

DETERMINANTS OF CONTINUOUS INTENTION ON ONLINE FOOD DELIVERY APPLICATIONS FROM CUSTOMERS PERSPECTIVES IN NORTHERN REGION, MALAYSIA

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Abstract: Online food delivery (OFD) services are increasingly common in Malaysia. Many people are drawn to using OFD in their daily lives because of its benefits for customers. Consumers have the option of ordering food online and using a delivery service rather than doing so in person. People from all walks of life are able to order food with just one click from their gadgets in the information technology (IT) era. Moreover, online food delivery applications (OFDAs) are a new type of platform for the distribution of online-to-offline (O2O) services. The term "OFDAs" refers to a mobile service that enables quick and easy online ordering as well as offline delivery of goods and services. This paper seeks to study the determinants of continuous intention to use online food delivery applications from customers' perspectives in the Northern Region, Malaysia. A quantitative approach was used in this study. Questionnaires were used to collect the data from all respondents via Google Form. The respondents were customers from the Northern Region, Malaysia, who used online food delivery applications, with a sample size of 477 people. Therefore, Partial Least Squares (SmartPLS) have been used to evaluate the research data. Finally, this study can be applied and extended to determine the determinants of continuous intention to use online food delivery applications in other countries.

Keywords: Continuous Intention, Online Food Delivery, Online Food Delivery Applications

Introduction

Food delivery is a courier service in which food is delivered to a customer by a restaurant, store, or independent food delivery company (Chai, 2019). Meanwhile, Online Food Delivery (OFD) refers to the preparation and delivery of customers' food online (Charlene, 2020). According to Ray (2019), the process by which food ordered online is cooked and delivered to customers by linking them with partner food service operations through their websites or mobile applications is termed OFD. Moreover, OFD is a digitalisation-based trend in which customers buy food or services online and pick them up at a physical location (Malhotra & Singh, 2020). A recent study by Tan (2021) found that 6.86 million Malaysians used online food delivery services (OFDS) in 2020. A Rakuten Insight survey in Malaysia found that 79% of respondents used OFDS during the pandemic, primarily because dining options in restaurants were temporarily prohibited due to COVID-19 measures (Müller, 2022). Today, Malaysia is transitioning to the endemic phase, but most people still prefer to use online food delivery services during and after the post-Covid-19 pandemic. Hence, this situation shows that Malaysian customers are more interested in ordering food through OFDAs (Tan et al., 2021).

Food delivery applications (FDAs) are regarded as a subset of online-to-offline (O2O) services. FDAs are characterised as service-based mobile applications that allow the customer to order food online and have it delivered to their doorsteps (Alalwan, 2020; Rabaa'i et al., 2022). Similar studies by Dorothy Johnson (2021) also highlighted the characteristics of OFDAs. The attributes of OFDAs include search filters, live tracking, chat or call support, payment methods, scheduled delivery and pick-up, and dine-in options. Thus, this study concludes that OFDAs have multiple functions that provide convenience to customers.

In Malaysia, OFDS are becoming more popular among customers as they encourage the use of OFD in daily life. By using OFDAs, busy working customers benefit by saving time and gaining convenience, especially when they are rushing and unable to grab a meal (Gupta, 2020; Hooi et al., 2021). However, several issues arise, such as a lack of knowledge about using OFDAs (Frederick & Bhat, 2021; Setiaji et al., 2021). Customers, particularly those from the older generation, often have trouble accessing technology because the applications are not easy to use due to their features, affecting the adoption of online food ordering (Frederick & Bhat, 2021). In addition, the findings of a study by Said (2021) in Malaysia related to the tendency to use online food delivery services in Pulau Pinang showed that only 6.3% of respondents aged 41 and over used these services. Other studies found similar findings, showing that the elderly lack knowledge in using online applications such as Foodpanda, GrabFood, and others (Amist et al., 2021; Hooi et al., 2021; Sin et al., 2022; Pal et al., 2022).

Besides that, another issue is poor facilities provided by OFD companies (Gupta, 2019; Lau, 2019; Ganatra, 2021). There are a few drawbacks to OFD, such as the absence of in-person interactions with service providers, the lack of replacement options for food with an unpleasant flavour or that has spoiled, and the lack of guarantees regarding taste and hygiene conditions (Gupta, 2019). In addition, Lau and Ng's study in 2019 stated that OFD services in Malaysia still face challenges regarding location and coverage boundaries, which slow down deliveries. Other studies found similar findings, showing that companies are poor at providing facilities for OFDA customers, such as proper logistics control, timely delivery, and an adequate number of delivery staff (Keeble, 2021; Roslan et al., 2022; Samuel et al., 2021).

