

The Impact of Customer Experience on Customer Loyalty in Using Grab Ride-hailing Service of Gen Z

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Abstract: *In the age of digital transformation, ride-hailing services are one of the latest innovations in e-commerce. Grab, the leading ride-hailing service, holds over 50% of the market share in Vietnam. This study aims to investigate and evaluate the impact of customer experience on Gen Z customer loyalty in using Grab's ride-hailing services. With a sample survey of 344 Gen Z customers who use Grab's ride-hailing services in Hanoi, the study uses the PLS-SEM model for quantitative analysis to estimate the research model with 11 concepts, with the questionnaire developed through inheritance of previous research and in-depth interviews. The research results confirm the impact of 9 factors on Customer Experience, the direct impact of Customer Experience on Customer Loyalty and the mediating role of Customer Satisfaction in the relationship between Customer Experience and Customer Loyalty in the ride-hailing service. The study also makes practical contributions by providing managerial implications for businesses to enhance customer loyalty.*

Keywords: Customer Satisfaction, Customer Loyalty, Gen Z, PLS-SEM, Ride-hailing Service

I. Introduction

Vietnam is a densely populated country with a total population of approximately 97.5 million people in 2021, ranking 15th in the world and having an average population density of around 311 people per square kilometer. As the population continues to grow, the demand for transportation and mobility has become increasingly complex and rapidly increasing. Goods, services, and people can now move easily thanks to the advancement of affordable transportation and information technology services (Abadi et al., 2020).

In the age of rapidly developing information technology, ride-hailing services have emerged as one of the latest innovations in e-commerce. These services are redefining the concept of accessing transportation by decoupling it from vehicle ownership (Alemi et al., 2018). Online transportation services, also known as ride-hailing services, are personal transportation services where customers can book rides through a mobile app and drivers can respond to orders through the app (Wallsten, 2015). In Vietnam, the number of users of these services is expected to continue to increase until 2028, with an estimated 28.83 million users in 2028 (Statista, 2024). Popular ride-hailing service providers in Vietnam include Grab, Gojek Vietnam, Be, and the newest entrant, Xanh SM, which was launched in April 2023. Among these, Grab holds over 50% of the market share in Vietnam (Statista, 2023).

"Gen Z" is a term used to refer to young people born between 1995 and 2010 (Francis & Hoefel, 2018). Francis & Hoefel (2018) also highlight some key characteristics that differentiate this generation from previous ones, such as following community trends and having highly practical actions. Therefore, Gen Z's customer behavior differs from that of other generations in several aspects. With the increasing popularity of ride-hailing services in Vietnam, particularly among Gen Z customers, ride-hailing service companies need to improve service quality to provide a better customer experience. When customers have a positive experience with the service, the company is more likely to gain satisfaction and loyalty from Gen Z customers, leading to a competitive advantage and maintaining a larger market share compared to other competitors.

Recognizing the potential for Grab's ride-hailing service to grow in Vietnam, researching the impact of customer experience on customer loyalty is essential to help this industry develop rapidly and bring benefits to Grab, contributing

to the overall development of the Vietnamese economy. Currently, there have been many studies on ride-hailing services in Vietnam, but none have delved into the impact of customer experience on customer loyalty or considered the characteristics of Gen Z compared to other generations. Therefore, this study aims to investigate the impact of customer experience on customer loyalty when using Grab's ride-hailing service among Gen Z in Hanoi, which has both theoretical and practical significance.

II. CURRENT STATUS

2.1 The Current Status of Ride-hailing Services in Vietnam

Ride-hailing services are services that connect customers and vehicle owners (drivers) in real time using mobile technology (Watanabe et al., 2016). In Vietnam, this market has seen significant growth in recent years. According to Statista data, the revenue of the Vietnamese ride-hailing market will reach 1.64 billion US dollars (USD) in 2024 and is expected to grow at an annual growth rate of 1.78% over the next 4 years, reaching 1.76 billion USD in 2028.

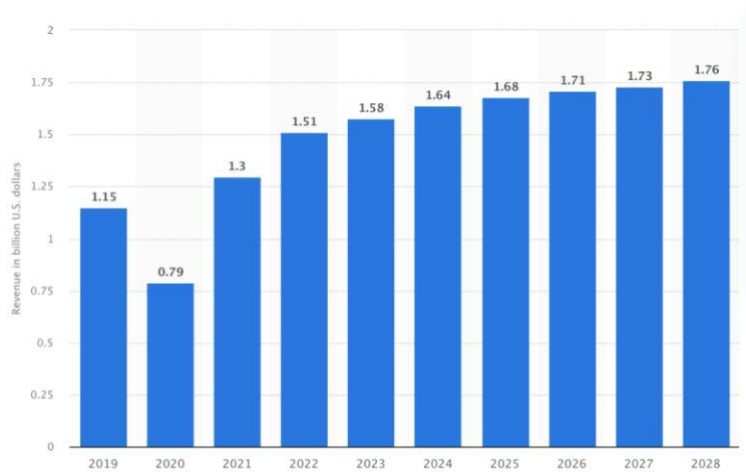


Figure 1: Revenue of the Vietnamese ride-hailing market from 2019 to 2023 and forecast to 2028 (USD billion)

Source: Statista (2024)

According to the news site Global Data, Grab Holdings Ltd, also known as Grab, is a multinational technology company headquartered in Singapore. Grab has experienced rapid growth in recent years and has a wide presence in many markets, including Vietnam. According to the latest report from Mordor Intelligence, Grab's ride-hailing service accounted for 58.68% of the Vietnamese ride-hailing market revenue as of the end of 4th quarter in 2023. With a market share of over 50%, Grab can be called the leading ride-hailing service in the Vietnamese market.

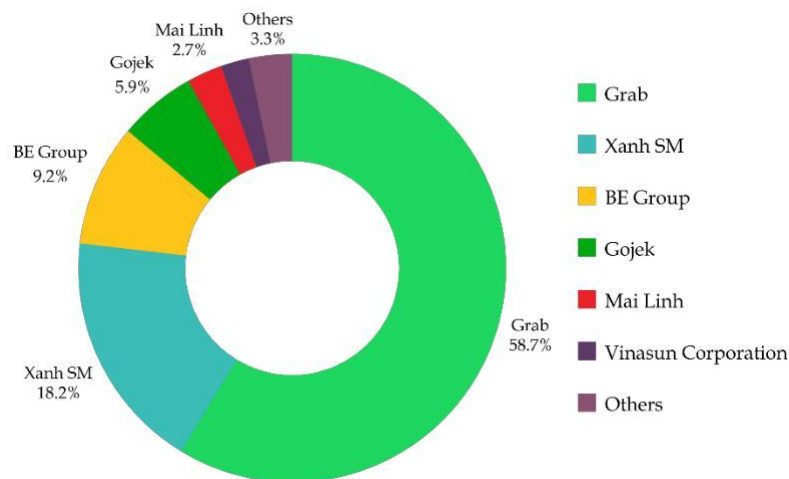


Figure 2: Market share of companies (in percent) in the Vietnamese ride-hailing market, 4th Quarter 2023

Source: Mordor Intelligence

2.2 Current Status of Grab Ride-hailing Service Usage among Gen Z in Vietnam

"Gen Z" is a term used to refer to people born between 1995 and 2010 (Francis & Hoefel, 2018). After reviewing previous studies, the authors note that Gen Z youth are currently between the ages of 15 and 29. Pichler et al. (2021) have synthesized the factors that influence Gen Z and shape their unique characteristics, with the most important factors being technology, mental health, personality, and diversity. Referring to the circumstances of Gen Z, Francis & Hoefel (2018) mentions three main points: dynamism and practicality, social media and digital. Therefore, compared to other generations, Gen Z's consumption behavior also has certain differences, especially in terms of the uniqueness, limitlessness, and ethics of Gen Z's consumption behavior.

