THE INFLUENCE OF PERCEIVED INFORMATION QUALITY, USER INTERFACE ATTRACTIVENESS AND SOCIAL PROOF OF QUICK SERVICE RESTAURANT APPLICATIONS ON DECISION CONFIDENCE AND PURCHASING BEHAVIOR

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Abstract

The Thai quick service restaurant (QSR) industry experienced rapid expansion along with the increasing use of mobile food ordering applications. This study investigates the effects of application design attributes on consumer behavior by examining how perceived information quality, user interface attractiveness, and social proof affect perceived control and the extent to which perceived control influences decision confidence and purchase behavior. Based on Cognitive Load Theory, Elaboration Likelihood Model, and Theory of Planned Behavior, this study proposes an integrated framework to explain consumers' interaction with quick service restaurant (QSR) mobile applications. Data were collected from 400 Thai consumers who used the QSR application. Using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study confirmed the interdependence between key constructs. The results show that perceived information quality is the strongest predictor of perceived control, followed by user interface attractiveness and social proof. Perceived control has a strong influence on decision confidence, which is a strong predictor of purchase behavior. In addition, decision confidence fully mediates the impact of application design features on ultimate purchase behavior. The results have important implications for application developers and QSR operators.

Keywords: Quick Service Restaurant, Information Quality, Social Proof, Consumer Confidence, Purchase Behavior

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Introduction

The Thai Quick Service Restaurant (QSR) sector has seen remarkable growth in recent years and is one of the most dynamic segments in the entire foodservice sector. Driven by rapid urbanization, rising disposable incomes, changing consumer lifestyles and remarkable technological advancements, the QSR sector in Thailand has expanded exponentially. By 2024, the sector is estimated to be worth approximately USD 2.78 billion and is responsible for about 14% of Thailand's food service industry (Kasikorn Research Center, 2024). The market indicated the availability of 33,253 outlets across the country and reported a year-on-year growth rate of 3.6% in 2024, a sign of huge consumer demand and robust industry momentum (U.S. Department of Agriculture, 2024). Competition is intense and the emphasis is on innovation, with major international franchises such as McDonald's, KFC, Burger King and Subway, as well as local chains such as The Pizza Company and Chester's Grill (ASEAN Food & Beverage, 2024).

A key driver for this expanding business is the global proliferation of mobile technology and the rapid emergence of food delivery applications. Cell phone penetration in Thailand was over 95% in 2023 and smartphone penetration was around 83%, reflecting the country's extremely advanced digital landscape (Statista, 2024). In addition to the proliferation of digital platforms, mobile food ordering apps such as GrabFood, LINE MAN Wongnai and Foodpanda have proven to be key drivers of changing consumer habits in the quick service restaurant (QSR) industry (Rakuten Insight, 2025). Research shows that almost 70% of urban consumers in Thailand regularly use food delivery apps, with about 19% ordering food three to six times a week and about 11% using the services several times a day (Rakuten Insight, 2025). The high frequency of use indicates that mobile applications have taken an important place in everyday consumption habits, especially in major urban centers such as Bangkok, Chiang Mai and Phuket.

Despite the aggressive adoption of mobile ordering apps in Thailand's quick service restaurant (QSR) industry, businesses are struggling to convert app engagement into successful transactions, reflected in an abandonment rate of almost 50 (Euromonitor International, 2024). This is a conversion problem that stems from a fundamental lack of knowledge about how certain mental and perceptual processes, particularly speed of information processing, visual appeal and social recognition signals as a group, influence consumers' sense of mastery and confidence in their ordering decisions. Recent studies have examined these variables individually. However, they do not have an explanatory model of how perceived information

quality, visual appeal of the user interface, and social proof are linked to influence the cognitive process leading to use of the application and thus successful purchase completion.

The behavioral patterns uncovered make it clear that our understanding of how certain aspects of mobile app design influence consumers' food ordering decisions is still very incomplete. Previous research has primarily focused on technology acceptance models or general service quality frameworks, while comparatively less effort has been made to decipher the composite cognitive processes that consumers employ when using mobile apps in foodservice (Lin et al., 2023; McLean et al., 2018). To address the identified research gap, the present study draws on a general theoretical framework based on Cognitive Load Theory (Sweller, 1988), the Elaboration Likelihood Model (Petty & Cacioppo, 1986) and the Theory of Planned Behavior (Ajzen, 1991). The synthesis of these viewpoints enables an in-depth investigation of the cognitive and perceptual activities underlying Thai consumers' mobile app-based food ordering behavior. To this end, the present study raises the following questions

1. How do perceived information quality, visual interface attractiveness, and social proof individually or jointly influence perceived control in the context of mobile food ordering in Thai QSRs?

2. In what ways do consumers' perceived control influence their trust decision when ordering food through a mobile app?

3. To what extent is decision-making trust a mediator between perceived control and purchasing behavior of Thai consumers using mobile food ordering apps?

Literature Review

This research employs several established theoretical models to develop an integrated model that describes the behaviors of Thai consumers when they use mobile food ordering applications. In particular, the model uses the tenets of Cognitive Load Theory (CLT), the Elaboration Likelihood Model (ELM), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Stimulus-Organism-Response (S-O-R) model, integrating their perspectives to develop a comprehensive picture of consumer decision-making processes in online environments.