Moreover, the emphasis on these issues is linked to other concerns, such as a lack of trust in OFDAs (Ye-Eun et al., 2017; Hu & Chen, 2018; Anic et al., 2019; Ghosh, 2020; The Sun Daily, 2021; Setiaji et al., 2021). Studies show that Online Privacy Concerns (OPC) influence attitudes toward online purchases because customers are unwilling to provide information to the FDA (Anic et al., 2019). Additionally, customers worry about security, payment options, quality, fees, and prices when local restaurants cooperate with the FDA due to a lack of trust in OFDAs (Ghosh, 2020). A study by Liem (2022) shows that customers lack trust in OFDAs due to various related problems such as privacy and security. Other studies found similar findings related to the lack of trust in using OFDAs (Koiri et al., 2019; Pal et al., 2022). This present study assessed the determinants of continuous intention to use online food delivery applications from customers' perspectives in Northern Region, Malaysia. The next section elaborates on the methods applied in this study, followed by a section presenting the results and discussion.

Literature Review

This study uses the UTAUT model and the Unified Theory of Acceptance and Use of Technology (UTAUT). The purpose of this model is to predict how people will act when utilising technology. The moderating variable for this study is gender, which was selected by the researcher. First, in place of the behavioural intention variable, the continuous intention variable is added. In order to focus on the customer's ongoing intention to utilise the OFDAs during the ordering procedure, the researcher eliminated the use behaviour variable. The study model's second change is the inclusion of two new factors: information quality and trust. These variables are used to determine consumers' ongoing intention towards OFDAs in the Northern Region of Malaysia. The researcher expanded the factors of trust and information quality to set themselves apart from earlier research that solely employed the UTAUT model rather than UTAUT2. Hedonic motivation, price value, and habit make up the UTAUT2 model. This study proposes one moderating variable, nine independent variables, and one dependent variable as the factors that influence customers' continuous intention regarding OFDAs in Malaysia's Northern Region. Continuous intention is the variable that is reliant. Performance expectancy, effort expectancy, social influence, enabling condition, hedonic motivation, price value, habit, information quality, and trust are the nine variables that make up the independent variable. The third change in this research is that age and experience are not included as moderating factors. As a result, this study collected data using a cross-sectional method as opposed to a longitudinal one.

Methodology

The study's goal was measured using a cross-sectional data approach. A purposive sampling technique was used by distributing questionnaires online using Google Form. The respondents were customers from the Northern Region which are Perak, Perlis, Kedah and Pulau Pinang who used online food delivery applications, with a sample size of 477 people. The questionnaire in this study has two sections: Section A and Section B. The respondents were required to complete a variety of demographic questions in Section A, which examined the background details of the sample, including gender, age, educational history, and others. Meanwhile, Section B consisted of information about online food delivery applications. Therefore, a Likert scale was utilised in this study to gauge respondents' opinions about the measurement statements (Sudha & Baboo, 2011). This study applies a 7-point Likert scale rather than a 5-point Likert scale because it is assumed that respondents have more options, allowing for a more thorough analysis (Hussey & Hussey, 1997).

Results And Discussion

Demographic Details of the Respondents

The demographic overview provides background information on 477 respondents consisting of 62.5% females and 37.5% males. This shows that the largest segment of respondents who use online food delivery applications is female. In terms of race, the Malays are the majority (84.9%), followed by Chinese (6.5%), Indian (4.4%), and others (4.2%). These respondents from Malaysia's Northern Region vary widely in terms of origin and culture. The age group between 21 and 25 years has the highest distribution (60.0%), while the age group above 50 years has the lowest (3.4%). The majority have Bachelor's Degrees (47.0%), followed by Diplomas (24.5%) as their highest educational level. According to this survey, respondents aged between 21 and 25 and holding Bachelor's Degrees are more conscious of using online food delivery applications. The data also reveal that respondents prefer utilising FoodPanda (55.3%) and GrabFood (43.4%) compared to Lalamove (0.8%) and Tapau Food (0.4%) because they are considered more dependable and practical.