Based on the information about Gen Z, the authors synthesized data from the "Completed result of the 2019 General Population and Housing Census" (General Statistics Office, 2020), calculated, and obtained the result: the Gen Z population of Vietnam in 2019 was approximately over 20 million people. Grab is the most widely used service among Gen Z among the ride-hailing services in Vietnam, in direct proportion to the market share that Grab has achieved in the Vietnamese technology service market. 57% of Gen Z youth who participated in a survey conducted by Decision Lab affirmed that they use Grab the most and with the highest frequency among the ride-hailing services currently available in the Vietnamese market (Statista, 2023).

III. LITERATURE REVIEW AND THEORETICAL MODELS

3.1 Literature review

Customer experience was a widely studied concept, often measured through customer satisfaction, loyalty, purchase intention, word-of-mouth, and other factors (Jain et al., 2017). However, in recent studies, customer experience has been considered independently. Globally, some studies have explored the impact of customer experience on customer loyalty for ride-hailing services, primarily within a single country and with a specific ride-hailing service.

Damanik et al. (2023) examined the impact of customer experience on customer loyalty through customer satisfaction, utilizing primary data collected from a survey of 75 individuals. The authors concluded that customer experience positively and significantly influences customer loyalty through customer satisfaction when using ride-hailing services in Medan, Indonesia. Similarly, Khoir Rozin, M. (2022) investigated the case of customer behavior switching from offline to online ride-hailing, employing primary data by surveying individuals who transitioned from offline to online ride-sharing services in Indonesia in 2022, with 239 questionnaire responses. The study's findings revealed a positive impact of customer experience on customer switching behavior, from offline to online ride-hailing. Additionally, Syauqi et al. (2023) utilized primary and secondary data in their 2023 analysis of the quality of the Go-jek online transportation service. The authors concluded that customer experience when using ride-hailing services had no impact on customer loyalty, contradicting most other studies.

While studies have been published worldwide on the impact of customer experience on loyalty for ride-hailing services, the results vary. In Vietnam, however, there has been virtually no research on the impact of customer experience on customer loyalty for ride-hailing services.

Some studies on ride-hailing services in general have been published in various provinces and cities in Vietnam. In 2020, Nguyen Ngoc Mai and Nguyen Thi Minh Thao proposed four research hypotheses in their study on the factors influencing the intention to use ride-hailing applications in Binh Duong province: the usefulness of ride-hailing applications, the attractiveness of personal vehicles, social influence factors, and behavioral control factors. The study found that, with the exception of the personal vehicle factor, the remaining factors all influenced customer satisfaction and customer intention to use ride-hailing applications. Additionally, in 2023, Hoang Dam Luong Thuy investigated the impact of perceptions on the intention to use ride-hailing technology among individual customers in Hanoi. The study, based on the technology acceptance model, concluded that the factors of perceived economic value, perceived usefulness, and perceived ease of use positively influence the intention to use ride-hailing services, with perceived economic value having the greatest impact.

While research on ride-hailing services and customer intention to use ride-hailing applications exists in Vietnam, these studies focus solely on customer intention and neglect other crucial factors in the customer service experience, such as customer experience, customer satisfaction, and customer loyalty, creating a significant research gap in this area.

Furthermore, previous studies with similar topics worldwide have not explored the distinct characteristics of Gen Z, who are quick to adapt to technological changes and exhibit different consumption trends compared to other generations. Therefore, investigating the "Impact of Customer Experience on Customer Loyalty in Using Grab Ride-hailing Services of Gen Z" is essential and holds significant theoretical and practical implications.

This study aims to address the impact of customer experience on customer loyalty in using Grab ride-hailing services among Gen Z. The study will employ a quantitative approach through a structured questionnaire to collect data from a representative sample of Gen Z ride-hailing service users in Hanoi, Vietnam. The findings will contribute to the understanding of customer experience, customer satisfaction, and customer loyalty in the context of ride-hailing services, particularly among Gen Z. The study's practical implications can guide ride-hailing service providers in enhancing customer experience and fostering customer loyalty, ultimately leading to business success.

3.2 Theoretical background and models

3.2.1 Basic concepts

Customer Experience

Experience is a state created by humans to satisfy personal stimuli (Poulsson & Kale, 2004). Customer experience refers to "all the experiences that customers have with a product or service provider during their interaction with that provider" (Pine & Gilmore, 1999). According to an article in Oracle Vietnam magazine, based on this definition, customer experience is concerned with how businesses interact with customers at every stage of the buying process - from marketing and sales to customer service and other steps.

Customer Satisfaction

Satisfaction can be defined as a positive emotional state resulting from a comprehensive performance evaluation based on the overall previous shopping experience with a specific product or service over time (Anderson, 1994). In addition, author Oliver (1997) in his work "Satisfaction: A Behavioral Perspective on the Consumer" proposed a definition that emphasizes consumers rather than customers, as consumers are the users and receivers of products, services and experiences directly, while customers are only the ones who pay for the product or service, but not definitely the consumers (the direct users).

Customer Loyalty

Customer loyalty is the positive attitude of buyers towards sellers, leading to repurchasing behavior (Srinivasan & Ponnarolu, 2002). Chaudhuri (1999) defines customer loyalty as the buyer's commitment to purchase and reuse their favorite products and services. Oliver (1997) provided a broader definition of customer loyalty: a deep commitment to repurchase or re-purchase preferred products or services consistently in the future, leading to the repurchase of the same brand or group of brands, regardless of the impact of real-world situations and marketing efforts on customer loyalty.

3.2.2 Theoretical Models

Customer Experience Measurement Scale

Customer experience is defined as "the quality of the customer experience, whether it is excellent or good, as well as the customer's subjective response to new and immediate experiences with the company" (Lemke et al., 2010). Using this definition, Lemke et al. (2010) conducted research to find an appropriate scale to measure customer experience. The research results showed 8 factors that measure customer experience:

- **Accessibility** refers to the extent to which customers can easily access the right people and/or facilities (e.g., physical stores, information pages).
- **Competence** is defined as the extent to which customers believe that employees know what they are doing and are competent enough to do their jobs.