Cognitive Load Theory, as developed by Sweller (1988), asserts that people possess a finite cognitive processing capacity. Presentation of excessive, vague, or unstructured information in mobile applications results in cognitive overload for customers, which detrimentally affects their decision-making capability (Chen et al., 2009). Lee et al. (2019)

found that information quality significantly influenced performance expectancy in food delivery apps. Chopdar and Balakrishnan (2020) found that information complexity negatively affected perceived control, supporting the cognitive load reduction mechanism. In mobile food ordering, the concept of application Information quality, which is delineated by qualities such as clarity, accuracy, completeness, and relevance, serves to counterbalance cognitive overload since more efficient information processing is achieved. Good quality information allows users to process and interpret application content easily, thereby increasing their sense of control.

Hypothesis 1 (H1) Perceived information quality has a positive impact on perceived control in mobile food ordering applications.

The Elaboration Likelihood Model (Petty & Cacioppo, 1986) distinguishes between central (deep processing) and peripheral (superficial processing) routes to persuasion. Lee and Lim (2023) experimental studies demonstrated that visual design principles significantly affected purchase intention through visual appeal and taste perception in food ordering contexts. Consumers are likely to utilize the peripheral route when it comes to mobile food ordering due to rushed decision-making circumstances. Peripheral cues such as attractive visual interface appeal and social proof are thus paramount. Social proof was found to have an influence on consumer decision-making processes (Floyd et al., 2014) The fact that there are high-quality images and good user ratings serves as heuristic cues, enabling quick and confident decision-making, which enhances users' perceived control of their ordering experience.

Hypothesis 2 (H2) Visual interface attractiveness has a positive effect on perceived control in mobile food ordering applications.

Hypothesis 3 (H3) Social proof positively influences perceived control in mobile food ordering applications.

The Theory of Planned Behavior, as proposed by Ajzen (1991), holds that perceived behavioral control, or the individual's perception of his/her ability to enact a certain behavior, is a significant influence on behavioral intentions and actual behaviors. Alalwan (2020)’s mobile food ordering study found that perceived control mechanisms significantly predicted user confidence and satisfaction. For mobile food ordering, Perceived Control reflects users' perceptions of their aptitude at being able to use and navigate the application successfully. More perceived control enhances decision confidence as consumers feel effective and

competent in being able to regulate their ordering procedures, thus positively affecting downstream behavioral results such as order completion.

Hypothesis 4 (H4) Perceived control positively influences mobile food ordering application decision confidence.

The Stimulus-Organism-Response (S-O-R) model, as outlined by Mehrabian and Russell (1974), describes how environmental stimuli in mobile applications specifically visual interface attractiveness and information quality affect users' internal emotional and cognitive states, including their confidence, to ultimately lead to observable behavioral consequences like completing an order. Foroughi, et al. (2019) found that decision confidence showed significant mediation effects between perceived control and subsequent purchase behaviors. Decision Confidence is the internal organism-level response mediating the relation between perceived control and the ultimate consumer behavior of completing an order. This mediation is significant since trust in the decision converts perceived empowerment into real consumer behavior directly.

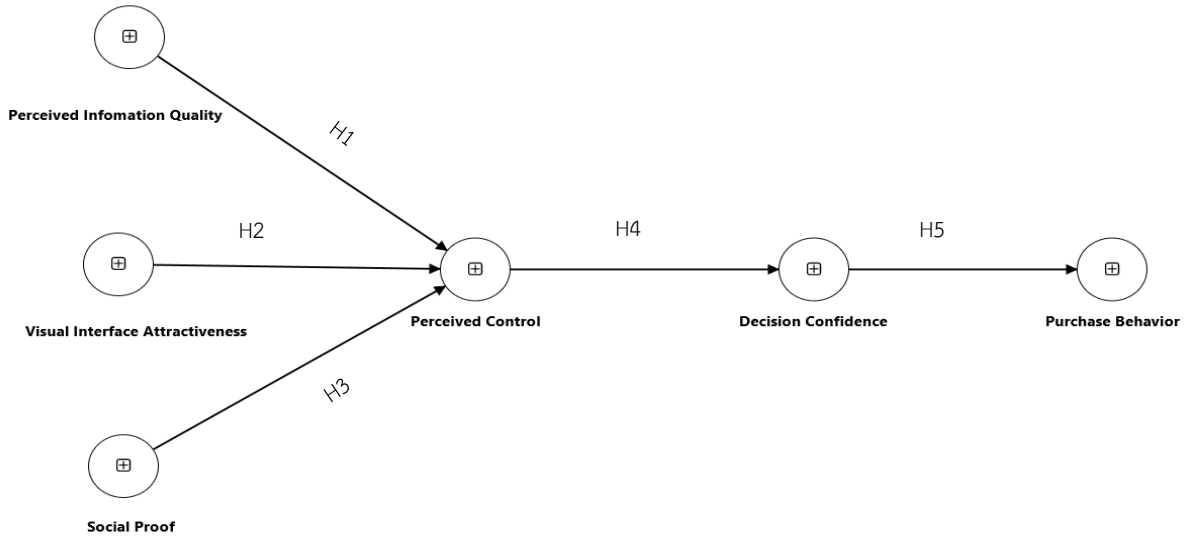
Hypothesis 5 (H5) Decision confidence positively influences purchase behavior in mobile food ordering applications.

Hypothesis 6 (H6) Perceived control and decision confidence are mediators of the effect of perceived information quality, visual interface attractiveness, and social proof on purchase behavior in mobile food ordering applications.

