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Riding the Wave of Satisfaction: Exploring Service Quality and Customer Satisfaction in Ride-Hailing Services

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ABSTRACT

In Malaysia, ride-hailing services like Grab Car increasingly supplement public transport. This study examines how five service quality dimensions—tangibility, empathy, responsiveness, reliability, and assurance—affect customer satisfaction. Using a quantitative method, data were collected via an online survey of 100 respondents and analyzed through regression analysis. The results show that perceived service reliability ($\beta = 0.345$, $p < 0.001$) and assurance ($\beta = 0.439$, $p < 0.001$) significantly and directly influence customer satisfaction, explaining 50.3% of the variance ($R^2 = 0.503$). Empathy ($\beta = 0.517$) and responsiveness ($\beta = 0.355$) influence satisfaction indirectly through reliability, while tangibility ($\beta = 0.415$) and responsiveness ($\beta = 0.365$) do so through assurance. However, tangibility does not significantly affect reliability, and empathy does not influence assurance. These findings suggest that improving reliability and assurance, supported by other service dimensions, can enhance customer satisfaction. This research offers practical insights for public transport and ride-hailing services to strengthen service quality and increase customer loyalty.

Keywords: Customer Satisfaction; Public Transport; Ride-Hailing Services; Service Assurance; Service Reliability

INTRODUCTION

Malaysia's public transport sector is expected to expand considerably. An estimated USD 558.30 million in revenue is anticipated by 2024. By 2029, it is projected that this amount will have grown at an annual rate of 1.73% to reach a market volume of around USD 614.90 million (Statista, n.d.). Recent reports indicated a significant increase in ridership, with buses and rail services seeing rises of 11.8% and 10.8% respectively, attributed to enhancements like increased train frequencies on key lines. Public transportation infrastructure in Malaysia has experienced significant growth and expansion, particularly in urban areas like the Klang Valley. The development includes a diverse range of options such as buses, Light Rail Transit (LRT), Mass Rapid Transit (MRT), and ride-hailing services like Grab. Recent initiatives have focused on extending existing LRT lines, launching Bus Rapid Transit systems, and enhancing overall efficiency to improve accessibility by 2040. Additionally, the affordability of public transport has been prioritized, with a transportation cost model supporting sustainable and economical commuting options for residents (Ab Majid et al., 2022).

Customer satisfaction is crucial for service-based industries, especially in competitive environments like ride-hailing services. In such markets, where multiple options are available to consumers, high levels of satisfaction can differentiate one company from another. Service quality directly influences customer loyalty. If customers are consistently satisfied with their experience, they are more likely to return and use the service regularly. Improved service quality can lead to enhanced customer loyalty, fostering longer-lasting relationships and repeat usage, which is essential for sustaining success in a crowded marketplace.

Grab Car plays a crucial role in the Malaysian transportation landscape by providing a convenient alternative to traditional public transport. With the rise of e-hailing services, Grab has transformed personal transportation, offering users on-demand access to vehicles through a user-friendly app. Research indicates that users appreciate the flexibility, ease of use, and often faster service compared to conventional public transport options. The convenience of ride-hailing services like Grab Car addresses gaps in the public transport system, such as limited routes and schedules, making it a vital component of urban mobility in Malaysia.

Service quality is a key factor influencing consumers' decisions to use a Grab car as a means of transportation. It ensures reliability, safety, fair pricing, and ease of use, which contribute to a positive and trustworthy ride-hailing experience. Grujičić et al. (2014) stated that quality of service is measured by how the passengers perceive the performance of the transport system service. Additionally, high service quality also helps a business attract customers from rivals in a competitive market and strengthens customers' desire to repurchase. Service quality encourages customers to make repeat purchases in addition to luring new clients away from competitive firms (Nur'Najmah et al., 2019).

Phuong and Trang (2018) stated that a good experience in shopping, purchasing, and delivery of products and services highly depends on the service quality of a website. Based on this description, the quality of a website plays an important role in providing a confident and comfortable shopping experience for customers, with an expectation of speedy delivery and trustworthy service. This is highly relevant to Grab Car's platform, where a well-designed, efficient app directly influences users' perceptions of service quality. A user-friendly app not only ensures the booking and payment experience but also fosters confidence in the service's reliability and responsiveness.

In the ride-hailing industry, Grab must prioritize the immediate satisfaction of their customers, and the experience customers have before (accessibility) and after (ratings) their rides. Biesok and Wyród-Wróbel (2011) stated that a company depends on its customers to stand out and develop in the market. Firms have to provide valuable and distinctive terms to their customers to meet their needs. When it comes to satisfaction, the environment both prior to and after the actual purchase outweighs the feelings associated with the process of purchasing. Consumer satisfaction is viewed as the outcome of a development process, an emotional reaction, and a cognitive reaction. (Fonseca et al., 2010).