- **Customer recognition** is the extent to which customers feel recognized and acknowledged when they begin a business relationship with a company.
- **Helpfulness** refers to the willingness of company employees to help.
- **Personalization** is the extent to which customers feel that the company treats them based on their individual needs.
- **Problem solving** of a company is defined as the extent to which customers feel that the company and its employees are committed to solving their problems.
- **Promise fulfillment** refers to the extent to which a company can keep its promises to its customers.
- **Value for time** is defined as the extent to which a business shows that it respects its customers' time and tries to use it effectively (e.g., by reducing waiting times and improving service).

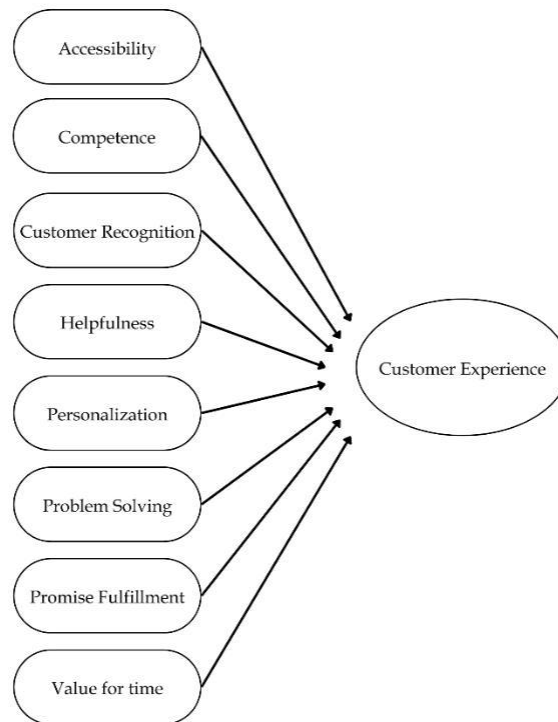


Figure 3: Customer Experience Measurement Scale

Source: Lemke et al. (2010)

Expectation Confirmation Theory

Expectation Confirmation Theory (ECT) is a cognitive theory that explains customer satisfaction based on perceptions of performance, expectations, and expectation confirmation (Oliver, 1980). According to this theory, when a product or service exceeds a buyer's expectations, they will increase their satisfaction with that product or service and vice versa. In addition, this theory also suggests that customer loyalty - customers' intention to repurchase a product or service - is also strongly influenced by customers' past experience with the product or service. Customer satisfaction is an important factor in maintaining customer relationships and building customer loyalty.

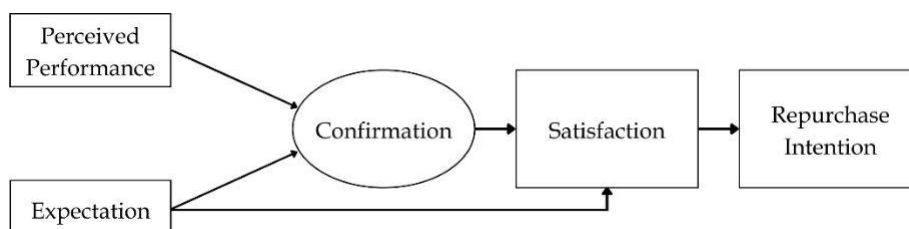


Figure 4: Expectation Confirmation Theory

Source: Oliver (1980)

IV. HYPOTHESIS DEVELOPMENT

4.1 Proposed Research Model

Based on the theoretical foundation of customer experience, customer satisfaction, and customer loyalty, the authors propose the research model presented in Fig.5 to investigate the impact of customer experience on customer loyalty among Gen Z in using Grab ride-hailing services.

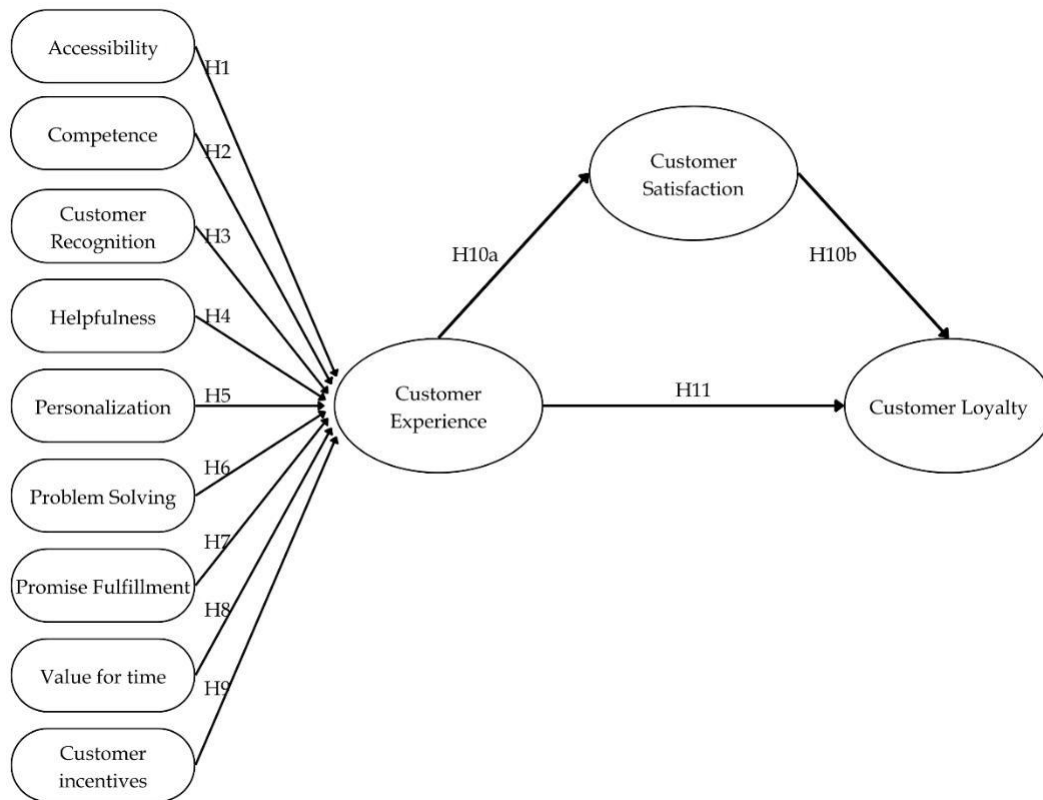


Figure 5: Proposed Research Model

Source: Suggested by the authors

4.2 Research Hypotheses

Factors in the customer experience measurement scale by Lemke et al. (2010)

Inheriting the customer experience measurement scale developed by Lemke et al. (2010), along with previous research results that also indicate the factors affecting customer experience, including: accessibility, competence, customer recognition, helpfulness, personalization, problem-solving, promise fulfillment, and value for time (Adzhani et al., 2021; Rozin, 2022), the study proposes the following hypotheses:

- H1: The factor "Accessibility" has a direct positive impact on "Customer Experience"
- H2: The factor "Competence" has a direct positive impact on "Customer Experience"
- H3: The factor "Customer Recognition" has a direct positive impact on "Customer Experience"
- H4: The factor "Helpfulness" has a direct positive impact on "Customer Experience"

H5: The factor "Personalization" has a direct positive impact on "Customer Experience"

H6: The factor "Problem-solving" has a direct positive impact on "Customer Experience"

H7: The factor "Promise fulfillment" has a direct positive impact on "Customer Experience"

H8: The factor "Value for time" has a direct positive impact on "Customer Experience"

Customer incentives

Customer incentives are a way for businesses to attract customers, especially Gen Z customers, in recent years. For the retail market, in the field of online shopping (e-commerce), customer incentives have been tested and shown to have a positive impact on impulsive shopping behavior on e-commerce platforms of Gen Z customers (Nguyen & Pham, 2022). Also in this field, customer incentives also have an impact on customer experience (Trinh & Pham, 2022). Although "customer incentives" is still a new factor that has not been studied much about its impact on customer experience, there are still previous studies that provide a basis for this relationship. Therefore, the authors propose the following research hypothesis:

H9: The factor "Customer Incentives" has a direct positive impact on "Customer Experience"

Customer experience, customer satisfaction, and customer loyalty

The relationship between customer experience, customer satisfaction, and customer loyalty has been documented and studied in a variety of social spheres around the world. The direct impact of customer experience on customer loyalty has been confirmed (Vu et al., 2020), as well as the indirect impact through the intermediary of customer satisfaction (Luu & Tran, 2014; Vuong et al., 2022). Additionally, customer satisfaction has also been shown to have a direct impact on customer loyalty (Muhammad, 2023). Based on the above arguments, the authors propose the following research hypotheses:

H10a: "Customer Experience" has a direct positive impact on "Customer Satisfaction"

H10b: "Customer Satisfaction" has a direct positive impact on "Customer Loyalty"

H10: "Customer Satisfaction" plays a mediating role in the relationship between "Customer Experience" and "Customer Loyalty"

H11: "Customer Experience" has a direct positive impact on "Customer Loyalty"

V. RESEARCH METHODOLOGY

5.1 Questionnaire and Research Scales

The indicator scales were formed through two main methods including (1) qualitative method of in-depth interviewing with Grab ride-hailing service customers and (2) selectively inheriting previous research in the field of customer experience, customer satisfaction and customer loyalty to the service, including the research of Lemke et al. (2010), Oliver (1980), Yen & Lu (2008). In summary, the impact on customer experience includes 9 concepts with the number of indicator scales as follows: Accessibility - EX.AC (3 indicators), Competence - EX.CO (2 indicators), Customer Recognition - EX.CR (2 indicators), Helpfulness - EX.HE (3 indicators), Personalization (2 indicators), Problem-solving - EX.PS (2 indicators), Value for time - EX.VL (3 indicators), Customer incentives - EX.VO (3 indicators); 2 concepts of customer satisfaction - CS and customer loyalty - CL have 3 and 4 indicators respectively. The scales are all selected to use the 5-point Likert scale from the lowest to the highest level of agreement with the level 1: Completely disagree, 2: Disagree, 3: Neutral, 4: Agree and 5: Completely agree. In addition, the questionnaire also includes questions about demographics, income, and frequency of use for the purpose of descriptive sample statistics.

5.2 Sample and Survey Subjects

According to the "10 times rule" of Hair et al. (2014) for the number of survey samples for the PLS - SEM model, the survey sample must reach at least $10 * 11 = 110$ samples because 11 is the largest number of paths directly connected to a structural concept. The study uses stratified random sampling based on 2 criteria: gender and living area. According to completed result of the 2019 General Population and Housing Census of the General Statistics Office (2020), the number of Gen Z subjects in Hanoi accounts for 51.16% living in urban areas and 48.84% living in rural areas; in general, 25.16% are males living in urban areas, 26.01% are females living in urban areas, the rest are 25.3% males living in rural areas and 23.53% females living in rural areas. Therefore, the study will ensure the representativeness of the sample by balancing the male - female, rural - urban groups of the survey sample as 1:1:1:1.

5.3 Data Collection Process

The survey was conducted online by sending electronic forms to communities and social networks where Grab's Gen Z customers in Hanoi are present and participate, resulting in 138 online receipts. At the same time, the author also conducted a field survey at universities in Hanoi by distributing survey forms to randomly selected subjects on university campuses, resulting in 233 paper receipts. The total survey results collected were 371 valid surveys. After synthesis and cleaning, 27 questionnaires were removed because 5 were not within the age range of the research subject of Gen Z and 22 were of poor quality; therefore, the final dataset for analysis is 344 observations.

VI. RESULTS

The survey results showed that the number of respondents was 175 males, accounting for 50.9%, of which 85 were from urban areas and 90 from rural areas, the remaining were females with 89 from urban areas and 80 from rural areas. In terms of the income level of the research sample, the income distribution is concentrated on the level from 0 - 1,499,999 VND and 1,500,000 - 2,999,999 VND, with the first level (from 0 - 1,499,999 VND) accounting for nearly 50% and the total of the two levels accounting for 79.6% of the research sample. This can also be explained by the fact that at this age, Gen Z is still young and financially unstable, so a large number of samples have low income levels. In terms of the frequency of using Grab ride-hailing services, the majority of the research sample uses the service less than once a week, up to 62.2%, indicating that the research sample does not have the habit of using ride-hailing services frequently.

6.1 Evaluation of Reflective Measurement Models

Table 1: Outer Loadings of Indicators from Reflective Model

	LOY	SAT
LOY1	0.904	-
LOY2	0.877	-
LOY3	0.786	-
LOY4	0.871	-
SAT1	-	0.915
SAT2	-	0.885
SAT3	-	0.890

Source: SmartPLS

From Table 1 above, it can be seen that all external loadings are greater than the threshold value of 0.708, indicating good indicator reliability of the variable (Hair et al., 2021). According to Hair et al. (2021), the best internal consistency reliability indices are between 0.8 and 0.9. Regarding the convergence value, the group uses the average variance extracted (AVE) index with the requirement $AVE \geq 0.5$. The mentioned verification indices are all presented in Table 2.

Table 2: Internal Consistency Reliability and Convergence of Reflective Measurement Models

	Cronbach's Alpha	rho _A	CR	AVE
LOY	0,883	0,899	0,919	0,741
SAT	0,878	0,880	0,925	0,804

Source: SmartPLS

Based on the data in Table 2 above, the internal consistency reliability of the model is quite good when the rhoA index - the best evaluated index is in the best range (from 0.8 to 0.9) and the convergence, AVE of both models are greater than 0.5, ensuring convergence. The HTMT index should be less than 0.85 to ensure discriminant validity. The HTMT value recorded between the LOY and SAT variables is $0.796 < 0.85$. The confidence interval of the HTMT value using the bootstrap estimate (n = 5,000) is presented in Table 3 below with the 95% data being 0.858, although it is greater than 0.85 but not significantly, it is still acceptable for the reason that it is still less than 0.9.

