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Gen Z Customers' Continuance Intention in Using Food Delivery Application in an Emerging Market: Empirical Evidence from Vietnam

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Abstract: New business models integrated with technological advances like online food ordering platforms have been increasingly prevalent and are believed to bring significant value to customers. This study applied the theory of planned behaviour (TPB) to examine how several factors influence the continuance usage intention of Gen Z customers when using food delivery applications (FDAs). Results from the CB-SEM analysis reveal that personal innovativeness positively influences the attitude of Gen Z customers. Continuance usage intention is positively influenced by attitude, perceived usefulness of promotion, and subjective norm. On the contrary, perceived health risk is indicated as a significant barrier to the perceived usefulness of promotion and continuance usage intention of Gen Z customers. These findings suggested discussions and have implications for stakeholders such as researchers, technology providers, enterprises, and policymakers.

Keywords: food delivery application; sharing economy; theory of planned behaviour; personal innovativeness; continuance usage intention; perceived health risk; perceived usefulness of promotion; Gen Z; emerging market; Vietnam

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1. Introduction

Facts indicate that there is promising potential for the mobile application industry, whose total generated value is forecasted to reach more than USD 613 billion in 2025. The consumption volume in the number of apps downloaded has witnessed a soar of 80% to 255 billion in 2023, only after seven years [1]. Nowadays, an average individual spends over three hours daily on smartphone activities [2,3]. Hence, doing business based on mobile applications has become an inevitable trend.

Vietnam, whose population is up to 100 million [4] and whose volume of apps downloaded ranked in the top 10 worldwide in 2021–2022 [5], is a potential market for developing app-based businesses food delivery applications, which is a relatively young but fast-growing industry in Vietnam. In 2022, this segment together with shared transport service was estimated to surge by more than 60% in 2025 [6]. Specifically, the sole segment of food delivery applications is currently assessed to be worth USD 1.1 billion, served by some prominent brands like Grab, ShopeeFood, and Baemin [7].

The mechanism of FDA operations in Vietnam consists of the participation of five parties, including:

(1) Food order fulfilment platforms such as Grab, Baemin, and ShopeeFood;
(2) Crowd shippers who register with the platform to physically pick up the food from stores and deliver it to customers;
(3) Restaurants that are registered as partners with the platform;

(4) Customers who browse the app to look for food, place an order, and pay for the meal, delivery service, and order processing service;
(5) Supporting service providers (e.g., payment service).

Several studies have evaluated the influencing factors to identify triggers for and barriers to the behaviour of customers using FDAs [8–10]. There are a number of theories applied to establish research models to explain consumer behaviour towards FDAs including the TAM and DOI [11], TPB [12], UTAUT [10], expectancy confirmation model [8], and perceived risk theory [13]. The results from these studies contribute to the identification of key determinants that govern customer behaviour in many markets. Most of the studies focused on application-centric factors, evaluating the overall performance of applications, whereas FDAs in Vietnam adopt a sharing economy model involving five categories of participants. This leads to a concern whether factors contributed by other stakeholders have any effects or not. Therefore, elements related to food retailers, service providers, and customers as well as their impacts should be further explored. So far, there have been a number of studies in the field of FDAs. Specifically, Zhao & Bacao [8] evaluated factors having an impact on customer satisfaction and intention to continue usage in China by applying the UTAUT and expectancy confirmation model, but their study did not cover attitude variables and did not focus on Gen Z users. Other studies analysed the upsides that technological features of FDAs have without investigating the influence of personal variables on customer behaviour [14,15]. Some studies were carried out during the COVID-19 pandemic [8,10,15]; therefore, it is necessary for an empirical study on the behaviours of FDA users in the post-pandemic context. Although some studies mentioned the importance of money-related benefits like promotion, cost savings, and price value [9,15,16], factors that have an impact on how FDA users perceive those monetary advantages have not been researched in depth. Furthermore, it is still recommended that the commonly applied TPB be expanded and empirically assessed in various contexts to obtain a higher explanation level [17–20], and studies applying these models in Vietnam are still limited.

Another point that should be highlighted is that the mentioned studies did not precisely target Gen Z users, who account for one-third of the world's population and will be the leading consumers in the future [21]. The Gen Z group accounts for one-quarter of the Vietnamese labour force, equivalent to approximately 16 million people who are forecasted to become key consumers [22]. Gen Z customers are individuals who are proactive in using technology in life, have highly personal innovativeness, and have careful consideration when making consumption decisions [23,24]. Furthermore, many characteristics of Gen Z customers are also found to bring challenges for businesses, such as low loyalty and frequent impulse buying behaviours [24,25]. In particular, the psychology and behaviour of individuals may have a great change after a long time of being negatively affected by the COVID-19 epidemic [26].

From what has been discussed, a study to extend theories and investigate the influences on continuance usage adoption, specifically for the Gen Z segment, is necessary. This study is expected to fill the previously mentioned gaps with four objectives:

- Establish a conceptual model to explain Gen Z customers using FDAs.
- Validate the measurement scale and model and assess the impact of several factors on the continuance usage intention of Gen Z customers using FDAs.
- Propose theoretical and practical implications to stakeholders to help develop the sustainability FDAs market.