While this study does not explicitly test Technology Acceptance Model (TAM) constructs, TAM provides foundational support for the proposed theoretical relationships. Davis (1989) demonstrates that perceived usefulness and perceived ease of use are fundamental drivers of technology acceptance. In the context of QSR mobile applications, perceived ease of use conceptually aligns with perceived control both reflect users' confidence in their ability to effectively interact with the system, while perceived usefulness conceptually aligns with information quality and visual interface attractiveness both contribute to users' perceptions of system value and effectiveness. This conceptual alignment reinforces the theoretical validity of the proposed relationships, as the current model extends TAM's foundational insights into the specific cognitive pathways relevant to mobile food ordering contexts.

This integrated theoretical model reflects a general cognitive process in mobile food ordering applications. Perceived Information Quality, Visual Interface Attractiveness, and Social Proof are environmental prompts that influence consumer perceptions and cognitive load.

These prompts enhance Perceived Control, thus increasing consumers' internal sense of empowerment and ability to use the application effectively. Decision confidence serves the vital function of mediator, linking psychological state to actual behavior, completion of order, thereby delineating the holistic and integrative aspect of the model. Figure 1 illustrates this proposition using structural equation modeling.



H6 (a,b,c): Mediated Paths

(a) Perceived Information Quality → Perceived Control → Decision Confidence → Purchase Decision,

(b) Visual Interface Attractiveness → Perceived Control → Decision Confidence → Purchase Decision,

(c) Social Proof → Perceived Control → Decision Confidence → Purchase Decision)

Figure 1. Proposed theoretical model

Research Methodology

This study adopts a confirmatory research approach, designed to test established theoretical relationships within the specific context of Thai QSR mobile applications. Rather than exploring new theoretical constructs, this research systematically validates and extends existing theories—specifically Cognitive Load Theory (Sweller, 1988), the Elaboration Likelihood Model (Petty & Cacioppo, 1986), and the Theory of Planned Behavior (Ajzen, 1991) within the mobile food ordering domain. This confirmatory study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to test predetermined theoretical relationships derived from established theories. While PLS-SEM is often associated with exploratory research, it is equally appropriate for confirmatory analysis when research

objectives focus on prediction and theory testing rather than theory development (Hair et al., 2017). Furthermore, PLS-SEM can handle small to medium sample sizes and does not necessitate data to fulfill rigorous assumptions of normality, thus rendering it suitable for the context of the study.

Population and Sampling

The population is Thai consumers who have used mobile food ordering applications with the screening criterion of having used mobile food ordering in the past 6 months. The determination of the sample size was carried out with the help of the G*Power software, taking into consideration three predictors: perceived information quality, visual interface attractiveness, social proof, perceived control, and decision confidence. The estimation was based on an effect size of 0.15, error probability of 0.05, and a test power of 0.95, which arrived at a minimum of 138 samples that were needed. Nonetheless, the present study gathered a total of 400 samples, which exceeded the guidelines stipulated by G*Power. The study employed a stratified random sampling technique in gathering data from 400 Thai consumers who made mobile app-based purchases at Quick Service Restaurants (QSRs) within the recent six months. The study employed a two-stage stratified random sampling approach to ensure representativeness across both geographical and demographic dimensions. Firstly, the Thai population was first stratified into five geographical regions based on Thailand's administrative divisions and market characteristics: Bangkok Metropolitan Area at 35% (n = 140), Central Region excluding Bangkok at 20% (n = 80), Northern Region at 15% (n = 60), Northeastern Region at 15% (n = 60), and Southern Region at 15% (n = 60). Secondly, within each geographical stratum, participants were further stratified by age groups reflecting the primary QSR mobile app user demographics: 18–24 years at 30%, 25–34 years at 35%, 35–44 years at 20% and, 45+ years at 15%. Subsample allocation balanced multiple considerations given constraints in accessing precise population parameters for QSR mobile app users in Thailand. Bangkok Metropolitan Area emphasis (35%) reflects urban concentration and market importance. Regional balance (15-20%) ensures adequate representation while maintaining statistical power. Allocation approximates urban population distribution while ensuring business relevance. Age allocation emphasizes prime mobile app usage demographics who are 25-34 years with adequate representation across age spectrum for generalizability. Random selection was done within each combined region-age stratum until target numbers are reached. This approach ensures a sample that accurately represents Thailand's large QSR

mobile application user base across different regions and age groups, increasing the external validity of findings regarding how application features influence consumer trust and buying behavior.

Measurement of Constructs

Each construct will be quantified in terms of validated measurement scales created from prior research. All the items will be rated on a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree." The source and measurement of each construct are provided in Table 1. All the questions were subjected to content validity, utilizing the index of item-objective congruence (IOC), and all questions cleared the cut-off with a score of more than 0.67. To provide internal consistency, the web-based questionnaire was administered to a group of 30 respondents who shared similar characteristics, and their Cronbach's alpha coefficient values varied from 0.804 to 0.927.

