et al., 2019). To measure the discriminant validity, there are two assessments offered which are Fornell and Larcker (1981) criterion analysis and heterotrait-monotrait (HTMT) ratio of the correlation analysis. Firstly, Fornell and Larcker (1981) argued that when the square root of AVE in each latent variable is greater than the correlations among the variables, the discriminant validity is established. Second, when the bootstrap confidence interval in the HTMT ratio of the correlation analysis is less than 1, it indicates that the study's discriminant validity is confirmed (Hair et al., 2021). The results of Fornell and Larcker (1981) criterion analysis and heterotrait-monotrait (HTMT) ratio of the correlation analysis are showed in Table 4 and Table 5.

Table 4: Result of Fornell and Larcker (1981) Criterion Analysis

	1	2	3	4	5	6	7	8	9	10
Tangibles	0.765									
Waiting Time	0.350	0.850								
Valence	0.352	0.657	0.826							
Assurance	0.284	0.561	0.631	0.716						
Empathy	0.186	0.350	0.341	0.346	0.784					
Reliability	0.200	0.383	0.450	0.439	0.231	0.792				
Responsiveness	0.348	0.648	0.348	0.309	0.603	0.407	0.796			
Customer Satisfaction	0.395	0.641	0.650	0.650	0.378	0.476	0.702	0.868		
Second-order factors										
Outcome quality								0.719	0.800	
Functional quality								0.760	0.734	0.745

Table 5: Result of Heterotrait-Monotrait (HTMT) ratio of the correlation analysis

	1	2	3	4	5	6	7	8
Reliability								
Assurance	0.624 [0.472, 0.777]							
Tangibles	0.299 [0.153, 0.448]	0.422 [0.270, 0.576]						
Empathy	0.317 [0.189, 0.479]	0.487 [0.352, 0.620]	0.275 [0.150, 0.433]					
Responsiveness	0.569 [0.417, 0.713]	0.899 [0.817, 0.987]	0.482 [0.328, 0.633]	0.432 [0.290, 0.573]				
Waiting Time	0.506 [0.370, 0.644]	0.730 [0.632, 0.827]	0.464 [0.318, 0.596]	0.795 [0.231, 0.481]	0.795 [0.709, 0.878]			
Valence	0.612 [0.471, 0.749]	0.866 [0.782, 0.950]	0.474 [0.355, 0.588]	0.831 [0.331, 0.594]	0.855 [0.769, 0.941]	0.831 [0.757, 0.899]		
Customer Satisfaction	0.619 [0.497, 0.739]	0.838 [0.753, 0.920]	0.506 [0.377, 0.635]	0.778 [0.347, 0.630]	0.906 [0.834, 0.977]	0.778 [0.683, 0.859]	0.809 [0.740, 0.874]	

From the results presented in Table 4, the items are loaded greater in their constructs as compared to the correlation among other variable as well as HTMT analysis shows all the bootstrap confidence interval value are below 1, hence it supports the discriminant validity for the proposed model. When all the construct reliability and validity is met, the second step of structural model can be further assessed.

4.3. Structural Model Analysis

To analyses the structural model, this study ran the bootstrapping with 5000 subsamples in PLS-SEM as suggested by Hair et al. (2019). For hypotheses testing, it is important to look into the t value. According to Hair et al. (2017), t value exceeds 1.96 shows that the path coefficient is significant at 5% level. Hence, the Figure 2 together with the Table 6 reported the path coefficient, p value and t value for the proposed model.

Figure 2. The path relations between service quality and passenger satisfaction in Grab, ride-healing service, Malaysia.