Recent studies have examined various aspects of Grab's services and success. For example, Liou et al. (2024) explored the factors influencing customer behavioral intentions to use GrabFood in Malaysia, while Ravi et al. (2024) highlighted the role of artificial intelligence in shaping customer purchase intentions on the platform. Kee, Al-Anesi et al. (2021) discussed how the COVID-19 pandemic served as a unique opportunity for GrabFood to optimize its performance, and Kee, Gan et al. (2021) analyzed Grab's remarkable rise as one of the greatest start-ups in the region. Adam et al. (2020) investigated customer satisfaction with Grab services in Malaysia, identifying factors such as perceived service tangibility, empathy, responsiveness, assurance, and reliability.

Building on the explained foundation, this study examines the relationship between service quality dimensions and customer satisfaction within the context of Grab Car services. The main objective is to investigate how perceived service tangibility, empathy, responsiveness, reliability, and assurance affect customer satisfaction. This research is significant as it addresses the increasing reliance on ride-hailing platforms as a substitute for public transportation in urban areas. It contributes to the existing literature by offering a more integrated model that includes both direct and indirect (mediated) effects of service quality on satisfaction, an area underexplored in previous studies. The novelty of this study lies in its focus on the mediating roles of perceived service reliability and assurance, offering deeper insights into how different service aspects work together to influence customer experiences in the ride-hailing sector.

LITERATURE REVIEW

Customer Satisfaction

Wilson et al. (2020) defined customer satisfaction as the client's assessment of a product or service based on whether it has fulfilled their needs and preferences. Customer satisfaction is influenced by a wide range of elements, including product quality, perceptions of justice and fairness, product and service prices, individual factors (such as the buyer's propensity or emotional condition), and the impact of other customers. Based on Waebuesar et al. (2022), customer satisfaction is crucial for businesses, as it determines customer satisfaction with products, services, and competencies. It helps companies improve or change their offerings, and can be applied to various sectors. Companies must consider customer needs and provide exceptional products and services. Customer satisfaction is a widely studied topic in research. Recent studies, such as those by Hui et al. (2024), Kee et al. (2022), Lew et al. (2024), Pérez-Morón et al. (2022), and Yo et al. (2021), have also explored customer satisfaction, contributing to the understanding of the area of business and consumer behavior.

According to Noor et al. (2014), for any services offered, consumer satisfaction is the main concern. Customer satisfaction is crucial for repeat business, positive word-of-

mouth to friends, family, and other acquaintances, and for generating positive referrals that help the business expand in the future (Chen, 2008). According to Hajduk et al. (2022), an organization's performance or the quality of its goods or services can be determined by measuring customer satisfaction. Customer satisfaction will thus serve as the pillar for success for all businesses, including those in the public sector. Thus, in this context, customer satisfaction highly depends on the service quality in public transport.

Perceived Service Tangibility

The term "tangibility" defines a service's physical aspects, such as its facilities, equipment, and staff appearance (Parasuraman et al., 1985). It includes external factors that affect the way customers evaluate the quality of the services they obtain. Wahid et al. (2017) highlighted how trained employees and well-furnished facilities significantly impact customers' perceptions of tangibility and, consequently, their level of satisfaction. Nguyen et al. (2020) further emphasized paying attention to the tangible factor of service quality since it has positive impacts on increasing customer loyalty and, thus, profitability. That is in line with the body of research, which has evidenced that tangible factors, in this case, the appearance and condition of the vehicle and the driver in public transport service, relate positively to customer satisfaction.

H1: Perceived service reliability will act as a mediator in the relationship between perceived service tangibility and customer satisfaction.
H4: Perceived service assurance will act as a mediator in the relationship between perceived service tangibility and customer satisfaction.

Perceived Service Empathy

Empathy has a critical role in raising customer satisfaction in a variety of service industries. Employee attitudes toward consumers are influenced by their emotional and observed experiences, and they are strongly positively correlated with customer satisfaction, according to Hassan et al. (2013). Effendi (2023) supports this idea, highlighting that businesses that truly comprehend and resolve consumer issues while offering attentive care cultivate a more sympathetic relationship with their customers. Furthermore, Olawole (2021) emphasizes that empathy predicts consumer happiness, stating that a caring approach and constant communication from service providers, such as drivers, are critical in improving passenger experiences. When taken as a whole, these viewpoints highlight how crucial empathy is to developing deep connections with clients and raising satisfaction levels.

H2: Perceived service reliability will act as a mediator in the relationship between perceived service empathy and customer satisfaction.
H5: Perceived service assurance will act as a mediator in the relationship between perceived service empathy and customer satisfaction.

Perceived Service Responsiveness

Responsiveness is the ability of the service provider to keep pace with the changing needs of consumers and take the initiative to go ahead and meet those needs. This element is essential since the delivery of timely service and attentiveness to customer requests can enable consumers' perception of quality. Based on Al-Azzam's (2015) statement, when the services are timely enough to meet clients' expectations, the clients feel satisfied and perceive a high level of service. This, therefore, conforms to the hypothesized positive relation between responsiveness and customer satisfaction in the public transport services where drivers make quick responses to passengers' needs, which may go a long way in making them satisfied with the overall service.

H3: Perceived service reliability will act as a mediator in the relationship between perceived service responsiveness and customer satisfaction.
H6: Perceived service assurance will act as a mediator in the relationship between perceived service responsiveness and customer satisfaction.