2. Literature Review and Hypotheses Development

2.1. Theoretical Background and Conceptual Model

The theory of planned behaviour (TPB) was developed from the theory of reasoned action (TRA) [27] and extended with a factor of perceived behavioural control to explain the behaviour of individuals [28]. In this model, behaviour is impacted by four factors, namely: behavioural intention, attitude, subjective norm, and perceived behavioural control. In some empirical studies, the impact of each influencing factor on behaviour is unclear or different from the original suggestion of Ajzen [28], especially the link between attitude and behaviour or attitude and behaviour [29,30]. Thus, an extension of the TPB model by being integrated with other theories or added with more factors is familiar to scholars [31,32]. Among current personal consumption studies, researchers commonly apply the TPB to the technology adoption aspect to answer their research questions [33,34].

In addition to the TAM [35] and UTAUT [36], which are two prominent models for analysing technology adoption behaviour, some previous studies have claimed that the TPB is proper for evaluating the influence of factors on the behaviour of customers using FDAs [37]. In addition to attitude, subjective norm, and perceived behavioural control, researchers often add context-focused variables. Especially during the COVID-19 pandemic, the number of studies on FDA research increased due to contextual features such as social distancing and individuals' increased perceived health risks [10,38]. For example, Al Amin et al. [39] extended the TPB by adding perception of food safety, food delivery hygiene, and social isolation to predict behavioural intention and continuance behaviour of consumers using FDAs in Bangladesh. Another direction indicating the adoption of the TPB is that researchers integrated this theory with other theories to improve their ability to explain dependent variables such as behavioural intention, usage behaviour, or continuance intention [39,40]. Wen et al. [40] integrated the TPB with TAM to investigate the significant influence of some factors on the usage intention of customers in the US. In their study, the authors also found a positive effect of utilitarian motivations, hedonic motivations, and perceived innovativeness on attitude. Furthermore, food safety risk perception is recognised as a barrier that reduces the trust of customers. Choe et al. [41] merged the TBP and TAM and demonstrated the significant influence of perceived usefulness and perceived ease of use on attitude and three main factors including attitude, subjective norm, and perceived behavioural control to enhance the intention to use drone food delivery services in Korea.

2.2. Conceptual Model

From the above arguments, to investigate factors affecting customer behaviour using FDAs, many studies attempted to extend the TPB, but limited studies were conducted for Gen Z customers. Based on the hypotheses, the conceptual model is established via the extension of the theory of planned behaviour (TPB). The essential components of the TPB model [28] consist of attitude and subjective norm, which are also suggested in the conceptual model in the relationship with continuance usage intention (Wen et al., 2021; Al Amin et al., 2021). Personal innovativeness was used to explain customers' attitudes because this factor is recognised as an essential personal characteristic that possibly leads to innovative food delivery services [40,42]. However, no studies confirmed this relationship in the Vietnam context. Perceived behavioural control is reflected through two factors: perceived health risk—the issues originating from management limitations of FDA brands in Vietnam [43]—and perceived usefulness of promotion—a kind of popular market development solution of FDA brands, which is the top concern of consumers in Vietnam using FDAs [44]. The research model in Figure 1 is expected to effectively explain Gen Z customers' attitudes and continuance usage intention in using FDAs in Vietnam.