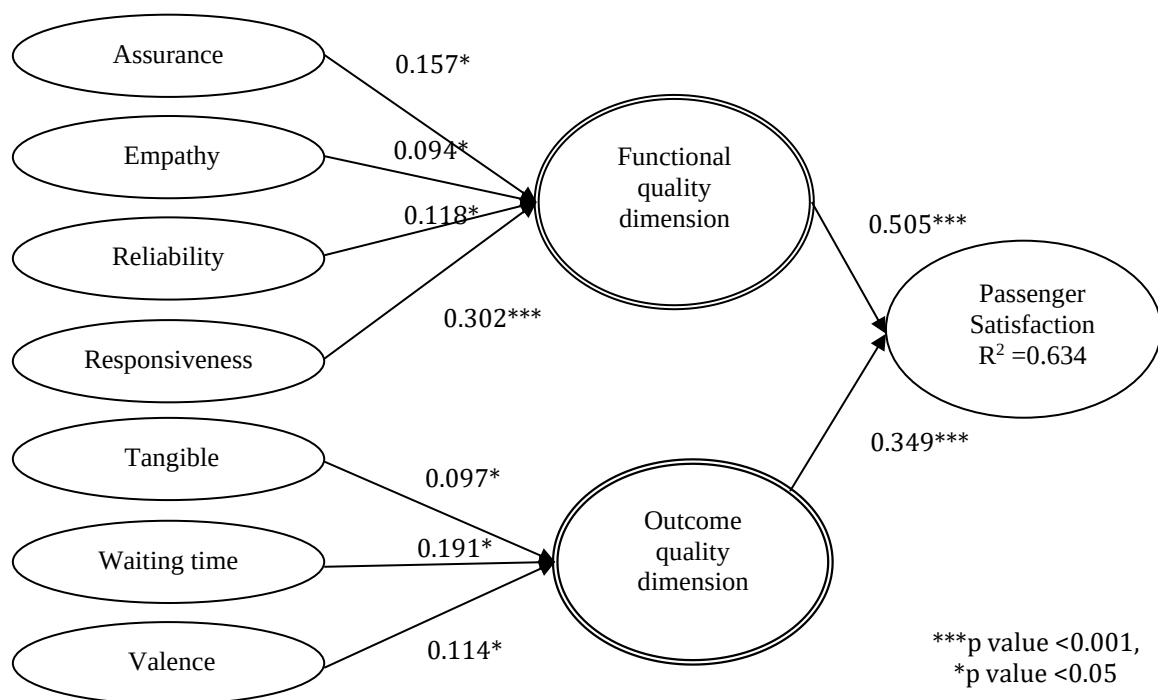


Table 6: Hypotheses Testing Result

	Path	Path coefficient	T statistics	P value	Supported?
H1	Functional quality dimension → Passenger satisfaction	0.505	11.113	0.000	Yes
H1a	Assurance → Passenger satisfaction	0.157	3.187	0.001	Yes
H1b	Empathy → Passenger satisfaction	0.094	2.491	0.013	Yes
H1c	Reliability → Passenger satisfaction	0.118	3.123	0.002	Yes
H1d	Responsiveness → Passenger	0.302	5.777	0.000	Yes

	satisfaction				
H2	Outcome quality dimension → Passenger satisfaction	0.349	7.322	0.000	Yes
H2a	Tangible → Passenger satisfaction	0.097	2.325	0.02	Yes
H2b	Waiting time → Passenger satisfaction	0.191	3.444	0.001	Yes
H2c	Valence → Passenger satisfaction	0.114	2.354	0.019	Yes

The results show that all the first-order constructs, assurance, empathy, reliability, responsible as well as the second-order model of functional quality dimension have significant relationship with passenger satisfaction. In the other hand, the first-order model of tangible, waiting time, valence together with outcome quality dimension have significant influence on passenger satisfaction in Grab, ride-hailing services, Malaysia. As a result, it can conclude that all hypotheses proposed are supported. In particular, it shows that the relationship between the functional quality dimensions ($\beta = 0.505$, $p < 0.001$), together with assurance ($\beta = 0.157$, $p < 0.05$), empathy ($\beta = 0.094$, $p < 0.05$), reliability ($\beta = 0.118$, $p < 0.05$), and responsiveness ($\beta = 0.302$, $p < 0.001$) and passenger satisfaction are significant with less than 5% probability of error. In the relationship of outcome quality ($\beta = 0.349$, $p < 0.001$), its elements of tangible ($\beta = 0.097$, $p < 0.05$), waiting time ($\beta = 0.191$, $p < 0.05$) and valence ($\beta = 0.114$, $p < 0.05$) and passenger satisfaction in Grab, ride-hailing services are significant with less 5% probability of error. With the consideration of path coefficient between functional and outcome quality, both quality dimensions are significantly important and contribute into the passenger satisfaction. Among these, a functional quality dimension ($\beta = 0.505$) has the stronger effect on passenger satisfaction in the comparison with outcome quality ($\beta = 0.349$).