Perceived Service Reliability

The perceived quality suggests that the consumer's perceptions of service quality begin with the consumer's fundamental level of satisfaction and whether the service provider can meet the consumer's expectations. Consumers assume the actual service received will mirror the promises made by the service provider. An unrealized level of promised service is perceived as a failure in service quality. Reliability is the ability of the provider to perform the services as promised, showing capability and competence in so doing, and remains one of the main sources of customer satisfaction (Obulemire et al., 2014). In the context of Grab Car as a stand-in of the public transport industry, this would imply that the service provider would be able to develop customer satisfaction based on the capability of the drivers to show up on time, follow through with ride requests accurately, and ensure reliability in safety and comfort during the journey.

H7: Perceived service reliability will positively influence customer satisfaction.

Perceived Service Assurance

Assurance encompasses the guarantee and certainty provided by employees through their knowledge of politeness and their ability to foster trust in customers, which includes effective communication, security, competence, and courtesy. The term 'assurance' also signifies a statement or indication that inspires confidence, representing freedom from doubt and self-assurance. This concept is critical in the context of quality assurance, as excessive self-confidence or habitual presumption can affect performance (Aldawood & Al-Otaibi, 2010). In the realm of ride-hailing services, Olawole (2021) defines assurance as the driver's expertise and understanding, which boosts confidence and trust in the service. Drivers provide passengers a sense of security by showcasing their knowledge, giving them confidence that they will arrive at their destination on schedule. Passengers' satisfaction will greatly increase when there is a strong sense of security and assurance.

H8: Perceived service assurance will positively influence customer satisfaction.

Conceptual Framework

Figure 1. Research Framework

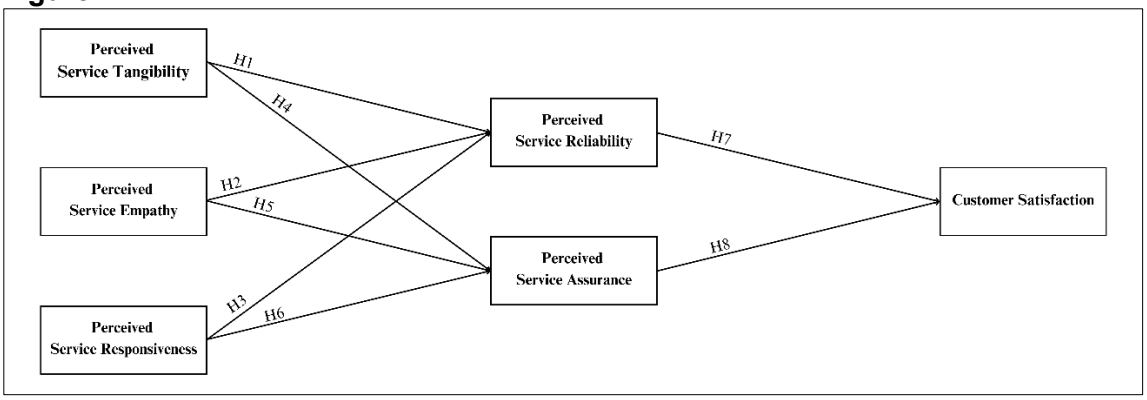

Figure 1 illustrates the theoretical framework implemented to identify the relationship of perceived service tangibility, perceived service empathy, perceived service responsiveness, perceived service reliability and perceived service assurance to customer satisfaction.

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RESEARCH METHOD

Sample and Procedure

In this study, two main research methods were adopted to gather and collect relevant information and data, which are quantitative and analytical research approaches. For the quantitative research approach, an online survey was designed using Google Forms and was distributed to 100 respondents from different social backgrounds to gather their opinions on the service quality and customer satisfaction in Grab Car. For information, Google Forms was chosen as the platform due to its convenience and user-friendliness for both the respondent and researchers. It enables researchers to efficiently gather a huge number of responses in a short period. The online surveys were distributed through social media and targeted personnel. Additionally, IBM SPSS Statistics 27 was employed to analyze the survey findings to provide a comprehensive statistical analysis. The analytical research approach was employed to review different sources of information. Research papers similar in scope to this study's title were analyzed and referred to accordingly as important references in the study.

Measures

The questionnaire consists of four main sections that were used to collect respondents' input on various aspects of using Grab Car, which are (1) demographic profile, (2) customer's experience in using Grab Car, (3) customer's perception and (4) customer satisfaction. For Sections (3) and (4), we implemented the 5-Point Likert Scale to allow the respondents to indicate their level of agreement with the statements provided in the survey. For instance, the scale demonstrates that "1" indicates "Strongly Disagree", while "5" indicates "Strongly Agree".

Section 1 of the questionnaire is used to collect respondents' demographic profile, which consists of information about gender, ethnicity, age, social status, and monthly income. By collecting the demographic information, we can gain precise and detailed insights from our respondents to ensure the research results' accuracy and applicability.

In Section 2, questions about the customer's experience in using Grab Car were asked in this part of the questionnaire. Examples of the questions are, "How frequently do you travel by Grab Car?", "Experience in using Grab Car", and "Where did you hear about Grab Car?".