Table 1. Source and Measurement of Constructs

Construct	Number of Items	Questions	Source
Perceived Information Quality (PIQ)	4	1. The application provides exact and accurate menu descriptions. 2. The application offers current information regarding various food products. 3. The application gives adequate information regarding the ingredients in food products. 4. The application effectively conveys pricing information for every menu item.	Xu et al. (2009) Filieri and McLeay (2014) Ahn et al. (2007)
Visual Interface Attractiveness (VIA)	5	1. The food items' images are visually attractive. 2. The graphic display of menu items makes me hungry. 3. Application's color scheme contributes to the appeal of the food items. 4. The menu item layout is aesthetically pleasing. 5. The food photos used by the application are professional and appealing	Kim and Lennon (2013) Wang et al. (2011) Cyr et al. (2010) Bhandari et al. (2017) Ha & Jang (2012)
Social Proof (SP)	4	1. Online reviews influence what I eat. 2. Positive ratings on the menu items increase my likelihood of ordering them. 3. I trust food items which have been ordered multiple times by other customers. 4. Positive reviews by previous customers make me confident regarding my order.	Filieri et al. (2015) Zhang et al. (2014) Cheung et al. (2012) Sparks and Browning (2011)

Table 1. Source and Measurement of Constructs (Cont.)

Construct	Number of Items	Questions	Source
Perceived Control (PC)	3	1.I feel in control when using the application. 2.I am able to easily modify my food order to suit my desire. 3.The website allows me to modify my decisions at any point before I finalize my order.	Ajzen (1991) Koufaris (2002)
Decision Confidence (DC)	5	1.I feel sure about my food ordering decisions. 2. I'm sure that I have chosen the right menu items. 3. I am confident that my food selection is nutritionally adequate. 4.I am satisfied with the choices I've made in the application. 5. I am certain that I made a reflective decision regarding what to eat.	Petty and Cacioppo (1986) Kim and Lennon (2013) Bhattacherjee (2001) Wang and Benbasat, (2007) Jiang and Benbasat, (2007)
Purchase Behavior (PB)	3	1.I have completed my food order using the application. 2.I continued with the purchase of the items in my cart. 3.I finished ordering by confirming my delivery details.	Pavlou & Fygenson, (2006) Chen & Barnes, (2007)

Data Analysis

This study employed a two-stage analytical approach based on Partial Least Squares Structural Equation Modeling (PLS-SEM). Firstly, the measurement model was thoroughly assessed to determine the construct validity. The reliability testing was verified with Cronbach's alpha (min acceptable value > 0.7) and composite reliability (CR > 0.7) to determine the internal consistency of the measurement items. The convergent validity was validated via factor loadings (> 0.7) and average variance extracted (AVE > 0.5) for every construct. Discriminant validity was established by making the square root of AVE for each construct larger than its correlation with other constructs, complemented by the Fornell-Lacker criterion. Having established a psychometrically sound measurement model, the structural model was then tested to confirm the hypothesized relationships between perceived information quality, visual interface attractiveness, social proof, perceived control, decision confidence, and order completion. Path coefficients (β) were inspected for assessing the size and direction of relationships, whereas t-values derived from bootstrapping with 5,000 resamples will ascertain statistical significance. The model's explanatory power was assessed using R-squared values of endogenous constructs, emphasizing explained variance in decision confidence and order fulfillment. Moreover, effect sizes (f^2) were computed to evaluate the meaningful influence

of each predictor variable, while the Stone-Geisser Q^2 value were utilized to examine the model's predictive significance.

Research Findings

Most of the respondents are female (54.2%), aged 25-34 years old (35.0%), living in Bangkok and Metropolitan area (35%), working as the employee (55.8%) with bachelor's degree (61.5%). They order food through QSR application on a weekly basis or more (41.3%), as presented in Table 2.

Table 2. Sample Demographic Characteristics

Respondent Profile	Frequency (%)	Respondent Profile	Frequency (%)
Gender		Occupation	
Male	183 (45.8)	Government officer	109 (27.3)
Female	217 (54.2)	Employee	223 (55.8)
Age		Business owner	43 (10.7)
18–24	120 (30.0)	Student	25 (6.2)
25–34	140 (35.0)	QSR App Usage Frequency	
35–44	80 (20.0)	Weekly or more	165 (41.3)
45 or older	60 (15.0)	2-3 times monthly	154 (38.5)
Education Level		Once a month or Less	81 (20.2)
Below bachelor's degree	74 (18.5)		
Bachelor's degree	246 (61.5)		
Above bachelor's degree	80 (20.0)		

Measurement Model

All Perceived Information Quality (PIQ) indicators had a normal distribution according to skewness, while kurtosis statistics were close to zero and consistent with the criteria from Schumacker and Lomax (2004), specifying that skewness and kurtosis of normal distribution data should be between +/-1 and +/-1.5, respectively. This implies that the collected data was appropriate for parametric statistical analysis. The reliability of PIQ constructs was evaluated by Cronbach's alpha (α), with the results revealing that the reliability coefficient of all constructs was 0.875, meeting the criterion of 0.7. The composite reliability values were measured by ρ_A , (0.876) and ρ_C (0.914), again meeting the threshold of 0.7 (Henseler et al.,

2015 (2015). Convergent validity validated by AVE revealed that PIQ constructs' AVE surpassed the criterion of 0.5 (Henseler et al., 2015). Thus, the PIQ indicators were considered highly appropriate to explain the latent variables, as delineated in Table 3.