Table 3: Confidence Intervals of HTMT Index with Bootstrap Estimates (n = 5,000)

	Original Sample	Mean Sample	2.5%	97.5%
SAT -> LOY	0.796	0.794	0.720	0.858

Source: SmartPLS

6.2 Evaluation of Formative Measurement Models

To test the convergence value, it is necessary to estimate 9 sub-models, also known as residual analysis, by building latent two-variable models in turn, including (1) 1 structural variable in turn being the 9 structural variables to be considered and (2) 1 single variable indicated by 1 indicator is a general assessment level of that factor that the authors have collected with the indices carrying 2 characters "_S" at the end of each index. To simulate the residual analysis models, with the first latent variable EX.AC, the estimated model results are as follows:

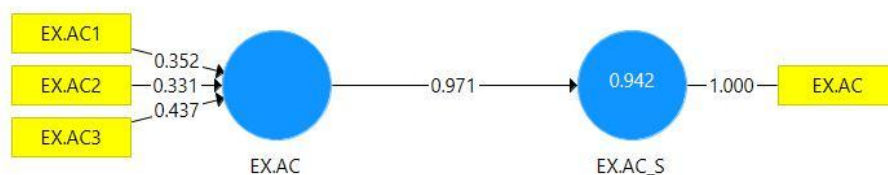


Figure 6: Redundancy analysis of EX.AC variable

Source: SmartPLS

The index that needs to be evaluated is the regression coefficient between the two latent variables in this case is $0.971 > 0.708$, which proves that the latent variable EX.AC well represents the nature of the concept it is expected to represent. Similarly, for the remaining 8 variables, the authors will present the coefficient indices and R2 indices in Table 4.

Table 4: Redundancy Analysis of Formative Measurement Models

Variables	Coefficient	R ²
EX.AC	0,971	0,942
EX.CO	0,954	0,911
EX.CR	0,965	0,931
EX.HE	0,969	0,940
EX.PE	0,966	0,932
EX.PS	0,955	0,912
EX.PF	0,957	0,917
EX.VL	0,946	0,895
EX.VO	0,965	0,931

Source: SmartPLS

The regression coefficients in Table 4 are all greater than 0.708, which proves that the above variables all achieve convergence and the indicators well represent their concepts. The VIF is used according to Hair et al. (2021) to test the problem of multicollinearity with the best range from 0 to 3 presented in Table 5.

Table 5: VIF Values of Indicators from Formative Measurement Models

Indicators	VIF	Indicators	VIF
EX.AC1	2,090	EX.PE2	1,679
EX.AC2	2,315	EX.PF1	1,532
EX.AC3	2,916	EX.PF2	1,532
EX.CO1	1,296	EX.PS1	1,811
EX.CO2	1,296	EX.PS2	1,811
EX.CR1	1,248	EX.VL1	2,188
EX.CR2	1,248	EX.VL2	2,137
EX.HE1	2,276	EX.VL3	1,051
EX.HE2	2,803	EX.VO1	2,653
EX.HE3	2,329	EX.VO2	2,906
EX.PE1	1,679	EX.VO3	2,779

Source: SmartPLS

All of the above indicators have a VIF of less than 3.0, so it can be concluded that there is no significant multicollinearity problem. The authors performed a bootstrap estimate (n = 5,000) to test the statistical significance of the indicator weights with the results in Table 6. All of the outer loading weights are statistically significant at the 5% significance level, except for the impact EX.VO3 -> EX.VO, which is not statistically significant at the 10% significance level. However, EX.VO3 is not removed from the model because the outer loading coefficient is 0.788 > 0.5, so it can be retained even though it is not statistically significant - this is confirmed by Hair et al. (2021).

Table 5: Statistical Significance of Indictors'Outer Weights

	Original Sample	Mean Sample	Std	T-value	p-value
EX.AC1 -> EX.AC	0.435	0.434	0.067	6.463	0.000
EX.AC2 -> EX.AC	0.281	0.287	0.072	3.920	0.000
EX.AC3 -> EX.AC	0.404	0.398	0.080	5.079	0.000
EX.CO1 -> EX.CO	0.625	0.623	0.047	13.426	0.000
EX.CO2-> EX.CO	0.538	0.539	0.048	11.259	0.000
EX.CR1 -> EX.CR	0.777	0.775	0.043	18.156	0.000
EX.CR2-> EX.CR	0.372	0.375	0.049	7.617	0.000
EX.HE1-> EX.HE	0.532	0.527	0.093	5.699	0.000
EX.HE2-> EX.HE	0.323	0.327	0.112	2.885	0.004
EX.HE3-> EX.HE	0.255	0.252	0.108	2.363	0.018
EX.PE1-> EX.PE	0.716	0.712	0.052	13.642	0.000
EX.PE2-> EX.PE	0.379	0.382	0.057	6.619	0.000
EX.PF1-> EX.PF	0.601	0.602	0.053	11.344	0.000
EX.PF2-> EX.PF	0.520	0.519	0.056	9.217	0.000
EX.PS1 -> EX.PS	0.727	0.729	0.057	12.792	0.000
EX.PS2 -> EX.PS	0.355	0.352	0.066	5.380	0.000
EX.VL1 -> EX.VL	0.333	0.329	0.069	4.807	0.000
EX.VL2 -> EX.VL	0.695	0.694	0.064	10.853	0.000
EX.VL3 -> EX.VL	0.137	0.139	0.065	2.105	0.035
EX.VO1 -> EX.VO	0.208	0.204	0.087	2.384	0.017
EX.VO2 -> EX.VO	0.835	0.833	0.090	9.293	0.000
EX.VO3 -> EX.VO	0.000	0.003	0.104	0.002	0.999

Source: SmartPLS

6.3 Evaluation of Structural Model and Hypothesis Testing

Path model testing includes multicollinearity, statistical significance of path coefficients, and R2 values (Hair et al., 2021). The authors summarize the VIF for each independent variable with each dependent variable in Table 6.

Table 6: VIF for Multicollinearity Testing of Structural Model Dependent Variables

Dependent Variables \ Independent Variables	EXP	LOY	SAT
EX.AC	3.364		
EX.CO	3.069		
EX.CR	2.935		
EX.HE	2.056		
EX.PE	2.493		
EX.PF	2.716		
EX.PS	2.451		
EX.VL	2.285		
EX.VO	1.654		
EXP		2.511	1.000
SAT		2.408	

Source: SmartPLS

There are two VIF indices of the two variables EX.AC and EX.CO in the model that affect the EXP variable higher than 3.0, which shows that there is a slight correlation between the variables that affect the EXP variable in the model. The variables EX.AC and EX.CO are not removed because multicollinearity often occurs in attitude research models and the effect of multicollinearity is not significant. The authors performed a bootstrap estimate (n = 5,000) to assess the statistical significance of the path coefficients, which are presented in Table 7.