Additionally, the lowest monthly income category is above RM 5,000 (3.8%) and the highest is below RM 1,000 (57.9%). Furthermore, employed respondents prefer to buy food online (53.7%) compared to those who are unemployed (8.0%) as they have sources of income. Finally, respondents rarely used OFDAs (1-2 times/month) (65.6%) to purchase food, as they prefer to visit physical store locations compared to using OFDAs.

Assessment of the Measurement Model

Before testing the hypotheses, the measurement model or outer model was examined. The purpose of the outer model in SmartPLS is to determine the connection between the observable and underlying constructs. It is also important to evaluate the outer model to confirm the validity and reliability of the instrument. According to Churchill (1979), measurement models must be evaluated to identify the best indicators for correctly operationalizing a given construct. To assess construct validity, this study employed three types of analysis: content validity, convergent validity, and discriminant validity (Hair et al., 2014). Figure 1 shows the measurement model evaluation.

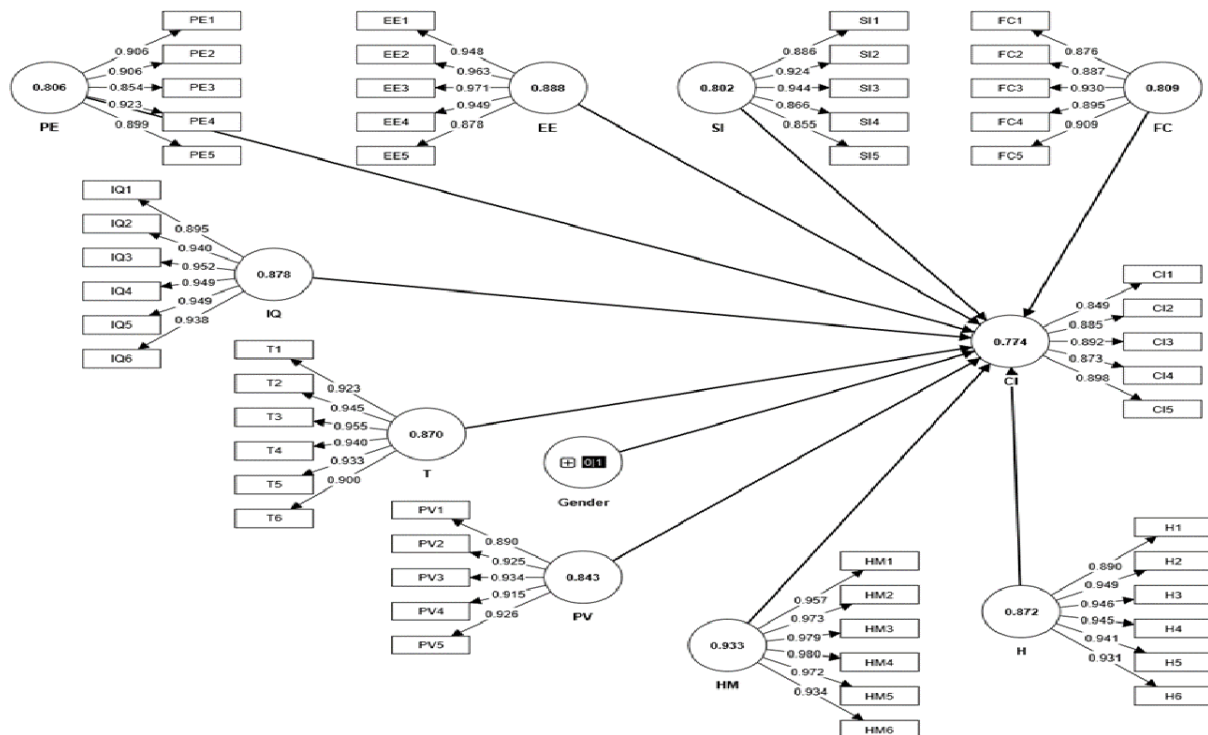


Figure 1: Measurement Model Evaluation

Content Validity

Content validity refers to the ability of the items created for a construct and their suitability to assess the concept (Hair et al., 2014). Furthermore, Principal Component Analysis (PCA), which is employed to evaluate the underlying factors, forms the foundation of Smart PLS (Bohrstedt, 1970). To demonstrate that all items belong to their specific constructs, it is essential to ensure that their loadings on those constructs are higher than their loadings on other constructs. There are two techniques to verify the accuracy of the items. Firstly, compared to their loadings on other constructs, indicators should have the highest loadings on their particular constructs. Secondly, each construct should be heavily loaded by the item loadings. The findings of this investigation support content validity through both of the aforementioned approaches.