Table 3. Evaluation of the Measurement Model: Perceived Information Quality

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
PIQ								0.875	0.876	0.914	0.727
	PIQ1	4.255	0.686	-0.656	-0.424	0.865	0.748				
	PIQ2	4.322	0.713	-0.690	-0.604	0.857	0.734				
	PIQ3	4.588	0.598	0.302	-1.152	0.836	0.699				
	PIQ4	4.237	0.762	-0.506	-0.600	0.853	0.728				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

All Visual Interface Attractiveness (VIA) indicators had a normal distribution, consistent with the criteria from Schumacker and Lomax (2004). The reliability of VIA constructs was evaluated by Cronbach's alpha (α), met the criterion of 0.7. The composite reliability values were measured by ρ_A (0.930) and ρ_C (0.945), meeting the threshold of 0.7 (Henseler et al., 2015 (2015). Convergent validity validated by AVE revealed that VIA constructs' AVE surpassed the criterion of 0.5 (Henseler et al., 2015). As a result, the VIA indicators were considered highly appropriate to explain the latent variables, as illustrated in Table 4.

Table 4. Evaluation of the Measurement Model: Visual Interface Attractiveness

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
VIA								0.927	0.930	0.945	0.775
	VIA1	4.010	0.728	-0.008	-0.406	0.899	0.808				
	VIA2	4.053	0.800	-0.778	-0.330	0.839	0.704				
	VIA3	4.062	0.808	-0.505	-0.456	0.871	0.759				
	VIA4	4.048	0.788	-0.521	-0.392	0.885	0.783				
	VIA5	4.020	0.755	-0.368	-0.348	0.907	0.823				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

All Social Proof (SP) indicators had a normal distribution, consistent with the criteria from Schumacker and Lomax (2004). The reliability of VIA constructs, evaluated by Cronbach's alpha (α), met the criterion of 0.7. The composite reliability values were measured by ρ_A (0.849)

and ρ_C (0.896), met the threshold of 0.7 (Henseler et al., 2015 (2015). Convergent validity validated by AVE met the criterion of 0.5 (Henseler et al., 2015). As a result, the SP indicators were considered highly appropriate to explain the latent variables, as represented in Table 5.

Table 5. Evaluation of the Measurement Model: Social Proof

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
SP								0.846	0.849	0.896	0.683
	SP1	4.310	0.662	-0.500	-0.494	0.809	0.654				
	SP2	4.410	0.626	-0.599	-0.577	0.822	0.676				
	SP3	4.353	0.658	-0.704	-0.526	0.836	0.699				
	SP4	4.223	0.666	-0.563	-0.338	0.839	0.704				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

All Perceived Control (PC) indicators had a normal distribution, consistent with the criteria from Schumacker and Lomax (2004). The reliability of VIA constructs, evaluated by Cronbach's alpha (α), met the criterion of 0.7. The composite reliability values were measured by ρ_A (0.876) and ρ_C (0.914), met the threshold of 0.7 (Henseler et al., 2015 (2015). Convergent validity validated by AVE met the criterion of 0.5 (Henseler et al., 2015). As a result, the PC indicators were considered highly appropriate to explain the latent variables, as exhibited in Table 6.

Table 6. Evaluation of the Measurement Model: Perceived Control

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
PC								0.875	0.876	0.914	0.727
	PC1	4.035	0.774	-1.058	-0.158	0.887	0.787				
	PC2	4.165	0.726	-1.079	-0.264	0.861	0.741				
	PC3	4.295	0.611	-0.625	-0.268	0.851	0.724				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

All Decision Confidence (DC) indicators had a normal distribution, consistent with the criteria from Schumacker and Lomax (2004). The reliability of VIA constructs, evaluated by Cronbach's alpha (α), met the criterion of 0.7. The composite reliability values were measured by ρ_A (0.905) and ρ_C (0.927), met the threshold of 0.7 (Henseler et al., 2015 (2015). Convergent

validity validated by AVE met the criterion of 0.5 (Henseler et al., 2015). The DC indicators were considered highly appropriate to explain the latent variables, presented in Table 7.

Table 7. Evaluation of the Measurement Model: Decision Confidence

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
DC								0.902	0.905	0.927	0.718
	DC1	4.19	0.651	-0.705	-0.213	0.869	0.755				
	DC2	4.253	0.677	-0.833	-0.359	0.806	0.650				
	DC3	4.24	0.669	-0.801	-0.322	0.837	0.701				
	DC4	4.232	0.655	-0.739	-0.282	0.856	0.733				
	DC5	4.293	0.606	-0.612	-0.246	0.869	0.755				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

All Purchase Decision (PC) indicators had a normal distribution, consistent with the criteria from Schumacker and Lomax (2004). The reliability of VIA constructs, evaluated by Cronbach's alpha (α), met the criterion of 0.7. The composite reliability values were measured by ρ_A (0.808) and ρ_C (0.884), met the threshold of 0.7 (Henseler et al., 2015 (2015). Convergent validity validated by AVE met the criterion of 0.5 (Henseler et al., 2015). As a result, the DC indicators were considered highly appropriate to explain the latent variables, as demonstrated in Table 8.

Table 8. Evaluation of the Measurement Model: Purchase Behavior

Latent Variable	Indicators	Mean	S.D.	Skewness	Kurtosis	Loading	R-sq	Alpha	ρ_A	ρ_C	AVE
PB								0.804	0.808	0.884	0.718
	PB1	4.338	0.627	-0.342	-0.465	0.841	0.707				
	PB2	4.34	0.696	-0.588	-0.62	0.848	0.719				
	PB3	4.173	0.74	-0.455	-0.473	0.853	0.728				

Note. Alpha, Cronbach's alpha; AVE, average variance extracted.

Discriminant validity was evaluated using the Fornell-Lacker criterion (Hair et al, 2017). The result revealed that the square root of the AVE for each latent factor exceeded the correlation coefficient between the two indicators, guaranteeing the discriminant validity of all factors, as illustrated in Table 9.