For Section 3, this part of the questionnaire is used to measure the relationship between the service quality dimensions and customer satisfaction towards using Grab Car. The five service quality dimensions consist of perceived service tangibility, perceived service empathy, perceived service responsiveness, perceived service reliability and perceived service assurance. Each dimension consists of five items, making this section of the questionnaire a total of 25 items. This section plays a crucial role in this study as it enables us to determine the relationship between the five dimensions towards customer satisfaction, providing useful information to improve the service quality of public transport.

For Section 4, a 5-item scale was implemented to measure customer satisfaction towards using Grab Car. Customer satisfaction is the dependent variable in this study. Example of the questions are, "I am satisfied with the price and service convenience offered by Grab Car, they are worth my money", "I am satisfied with my interactions with drivers while riding Grab Car", "I am satisfied with my interactions with drivers while riding Grab Car", "I will happily use Grab Car again in the future", "I will happily recommend the

Grab Car service to other friends and families", and "I will share my experience with Grab Car as a positive sharing to other friends and families".

RESULTS

Table 1. Respondents' Profile Summary (N=100)

Response	Frequency	Percentage (%)
Gender		
Female	55	55.00
Male	45	45.00
Ethnicity		
Malay	45	45.00
Chinese	34	34.00
Indian	20	20.00
Others	1	1.00
Age		
Below 20 years old	11	11.00
20 – 29 years old	62	62.00
30 – 39 years old	12	12.00
40 – 49 years old	7	7.00
50 years and above	8	8.00
Social Status		
Student	67	67.00
Employed	25	25.00
Not in labour force	4	4.00
Retirement	4	4.00
Monthly Income		
No income	58	58.00
RM1000 and below	14	14.00
RM1001 – RM2000	7	7.00
RM2001 – RM3000	9	9.00
RM3001 and above	12	12.00

Table 1 presents the demographic breakdown of the 100 respondents who participated in the survey. The gender distribution is relatively balanced, with 55% of the respondents being female (N=55) and 45% male (N=45). This slight predominance of female respondents may reflect a higher level of engagement or responsiveness among women in online survey settings, which is consistent with findings in similar academic research.

Regarding ethnicity, Malay participants constitute the largest ethnic group, representing 45% (N=45) of the total sample. This is followed by Chinese respondents at 34% (N=34), and Indian respondents at 20% (N=20). Only 1% (N=1) identified as belonging to the "others" category. This ethnic distribution suggests that the sample largely reflects the demographic composition of Malaysia's population, though Malays are slightly overrepresented relative to national census proportions.

In terms of age, the vast majority of respondents fall within the 20 to 29-year-old age group (62%, N=62). This skew toward younger adults is likely a result of the sampling method, as the survey was initially disseminated among university students before being shared with the general public. This trend is further supported by the social status data, where 67% of respondents identified as students (N=67). This strong representation of

students suggests that the data reflects the views of younger, tech-savvy individuals who are more likely to engage with digital platforms and online financial services.

The monthly income distribution adds another layer of confirmation to this pattern. A significant portion of respondents (58%, N=58) reported having no income, which is consistent with the high number of students in the sample. It also highlights the financial dependency or limited earning capacity typically associated with individuals in early adulthood or those still pursuing higher education.

Taken together, these demographic trends provide useful context for interpreting the rest of the study. The dominance of younger, student-aged respondents without income may influence perceptions of digital banking services, customer satisfaction, and technology adoption behaviors. While this may limit the generalizability of findings to older or working populations, it does offer valuable insight into the attitudes of a key user segment for future digital financial services.

Table 2. Respondents' Experience in Using Grab Car (N=100)

Response	Frequency	Percentage (%)
How frequent do you travel by Grab Car?		
Never	4	4.00
Rarely	35	35.00
Daily	5	5.00
Weekly	20	20.00
Monthly	36	36.00
Experience in using Grab Car		
Less than 1 year	20	20.00
1 – 2 years	30	30.00
3 – 5 years	27	27.00
More than 5 years	23	23.00
Where did you hear about Grab Car?		
Recommendations from friend/colleague/family	34	34.00
Social media	34	34.00
The Internet	22	22.00
TV, Newspaper, Magazine	7	7.00
This is the first time I heard about this App	3	3.00

Table 2 provides a detailed overview of respondents' familiarity and experience with the Grab Car service. The data shows that the majority of respondents have interacted with the platform in some form, though the frequency of usage varies considerably.

Only 4% of respondents (N=4) indicated that they have never used Grab Car, suggesting high general awareness and access to the service among the surveyed population. A significant portion, 35% (N=35), reported that they rarely use the service, implying that while they are aware of and have tried it, it is not their primary mode of transportation. Meanwhile, 36% (N=36) of respondents use Grab Car on a monthly basis, and 20% (N=20) use it weekly, indicating a moderate but consistent engagement with the app. Interestingly, only a small fraction, 5% (N=5), reported using Grab Car on a daily basis, possibly due to budget constraints or the availability of alternative transportation options.