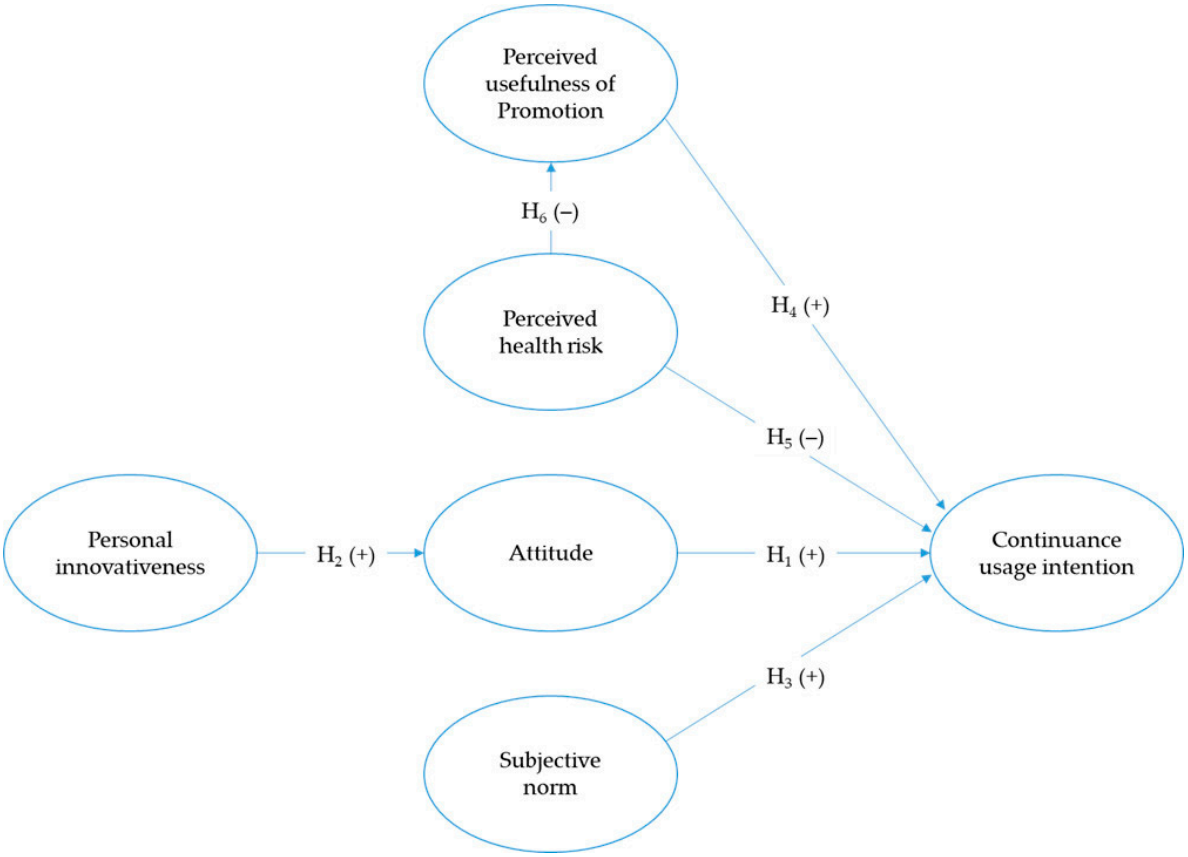

Figure 1. Conceptual model.

2.3. Hypotheses Development

2.3.1. Attitude and Continuance Usage Intention

Understanding the relationship between attitude and behavioural intention plays a critical role in marketing research. This link has been evaluated in various studies on individuals' consumption and innovation technology adoption [32,34]. Teo & Lee [45] defined the attitude of an individual as their assessment, which could be either positive or negative, implying their predisposition towards a specific behaviour. Meanwhile, continuance usage intention is related to repeated purchasing decisions [46], meaning an individual's analysis of their situation and possible circumstances to consider repurchasing action [47]. When customers are offered abundant choices, for instance in the e-commerce sector, having insights into continuance usage intention can critically contribute to the development of enterprises [48].

Many popular models are used to explain technology acceptance, such as the TPB [28], TAM [35], or UTAUT [36], which suggest that attitude could enhance behavioural intention significantly. These findings have also been reconfirmed in recent studies about technology adoption [49,50]. However, several studies in emerging markets demonstrated that there is a gap between attitude and intention, owing to limitations in individuals' abilities and contextual factors [51,52]. This has implied to the authors of this study that there is still an inconsistency in studies examining the impact of attitude on continuance intention. Furthermore, the evaluation of the relationship between these two factors is even more significant for the group of Gen Z consumers who have been proven to possess low loyalty and high willingness to experience new products and services. In the FDA industry, although Chen et al. [12] found that attitude may promote purchase intention, the impact on post-purchase intention, particularly continuance, has not been studied much. To fill the mentioned gaps, this study proposed hypothesis H1:

H1: *Attitude has a positive relationship with the continuance usage of Gen Z customers using FDAs.*

2.3.2. Personal Innovativeness and Attitude

Consumer innovativeness reflects the possibility that a consumer would like to buy a product that has just been introduced to the market or innovated, sooner than others [50]. Researchers and businesses are concerned about this factor [51] because of its relevance and significance to the entry of new things, particularly a business model. Thus, personal innovativeness is a key determinant for promoting technology adoption [53]. Several previous studies found that personal innovativeness positively affects the attitude of customers. For example, Nguyen et al. [54] integrated personal innovativeness into the TPB model to demonstrate the significant improvement that this factor can bring to attitudes towards renewable energy consumption. In particular, Wen et al. [40] and Hwang et al. [42] indicated that personal innovativeness could predict the attitude of customers in the food delivery context. However, no studies examine the influence of personal innovativeness of Gen Z customers using FDAs in Vietnam. Therefore, this study proposes hypothesis H2:

H2: *Personal innovativeness has a positive relationship with the attitude of Gen Z customers using FDAs.*

2.3.3. Subjective Norm and Continuance Usage Intention

Subjective norm is understood as a person's concern towards how others judge whether that individual performs a behaviour or not [28]. As one common attribute applied to explain behavioural intention in the TPB model, subjective norm shows a significant influence on the behavioural intention of individuals in many studies applying the TPB [32,54]. In markets where collectivism is prominent like Vietnam, Nguyen et al. [54] proved the significant effect of subjective norm on customer behaviour. Lee et al. [55] found that subjective norm has the ability to predict the satisfaction and perceived enjoyment of Gen Z customers using E-wallet in Malaysia. Notably, Al Breiki et al. [56] indicated the positive relationship between subjective norm and teachers' intention to adopt virtual reality in Oman. However, there is a lack of studies examining the role of subjective norm in continuance usage intention in the FDA context. From the above arguments, hypothesis H3 is formulated:

H3: *Subjective norm has a positive relationship with the continuance usage intention of Gen Z customers using FDAs.*

2.3.4. Perceived Health Risk, Perceived Usefulness of Promotion, and Continuance Usage Intention

In this study, the perceived usefulness of promotion and perceived health risk represent perceived behavioural control, which can influence the behavioural intention and behaviour of each individual [28]. According to Al Amin et al. [39], perceived behavioural control measures the level of difficulty that a person perceives when trying to perform a behaviour. To explain the ability of behavioural control to promote or inhibit the behaviour of individuals, many studies have specifically proposed factors that reflect this variable as the perceived monetary barrier [53,54], perceived innovativeness [40], or perceived health risk [57]. Based on the characteristics of the FDA market in Vietnam, this study proposes to evaluate the impact of perceived health risk and perceived usefulness of promotion on Gen Z customers' FDA usage behaviour.

The usefulness of promotion in FDAs refers to the effectiveness of the discounts, terms, and conditions of promotions provided by FDAs to enhance customers' purchasing behaviours [9]. In Vietnam, customers often receive multiple vouchers offered by either FDAs or restaurants, but just one is applied per order. Promotion is a popular tool to increase market share in the competitive war among FDA brands in Vietnam [58]. In general, promotion offers from providers could help customers save money and access services at the right price. Yeo et al. [59] found that price-saving orientation significantly strengthens post-usage usefulness and convenience motivation of customers using online

food delivery services in Malaysia. Prasetyo et al. [9] pointed out that promotion could predict the actual FDA usage by customers in Indonesia. A survey-based study of more than 45,000 FDA users in Vietnam pointed out that promotion was a considered criterion when they select apps to use [44]. Hence, hypothesis H4 is proposed:

H4: *Perceived usefulness of promotion has a positive relationship with the continuance usage intention of Gen Z customers using FDAs.*

Reisigner & Mavondo [60] defined perceived risks as uncertainty and negative consequence concerns by customers when purchasing products or services. Food hygiene, safety issues, and consumer health benefits are gradually becoming the top concern for food-related businesses [29,61]. Frewer et al. [62] emphasized that food safety risk perception can influence the decision-making process of food purchasing. In the context of online food purchasing, Anisimova et al. [63] found the significant role of perceived health benefits in customers' purchasing intention in Australia. Furthermore, individuals with higher food safety concerns may be willing to pay more for food purchases.

However, during the COVID-19 pandemic outbreak, several studies revealed contrary findings. Specifically, Hong et al. [64] demonstrated that food-related risk perception had no significant influence on a customer's intention to use FDAs. Similarly, Suhartanto et al. [38] also showed that perceived health risk does not affect the perceived benefits of young customers using FDAs. The inconsistency in results of previous studies along with the remarkable contextual changes post-pandemic stimulated the authors of this study to examine hypothesis H5:

H5: *Perceived health risk has a negative relationship with the continuance usage intention of Gen Z customers using FDAs.*

Perceived food safety improves perceived health benefits, and customers are willing to pay for safe food [61,65]. Therefore, the benefits of promotion may not be effective when customers perceive health risks from using FDAs. In Vietnam, FDAs and restaurants collaborate to provide many promotional codes to attract customers. However, as mentioned above, food hygiene and safety issues are not guaranteed in the FDA context in Vietnam. Gen Z is identified as the generation that pays special attention to health issues and always tries to monitor their health in the best way possible [66]. Therefore, perceived health risks can minimise promotion effectiveness from FDAs. Thus, this study proposes Hypothesis H6:

H6: *Perceived health risk has a negative relationship with the perceived usefulness of promotion for Gen Z customers using FDAs.*

3. Research Methodology

3.1. Research Approach

In this study, the conceptual model is based on the TPB, and the main objectives are assessing the impact of several factors on continuance usage intention. This study mainly focuses on verifying the relationships in the research context in Vietnam. Hence, structural equation modelling (SEM) analysis, which is widely used in studying similar topics [8,9], is used.

In general, there are two popular approaches to using this analysis method, namely: covariance-based SEM (CB SEM) and partial least squares SEM (PLS SEM). In this study, the theories applied have been verified in a number of previous studies, and the purpose of this study is to validate the research model. Furthermore, the sample size is larger than 300, and the CB-SEM method has advantages in assessing the goodness of fit level of the model, so CB-SEM is selected to test research hypotheses [67].

Since research on the same topic in Vietnam has not been very common, and measurement scales have not been widely applied, this study also conducted some interviews to regulate the measurement scale. Specifically, in-depth interviews with experts and

focus group interviews were used to help adjust the scale to ensure it was suitable for the research context.