Additionally, the explanatory power of model can be identified via the coefficient of determinant (R^2) analysis. According to [Hair et al. \(2019\)](#), R^2 reveal the variance for the dependent variable that can be explained by the independent variable in the proposed model. From the result of R^2 reported in [Table 7](#), it shows that 63.4% of the passenger satisfaction of Grab-ride-healing service can be explained by the proposed constructs which are outcome quality and functional quality dimension. With the R^2 of 0.634, it shows that the explanatory power of the proposed model in [Figure 1](#) is moderate and satisfactory predictive power as [Hair et al. \(2019\)](#) recommended the explanatory power in R^2 above 0.75 are large and R^2 value above 0.50 is moderate.

Table 7: Result of Coefficient of Determinant (R^2) and Predictive Relevance

	R^2	Q^2
Passenger Satisfaction	0.634	0.447

Beyond the R^2 for model explanatory power, the predictive relevance of the model can be read through the analysis of Q^2 value ([Hair et al., 2019](#)). Q^2 value greater than zero indicated the path model can predict the originally observed value. In the results generated in [Table 7](#), the passenger satisfaction in Grab, ride-hailing service has the Q^2 value of 0.447, which shows the proposed path which are functional quality and outcome quality dimension has significant predictive relevance to passenger satisfaction. With the value of R^2 and Q^2 , it reveals that proposed model to examine the relationship between functional and outcome quality dimension with passenger satisfaction has substantial explanatory power and predictive accuracy.

5. Discussion

Primarily, all the proposed paths in the conceptual model have been supported with significant relationship with passenger satisfaction. As such, all the nine hypotheses are supported. It is in line with the past studies of Grönroos (1984), Kang (2006), Jain and Jain (2015), Nunkoo et al. (2017) and Chica-Olmo, Gachs-Sánchez and Lizarraga (2018). From the result, passengers place a larger consideration on the functional service quality dimension as it has the greatest impact towards passenger satisfaction. It revealed that passenger satisfaction will be affected by the service process on how the Grab, ride-hailing service is delivered to passenger. When the service process (functional quality dimension) is pleasure, it leads to greater satisfaction in ride-hailing service. In particular, Grab and drivers must ensure that assurance, empathy, responsiveness, and reliability are safeguarded in order to ensure that passengers receive a pleasant service experience. Sufficient knowledge and skills help the driver to share the information accurately (assurance) to passengers, it then creates a sense of security and confidence during the service process and it will lead to better satisfaction level. Furthermore, drivers must engage with passengers regularly to demonstrate care (empathy) and always be their side for assistance and responsively react to request (responsiveness) in order to learn their needs and to ensure that the service meets their demands at their convenience level. During the service process, drivers must possess trustworthy attitude to ensure the mistake or error is minimized to provide service precisely and in reliable manner (reliability). In the other hand, outcome quality dimension also found to have a significant relationship with passenger satisfaction in Grab, ride-hailing service. Hence, it is consistent with Grönroos (1984), Kang (2006), Jain and Jain (2015), Nunkoo et al. (2017) and Chica-Olmo, Gachs-Sánchez and Lizarraga (2018), who agreed that outcome quality should not be overlooked. While the outcome quality isn't captured and taken into account when evaluating service quality, it leads to erroneous data on service quality measurement. In ensuring on what service outcome is expected from passengers, ride-hailing service organization and the driver need to give emphasis to the aspect of tangible, waiting time and valence. Grab, ride-hailing service driver need to ensure their appearance is neat and the interior of the vehicle is clean and appealing (tangible). Additionally, they must keep the passengers informed about the waiting process and effectively enhance the waiting time in order to increase the passengers' satisfaction (waiting time). Finally, the driver must be always aware of the passengers' valence, keep them informed, and provide a remedy if a foreseeable feature is likely to provoke the negative valence (valence). In short, both functional and outcome quality dimensions show relative significances in determining the passenger satisfaction. Hence, both dimensions of service quality cannot be neglected by the researchers and providers.