When asked about the duration of usage, the responses were more evenly distributed. About 20% (N=20) of the respondents have been using Grab Car for less than one year, reflecting either newer adoption patterns or possibly respondents who have recently relocated to urban areas. On the other end of the spectrum, 23% (N=23) of respondents

have been using Grab Car for more than five years, suggesting a loyal user base that has incorporated the platform into their regular travel habits.

In terms of initial exposure to Grab Car, the most commonly cited sources were social media and word-of-mouth recommendations (from friends, colleagues, or family), each accounting for 34% (N=34) of the responses. This highlights the role of digital channels and personal networks in shaping technology adoption, particularly among younger demographics. Additionally, 22% (N=22) learned about Grab Car through general Internet searches or online content, indicating the influence of digital presence beyond social platforms. A smaller group, 7% (N=7), discovered the service through more traditional media such as television, newspapers, or magazines, while 3% (N=3) stated that this was their first time hearing about the app, suggesting minimal exposure or possibly a lack of prior need for such services.

Overall, the data suggest that Grab Car enjoys high brand awareness, with most respondents having used the service at least occasionally. However, the variance in usage frequency and duration points to differing levels of dependence, possibly influenced by income, mobility needs, or alternative transport options. Social influence and digital media appear to be the strongest drivers of initial awareness, underscoring the importance of maintaining a strong online and community-based marketing presence.

Table 3. Descriptive Statistics, Cronbach's Coefficient Alpha, and Zero-order Correlations for All Study Variables

Variables		1	2	3	4	5	6
1	Perceived Service Tangibility	0.786					
2	Perceived Service Empathy	0.658**	0.898				
3	Perceived Service Responsiveness	0.791**	0.802**	0.878			
4	Perceived Service Reliability	0.626**	0.805**	0.773**	0.844		
5	Perceived Service Assurance	0.783**	0.686**	0.790**	0.634**	0.870	
6	Customer Satisfaction	0.556**	0.696**	0.656**	0.623**	0.657**	0.927
Number of Items		4	5	5	3	4	5
Mean (M)		3.7000	3.8660	3.9340	3.7833	3.8850	3.9360
Standard Deviation (SD)		0.78254	0.75642	0.70842	0.74064	0.80749	0.78258

Note: N=100; *p<0.05, **p<0.01; Diagonal entries in bold indicate Cronbach's coefficient alpha

Table 3 presents a comprehensive overview of the descriptive statistics, Cronbach's Alpha values, and the zero-order Pearson correlations among the key study variables. These variables include perceived service tangibility, empathy, responsiveness, reliability, assurance, and customer satisfaction. Together, they form the foundation of the service quality construct assessed in the study, and their interrelationships offer valuable insight into how each dimension relates to customer perceptions and outcomes.

The reliability of each construct was measured using Cronbach's Alpha, a widely accepted indicator of internal consistency that evaluates whether the items within a scale

are measuring the same underlying concept (Singh et al., 2023). According to the results, all six variables demonstrate strong reliability, with alpha coefficients exceeding the commonly accepted threshold of 0.70. Specifically, perceived service tangibility scored 0.786, empathy 0.898, responsiveness 0.878, reliability 0.844, assurance 0.870, and customer satisfaction 0.927. These results suggest that the items within each scale are highly cohesive and consistently reflect the constructs they are intended to measure.

It is worth noting that during the scale refinement process, some items with low factor loadings were removed to improve scale validity and reliability. The resulting alpha values reflect this adjustment, which ensures that the final items retained in the analysis are both statistically sound and conceptually meaningful. The particularly high reliability observed in the customer satisfaction construct (α = 0.927) may indicate strong coherence among items, although it could also suggest potential redundancy—an aspect that future studies may want to evaluate further through exploratory or confirmatory factor analysis.

In addition to the reliability measures, the table also reports the zero-order Pearson correlations among all study variables. The analysis reveals positive and statistically significant relationships across the board, indicating that higher perceptions of service quality, across all five SERVQUAL dimensions, are associated with higher levels of customer satisfaction. The strongest correlations were observed between responsiveness, empathy, and assurance, reinforcing the idea that interpersonal and communicative aspects of service delivery play a critical role in shaping overall satisfaction.

Taken together, the findings presented in Table 3 provide robust support for the measurement model used in this study. The strong internal consistency and the expected directionality of correlations suggest that the constructs are well-defined and empirically distinct, while still being meaningfully related. This offers a strong foundation for further analysis, particularly in testing the structural relationships between service quality dimensions and customer satisfaction.

Table 4. Regression Analysis

Variables		Perceived Service Reliability	Perceived Service Assurance	Customer Satisfaction
1	Perceived Service Tangibility	0.005	0.415***	
2	Perceived Service Empathy	0.517***	0.120	
3	Perceived Service Responsiveness	0.355**	0.365**	
4	Perceived Service Reliability			0.345***
5	Perceived Service Assurance			0.439***
R^2		0.693	0.696	0.503
F value		72.360	73.279	49.128
Durbin-Watson Statistic		2.200	2.199	2.283

Note: N=100; *p<0.05, **p<0.01, ***p<0.001.