Table 7: Statistical Significance of Path Coefficient of PLS-SEM Model

	Original Sample	Mean Sample	Std	T-value	p-value	Hypothesis
EX.AC -> EXP	0.218	0.219	0.040	5.488	0.000	H1
EX.CO -> EXP	0.111	0.112	0.037	2.983	0.003	H2
EX.CR -> EXP	0.161	0.161	0.033	4.909	0.000	H3
EX.HE -> EXP	0.087	0.088	0.028	3.081	0.002	H4
EX.PE -> EXP	0.076	0.074	0.031	2.424	0.015	H5
EX.PF -> EXP	0.122	0.123	0.035	3.457	0.001	H6
EX.PS -> EXP	0.083	0.082	0.032	2.575	0.010	H7
EX.VL -> EXP	0.159	0.160	0.034	4.634	0.000	H8
EX.VO -> EXP	0.197	0.196	0.025	8.015	0.000	H9
EXP -> LOY	0.293	0.292	0.055	5.317	0.000	H11

EXP -> SAT	0.757	0.754	0.036	21.142	0.000	H10a
SAT -> LOY	0.503	0.496	0.055	9.087	0.000	H10b

Source: SmartPLS

From Table 7, it can be concluded that there are 2 impacts from the variables EX.PE and EX.PS that are statistically significant at the 5% significance level and all other impacts are statistically significant at the 1% significance level. In addition, the impacts from Customer Experience to the remaining two variables and the impact from Customer Satisfaction to Customer Loyalty are statistically significant at the 1% significance level. The R2 values of the reported structural models are all greater than 0.5, indicating that the model has good explanatory power, as specified in Table 8.

Table 8: R2 and adjusted R2 of Structural Model

	R2	Adjusted R2
EXP	0.862	0.858
LOY	0.558	0.545
SAT	0.573	0.571

Based on the results of the structural model testing, it can be observed that the research hypotheses have been confirmed. For the group of hypotheses on the customer experience scale (from H1 to H9), all hypotheses from H1 to H9 are accepted at the 5% significance level, confirming the significant impact of 9 factors including (1) accessibility with $\beta = 0.218$, p-value = 0.000, (2) competence with $\beta = 0.111$ and p-value = 0.003, (3) customer recognition with $\beta = 0.161$ and p-value = 0.000, (4) helpfulness with $\beta = 0.087$ and p-value = 0.002, (5) personalization with $\beta = 0.076$ and p-value = 0.015, (6) problem solving with $\beta = 0.083$ and p-value = 0.010, (7) promise fulfillment with $\beta = 0.122$ and p-value = 0.001, (8) value for time with $\beta = 0.159$ and p-value = 0.000, (9) customer benefits with $\beta = 0.197$ and p-value = 0.000 to customer experience. For the group of hypotheses H10, H10a, H10b, and H11, the path coefficients are statistically significant at the 1% significance level, so we accept hypotheses H10a, H10b, and H11 with p-value = 0.000 < 1%. Hypothesis H10 is accepted when customer satisfaction is confirmed to play a complementary mediating role in the impact of customer experience on customer loyalty when the indirect impact of customer experience on customer loyalty through customer satisfaction is 0.381 with p-value = 0.000.

VII. DISCUSSION

7.1 The Customer Experience Scale

Accessibility

The Accessibility factor has a positive impact on customer experience with an estimated coefficient of 0.218 at the 1% significance level. This means that when accessibility increases by 1 unit, customer experience improves by 0.218 units. This is because when accessibility increases, customers have a more convenient experience in using the service, and therefore their customer experience is improved. This is also the factor that is considered to explain the most change in customer experience.

The analysis results are consistent with the research study on the Ojek technology ride-hailing service in Indonesia by Rozin in 2022, when the previous study found an estimated coefficient for the impact of accessibility on customer experience of 0.109. After about two years since that study, customer awareness of the experience has increased in the use of technology ride-hailing services, and there are also more and more competitors in the Vietnamese market, so the

accessibility factor also has a greater impact on customer experience. Especially, as Gen Z are tech-savvy individuals, they have higher expectations for accessibility to the technology ride-hailing service. Therefore, the accessibility factor has a particularly large impact on the customer experience of Gen Z in using the Grab service.

Competence

The Competence factor is confirmed to have a positive impact on customer experience with a regression coefficient of 0.111 and a relatively low p-value (0.003). This means that when the competence factor increases by 1 unit, customer experience increases by 0.111 units. The more customers perceive the good competence of the service provider and the staff providing the technology ride-hailing service (drivers), the better their experience with that service will be.

This is a new research finding compared to the previous study on technology ride-hailing services, as the results of that study showed that the competence factor did not have a positive impact on customer experience (Rozin, 2022). However, in other fields, such as e-commerce, the competence factor has also been shown to have a positive impact on customer experience (Adzhani et al., 2021). To explain this difference, the authors suggest that with the increasing awareness of customers about technology ride-hailing services, especially Gen Z customers with their sensitivity to social change, customers, in addition to using the service, are also increasingly interested in the competence of the business and its employees, and evaluate their competence during the service experience.

Customer recognition

The Customer Recognition factor has a positive impact on customer experience with an estimated coefficient of 0.161 at the 1% significance level. This means that when customer recognition increases by 1 unit, customer experience improves by 0.161 units. This is because when a business is concerned about the presence and rights of customers, customers feel more proactive and respected in using the service, and therefore their customer experience will be better.

This result is consistent with Rozin's previous study in 2022, with the estimated coefficient given in that study being 0.225. It can be seen that, regardless of age, customers always want to be recognized for their presence and importance, as well as to affirm the rights they have when using products and services. Especially for Gen Z, when they are still young, the desire to express their individuality is very strong. Gen Z always want to be recognized by those around them, and recognition in the process of using technology ride-hailing services is no exception. When businesses show respect for the presence of Gen Z customers, their experience in using the service will be improved.

Helpfulness

The Helpfulness factor has a positive impact on customer experience with an estimated coefficient of 0.087 at the 1% significance level. This means that when helpfulness increases by 1 unit, customer experience improves by 0.087 units. Specifically, when Grab offers many ways for customers to seek helpful support from the business through employees or chatbots, customers feel more supported in using the service, and therefore their customer experience increases.

Helpfulness is always a concern for customers in their own experience, especially for a service product. This result is also consistent with the result of the previous study with an estimated coefficient of 0.129 (Rozin, 2022). For Gen Z, who can use technology easily, they always want to get quick help from the company through the mobile app when problems arise during their use of the technology ride-hailing service. Therefore, helpfulness is a factor that is highly valued by Gen Z in the process of experiencing the Grab service.

Personalization

The Personalization factor is shown to have a positive impact on customer experience with an estimated coefficient of 0.076 at the 5% significance level. This means that when personalization increases by 1 unit, customer experience improves by 0.076 units. This can be easily seen, when Grab offers many ways for customers to seek helpful support from the business through employees or chatbots, designs many interfaces and supplementary activities to make customers feel that their presence is unique, then customers will feel that the service is personalized, and the customer experience will be improved.