6. Implications

6.1. Theoretical Implication

With the consideration of the status quo in literature as highlighted in Kang (2006), Jain and Jain (2015) and Faizan et al. (2017), this study has expanded the contribution in recognizing the importance of outcome quality dimension, understanding its impact as well as the elements of tangible, waiting time and valence, this study proposes and validates the Grönroos (1984) two dimensional service quality model to assess the service quality in outcome quality dimension and functional quality dimension to examine the Grab, ride-hailing services' satisfaction. Besides, this study proven and validate that service quality in ride-hailing service is multi-dimensional in nature where

technical and functional aspects of service quality have considerable importance. Hence, the perceived service quality for Grab, ride-hailing services can be conceptualized the outcome quality dimension and functional quality dimension as the second-order model. This insight provides valuable direction for practitioners and academics when it comes to develop a second-order model for scale measurement of functional quality and outcome service quality.

6.2. Managerial Implication

Majority of academic and service provider often misplace their focus on the improving the elements of “how” the service should be delivered, but neglect the contribution of “what” service outcome is expected by passengers. As a result, this study recommended that service providers and organizations integrate outcome quality in their evaluations to better capture variances in perceived service quality in ride-hailing services. Identify and enhance the functional quality dimension and outcome quality dimension deficits to promote satisfaction for improved competitive advantages, profitability, sustainability, and company success.

In details, human development such as provide training and education is needed to ensure all Grab, ride-hailing drivers are equipped with sufficient competence to interact and provide accurate information with passenger. Additionally, the service provider's communication skills and emotional intelligence required to develop in order for the service process to be pleasure. Additionally, when a driver has a trustworthy attitude and receives compliments from passengers continuously, provide them unique incentives. This incentive approach will further motivate them to provide prompt services as promised. This is because passengers are concerned about the driver's politeness, positive vibe with good communication, prompt response to requests, care, and understanding while the service is being delivered.

The service outcome, on the other hand, makes a substantial contribution to service quality evaluation in order to increase passenger satisfaction. As a result, both the service organization and the Grab provider must be concerned about the passenger's service outcome. Grab, ride-hailing service provider must keep the vehicle clean and pleasing at all times and dress appropriately. This provide positive image to enhance the passenger satisfaction. Drivers also encourage to always be prepared and familiar the road map to effectively control the waiting time and management it with sincere if there is a long waiting time. Additionally, if the stipulated waiting time cannot be met, compensate the passengers to reduce the negative impact on satisfaction. Although valence is uncontrolled, the service provider can mitigate it by informing the passenger ahead of time of any potential negative valence. Example, inform passenger about the current traffic status, provide alternative solution to ease their journey to avoid the negative valence. Importantly, the service provider must focus on strategic improvement on both the functional and outcome quality dimensions in order to close passengers' expectation gaps, increase satisfaction, and ensure the profitability, long-term viability, and success of the ride-hailing business.

7. Limitation and Future Research Direction

The empirical finding shed a light for importance role of functional and outcome quality dimension in understanding the passenger satisfaction, however the empirical results cannot be generalized because this study focuses on Grab, a Malaysian ride-hailing

service. Therefore, future research might broaden the sample by concentrating on other nations and industries, as well as undertake comparison studies to better understand the significance of service quality. Since this study focus on the relationship of service quality dimensions and passenger satisfaction. Future research can enhance the conceptual framework by examining the mediating influence and incorporating passenger loyalty, resulting in an interesting and enlightening study in the body of literature. This study does not incorporate any moderating factor in the conceptual model. Since passenger play an important role in determine the service quality and satisfaction, future research might include the passenger's gender or age as a moderating element to acquire a deeper understanding of the users' perceptions and how they influence service quality and satisfaction.

8. Conclusion

Service quality and customer satisfaction are inextricably linked. In the service quality assessment of Grab, ride-hailing services give an ideal method to decrease dissatisfied among passengers, by considering both outcome and functional quality. Passenger is the largest capital in this ride-hailing services. Understanding their wants and expectations for how service should be delivered and what service outcome they should expect is critical to the long-term success of the ride-hailing business.

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Conflict of Interests

The authors declare no conflict of interest in this study.

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