Table 9. Discriminant Validity: Fornell-Lacker Criterion

	PIQ	VIA	SP	PC	DC	PB
Perceived Information Quality (PIQ)	0.853					
Visual Interface Attractiveness (VIA)	0.702	0.880				
Social Proof (SP)	0.616	0.536	0.827			
Perceived Control (PC)	0.706	0.665	0.574	0.886		
Decision Confidence (DC)	0.797	0.728	0.613	0.667	0.848	
Purchase Behavior (PB)	0.586	0.567	0.651	0.586	0.630	0.847

Evaluation of Structural Model

The main criteria to evaluate the structural model are multicollinearity, the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q2), and model fit (Hair et al., 2011; Hair et al., 2017). The coefficient of determination (R^2) of the perceived control, decision confidence, and purchase behavior were equal to 0.573, 0.445 and 0.397, respectively, as presented in Table 10.

Table 10. Explained Variance (R^2)

Construct	R^2	Adjusted R^2
Perceived Control (PC)	0.573	0.570
Decision Confidence (DC)	0.445	0.444
Purchase Behavior (PB)	0.397	0.396

The F^2 effect sizes are used to assess the impact of the model, where f^2 values above 0.02, 0.15, and 0.35 are considered small, medium and large effects, respectively. The largest effect size was for PC on DC (0.802), considered large, followed by DC on PB (0.659) and PIQ on PC (0.151), which were both considered large and medium, respectively, as shown in Table 11.

Table 11. F^2 Effect Sizes

Construct	PC	DC	PB
Perceived Information Quality (PIQ)	0.151		
Visual Interface Attractiveness (VIA)	0.102		
Social Proof (SP)	0.043		
Perceived Control (PC)		0.802	
Decision Confidence (DC)			0.659

The Q^2 value of this study is greater than 0 for the endogenous latent variable, indicating that the PLS path model possesses strong predictive relevance for the latent variable, as represented in Table 12. The predictive relevance based on the cross-validated redundancy for the latent variables PC, DC and PC were classified as high (Q^2 >0.35), and the predictive power based on the cross-validated commonality of all latent variables was also considered high. This implies that this model has significant predictive power.

Table 12. Predictive Relevance (Q^2-value)

	Cross-validated redundancy		Cross-validated commonality	
	Q^2	Prediction Capability	Q^2	Prediction Capability
Perceived Control (PC)	0.564	0.564	0.565	0.565
Decision Confidence (DC)	0.589	0.589	0.700	0.700
Purchase Behavior (PB)	0.350	0.350	0.535	0.535
Perceived Information Quality (PIQ)			0.709	0.709
Visual Interface Attractiveness (VIA)			0.592	0.592
Social Proof (SP)			0.499	0.499

Note. Low (Q^2 >0), Medium (Q^2 >0.15), and high (Q^2 >0.35)

The overall goodness-of-fit (GOF) of the structural model is assessed by calculating the square root of the product of the mean coefficient of determination (R^2) and the mean commonality (AVE value), obtaining a GOF value of 0.586. As this value is higher than 0.36, it demonstrates a high model fit (Tenenhaus et al., 2005), as shown in Table 13.

Table 13. Goodness-of-Fit (GOF) Results

Construct	AVE	R^2
Perceived Information Quality (PIQ)	0.727	-
Visual Interface Attractiveness (VIA)	0.775	-
Social Proof (SP)	0.683	-
Perceived Control (PC)	0.751	0.573
Decision Confidence (DC)	0.718	0.445
Purchase Behavior (PB)	0.718	0.397
Average values	0.729	0.472
AVE x R^2	0.344	
GOF = √(AVE × *R*2)	0.586	

Table 14. Structural Model Results

Direct Effect Testing	β	S.D.	t-test	P Values	f-sq	Results
PIQ → PC (H1)	0.389	0.057	6.773	0.000*	0.151	Supported
VIA → PC (H2)	0.298	0.051	5.884	0.000*	0.102	Supported
SP → PC (H3)	0.175	0.050	3.533	0.000*	0.043	Supported
PC → DC (H4)	0.667	0.031	21.312	0.000*	0.802	Supported
DC → PB (H5)	0.630	0.037	16.958	0.000*	0.659	Supported
Indirect Effect Testing	**β**	**S.D.**	**t-test**	**P Values**	**f-sq**	**Results**
PIQ → PC → DC → PB (H6a)	0.163	0.030	5.395	0.000*	-	Supported
VIA → PC → DC → PB (H6b)	0.125	0.026	4.914	0.000*	-	Supported
SP → PC → DC → PB (H6c)	0.074	0.021	3.478	0.000*	-	Supported

The result was statistically significant ($p < 0.001$).

Table 15. Direct, Indirect, and Total Effect

	Perceived Control (PC) $R^2 = 0.573$			Decision Confidence (DC) $R^2 = 0.445$			Purchase Behavior (PB) $R^2 = 0.397$		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
Perceived Information Quality (PIQ)	0.389***	-	0.389***	-	0.259***	0.259***	-	0.163***	0.163***
Visual Interface Attractiveness (VIA)	0.298***	-	0.298***	-	0.199***	0.199***	-	0.125***	0.125***
Social Proof (SP)	0.175***	-	0.175***	-	0.117***	0.117***	-	0.074***	0.074***
Perceived Control (PC)	-	-	-	0.667***	-	0.667***	-	0.420***	0.420***
Decision Confidence (DC)	-	-	-	-	-	-	0.630***	-	0.630***

The result was statistically significant ($p < 0.001$).