Table 4 exhibits the result of the regression analysis, which examines the relationship between customer satisfaction and the independent variables, which are perceived service tangibility, perceived service empathy, perceived service responsiveness, perceived service reliability and perceived service assurance. Based on the findings in the table, it supports the H7 and H8, which proves that perceived service reliability and perceived service assurance can positively influence customer satisfaction, with the beta values of 0.345 and 0.439, respectively, and a significance level of p<0.001. Furthermore,

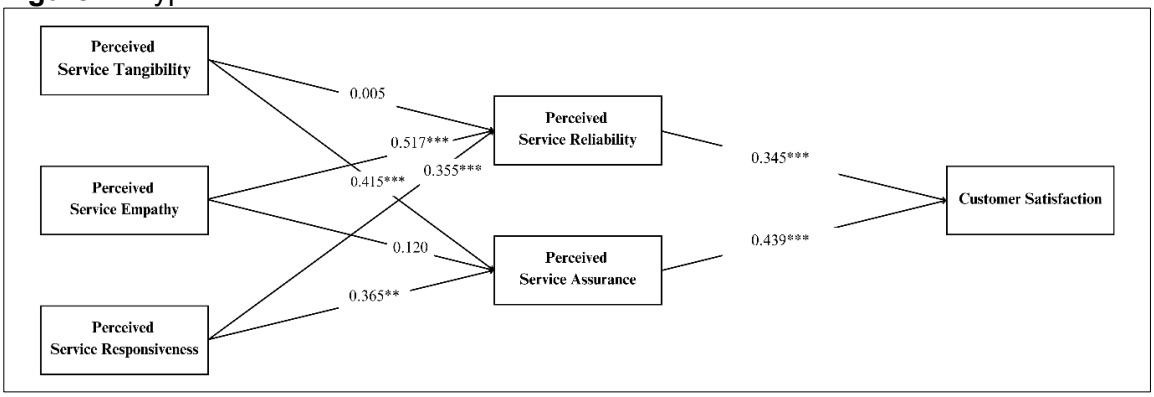
the R^2 value, 0.503, suggests that 50.3% of the variance in customer satisfaction can be justified by perceived service reliability and perceived service assurance.

In addition, the analysis demonstrates that perceived service empathy and perceived service responsiveness indirectly influence customer satisfaction via the mediating role of perceived service reliability. Hence, H2 and H3 are supported. This is because the dependent variable, perceived service reliability and the other two independent variables, perceived service empathy and perceived service responsiveness, demonstrate significant and positive relationships, with the beta value of 0.517 and 0.355. However, perceived service tangibility and the mediating variable, perceived service reliability, show no significant relationship; thus, H1 is rejected.

Simultaneously, the findings support H4 and H6, as the independent variables (perceived service tangibility and perceived service responsiveness) and the dependent variable (perceived service assurance) exhibit significant relationships with the beta value of 0.415 and 0.365. This ultimately means that perceived service tangibility and perceived service responsiveness will indirectly influence customer satisfaction through the mediating variable, perceived service assurance. Notably, perceived service empathy does not demonstrate a significant relationship with perceived service assurance, resulting in the rejection of H5.

The summarized output of the hypothesized model is shown in Figure 2.

Figure 2. Hypothesized Model



DISCUSSION

The purpose of this study is to use Grab Car as a stand-in to assess the level of service quality provided by public transport. The study examines the relationship between five independent variables: perceived service tangibleness, empathy, responsiveness, reliability, and assurance. The dependent variable, customer satisfaction, is impacted by the five independent variables. Both direct and indirect correlations between these factors are found in the study. This study aims to evaluate the level of consumer satisfaction with public transport service quality, with a particular focus on Grab Car services in Malaysia. The results indicate that while certain independent variables, such as perceived service tangibility, perceived service empathy, and perceived service responsiveness, have various degrees of relevance depending on the mediator variables (perceived service assurance and perceived service reliability), they appear to have a more significant and indirect impact on customer satisfaction.

The relationship between perceived service empathy, perceived service responsiveness, and perceived service reliability has been explored in various studies on service quality

and customer satisfaction. Lai and Chen (2011) highlight that these dimensions are interconnected and play pivotal roles in shaping customer perceptions and behavioral intentions in service contexts. It becomes apparent that perceived service empathy is the most influential factor in shaping perceived service reliability (beta =0.517). This can be attributed to the fact that perceived service empathy is closely linked to perceived service reliability because it shows customers that the service provider understands their needs and can adapt to their preferences, creating a sense of dependability. According to Parasuraman et al. (1985), empathy measures the capacity to show concern and pay close attention to comprehend clients' demands. Additionally, research suggests that empathetic interactions lead to higher levels of customer loyalty because they form an emotional bond that reinforces trust in the service's dependability (Hennig-Thurau et al., 2002; Ladhari, 2009).