3.2. Instrument Development

The questionnaires consist of three parts: Part 1 includes an introduction and instructions for respondents before answering the questions. Part 2 includes questions based on the proposed measures designed on a 7-point Likert scale (from 1—strongly disagree to 7—strongly agree). Part 3 includes questions related to respondent's demographics.

The measurement scale was referenced from validated measures of related previous studies and rephrased to fit in the Vietnam context. In the translation process, two language experts were invited to conduct and crosscheck the translation, following recommendations from Harkness et al. [68]. Afterwards, a preliminary questionnaire was formed based on measuring factors in the research model. Since no similar studies have been carried out in the Vietnamese context, a pre-testing process was applied to ensure the reliability and relevance of the scale before surveying on a large scale. Firstly, five experts, including 2 with a Ph.D. in Marketing, 1 FDA technology expert, and 2 managers of FDA enterprises were invited to participate in in-depth interviews to recheck and calibrate the initial measures.

Secondly, thirty short interviews were conducted with customers who used FDAs regularly (>3 orders/week) to ensure that the statements in the questionnaire were consistent with the customers' perceptions [69]. After performing the above steps, the authors discussed and considered the comments and suggestions to adjust the scale.

3.3. Sampling and Data Collection

The primary data used in this study was collected from Gen Z customers in two big cities in Vietnam: Hanoi and Hochiminh City. These big metropolises are densely populated, well-civilized, have a high e-commerce index, and are also the main markets of FDA services [4,70]. Because a precise determination of the overall sample size was not available, we used a convenience sampling method to collect data. According to Krejcie & Morgan [71], the recommended minimum sample size to ensure research significance for this study is 384. In this study, the actual sample size is 550 with description of sample characteristics in Table 1. Hence, the research sample meets the requirements of Krejcie & Morgan [71] and is consistent with the quantitative analyses of this study [72].

Researchers were dispatched to cities and collected data during face-to-face interviews at shopping malls, universities, and public locations. The target respondents were Gen Z customers who had used FDAs regularly and had good knowledge of FDAs. In addition, a gift worth VND 40,000 (approximately USD 2) was given to the respondents after completing the interview process in order to increase the respondents' enthusiasm. This study complied with the Helsinki Declaration, and the respondents were assured of privacy and provided information without any health and psychological pressures. These contents were shown on the survey, and the respondents were asked to confirm that they completely volunteered to participate in this study.

Table 1. Sample characteristics.

Characteristic	Frequency	Percentage (%)
Gender		
Male	262	47.64
Female	288	52.36
Age		
15–18	34	6.18
19–22	176	32.00
22–25	236	42.91
25–28	104	18.91

Table 1. *Cont.*

Characteristic	Frequency	Percentage (%)
Education level		
High school or less	57	10.36
Professional degree	87	15.82
College degree	81	14.73
University undergraduate degree	246	44.73
Postgraduate degree	79	14.36
Monthly income		
VND <10,000,000	241	43.82
VND 10,000,000–VND 20,000,000	218	39.63
VND 20,000,000–VND 30,000,000	58	10.55
VND 30,000,000–VND 40,000,000	25	4.55
Above VND 40,000,000	8	1.45
Marital status		
Married	158	28.73
Single	392	71.27

Note: USD 1 was approximately VND 23,000 during survey period.

3.4. Measurement Scales

To establish measurement scales, our research referenced items from previous studies. Firstly, continuance usage intention consists of four items, which are adapted from Lee et al. [16]. The second variable is adapted from Nguyen et al. [49] to measure attitude. The subjective norm includes three items that are referenced by Nguyen et al. [54]. The two variables representing perceived behavioural control are the perceived health risk and perceived usefulness of promotion, which are adapted from Davis [35], Hwang et al. [13], and Praseyto et al. [9]. Finally, personal innovativeness is measured using four items that are adapted from Vu et al. [53]. A summary of the measurement scales is described in Table 2.

Table 2. Summary of dimensions.

Dimensions	Number of Items	Sources
Subjective norm	3	[54]
Attitude	3	[49]
Personal innovativeness	4	[53]
Perceived usefulness of promotion	3	[9,35]
Perceived health risk	3	[13]
Continuance usage intention	4	[16]

3.5. Data Analysis

This study uses quantitative methods to evaluate reliability, convergent, and discriminant validity measurement scales and to test the research hypotheses. Confirmatory factor analysis (CFA), the common bias method (Harman's single factor and common latent factor), and Cronbach alpha were conducted to assess the measurement scale. CB SEM is applied to test the hypotheses and path analysis. The thresholds consist of GFI (goodness of fit index), CFI (comparative fit index), TLI (Tucker–Lewis's index), and RMSEA (root mean square error of approximation) values, which are referenced from Hair et al. [72]. SPSS 26 and AMOS 26 software were used to support the analysis.