According to Table 14, the analysis of the structural model reveals strong support for all hypothesized relationships. Perceived Information Quality emerges as the strongest predictor of Perceived Control (β=0.389, p<0.001), followed by Visual Interface Attractiveness (β=0.298, p<0.001) and Social Proof (β=0.175, p<0.001). The influence of Perceived Control on Decision Confidence is particularly robust (β=0.667, p<0.001). Decision Confidence strongly influences Purchase Behavior (β=0.630, p<0.001).

The mediation analysis confirms significant indirect effects of all three application quality dimensions on Purchase Behavior through the Perceived Control ⟶ Decision Confidence pathway. Perceived Information Quality has the strongest indirect effect (β=0.163,

p<0.001), followed by Visual Interface Attractiveness (β=0.125, p<0.001) and Social Proof (β=0.074, p<0.001). Overall, the model explains substantial variance in Perceived Control (R^2=0.573) and Purchase Behavior (R^2=0.397), demonstrating that application qualities significantly influence consumer purchasing decisions through enhanced perceptions of control and decision confidence, shown in Table 15. The tested structural model with statistical significance path was illustrated in Figure 2.

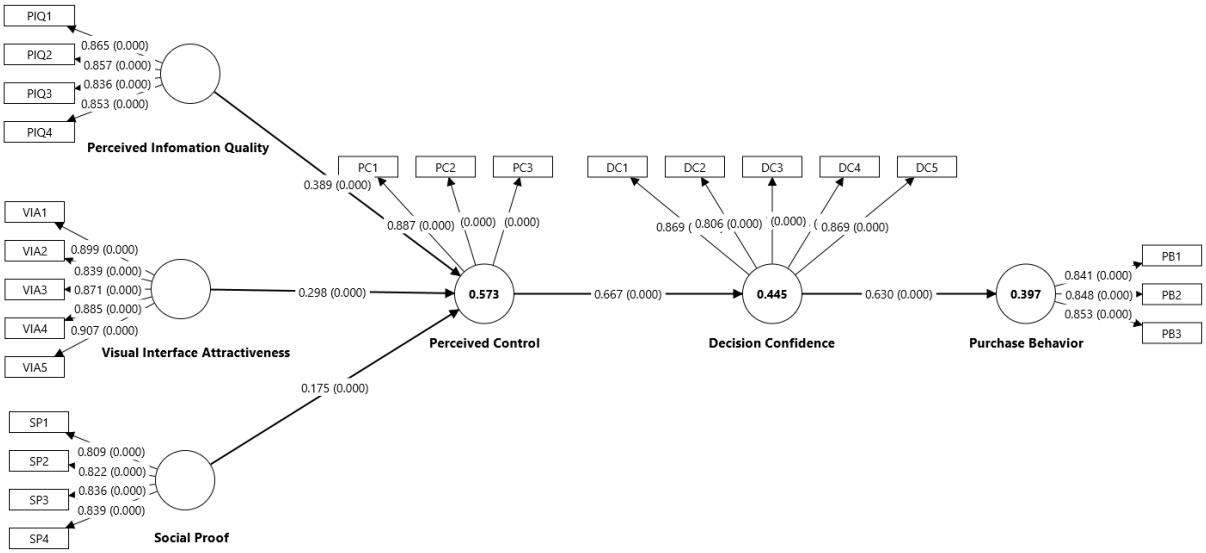


Figure 2. Tested Structural Model

Conclusion and Discussion

The results of the structural equation modeling provided strong support for all hypothesized relationships, and the results were highly consistent with current theoretical foundations and empirical findings. First, perceived information quality was identified as the strongest predictor of perceived control. This result is in line with the assumptions of cognitive load theory (Sweller, 1988) and previous research findings by Zou and Liu (2019) and Chopdar and Paul (2023). High-quality information, including accurate menu details, complete ingredient information, and transparent prices, significantly improve consumers' ability to effectively navigate and interact in the app. Second, the esthetics of the visual interface was an important positive determinant of perceived control, confirming the hypotheses of the Elaboration Likelihood Model (Petty & Cacioppo, 1986). These research findings are consistent with previous studies by Lee and Lim (2023) and Kim and Lennon (2013) showing that esthetically pleasing interfaces significantly improve the user experience by making

interactions more intuitive and enjoyable. Third, the phenomenon of social proof showed a modest but significant impact on perceived control. This finding is consistent with the existing literature on consumer-generated content and its influence on consumer decision making in online environments (Park & Chun, 2022; Filieri et al., 2015; Sparks & Browning, 2011). The results of the study show that positive user reviews and high ratings are a source of reassurance that enables users to feel more confident and empower their ordering decisions. Fourth, the study also confirms the significant effect of perceived control on decision certainty as expected from the theory of planned behavior (Ajzen, 1991). The result is consistent with the findings of Koufaris (2002) that customers who perceive more control when interacting with digital interfaces have more confidence in their decisions. Fifth, confidence in decision making has been shown to be a strong predictor of purchase behavior, which is supported by previous research highlighting self-efficacy as a determinant of consumer behavior (Cannon & Rucker, 2022; Bhattacherjee, 2001; Wang & Benbasat, 2007). Confidence generated translates perceived power into real consequences and thus provides efficacy for the stimulus-organism-response model (Mehrabian & Russell, 1974), where decision confidence serves as an important cognitive mediator between stimuli related to apps and real consumer actions. From these empirical results, a clear hierarchy of design priorities for mobile QSR applications emerges: Improvements in information quality have the greatest impact on behavior, followed by improvements in the visual user interface and the integration of social proof. For practical implementation, QSR operators should allocate an appropriate amount of development resources to improving information architecture, optimizing visual design and social proof features to maximize conversion rates and return on investment.