Additionally, item loadings for the mutual relationships should be greater than 0.30 (Rourke & Anderson, 2004). Item loadings have also been characterised by Chan (2003) as poor (0.30), fair (range of 0.31 to 0.50), moderate (0.51 to 0.60), and moderately strong (0.61 to 0.80). The findings reveal the item loadings for each of the components used, including continuous intention, performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, perceived value, habit, information quality, and trust. Each loading in this investigation was found to be more than 0.51, indicating either a moderate or moderately strong loading.

Convergent Validity

Convergent validity is the degree to which a set of items correlates with other measures of the same construct (Hair et al., 2010). Certain requirements, including factor loadings, composite reliability (CR), and average variance extracted (AVE), must be met to demonstrate convergent validity (Sekaran & Bougie, 2016). All item loadings were examined to achieve this. According to multivariate analytic literature, items with loading values of 0.50 or higher are suitable for

analysis, while those with loading values lower than 0.40 should be removed (Fornell & Larcker, 1981; Hair et al., 2014). However, Hair et al. (2014) argued that outer loadings between 0.40 and 0.70 should only be removed if doing so results in an increase in composite reliability or average variance extracted. To fully explain the variance indicator, the average variance extracted must surpass 0.50, and composite reliability must exceed 0.70 (Gefen et al., 2000). According to Table 1, the loading factors for the constructs in this investigation range from 0.849 to 0.980. Because they have no discernible effect on the increase in average variance extracted and composite reliability, loading factors less than 0.70 were retained. Additionally, the average variance extracted (AVE) values ranged from 0.774 to 0.933, and the composite reliability of each construct ranged from 0.945 to 0.988, which are significantly higher than the recommended values. As a result, convergent validity is confirmed, as the results fully meet all of the requirements.

Table 1: Convergent Validity Analysis

Construct	Item	Loading	Cronbach Alpha	Composite Reliability (CR) ²	AVE
Continuous Intention	CI1	0.849	0.927	0.945	0.774
	CI2	0.885			
	CI3	0.892			
	CI4	0.873			
	CI5	0.898			
Effort Expectancy	EE1	0.948	0.968	0.975	0.888
	EE2	0.963			
	EE3	0.971			
	EE4	0.949			
	EE5	0.878			
Facilitating Conditions	FC1	0.876	0.941	0.955	0.809
	FC2	0.887			
	FC3	0.930			
	FC4	0.895			
	FC5	0.909			
Habit	H1	0.890	0.972	0.976	0.872
	H2	0.949			
	H3	0.946			
	H4	0.945			
	H5	0.941			
	H6	0.931			
Hedonic Motivation	HM1	0.957	0.986	0.988	0.933
	HM2	0.973			
	HM3	0.979			
	HM4	0.980			
	HM5	0.972			
	HM6	0.934			
Information Quality	IQ1	0.895	0.972	0.977	0.878
	IQ2	0.940			
	IQ3	0.952			
	IQ4	0.949			
	IQ5	0.949			
	IQ6	0.938			

Performance Expectancy	PE1	0.906	0.940	0.954	0.806
	PE2	0.906			
	PE3	0.854			
	PE4	0.923			
	PE5	0.899			
Price Value	PV1	0.890	0.953	0.964	0.843
	PV2	0.925			
	PV3	0.934			
	PV4	0.915			
	PV5	0.926			
Social Influence	SI1	0.886	0.938	0.953	0.802
	SI2	0.924			
	SI3	0.944			
	SI4	0.866			
	SI5	0.855			
Trust	T1	0.923	0.970	0.976	0.870
	T2	0.945			
	T3	0.955			
	T4	0.940			
	T5	0.933			
	T6	0.900			

a: Composite Reliability: $CR = (\sum \text{factor loading})^2 / \{(\sum \text{factor loading})^2 + \sum (\text{variance of error})\}$ b: Average Variance Extracted: $AVE = (\sum \text{factor loading})^2 / \{\sum (\text{factor loading})^2 + \sum \text{variance of error}\}$

Discriminant Validity

The goal of discriminant validity is to confirm the construct validity of the outer model by ensuring that the items used are distinct and not overly related to other constructs. Discriminant validity can be confirmed if the diagonal elements are valued higher than the ones in their corresponding columns and rows. Two techniques are commonly used to assess discriminant validity: cross-loadings and the Fornell-Larcker criterion. In accordance with the recommendations by Fornell and Larcker (1981) and Hair et al. (2014), this study examined discriminant validity using the square roots of the average variance extracted (AVE). Additionally, the square root of AVE should be greater than 0.50. The results in the correlation matrix reveal that the square roots of the average variance extracted (AVE) are higher than the other values in the corresponding rows and columns. After establishing content validity, convergent validity, and discriminant validity, the construct validity of the outer model was proven. Therefore, it is assumed that the findings related to the hypotheses will be dependable and valid.