When compared to Rozin's previous study in 2022, although the positive impact is still maintained, the personalization in this study no longer has as great an impact on customer experience as it did before. This can be

explained by the fact that as the Grab technology ride-hailing service becomes more popular and the number of times the service is used continues to increase, especially for Gen Z, the personalization of the service for each customer is no longer valued as highly by users as other factors, as personalization does not actually bring significant benefits to the use of the service by customers.

Problem Solving

The Problem Solving factor is shown to have a positive impact on customer experience with an estimated coefficient of 0.122 at the 1% significance level. This means that when problem-solving ability increases by 1 unit, customer experience improves by 0.122 units. Indeed, when a business can increase the efficiency and speed of resolving problems that arise for customers, it makes customers feel respected and well and promptly supported, which improves the customer experience.

Problem solving has always been considered a factor with a significant impact on customer experience, with an estimated coefficient of 0.235 in Rozin's study (2022). This can be explained by the fact that when using any service, especially technology ride-hailing services, it is entirely possible that unexpected situations will arise, and at a not insignificant rate. At that time, the efforts of the business and its staff to resolve problems are an important factor in helping customers to have a better experience. Especially when Gen Z, who are tech-savvy, can quickly report problems with their trips to the company, and they also want the problem to be resolved thoroughly.

Promise Fulfillment

The Promise Fulfillment factor has a positive impact on customer experience with an estimated coefficient of 0.083 at the 5% significance level. This means that when promise fulfillment ability increases by 1 unit, customer experience improves by 0.087 units. The reason for this is that when businesses provide service information through means of communication with customers, if businesses take responsibility to ensure that this information is as accurate as possible, customers feel more confident in using the service, and therefore the customer experience will improve.

In Rozin's previous study (2022), this factor was thought to have no impact on customer experience. However, with the development of technology ride-hailing services in the Vietnamese market, it is completely understandable that customers have expectations of the service. And when a business has made a promise, users also want that promise to be fulfilled. In the case of technology ride-hailing services, for users who are Gen Z, it is quite important that the trip information is accurate. For Gen Z, the information about the driver and the vehicle they are using must match the information provided when booking the trip, as this is the only way they can feel confident in making their trip. In addition, the estimated time and the actual time to complete the trip must be relatively close, as Gen Z are busy in their school years and the early years of their careers, so they need time accuracy in their travel to complete their other tasks.

Value for time

The Time Value factor has a positive impact on customer experience with an estimated coefficient of 0.159 at the 1% significance level. This means that when the time value increases by 1 unit, the customer experience improves by 0.159 units. Obviously, when businesses respect and use effectively the time that customers spend on business-related matters, customers feel respected and will save more when using technology ride-hailing services, and therefore the customer experience will improve.

Rozin (2022) suggested that time value has a positive impact on customer experience with an estimated coefficient of 0.109. Thus, it can be seen that the results of this study are consistent with previous research, and the time value factor is also increasingly considered important in customer experience, especially for Gen Z customers. Young Gen Z are those who are still in school or in the early years of their careers, and they are always busy asserting themselves and seizing opportunities for development. Therefore, they dislike waiting, their time is limited, and making effective use of time is always valued by this generation.

Customer Incentives

The Customer Incentives factor has a positive impact on customer experience with an estimated coefficient of 0.197 at the 1% significance level. This means that when customer incentives increase by 1 unit, customer experience improves by 0.197 units. In fact, when businesses use a variety of sales promotion tools to make customers feel like they are

getting a better deal when they use the business's services, they feel like they are saving money when they use the business's technology ride-hailing service, which improves the customer experience.

“Customer incentives” is a new factor proposed by the authors based on the unique characteristics of Gen Z. The research results have shown that “customer incentives” is a factor that Gen Z is particularly interested in during the service experience, explaining up to 3.88% of the change in customer experience, the second highest among the 9 factors affecting customer experience in the proposed research model. This consumption habit of Gen Z has been mentioned in some previous studies in other fields (Nguyen & Pham, 2022; Trinh & Pham, 2022). Because people in Gen Z are still in their school years and early working years, their income is generally not as high as previous generations. Therefore, they need to use products and services with many incentives to reduce the amount of money they need to spend, while older generations are not too concerned about these incentives. Additionally, Gen Z is also tech-savvy and can easily apply customer incentives in technology ride-hailing services without any difficulty. Therefore, “customer incentives” is a new factor identified by the authors to have a positive impact on customer experience.

7.2 The Direct and Indirect Impact of Customer Experience on Customer Loyalty

The research findings indicate that customer experience has both a direct and indirect impact on customer loyalty. The direct impact aligns with previous studies that have examined this relationship, such as the study by Vu Thi Mai Chi et al. (2020). The indirect impact through customer satisfaction also aligns with previous studies (Luu & Tran, 2014; Vuong et al., 2023). However, few previous studies have identified the simultaneous existence of both direct and indirect impacts. This study has demonstrated the existence of both impacts. Customer satisfaction is confirmed as a partially complementary mediating variable, amplifying the relationship between customer experience and customer loyalty, in addition to the direct relationship between customer experience and customer loyalty.

7.3 Managerial Implication for Business

With the results of the research, it can be seen that customer experience has a significant impact on customer loyalty in using Grab technology ride-hailing service, especially for Gen Z. Therefore, to maintain its leading position, as well as maintain its competitive advantage in the ride-hailing market in Vietnam, Grab needs to improve customer experience, thereby gaining Gen Z customer loyalty. To do this, the authors propose a number of measures that Grab ride-hailing service can apply to improve Gen Z customer experience, corresponding to factors that positively impact the customer experience.

Accessibility

The Grab mobile app plays a crucial role in customer interaction every time they use the service. Therefore, improving and optimizing the app is an essential part of enhancing accessibility, along with the customer experience and their loyalty.

- **User-friendly interface:** Grab can design a more user-friendly and intuitive interface, making it easier for customers to find, book, and pay for services quickly and conveniently.
- **Performance optimization:** Grab needs to continuously update and optimize the app to minimize loading times and ensure smooth operation even in unstable network conditions.

Competence

Drivers play a vital role in affirming the capability of Grab's ride-hailing service, which in turn creates a good customer experience. Therefore, investing in driver training is an important part of improving the service. Driver training will help businesses enhance the perception of capability in the eyes of customers, thereby improving the customer experience.

- **Safe driving skills:** Grab can provide training on safe driving techniques and traffic law compliance to ensure that Grab drivers always prioritize customer safety.

- **Service knowledge:** Grab needs to train drivers on the specific services they provide, including how to use the app, communicate with customers, and resolve issues that arise during trips.
- **Communication skills:** Grab should support drivers in developing effective communication skills to build good relationships with customers and create a positive service experience.