The mediation analysis demonstrates the presence of robust indirect effects of all three independent variables: perceived information quality, attractiveness of the visual interface and social proof, on purchase behavior through the mediators perceived control and decision confidence mediators. Perceived information quality conveyed the most robust indirect effect, suggesting that it plays a critical role in influencing consumers' overall experience and resulting outcomes. This finding confirms the evidence summarized in previous studies by Yogatama, 2023 and McLean et al. (2018) that providing consumers with safe, accurate and correctly conveyed information is a key component in developing consumer engagement and forming purchase decisions in online environments. The visual appeal of interfaces and social proof both showed significant indirect effects on purchase behavior. This is indicative of their complementary functions in enhancing consumer confidence and

behavioral intentions in line with existing literature (Kim, 2024; Filieri et al., 2015). These results demonstrate the significant influence of application design elements on consumers' psychological state and behavior. The validated mediation pathway provides QSR operators with a systematic implementation roadmap: Phase 1 should focus on improving information quality, followed by Phase 2, improving visual design, and Phase 3, integrating social proof to maximize the cumulative effect on purchase behavior.

However, a limitation of this study concerns the heterogeneity of mobile QSR platforms and their different technical features. Thai consumers use different food delivery apps (GrabFood, LINE MAN Wongnai, Foodpanda, ShopeeFood), which vary significantly in terms of design, functionality, and technological capabilities. Specific platform variations that can affect results include some features such as virtual assistants (VAs), AI-powered recommendations, voice ordering and chatbot support, while others have simpler interfaces.

Practical and Managerial Implications

The results of this study provide QSR brands with a solid handbook for modern digital marketing and communication — not just for app development. Leveraging perceived information quality means treating the app as a channel for brand content: QSRs should emphasize detailed, credible and transparent information not only within the app, but also in external communication, e.g. in social media posts or digital ads that present “behind the menu” stories, sourcing transparency or nutrition highlights. High-quality information becomes a brand asset that reduces consumer uncertainty and serves as compelling content at all customer touchpoints. The appeal of the visual interface should be considered as a branding tool in its own right. QSRs can extend the principles of engaging, appetizing and professionally designed imagery from the app to their wider campaigns, including Instagram content, dynamic website landing pages and even physical store screens. Brand image can be reinforced through a cohesive visual style that consumers immediately associate with freshness, quality and simplicity — in essence, the app and its communication channels become visually synonymous with the brand itself. This not only attracts attention but also builds trust in the brand and encourages spontaneous purchasing decisions. Social proof should be at the heart of marketing communication strategies. In addition to star ratings in the app, QSRs can reinforce customer reviews and positive user stories in advertising, whether it’s banner ads, influencer content or short videos. Sharing “most ordered" badges in real time, highlighting current menu items or showcasing user-generated content on social media creates a sense of popularity and

belonging. By actively integrating social proof into every stage of the digital marketing funnel, QSRs can build confidence in their decisions and inspire both new and returning customers to take action. Ultimately, the strategic use of these three elements enables QSRs to transform their digital platforms into compelling marketing ecosystems. By treating perceived information quality, user interface appeal and social proof as ongoing communication tools, brands can not only improve app engagement and conversion rates but also strengthen consumer loyalty and competitive differentiation in Thailand's rapidly evolving QSR landscape.

Academic Implications

This study contributes to the theoretical foundation by integrating Cognitive Load Theory, the Elaboration Likelihood Model, and the Theory of Planned Behavior into a model to explain consumer behavior related to mobile food ordering. The innovation is that this integration is empirically tested using PLS-SEM and decision confidence is quantitatively measured as a mediating effect. In contrast to previous studies that examined these constructs independently, the current study confirms their interdependence and identifies decision confidence as an important mediator in translating cognitive perceptions into actual purchase behavior. These findings extend the theory of digital consumer psychology and increase the relevance of behavioral theories in mobile commerce research.

This research creates significant new knowledge by establishing the first empirically validated, integrated cognitive framework for mobile QSR application design in Southeast Asian contexts. The discovery of sequential mediation mechanisms (design ⟶ control ⟶ trust ⟶ behavior) provides new theoretical insights while enabling practical solutions to industry challenges, such as the 50% abandonment rate.

Future Research Opportunities

There are several possibilities for future research. First, future research could examine the effects of influencer marketing in QSR applications, such as how endorsements from popular food critics or micro-influencers influence perceived information quality, social proof, and ultimately decision confidence and purchase behavior. Secondly, researchers could investigate the impact of personalization strategies such as AI-driven menu recommendations or targeted promotions on user engagement and loyalty and their interaction with perceived control and trust. In addition, conducting qualitative studies, such as interviews or focus groups, would enable a more comprehensive understanding of the emotional and experiential

aspects of mobile ordering and provide insights into consumers' perceptions of brand communication and digital touchpoints. Cross-cultural comparisons and longitudinal studies would also help to determine whether these marketing and communication factors hold true in different markets and over time. Such research directions will contribute to a more holistic view of how innovative communication strategies can improve the customer experience and drive business results in the evolving QSR sector.

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