The Assessment of the Model and Hypothesis Testing

After establishing the measurement model, the structural model is assessed to test hypotheses and explain relationships between latent variables. This includes evaluating path coefficient significance, R-square levels, effect size, predictive relevance, and moderating effects (Hair et al., 2014). Smart PLS software was used in this study, applying bootstrapping techniques to assess statistical significance. The PLS algorithm generated path coefficients, with bootstrapping producing t-values based on 10,000 bootstrap samples and 433 cases. The resulting P-values and estimates for the structural model, including the moderating effect of gender, are presented in Figure 2.

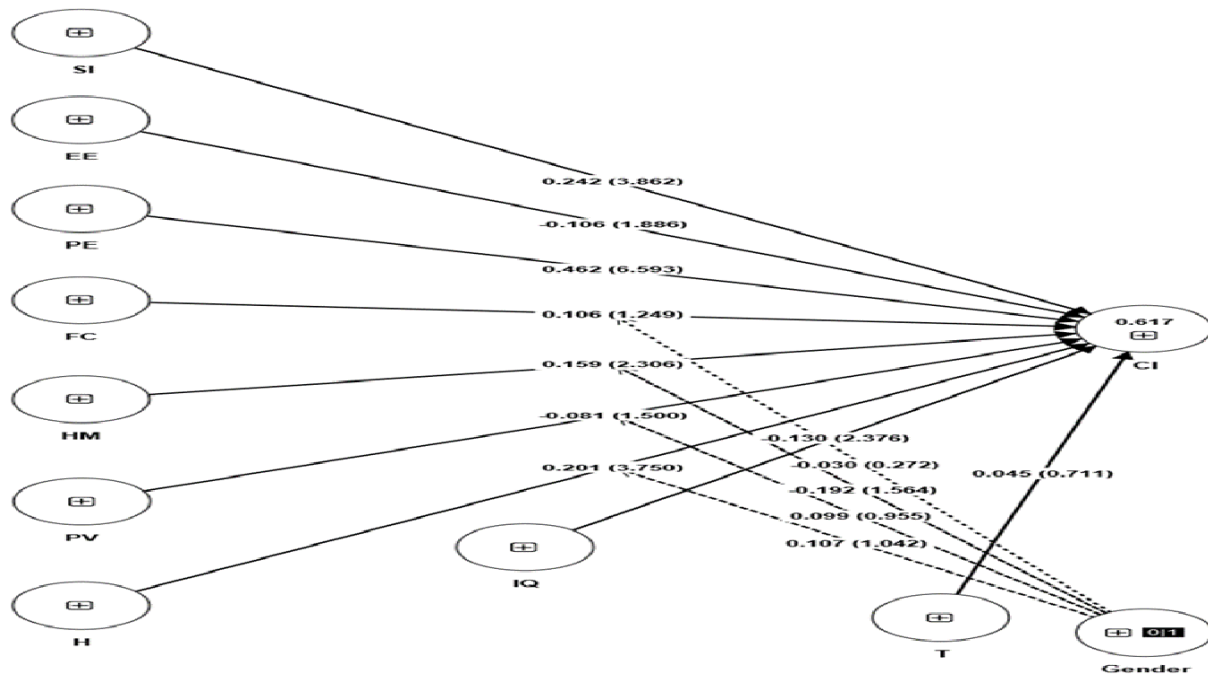


Figure 2: Path Model Results

Table 2 illustrates the final results of the structural model assessment with the moderator. The bootstrapping technique calculated the p-values for all direct relationships (H1-H13). The results reveal that continuous intention (CI) is positively impacted by performance expectancy (PE) ($\beta=0.462$, $t=6.593$, $p<0.001$), social influence (SI) ($\beta=0.242$, $t=3.862$, $p<0.001$), hedonic motivation (HM) ($\beta=0.159$, $t=2.306$, $p<0.001$), habit (H) ($\beta=0.201$, $t=3.750$, $p<0.001$), and information quality (IQ) ($\beta=-0.130$, $t=2.376$, $p<0.001$). However, hypotheses H2, H4, H6, and H9 were rejected. Effort expectancy (EE) ($\beta=-0.106$, $t=1.886$, $p>0.05$), facilitating conditions (FC) ($\beta=0.106$, $t=1.249$, $p>0.05$), perceived value (PV) ($\beta=-0.081$, $t=1.500$, $p>0.05$), and trust (T) ($\beta=0.045$, $t=0.711$, $p>0.05$) were not significantly related to continuous intention (CI).