In addition, the service provider's capability is also of interest to customers, especially Gen Z customers, who are tech-savvy. Therefore, Grab can further improve features to give customers a positive perception of the company's capability, thereby enhancing the customer experience and customer loyalty.

- **Advanced features:** Grab needs to research and add new features such as pre-booking, real-time location sharing, and ordering for friends or family to enhance the convenience for users.
- **Virtual Reality (VR) and Augmented Reality (AR):** Integrating new technologies into Grab's app can provide a fresh and engaging experience for customers. For example, customers can use new technologies to check destination information or experience a preview of the trip.

Customer Recognition

Customer recognition has been recognized to have a positive impact on the customer experience in using Grab's ride-hailing service. Therefore, businesses need to continue to improve the features that make customers feel respected and valued when using the service. Currently, Grab has been conducting service quality assessments quite regularly. However, the company can collect customer feedback using more methods such as using open-ended questions, in-depth interviews, etc. so that customers can share their opinions more.

Helpfulness

The helpfulness of the service is reflected in the customer support features. Helpfulness has been shown to have a positive impact on the customer experience, laying the foundation for increased customer loyalty. Therefore, Grab needs to continue to improve these features by

- **Chatbot and Self-Service Support:** While Grab has begun to integrate chatbot and automated support systems to resolve customer issues, these features are not yet comprehensive and thorough. Further improvement of the feature can improve problem-solving ability and the helpfulness of the service, saving time and improving the customer experience.
- **Providing helpful information about Grab services and traffic activities:** Sharing additional useful information can help businesses improve the helpfulness factor in the customer experience, thereby improving customer satisfaction and loyalty.

Personalization

New technologies can be applied to optimize processes and provide more personalized services, thereby improving the customer experience and increasing customer loyalty when using Grab's ride-hailing service.

- **Artificial Intelligence (AI):** Using AI to analyze data and provide personalized suggestions to customers, from suggesting destinations to recommending the best route, can improve personalization.
- **Improved GPS (Global Positioning System) positioning:** By using this technology, Grab can provide accurate positioning and estimated trip completion times, making it easier for customers to track their own journey.

Problem Solving

To enhance problem-solving ability, Grab needs to increase the number and quality of its staff, especially in terms of staff's ability to quickly receive problems from customers and to resolve problems in a reasonable and satisfactory manner for customers while still ensuring the quality of work.

Promise Fulfillment

Grab is currently implementing features related to promise fulfillment quite effectively. However, to further improve this factor, the company needs to ensure that information about drivers and vehicles is continuously updated if there are any changes. In addition, the company can apply modern technology to control external factors that affect the trip (such as traffic jams, construction sites), thereby providing more accurate trip time estimates for customers.

Value for time

Although Grab's network of drivers is currently quite large and dense, there are still areas where Grab drivers are less present, as well as objective factors such as adverse weather conditions that cause long waiting times to find a driver, which negatively affects the customer experience and reduces customer loyalty. Therefore, Grab needs to further develop its network of drivers and offer support policies for drivers in adverse circumstances due to objective factors to encourage faster connections between drivers and customers.

Customer incentives

Promotional policies are an effective tool to attract and retain customers, and have been proven in the study through the positive impact of the customer incentives factor on the customer experience. Grab can introduce more promotional policies to improve the customer experience, thereby enhancing customer loyalty.

- **New user incentives:** Provide promotional codes and discounts for new users to encourage them to try Grab's services.
- **Rewards program:** Establish additional rewards and points programs to encourage customer loyalty.
- **Holiday and special event promotions:** Run special promotions during holidays and special events such as Lunar New Year or Grab's anniversary to create a sense of fun and connection with customers.
- **Promote promotions in various forms:** The company can promote customer incentives through social media to reach a wider audience.

VIII. CONCLUSION

8.1 Conclusion

After analyzing, evaluating, and discussing the research results, the authors reiterate the fundamental research tasks that have been addressed in three directions: (1) theoretical, (2) practical, and (3) solutions and recommendations.

About theoretical contributions, the study successfully synthesized and summarized theories and research related to the research problem of the impact of customer experience on customer loyalty in using ride-hailing services. The two main theoretical problem areas include (1) customer experience measurement and (2) the interaction between the three factors of customer experience, customer satisfaction, and customer loyalty. The study constructed a comprehensive customer experience measurement scale that is theoretically sound. The customer experience scale developed by the authors has been empirically proven to be effective in fully and accurately representing the essence of the customer experience concept. The study also reaffirmed the mediating role of customer satisfaction in the relationship between customer experience and customer loyalty, consistent with previous research.

About practical contributions, the study analyzed the real-world situation of the ride-hailing service industry in the world and Vietnam and considered and evaluated theories from research papers in that context, ensuring the practical flexibility of marketing research. The study identified meaningful factors in the customer experience measurement scale, including the 9 factors proposed by the authors: (1) accessibility, (2) competence, (3) customer recognition, (4) helpfulness, (5) personalization, (6) problem solving, (7) promise fulfillment, (8) value for time, and (9) customer incentives. The study also confirmed the additional mediating effect of customer satisfaction in the relationship between customer experience and customer loyalty.

About solutions and recommendations, based on the research results discussed, the authors propose recommendations for ride-hailing service businesses to achieve business success, specifically to increase customer experience through theoretically and empirically proven measurement scales; thereby, increasing customer loyalty, retaining, and maintaining long-term customer relationships.

8.2 Contribution and Significance

The study makes significant contribution to both scientific and practical knowledge. As for scientific aspect, the study validates the applicability of a customer experience scale developed by Lemke et al. (2010) over a decade later. The study confirms the importance of Customer Incentives as a factor in customer experience measurement, at least for the service industry, adding another dimension to the customer experience scale. The study reaffirms the mediating role of customer satisfaction in the relationship between customer experience and customer loyalty. The study provides a valuable reference for future research on customer experience factors, customer satisfaction, and customer loyalty.

Furthermore, the study offers practical insights for businesses on how to enhance Customer Experience metrics and, consequently, improve customer satisfaction and loyalty. Key takeaways for businesses include (1) enhancing mobile application by improving the mobile app to make it easier for customers to access services, (2) training drivers with comprehensive training provided to drivers to instill confidence and trust in customers during their service experience, (3) implementing attractive promotions by developing attractive promotional policies to make customers feel they are getting good value for their money, (4) integrating new technologies to provide customers with a convenient and superior product experience. The findings of this study serve as a valuable resource for businesses seeking to achieve their business objectives.

8.3 Limitation and future research

While the study has made significant scientific and practical contributions to the ride-hailing industry, it also acknowledges some limitations that suggest for further research: In some model tests, the study's research model deviated from strict adherence to statistical assumptions. This introduces some theoretical limitations that the authors acknowledge as a trade-off between scientific rigor and practical relevance. Based on these limitations, the authors propose the following directions for future research including extending the development of customer experience measurement scales to other service sectors. Evaluate the moderating effects of additional variables such as age, habits, preferences, and frequency of usage on the customer experience and model.

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