3.6. Pre-Test

A pre-test was applied to the sample size of 50 Gen Z customers. Two items of the measurement scale were discarded in this process because they did not meet the requirements of the Cronbach alpha test. Eventually, 20 items representing six factors were

confirmed with Cronbach's alpha coefficient for groups of variables reaching values above 0.7. Details of the number of items and sources is described in Table 2.

4. Results

4.1. Common Bias Method Test

In this study, the authors applied several suggestions from Podsakoff et al. [73] to reduce the potential occurrence of common bias method errors. First, the order of questions in the questionnaires was shuffled to minimize the impressions of the structure of the research model. Second, the respondents' personal information was kept confidential during data collection. Finally, some quantitative analyses, such as Harman's single factor, were conducted. After data collection, Harman's single factor explained 26.994% total variance (<50%). Thus, common bias method error did not appear in this study [74].

4.2. Reliability, Convergent and Discriminant Validity

Confirmatory factor analysis (CFA) was performed to evaluate the reliability and convergent and discriminant validity of the measurement scale. At this stage, all model fit indices were $\chi^2/df = 1.579$ (<3), AGFI = 0.941 GFI = 0.956 (>0.9), TLI = 0.977 (>0.9), CFI = 0.981 (>0.9) and NFI = 0.951 (>0.9), and RMSEA = 0.032 (<0.08) and the *p*-value = 0.000 (<0.05). Thus, all suggested thresholds from Hair et al. [72] were guaranteed (Table 3).

Table 3. Goodness fit indices of models.

Criterion	Thresholds	Measurement Model	Structural Model
χ^2/df	<3	1.579	2.288
AGFI	>0.9	0.941	0.918
GFI	>0.9	0.956	0.937
TLI	>0.9	0.977	0.949
CFI	>0.9	0.981	0.957
NFI	>0.9	0.951	0.926
RMSEA	<0.08	0.032	0.048
p-value	<0.05	0.000	0.000

The results in Table 4 indicate that all factor loadings were greater than 0.6 (ranging from 0.695 to 0.858) and the α coefficients ranged from 0.766 to 0.867 (>0.7). In addition, the average variance extracted (AVE) ranged from 0.524 to 0.685 (>0.5) and the composite reliability (CR) ranged from 0.767 to 0.867 (>0.7). Therefore, the reliability and convergent validity are confirmed [72].

Table 4. Descriptive reliability and convergent validity.

Variable Statement	Fls	CR	AVE	MSV
Personal innovativeness–α = 0.859; Mean = 4.840; SD = 0.783				
Overall, I like modern, innovative technology services/products and want to use them	0.781			
I often search for information about innovative delivery services	0.787	0.859	0.604	0.370
I know a lot about advanced technologies in delivery services	0.832			
I look forward to using services/products with the most advanced technology	0.704			
Subjective norm—α = 0.766; Mean = 4.645; SD = 0.829				
People important to me feel good about using FDAs	0.707			
For people in my situation, it is common to use FDAs	0.755	0.767	0.524	0.011
People expect me to use FDAs	0.708			
Attitude—α = 0.803; Mean = 4.521; SD = 0.781				
Using FDAs is a smart solution	0.766			
Using FDAs is a good idea	0.824	0.807	0.583	0.339
I really enjoy using FDAs	0.695			

Table 4. *Cont.*

Variable Statement	Fls	CR	AVE	MSV
Perceived health risk—α = 0.865; Mean = 4.243; SD = 1.008				
I worry that eating foods from restaurants on FDAs is harmful	0.786			
I worry about my health after eating foods from restaurants on FDAs	0.837	0.867	0.685	0.128
I worry that eating foods from restaurants on FDAs is unhealthy	0.858			
Perceived usefulness of promotion—α = 0.788; Mean = 4.332; SD = 0.801				
I feel that a discount provided encourages me to use FDAs	0.758			
Terms and conditions of promotions are important to me before I use FDAs	0.742	0.789	0.556	0.394
I think that promotion expiry date influences me in making an order	0.736			
Continuance usage intention—α = 0.859; Mean = 4.716; SD = 0.729				
I intend to continue using FDAs in the future	0.766			
I will always try to use FDAs in my daily life	0.761	0.859	0.604	0.394
I plan to continue to use FDAs frequently	0.784			
I have decided to use FDAs for purchasing foods next time	0.797			

Note: SD—standard deviation; CR—composite reliability; AVE—average variance extracted; MSV—maximum shared variance; Fls—factor loadings; α—Cronbach alpha.

Finally, the findings from Tables 4 and 5 illustrate that all maximum shared variance (MSV) values < average variance extracted (AVE) values and square root AVE > correlation values for groups of variables. Notably, the highest correlation values is 0.667 (<0.7). Thus, discriminant validity is also guaranteed and multicollinearity did not occur in this study [75,76].

Table 5. Discriminant validity and correlation.