Besides that, perceived service responsiveness is significant to perceived service reliability because it directly affects how customers perceive the ability of the service to meet their needs consistently. A prompt and proactive response, such as efficient handling of complaints, shows customers that the service is dependable. As Zeithaml et al. (2002) state, responsiveness is essential for building customer trust and satisfaction. Perceived service responsiveness also indirectly influences customer satisfaction by reducing frustrations, such as long waiting times, which could negatively impact the overall experience.

Furthermore, it is evident that perceived service tangibility has no significant direct relationship with perceived service reliability. This suggests that tangible aspects may not be as critical compared to other dimensions like empathy and responsiveness. As Grönroos (2001) states, in service industries that emphasize personal interaction and technology, customers tend to rely more on intangible aspects rather than physical cues when assessing reliability. Tangibility might play an indirect role in customer satisfaction by enhancing the overall service experience. For example, a clean vehicle could enhance satisfaction, but it does not directly affect perceptions of whether the service is consistent or dependable.

Perceived service tangibility plays a critical role (beta = 0.415) in perceived service assurance by providing customers with visible cues about the reliability and professionalism of a service, indirectly influencing customer satisfaction. In the context of Grab Car, tangible elements such as vehicle cleanliness, driver appearance, and the overall service environment shape customers' perceptions of service quality. These physical aspects help assure customers of their safety and comfort, fostering trust in the service. Research supports this connection, showing that clean and well-maintained vehicles not only enhance customer confidence but also serve as key predictors of satisfaction (Bismo et al., 2018; Salleh et al., 2021; Zygiaris et al., 2022). When customers experience high tangibility, their concerns about service quality are alleviated, ultimately leading to greater satisfaction with the overall service. Perceived service responsiveness is significant to perceived service assurance (beta = 0.365) because it demonstrates a service provider's willingness and ability to address customer needs promptly, indirectly enhancing customer satisfaction.

In the context of Grab Car, responsiveness is reflected in how quickly drivers respond to ride requests or handle inquiries and complaints. When customers experience timely and effective responses, they feel more assured about the service's reliability and professionalism, which contributes to their confidence and trust. Research highlights that quick response times and effective communication enhance the customer experience, fostering feelings of safety and reliability (Kurniawati et al., 2021; Mujahid et al., 2022).

These positive experiences directly correlate with higher levels of satisfaction, making responsiveness a key factor in ensuring customer loyalty and contentment (Salleh et al., 2021; Zygiaris et al., 2022). Perceived service empathy, defined as the care and personalized attention provided by service providers, is not directly significant to assurance in the context of Grab Car services but indirectly influences customer satisfaction. Unlike perceived service tangibility and perceived service responsiveness, which directly impact perceptions of safety and reliability, empathy primarily enhances the customer experience by fostering loyalty and emotional connection. Research indicates that while empathetic interactions improve customer relations, they do not necessarily increase perceptions of assurance or safety (Kurniawati et al., 2021; Mujahid et al., 2022). Customers tend to prioritize tangible factors, such as vehicle cleanliness and responsive service, when evaluating assurance, which are more critical to their confidence and trust. Nevertheless, empathy does play an indirect role in customer satisfaction by strengthening long-term loyalty and positive sentiments toward the service.

Furthermore, when analyzing the quality of public transportation services, especially when using services like Grab Car as a measurement, perceived service reliability and perceived service assurance are crucial. Perceived service reliability (beta = 0.345) in the context of public transportation ensures that services like Grab Car continuously satisfy consumer requirements, including availability and punctuality, which are crucial for daily commuting. Research has shown that reliability significantly reduces uncertainties, thus making it a cornerstone of customer satisfaction in transportation services (Ngoc & Park, 2021). It is believed that reliability is crucial to public transportation since workers rely on quick services for their daily routines emphasizing professionalism, competence, and safety. A better alternative to satisfy these needs is Grab Car.

Meanwhile, perceived service assurance, with a beta of 0.439, strongly emphasizes professionalism, competence, and safety. Perceived service assurance talks about the trust and security concerns regarding public transportation, where service quality may differ. The studies have revealed that assurance develops confidence and trust, which is important in retaining customers and creating service loyalty (Ann & Shafi, 2022; Teo et al., 2018). For us, perceived service assurance is a necessity in public transport as it creates trust, especially when it is associated with those services concerning the highest importance of safety. At the same time, based on the findings, perceived service responsiveness is the only independent variable significant to both the mediating variables (perceived service reliability and perceived service assurance), directly and indirectly influencing customer satisfaction. This is because responsiveness ensures the timely resolution of problems, enhances the overall customer experience and reinforces assurance and reliability. In support, Maryanto and Kaihatu (2021) established that as Grab Car resolves problems on time, passengers are more confident in it as a substitute or improvement upon public transportation. Based on this, it can be concluded from the study that there is a significant relationship between customer satisfaction, perceived service assurance, and perceived service reliability. By focusing on these aspects, Grab Car provides a model for improving the quality of public transportation (Ngoc & Park, 2021).