Table 2: Convergent Validity Analysis

Hypothesis	Relation	Path Coefficient	T-Value	P-Value	Decision
H1	PE->CI	0.462	6.593	0.000***	Supported
H2	EE->CI	-0.106	1.886	0.059	Not Supported
H3	SI->CI	0.242	3.862	0.000***	Supported
H4	FC->CI	0.106	1.249	0.212	Not Supported
H5	HM->CI	0.159	2.306	0.021*	Supported
H6	PV->CI	-0.081	1.500	0.134	Not Supported
H7	H->CI	0.201	3.750	0.000***	Supported
H8	IQ->CI	-0.130	2.376	0.018*	Supported
H9	T->CI	0.045	0.711	0.477	Not Supported
H10	GENDER*FC->CI	-0.30	0.272	0.785	Not Supported
H11	GENDER*HM->CI	-0.192	1.564	0.118	Not Supported
H12	GENDER*PV->CI	0.099	0.955	0.339	Not Supported
H13	GENDER*H->CI	0.107	1.042	0.298	Not Supported

Testing Moderating Effect

This study used Smart PLS to analyse the moderating influence of gender on the relationships between facilitating conditions, hedonic motivation, perceived value, and habit in continuous intention. Previous research, such as Yu (2012), has shown that age and gender moderate the effects of price value and facilitating conditions on behavioural intentions—particularly among older women. Additionally, the relationships between habit, hedonic motivation, and behavioural intentions have also been moderated by factors like gender, age, and experience. However, no prior studies have specifically examined gender's moderating role in these factors within the context of online food delivery applications, nor have any gender differences been discussed in the hypothesized relationships of this model.

According to the results in Table 2, gender does not significantly moderate the relationships between continuous intention (CI) and facilitating conditions (FC) ($\beta=-0.30$, $t=0.272$, $p>0.1$) or hedonic motivation (HM) ($\beta=-0.192$, $t=1.564$, $p>0.1$). Hypothesis H12 is also not supported, showing that gender does not moderate perceived value (PV) ($\beta=0.099$, $t=0.955$, $p>0.1$). Finally, hypothesis H13 reveals that gender does not significantly moderate the relationship between habit (H) and continuous intention (CI) ($\beta=-0.107$, $t=1.042$, $p>0.1$).

Conclusion

This study aimed to develop a model for OFDAs in Malaysia using the UTAUT2 framework, with gender as a moderating factor. It identified key determinants influencing the continuous intention of OFDAs, including performance expectancy, social influence, hedonic motivation, habit, and information quality. However, effort expectancy, facilitating conditions, price value, and trust were found to have no significant relationship with continuous intention. Notably, performance expectancy emerged as the most influential factor, while gender did not moderate the relationships between continuous intention and other variables.

The findings suggest that OFDA service providers need to improve system performance, usability, and awareness to enhance customers' continuous use of the technology. Customers expressed concerns about limitations in knowledge, awareness, and the capabilities of OFDAs, suggesting that improving system quality could lead to higher adoption rates. Gender differences had no significant effect, indicating that continuous intention to use OFDAs was consistent across genders in the Northern Region of Malaysia.

This study contributes both theoretically and practically by providing insights into the adoption of OFDAs. However, it acknowledges several limitations, such as the geographical focus on Northern Malaysia and reliance on a questionnaire for data collection. Future research could expand the geographical scope, explore additional variables like perceived economic risk, and adopt qualitative methods to gain deeper insights into technology adoption in the food industry. The absence of significant gender moderation also suggests the need to investigate other potential moderating factors.

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Authors' Contribution

Nur Syakinah Binti Abdul Nasir wrote the first draft and analysis; Nurul Labanihuda Abdull Rahman wrote and edited the paper, Hasyeilla Binti Abd Mutalib reviewed and Mohd Imran Khusairi Bin Shafee improved the article.

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