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Attitude	**0.763**					
(2) Personal innovativeness	0.490	**0.777**				
(3) Continuance usage intention	0.582	0.608	**0.777**			
(4) Perceived health risk	−0.186	−0.135	−0.358	**0.828**		
(5) Perceived usefulness of promotion	0.359	0.354	0.628	−0.252	**0.745**	
(6) Subjective norm	−0.040	0.058	0.107	−0.090	−0.028	**0.724**

Note: Diagonal values that are in bold to indicate the square root of AVE of the construct.

4.3. Hypotheses Testing and Path Analysis

Structural equation modelling (SEM) analysis was conducted to test the proposed hypotheses. Based on the statistical results in Table 3, the SEM model's goodness of fit indices consists of $\chi^2/df = 2.288$ (<3), AGFI = 0.918; GFI = 0.937 (>0.9), TLI = 0.949 (>0.9), CFI = 0.957 (>0.9), and RMSEA = 0.048 (<0.08) and a *p*-value = 0.000 (<0.05). Hence, all model fit criteria satisfied the threshold suggestions of Hair et al. [72].

The findings in Table 6 demonstrate that all hypotheses are accepted (*p*-value < 0.05). Among the three factors that influence continuance usage intention, the impact of attitude is highest (β = 0.486; t-value = 10.444; *p*-value < 0.001). The impacts of perceived usefulness of promotion (β = 0.462; t-value = 9.368; *p*-value < 0.001) and subjective norm (β = 0.119; t-value = 2.856; *p*-value < 0.01) are evaluated at a lower level. On the contrary, perceived health risk is recognized as a significant barrier to continuance usage intention (β = −0.177; t-value = −4.246; *p*-value < 0.001) and perceived usefulness of promotion (β = −0.255; t-value = 4.923; *p*-value < 0.001). This research highlights the essential role of personal innovativeness on attitude (β = 0.534; t-value = 10.369; *p*-value < 0.001). The explanation levels for perceived usefulness of promotion, attitude, and continuance usage intention are 6.5%, 28.5%, and 57.3%, respectively.

Table 6. Hypothesis testing and path analysis results.

	Hypothesis	β	t-Value	Findings
H1:	Attitude → continuance usage intention	0.486 ***	10.444	Accepted
H2:	Personal innovativeness → attitude	0.534 ***	10.369	Accepted
H3:	Subjective norm → continuance usage intention	0.119 **	2.856	Accepted
H4:	Perceived usefulness of promotion → continuance usage intention	0.462 ***	9.368	Accepted
H5:	Perceived health risk → continuance usage intention	−0.177 ***	−4.246	Accepted
H6:	Perceived health risk → perceived usefulness of promotion	−0.255 ***	−4.923	Accepted

Note: β—standardized estimate; *** p-value < 0.001; ** p-value < 0.01.

5. Discussion, Implication, and Conclusions

5.1. Discussion

This study is one of the first to apply the TPB to assess the FDA usage behaviour of Gen Z customers in Vietnam—a potential market for FDA service, according to our best knowledge. By conceptualizing and validating the measurement scale and structural model, this study helps enrich knowledge about innovation technology adoption of Gen Z customers in an emerging economy. This study is a response to calls from some academics to expand and refine the TPB in technology adoption studies, especially in need of increased empirical research on adoption in different contexts [17]. This study reconfirmed the suitability of the TPB to explain individuals' technology adoption similar to other previous studies [53,56]. The results demonstrated that applying the TPB could effectively explain Gen Z customers using FDAs. Compared with some similar studies on FDAs, the explanation level of the TPB model in this study is higher [37,40,59].

In this study, the SEM analysis highlights the significant role of attitude in continuance usage intention. This finding is the same as the observation by famous scholars [28,35]. The attitude–behaviour gap does not exist, and it implies Gen Z customers are more inclined to continue using FDAs when they have a good attitude towards FDAs. In addition to attitude, subjective norm—one basic component of the TPB model—also has a direct impact on continuance usage intention. This result reflects the role of a high level of collectivist culture in individuals' decision-making [54].

This study found perceived usefulness of promotion could dramatically enhance the continuance usage intention of Gen Z customers using FDAs. This result is similar to the views of some similar studies in Southeast Asian markets such as Indonesia and Malaysia [9,59]. This finding is partly explained by the financial limitations of Gen Z customers, as illustrated in the sample characteristics: most respondents have moderate and low monthly incomes. Thus, financial benefits from promotions showed the ability to significantly improve the continuance usage intention of Gen Z customers.

This study extends the TPB model by adding perceived health risks that effectively explain the perceived usefulness of promotion and continuance usage intention of Gen Z customers. This finding reinforces other views that perceived health risk is related to the decisions considered in several previous studies conducted in other markets, such as Australia [63]. However, this finding is contrasted in comparison with other studies conducted during the COVID-19 period [38,64]. The differences can be explained partly because FDA services seem to be an obligate option in the COVID-19 context. The results of the SEM analysis emphasized the essential role of promotion in improving the adoption of customer FDAs, which is similar opinions of other research [9,59]. Interestingly, this study recognised perceived health risk as a new factor that can decrease the perceived usefulness of promotion, which implies that health benefits should be considered carefully along with price benefits.