As part of its public transportation policy, the Malaysian government has introduced several kinds of initiatives to encourage the usage of Grab Car. First of all, in order to guarantee safety and reliability, the government has put laws into place that encourage ride-sharing services, such as legalizing and regulating them. Second, the government has made it simpler for commuters to transfer between different forms of transportation

by integrating ride-sharing services with public transportation systems by setting up specific pick-up and drop-off locations at significant public transportation hubs (Kee, Rusdi et al., 2021). Using a variety of marketing techniques, Grab Car has aggressively advertised its services. In order to draw in and keep customers, one important step is the implementation of loyalty programmes and incentives (Kee et al., 2022). By offering value for money, these incentives not only promote more frequent Grab Car use but also raise the level of customer satisfaction (Aryani et al., 2022). In order to encourage more people to utilise Grab Car, the government can provide commuters who use Grab Car and public transportation with combined fare savings. More people would utilize these services as a result of this programme, which would lower the total cost of commuting. Grab Car can also help the government by providing information on client preferences and ride trends. This data may be used to better manage public transportation and make sure that commuter demands are met (Kee, Zakiah et al., 2021).

This study emphasizes the complex connections between the many aspects of service quality, including perceived service tangibility, perceived service responsiveness, perceived service empathy, perceived service assurance, and perceived service reliability, and how these links affect customer satisfaction as a whole. Each component has a distinct impact on client perceptions and satisfaction. Customer satisfaction is directly correlated with perceived service assurance and perceived service reliability, while perceived service empathy, perceived service responsiveness, and perceived service tangibility have indirect effects through these dimensions. This interdependence emphasises the need for an all-encompassing strategy to improve service quality in the public transportation industry. Service providers may greatly increase consumer happiness and loyalty by fully comprehending and enhancing these factors, which will promote a more effective and user-friendly public transportation system.

CONCLUSION

In conclusion, this study provides a nuanced understanding of how service quality dimensions influence customer satisfaction in ride-hailing services, using Grab Car as a contextual stand-in for public transportation in Malaysia. The results demonstrate that perceived service reliability and assurance significantly and directly enhance customer satisfaction, while perceived empathy and responsiveness exert indirect effects through reliability, and tangibility and responsiveness through assurance. These findings highlight the complex and interconnected nature of service quality elements, where both direct and mediated relationships play essential roles in shaping the passenger experience.

All service quality dimensions—tangibility, empathy, responsiveness, reliability, and assurance—carry critical weight in the delivery of consistent, high-quality transportation services. For instance, service tangibility contributes to passenger comfort, empathy builds emotional rapport, responsiveness ensures timely support, and assurance instills trust and a sense of safety. This holistic service experience ultimately drives customer satisfaction and strengthens loyalty in a competitive transportation landscape. Although the research focuses on Grab Car, the findings have broader implications for public transportation in Malaysia, emphasizing the need for continuous quality improvement across all service touchpoints.

Furthermore, the government, as the ultimate policy-maker, plays a key role in ensuring quality standards across the public transport sector. As Delbosc (2012) and Othman & Ali (2020) point out, transportation directly impacts life satisfaction by enhancing mobility and access to essential services. In this regard, policies such as Malaysia's e-hailing

regulations introduced in 2019 have improved industry standards, especially in assurance, responsiveness, and reliability (Grab Malaysia, n.d.). Grab's compliance—e.g., background checks, in-app emergency features, and vehicle inspections—demonstrates how regulation can elevate service quality, ensuring passenger trust and satisfaction.

To further improve public transportation services, authorities should consider enhancing existing technologies such as real-time tracking systems and delay notifications, and introducing compensation schemes for service disruptions. These efforts, alongside internal improvements by ride-hailing providers like Grab, can significantly elevate the passenger experience, ensure service consistency, and maintain competitiveness. As suggested by Prasoon and Chaturvedi (2016), quality transportation not only supports daily mobility but also contributes to greater community liveability.

Overall, this research offers practical insights for both policymakers and service providers. For the government, the findings support strategic initiatives aimed at increasing public transport adoption and reducing dependency on private vehicles. For businesses, understanding customer expectations and service quality perceptions can lead to enhanced loyalty and market retention. Academically, this study contributes to the evolving discourse on service quality in digital transportation, providing empirical evidence on the mediating roles of assurance and reliability, which adds depth to current models. In a rapidly growing transportation ecosystem, those who adapt and implement quality improvements effectively will gain a lasting competitive advantage.

LIMITATION

There are some limitations that were encountered in the process of this study. This is due to the unexpected constraints and uncontrollable situations which cannot be controlled by the researchers. Firstly, not all public transport users in Malaysia can be represented by the study's findings based on Grab Car, due to the small sample size when considering the entire population of Malaysia. Every user may have a different perspective on the satisfaction towards the service quality in Grab Car as a stand-in for the service quality in public transport. Besides, the study focuses only on Grab Car as one of the many modes of public transport in Malaysia. Hence, more research should be done on other modes of public transport to gain a holistic view of the customer's satisfaction towards the service quality of public transport. Lastly, the inequality in responses in terms of the respondents' demographics, such as gender, age, and social status, might cause bias and unfair responses. Therefore, these limitations are to be cautious, and improvements should be made in future studies to gain a deeper understanding of the service quality in public transport in Malaysia.

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DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research authorship, and or publication of this article.

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