Finally, this study highlights the critical role of personal innovativeness in attitude. This finding is similar to conclusions from previous studies [40,42,54]. FDAs with many valuable functions allow customers to save time, recommend many useful options, and create many experiences with outstanding features. Hence, this service easily attracts young customers who are highly innovative.

5.2. Contribution and Implication

5.2.1. Theoretical Contribution and Implication

Firstly, this study suggested and validated measurement scales with high reliability regarding FDA adoption in emerging market contexts by extending the TPB model. These findings helped enrich knowledge about innovation technology adoption by Gen Z customers in Vietnam and carried out a new approach to establish conceptual models. This study also reconfirmed previous observations of other previous studies about FDAs as well as technology adoption [9,38,64]. In particular, this study found a negative effect of perceived health risk on the perceived usefulness of promotion. This finding extends knowledge about customer behaviour using FDAs because most previous studies focus on the essential role of promotion in FDA adoption [9,59] instead of exploring new factors to explain the usefulness of promotion. Thus, these findings suggest theoretical implications that researchers should extend theories such as TPB to explain individuals' behaviour and re-examine the relationships between factors in various contexts. Furthermore, the validated models and measurement scales could become the essential background for future research about relevant themes.

5.2.2. Managerial Contribution and Implication

This study helps identify the key determinants that influence Gen Z customers using FDAs. Therefore, enterprises, technology providers, and policymakers can understand insights into the consumption habits of Gen Z customers, thereby being able to devise appropriate business strategies for this customer segment.

Firstly, this study indicated that the perceived usefulness of promotion is a key determinant influencing continuance usage intention. Thus, enterprises should focus on improving the effectiveness of promotions by providing suitable discounts and terms for Gen Z customers. However, these promotions should ensure other conditions, such as the minimum price of orders to receive promotions and the expiry date.

Secondly, several practical implications are for FDA enterprises to reduce perceived health risks, which significantly decrease the usefulness of promotion and continuance usage intention of Gen Z customers. Enterprises need to complete policies to ensure food hygiene and safety for restaurants registered for business on applications. In addition to supervising activities, enterprises can strengthen the development of interactive channels to receive customer feedback on food safety and hygiene issues. Finally, research indicates that Gen Z customers pay attention to health benefits. Thus, FDAs could develop more communication channels about nutrition and healthy lifestyles to orient customers' consumption habits in addition to normal advertising activities.

Thirdly, the role of subjective norms should be strengthened as this factor significantly boosts the continuance usage intention of Gen Z customers. Enterprises can establish and develop customer groups to create opportunities for customers to communicate, exchange information, and share user experiences and feedback after using FDAs. Notably, this study implies that innovative customers are a potential segment market, so FDA enterprises and technology providers can consider adding new innovative technology features to enhance Gen Z customers' experience, such as applying artificial intelligence, biometrics, and big data technologies. These technologies can aim to make applications more thoughtful and practical, such as suggesting more valuable choices, enhancing information security, and improving users' health through the knowledge and experience provided by FDAs or other users.

Finally, this study emphasized that attitude is a critical factor affecting the continuance usage intention of Gen Z customers. Thus, enhancing attitude is a possible approach to attract customers using FDA services. This finding suggests that enterprises should promote compatibility and relative advantage aspects of system quality. Furthermore, delivery time, packaging, and shipper interactions should be ameliorated to enhance attitude.

5.3. Conclusion and Limitation

The sharing economy business models applying innovation technologies in FDAs, ride-hailing, and hospitality with prominent big brands such as Uber, Grab, and Airbnb are gradually gaining popularity and attracting the participation of stakeholders as both suppliers and customers. Applying the TPB, this study evaluated the influence of several factors on the attitude and continuance usage intention of Gen Z customers in Vietnam—a typical emerging economy in Southeast Asia.

This study proposed and validated a conceptual model using CB-the SEM method to fulfil three objectives. These findings help identify the key determinants affecting the attitude and continuance usage intention of Gen Z customers using FDAs. Based on the results, several implications are also suggested to stakeholders to improve business performance. In addition to reaffirming some of the promoting and inhibiting roles of some factors on the behaviour of customers using FDAs, this study also found that the characteristics of Gen Z customers partly explain these differences compared with previous studies. The research findings have also shown that, in order to promote the behaviour of using the FDA platform, enterprises need to evaluate the comprehensive influences of various factors, the quality of personal factors, and the quality of business characteristics, including customers. The goal is to bring maximum benefit to customers. This study also enriches knowledge about customer behaviour research and contributes to theoretical and practical aspects.

Several limitations are still recognized in our study, such as the small sample size and many demographic characteristics, such as monthly income, shopping frequency, age, and gender, that could not be analysed for influence on the behaviour of Gen Z customers. Finally, the conceptual model is still basic, and some important factors for explaining the operational capabilities of the application, the role of the shippers, and trust of restaurants on the application have not yet been included in the assessment. Hence, the conceptual model should be extended to improve the explanation level for dependent factors.

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